

**Board of Education  
Newtown, Connecticut**

Minutes of the Board of Education meeting on June 18, 2019 at 6:00 p.m. in the Municipal Office Building, 3 Primrose Street.

M. Ku, Chair	L. Rodrigue
R. Harriman-Stites, Vice Chair	J. Evans Davila (absent)
D. Cruson, Secretary	R. Bienkowski
D. Leidlein	14 Staff
J. Vouros	8 Public
A. Clure	2 Press
D. Delia	

Mrs. Ku called the meeting to order at 6:05 p.m.

MOTION: Mr. Cruson moved that the Board of Education add “discussion of the Superintendent contract” to the executive sessions. Mr. Delia seconded. Motion passes unanimously.

MOTION: Mrs. Harriman-Stites moved that the Board of Education go into executive session for the evaluation of the Superintendent and discussion of the Superintendent contract, the non-union wages for 2019-2020, and to interview the candidate for the Director of Teaching and Learning position and invite Dr. Rodrigue, Mr. Bienkowski and Frank Purcaro. Mr. Cruson seconded. Motion passes unanimously.

Item 1 – Executive Session

Executive session ended at 7:34 p.m.

Item 2 – Pledge of Allegiance

Item 3 – Action on Executive Session Items

MOTION: Mrs. Harriman-Stites moved that the Board of Education approve salary adjustments for all non-union employees for 2019-2020 as per the Superintendent’s recommendation. Mr. Cruson seconded. Motion passes unanimously.

MOTION: Mrs. Harriman-Stites moved that the Board of Education appoint Frank Purcaro Director of Teaching and Learning, effective September 1, 2019, subject to the terms of the Memorandum of Agreement with the Newtown Association of School Administrators regarding the position of Director of Teaching and Learning, and subject to the satisfactory completion of all statutory requirements concerning the hiring of Board of Education employees. Mr. Delia seconded.

Mr. Delia was very excited Mr. Purcaro was coming to Newtown which will be wonderful for the teachers, children and community.

Mrs. Harriman-Stites was part of the search committee and was thrilled he decided to come to Newtown.

Motion passes unanimously.

Mr. Purcaro thanked the members of the Board of Education and Dr. Rodrigue for this tremendous opportunity. He has had discussions about the great culture here and was excited to be part of the team.

Item 4 – Celebration of Excellence

Dr. Rodrigue was proud to recognize the teacher of the year and paraeducator of the year. They are both highly regarded individuals in the community.

Kim Lowell, 2019 Teacher of the Year, has been a physics teacher at Newtown High School since 1999. She is an exemplary educator who strives to provide each student with the tools he or she needs to be successful. She is a champion of children and individualizes her instruction so that all students are able to learn to the best of their ability. Kim will represent Newtown in the Connecticut Teacher of the Year Program.

Pamela Jackson, 2019 Paraeducator of the Year, has been at Reed Intermediate School since 2006. Pam exemplifies dignity, professionalism, and commitment to fulfilling the components of her job. Her greatest strength is her patience and dedication to the students and she will be honored at the State level in the fall of 2019.

#### Item 5 – Consent Agenda

MOTION: Mrs. Harriman-Stites moved that the Board of Education approve the consent agenda which includes the donation to Newtown High School and the correspondence report. Mr. Cruson seconded. Motion passes unanimously.

#### Item 6 – Public Participation

##### Item 7 – Reports

Chair Report: Mrs. Ku attended a CABE government relations meeting and a resolutions committee meeting by phone. The special education funding task force did not have a recommendation. CABE is looking for resolutions from districts regarding their legislative recommendations which are due in August.

#### Superintendent's Report:

Dr. Rodrigue said the year ended on a positive note with an outstanding high school graduation and middle school moving-up ceremony and thanked the staff and administration at both schools. We have curriculum writing projects taking place with a new format this year with teachers only working at the high school and Reed which will allow for more collaboration. Alams by Precision began replacing cameras in the elementary schools. The new district website will be presented this evening which will be far more user friendly for our staff and parents.

#### Committee Reports;

Mr. Vouros said at the last Curriculum and Instruction Committee meeting they met with fine arts teachers from the middle school with a pilot proposal for 8<sup>th</sup> grade students to continue taking courses with the level of interest they choose. They also met with Sara Strait regarding the Project Adventure and Beyond pilot program for Reed.

Mr. Cruson said the CIP and finance committee met and reviewed the 2020-2021 CIP recommendations. They also discussed the 2019-2020 budget adjustments and an update on the lunch program and increase in the cost of lunches.

Mr. Clure thanked Jeff Tolson who runs REACH after school at the high school. This program recognizes seniors and inducts them into the REACH Hall of Fame. He also thanked Nathalie de Brantes for her work on the high school graduation.

#### Financial Report:

MOTION: Mrs. Harriman-Stites moved that the Board of Education approve the financial report for the month ending May 31, 2019. Mr. Cruson seconded.

Mr. Bienkowski presented the financial report and noted that we received the second installment of the Excess Cost and Agency Placement Grant which amounted to \$408,894. This was \$121,496 more than budgeted. The non-lapsing account now has approximately \$230,000.

Mr. Delia asked if we used any of the \$100,000 in the special education contingency fund. Mr. Bienkowski said we will use it when we make transfers at the end of the year. We will need it for special education tuition which is \$101,000 in the red. He expects we will use the whole contingency amount.

Mrs. Ku said we allocated some of the non-lapsing fund for general expenditures and a separate fund for special education costs but that amount could also be used for other things. Mr. Bienkowski said it could be used for other areas which the Board would decide.

Motion passes unanimously.

#### Item 8 – Old Business

Algebra 1, Algebra 11 and Geometry Curricula:

MOTION: Mrs. Harriman-Stites moved that the Board of Education approve the Algebra I, Algebra II and Geometry curricula. Mr. Delia seconded.

Mrs. Leidlein was concerned about taking algebra 11 right after algebra 1. The majority of the SAT is based on algebra. She asked how many students come into the high school that are already placing out of algebra 1 and taking algebra 11 as freshmen and asked if any freshmen take geometry. What do we do for those students who have another year removed from an algebra refresher before SATs? She asked if any action should be taken for test preparation.

Dr. Longobucco said students don't place out of algebra or geometry if they've taken it in the middle school. Those students would get back to pre-calculus which has an algebra driven content in their junior year. Regarding geometry, juniors do warm-up activities prior to the SAT. Mrs. Leidlein asked if we looked at any data from the SATs to see how we did in math. Dr. Longobucco said we did and there was an improvement.

Mr. Clure appreciated Mr. Hall's presentation at the last meeting and thanked him and the staff for coming out to the meeting.

Mrs. Ku questioned how resources are used and the process for curriculum revision which teachers develop after training and then it's sent to the district committee and finally to the Curriculum Council and Curriculum and Instruction Committee.

Dr. Longobucco said units in the curriculum are looked at in the PLC groups at the building level and they don't necessarily go through a curriculum change.

Dr. Rodrigue said the Curriculum Council digs deep into the curriculum with lots of checks and balances in the process.

Motion passes unanimously.

Budget adjustments:

2019-2020 Budget Adjustments:

MOTION: Mrs. Harriman-Stites moved that the Board of Education approve the preliminary 2019-2020 budget adjustments. Mr. Cruson seconded.

The motion was amended to read: Move that the Board of Education approve the preliminary and salary 2019-2020 adjustments.

Mr. Bienkowski stated that this is done every year based on things that occurred since the budget was approved.

Vote on the amendment: 7 ayes

Vote on the amended motion: 7 ayes Motion passes unanimously.

#### Item 9 – New Business

Fundations Reading Program:

MOTION: Mrs. Harriman-Stites moved that the Board of Education approve the Fundations Reading Program. Mr. Vouros seconded.

Dr. Rodrigue introduced Chris Moretti and Patty Vitarelli who visited neighboring schools using this program.

Mr. Moretti said a group of administrators and language arts consultants went to Waterford, Trumbull, Region 10 and Monroe where they offered Fundations and the Teachers College program. We preferred Fundations.

Mrs. Vitarelli said they considered the Words Their Way program but we all felt Fundations would meet our students' needs. The program is based on Wilson and taught 30 minutes a day with whole groups. This program covers grades K-3 but we want to adopt it for K-1 next year.

Mrs. Leidlein asked if we have a professional development plan to train teachers.

Mr. Moretti said we are mapping out PD for next year and this would be discussed the next day.

Mr. Delia asked about why it is not being used in 2<sup>nd</sup> and 3<sup>rd</sup> grades.

Mrs. Vitarelli said we were discouraged from offering to 2<sup>nd</sup> and 3<sup>rd</sup> grade because they haven't been exposed to enough from Words Their Way.

Mr. Delia asked about teacher preparation for Fundations.

Mrs. Vitarelli said Fundations has eliminated a lot of preparation for teachers unlike the other programs.

Mr. Moretti said the program is very regimented and the process and materials was all the same from K-3. We want the teachers trained well and they are very excited about this possibility. This will be a priority so we will make sure we map out what they need.

Mrs. Leidlein asked how this compared to Words Their Way.

Mrs. Vitarelli said the first year will be expensive to get it started but it will be more cost beneficial than Words Their Way.

Mr. Vouros asked the students' reaction when they observed their lesson.

Mrs. Vitarelli said they were completely engaged and quick and proud. It was seamless.

Mr. Moretti said there are many modalities like singing and chanting.

Motion passes unanimously.

Project Adventure Pilot:

MOTION: Mrs. Harriman-Stites moved that the Board of Education approve the Project Adventure Pilot for Reed Intermediate School. Mr. Vouros seconded.

Sara Strait spoke about the proposed Project Adventure and Beyond pilot program which will incorporate the elements of Project Adventure and applied Social Emotional Learning competencies.

Mrs. Harriman-Stites felt it was a great idea and made sense to do it this way.  
Mr. Clure asked if they could use the Project Adventure equipment at the high school but Mrs. Strait said it was too high.

Mrs. Ku said there was an opportunity to expand the equipment already at Reed.  
Mrs. Strait said they have a few low elements there.  
Mr. Vouros said it would be helpful to know the cost of equipment which would be needed.  
Mrs. Uberti said they are looking at other funding sources right now.

Motion passes unanimously.

District Web Site:

Carmella Amodeo and Joanne Morris presented the new website.

Mr. Delia asked if there were any security concerns related to the posting of the website  
Mrs. Amodeo said there were none because our provider stepped up to having precautions and has protected it as well as they can.

Mr. Delia asked who managed this with updates from the schools.  
Mrs. Morris said she and Mrs. Amodeo would share that until we get rights to pass it to anyone else.  
Dr. Rodrigue thanked them for the work that went into this project.

CIP:

MOTION: Mrs. Harriman-Stites moved that the Board of Education approve the CIP as recommended by the CIP/Facilities/Finance Subcommittee. Mr. Vouros seconded.

Mr. Cruson spoke about the CIP.

Mr. Bienkowski said regarding the Hawley work in the 2020-2021 year we have to assume it will be on the referendum in April 2020. The proposal is to engage an architect and engineering firm to do the design to be bid in January 2021 and done in the 2021-2022 school year.

Mr. Clure asked what percentage of Hawley will be cooled.  
Mr. Bienkowski said it would be the entire building.  
Mr. Clure said that would make Middle Gate the only elementary school without air conditioning and questioned why it was pushed out further.

Mr. Bienkowski said we tried to focus on schools with the greatest issues with heat. Hawley and the middle school have had more issues.  
Mrs. Leidlein said that Hawley and the middle school are multi-level so that adds to the heat concerns as well as the age of those buildings.  
Mr. Clure feels we should do Middle Gate after those schools.

Mrs. Leidlein said those schools also had to do with ventilation. The CIP is part of what the town borrows and gets combined with town projects. We need to be aware that asking for high dollar projects multiple years in a row effects other areas.

Mrs. Ku understands that but is sympathetic to Mr. Clure's comment on Middle Gate needing air conditioning. She would like to see a Middle Gate air conditioning plan.  
Mr. Bienkowski felt we should go back to the Climate Control Committee to see which schools are included.

Mrs. Leidlein said the CIP Committee can discuss this.  
Mr. Bienkowski said we say that we can consider this but is not sure we should get into that debate now.

Mr. Vouros suggested contacting Chris Geissler to see how he feels about this. Mr. Vouros was there in June and the heat was unbearable in the courtyard as there are no blinds on the windows.

Mr. Clure would like to see that Middle Gate get some consideration. It was unbearable last week and the whole back wing is very hot. He would like to see Middle Gate considered in the next five years.  
Mrs. Leidlein said if we move this forward tonight she thinks the CIP committee could meet and talk about that project and make the changes but not be before we present to BOF.

Motion passes unanimously.

#### First Read of Policies:

Mrs. Harriman-Stites spoke about each policy.

Policy 5141.27 First Aid/Emergency Medical Care – Use of Automatic External Defibrillators is an edit of an existing policy. The critical piece is that we added alternate language to give the Superintendent the ability to administer guidelines.

Mrs. Leidlein asked if this had anything to do with administering first aid on school buses.

Mrs. Harriman-Stites said it was just for schools.

Policy 5141.3 Health Assessments and Immunizations has changes around sports and when children get physicals.

Policy 5141.4 Reporting of Child Abuse and Neglect is a standard policy but we edited the regulation.

Policy 5141.61 Dealing with the Effect of a Death is a new policy. Dr. Rodrigue and the A-Team worked on this ensuring common practice in the schools.

Policy 5141.7 Student Sports – Concussions is new.

Mr. Delia confirmed that coaches will be required to do training.

Mrs. Harriman-Stites said there would be additional training.

Mrs. Leidlein asked if there was any consideration given to how many concussions an athlete can have before they are not allowed to play sports.

Dr. Rodrigue said it is normally the doctor's recommendation and working with the families and the coach.

Mrs. Leidlein thought we should have some wording that speaks to that.

#### Minutes of June 4, 2019

MOTION: Mrs. Harriman-Stites moved that the Board of Education approve the minutes of June 4, 2019. Mr. Cruson seconded. Vote: 6 ayes, 1 abstained (Mrs. Leidlein) Motion passes.

Mr. Clure thanked Terri Greenfield for her work on the middle school moving up ceremony which takes a lot to plan.

Item 10 – Public Participation

MOTION: Mrs. Harriman-Stites moved that the Board go into executive session for the evaluation of the Superintendent and discussion of the Superintendent contract. Mr. Cruson seconded. Motion passes unanimously.

Item 11 – Executive Session

MOTION: Mr. Cruson moved to adjourn the meeting. Mrs. Harriman-Stites seconded. Motion passes unanimously.

Item 12 – Adjournment

The meeting adjourned at 11:30 p.m.

Respectfully submitted:

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Daniel J. Cruson, Jr.  
Secretary

May 30, 2019

TO: Lorrie Rodrigue

FROM: Kimberly Longobucco

Please accept the donation of \$250 from Newtown Rotary Club Foundation to the Newtown High School Unified Arts Program.

This is a very generous donation.

Thank you.

Newtown Rotary Club  
PO Box 263  
Newtown, CT 06470



Correspondence Report  
05/21/2018 – 06/17/2019

<b>Date</b>	<b>Name</b>	<b>Subject</b>
5/21/19	Juliette de la Salle	Press request // French TV report
5/23/19	Aaron Carlson	Student experiences
6/8/19	David Kreymborg	Ipad

**NEWTOWN BOARD OF EDUCATION**  
**MONTHLY FINANCIAL REPORT**  
**May 31, 2019**

**SUMMARY**

The May financial report indicates that the Board of Education spent approximately \$4.6M; \$3.7M on salaries; with the balance of \$0.9M for all other objects.

The second installment of the Excess Cost and Agency Placement Grant has been received and was based on a state calculated rate of 73.62%, which amounted to \$408,894. This grant, which is \$121,496 more than budgeted, is now captured in the highlighted “YTD Expenditure” column and has worked its way to the bottom line. The offsetting revenue schedule details the final amount received.

Balances continue to adjust as operations move toward year-end closure while additional accommodations are made. Salaries balance projection will be about \$22,000 less. Benefits have improved by about \$7,000 due to reduced FICA, Medicare, and unemployment. Professional Services is about \$5,000 more and Purchased Property Services may cost about \$14,000 less.

Other Purchased Services has an improved balance of about \$9,000.

Supplies will include the Foundations Program and still provided a positive balance due to increased energy savings.

Property balance decreased of approximately \$73,000 due to inclusion of a special education chromebook equipped cart, a maintenance vehicle, and tables at Middle Gate.

This report now captures the overall remaining balance in the 900 Object Line ‘Transfer Non-Lapsing’ account for school purposes following the close of this year.

We are certain that these balances will hold until the end of the year.

On the revenue front we have received additional tuition payments and miscellaneous revenue.

Ron Bienkowski  
Director of Business  
June 12, 2019

## TERMS AND DEFINITIONS

The Newtown Board of Education's Monthly Financial Report provides summary financial information in the following areas:

- Object Code – a service or commodity obtained as the result of a specific expenditure defined by eight categories: Salaries, Employee Benefits, Professional Services, Purchased Property Services, Other Purchased Services, Supplies, Property, and Miscellaneous.
- Expense Category – further defines the type of expense by Object Code
- Expended 2017-18 – audited expenditures from the prior fiscal year (for comparison purposes)
- Approved Budget – indicates a town approved financial plan used by the school district to achieve its goals and objectives.
- YTD Transfers – identified specific cross object codes requiring adjustments to provide adequate funding for the fiscal period. This includes all transfers made to date.
- Current Transfers – identifies the recommended cross object codes for current month action. (None)
- Current Budget – adjusts the Approved Budget calculating adjustments (+ or -) to the identified object codes.
- Year-To-Date Expended – indicates the actual amount of cumulative expenditures processed by the school district through the month-end date indicated on the monthly budget summary report.
- Encumbered – indicates approved financial obligations of the school district as a result of employee salary contracts, purchasing agreements, purchase orders, or other identified obligations not processed for payment by the date indicated on the monthly budget summary report.
- Balance – calculates object code account balances subtracting expenditures and encumbrances from the current budget amount indicating accounts with unobligated balances or shortages.
- Anticipated Obligation - is a column which provides a method to forecast expense category fund balances that have not been approved via an encumbrance, but are anticipated to be expended or remain with an account balance to maintain the overall budget funding level. Receivable revenue (i.e., grants) are included in this column which has the effect of netting the expected expenditure.

- Projected Balance - calculates the object code balances subtracting the Anticipated Obligations. These balances will move up and down as information is known and or decisions are anticipated or made about current and projected needs of the district.

The monthly budget summary report also provides financial information on the State of Connecticut grant reimbursement programs (Excess Cost and Agency Placement Grants and Magnet Grant Transportation). These reimbursement grants/programs are used to supplement local school district budget programs as follows:

Excess Cost Grant – (Current Formula) this State of Connecticut reimbursement grant is used to support local school districts for education costs of identified special education students whose annual education costs exceed local prior year per pupil expenditure by 4 ½. Students placed by the Department of Child and Family Services (DCF) are reimbursed after the school district has met the prior year's per pupil expenditure. School districts report these costs annually in December and March of each fiscal year. State of Connecticut grant calculations are determined by reimbursing eligible costs (60%-100%) based on the SDE grant allocation and all other town submittals.

Magnet Transportation Grant – provides reimbursement of \$1,300 for local students attending approved Magnet school programs. The budgeted grant is \$52,700 for this year.

The last portion of the monthly budget summary reports school generated revenue that are anticipated revenue to the Town of Newtown. Fees and charges include:

- Local Tuition – amounts the board receives from non-residents who pay tuition to attend Newtown schools. Primarily from staff members.
- High school fees for parking permits..
- The final revenue is miscellaneous fees, which constitute refunds, rebates, prior year claims, etc.

## NEWTOWN BOARD OF EDUCATION

## 2018-19 BUDGET SUMMARY REPORT

FOR THE MONTH ENDING - MAY 31, 2019

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2017 - 2018	2018-19		YTD		YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE
			APPROVED BUDGET	TRANSFERS 2018 - 2019	CURRENT TRANSFERS	CURRENT BUDGET					
<b><u>GENERAL FUND BUDGET</u></b>											
100	SALARIES	\$ 46,681,657	\$ 48,352,266	\$ (51,880)	\$ -	\$ 48,300,386	\$ 39,085,963	\$ 8,906,156	\$ 308,267	\$ 95,869	\$ 212,398
200	EMPLOYEE BENEFITS	\$ 11,604,603	\$ 11,165,964	\$ -	\$ -	\$ 11,165,964	\$ 10,883,550	\$ -	\$ 282,414	\$ 294,402	\$ (11,988)
300	PROFESSIONAL SERVICES	\$ 860,328	\$ 823,818	\$ 8,670	\$ -	\$ 832,488	\$ 640,552	\$ 67,486	\$ 124,450	\$ 82,946	\$ 41,504
400	PURCHASED PROPERTY SERV.	\$ 1,876,912	\$ 2,175,147	\$ 5,550	\$ -	\$ 2,180,697	\$ 1,994,105	\$ 198,351	\$ (11,760)	\$ 45,017	\$ (56,777)
500	OTHER PURCHASED SERVICES	\$ 8,922,509	\$ 8,939,787	\$ 33,984	\$ -	\$ 8,973,771	\$ 7,772,476	\$ 1,001,080	\$ 200,216	\$ 195,924	\$ 4,291
600	SUPPLIES	\$ 3,501,034	\$ 3,831,795	\$ 3,676	\$ -	\$ 3,835,471	\$ 3,206,405	\$ 453,599	\$ 175,466	\$ 137,227	\$ 38,240
700	PROPERTY	\$ 556,785	\$ 596,247	\$ -	\$ -	\$ 596,247	\$ 333,166	\$ 307,028	\$ (43,947)	\$ 128,702	\$ (172,649)
800	MISCELLANEOUS	\$ 60,808	\$ 69,207	\$ -	\$ -	\$ 69,207	\$ 60,500	\$ 511	\$ 8,196	\$ 1,665	\$ 6,531
910	SPECIAL ED CONTINGENCY	\$ -	\$ 100,000	\$ -	\$ -	\$ 100,000	\$ -	\$ -	\$ 100,000	\$ -	\$ 100,000
<b>TOTAL GENERAL FUND BUDGET</b>		\$ 74,064,636	\$ 76,054,231	\$ -	\$ -	\$ 76,054,231	\$ 63,976,718	\$ 10,934,210	\$ 1,143,303	\$ 981,753	\$ 161,550
900	TRANSFER NON-LAPSING	\$ 276,038	\$ -								\$ 161,550
<b>GRAND TOTAL</b>		\$ 74,340,674	\$ 76,054,231	\$ -	\$ -	\$ 76,054,231	\$ 63,976,718	\$ 10,934,210	\$ 1,143,303	\$ 981,753	\$ -

(Audited)

## NEWTOWN BOARD OF EDUCATION

## 2018-19 BUDGET SUMMARY REPORT

FOR THE MONTH ENDING - MAY 31, 2019

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2017 - 2018	2018-19		YTD		YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE
			APPROVED BUDGET	TRANSFERS 2018 - 2019	CURRENT TRANSFERS	CURRENT BUDGET					
<b>100</b>	<b>SALARIES</b>										
	Administrative Salaries	\$ 3,589,381	\$ 3,927,185	\$ -		\$ 3,927,185	\$ 3,542,463	\$ 373,564	\$ 11,159	\$ 7,029	\$ 4,130
	Teachers & Specialists Salaries	\$ 30,286,831	\$ 30,663,134	\$ (30,000)		\$ 30,633,134	\$ 23,572,404	\$ 7,023,345	\$ 37,385	\$ 6,000	\$ 31,385
	Early Retirement	\$ 32,000	\$ 40,000	\$ -		\$ 40,000	\$ 40,000	\$ -	\$ -	\$ -	\$ -
	Continuing Ed./Summer School	\$ 88,754	\$ 93,428	\$ -		\$ 93,428	\$ 82,724	\$ 6,187	\$ 4,518	\$ 1,500	\$ 3,018
	Homebound & Tutors Salaries	\$ 133,352	\$ 218,868	\$ -		\$ 218,868	\$ 125,533	\$ 6,713	\$ 86,622	\$ 10,413	\$ 76,209
	Certified Substitutes	\$ 585,384	\$ 665,815	\$ (13,963)		\$ 651,852	\$ 560,202	\$ 36,765	\$ 54,885	\$ 50,907	\$ 3,978
	Coaching/Activities	\$ 580,835	\$ 618,223	\$ -		\$ 618,223	\$ 616,590	\$ 1,786	\$ (153)	\$ 2,646	\$ (2,799)
	Staff & Program Development	\$ 175,766	\$ 224,173	\$ (10,000)		\$ 214,173	\$ 135,766	\$ 70,824	\$ 7,583	\$ (2,100)	\$ 9,683
	<b>CERTIFIED SALARIES</b>	<b>\$ 35,472,303</b>	<b>\$ 36,450,826</b>	<b>\$ (53,963)</b>	<b>\$ -</b>	<b>\$ 36,396,863</b>	<b>\$ 28,675,682</b>	<b>\$ 7,519,183</b>	<b>\$ 201,998</b>	<b>\$ 76,395</b>	<b>\$ 125,603</b>
	Supervisors/Technology Salaries	\$ 737,247	\$ 920,240	\$ -		\$ 920,240	\$ 796,674	\$ 83,227	\$ 40,339	\$ 1,000	\$ 39,339
	Clerical & Secretarial salaries	\$ 2,175,395	\$ 2,276,982	\$ -		\$ 2,276,982	\$ 2,003,819	\$ 261,876	\$ 11,287	\$ 6,600	\$ 4,687
	Educational Assistants	\$ 2,404,167	\$ 2,538,989	\$ 59,053		\$ 2,598,042	\$ 2,325,165	\$ 282,919	\$ (10,042)	\$ (2,057)	\$ (7,985)
	Nurses & Medical advisors	\$ 734,835	\$ 740,251	\$ -		\$ 740,251	\$ 572,638	\$ 160,197	\$ 7,416	\$ 3,238	\$ 4,178
	Custodial & Maint Salaries	\$ 3,034,637	\$ 3,121,867	\$ -		\$ 3,121,867	\$ 2,751,810	\$ 362,504	\$ 7,553	\$ 10,913	\$ (3,360)
	Non Certified Adj & Bus Drivers salaries	\$ 24,888	\$ 68,670	\$ (56,970)		\$ 11,700	\$ 10,552	\$ 686	\$ 462	\$ 462	\$ 0
	Career/Job salaries	\$ 84,244	\$ 74,790	\$ -		\$ 74,790	\$ 67,471	\$ 28,357	\$ (21,038)	\$ (38,113)	\$ 17,075
	Special Education Svcs Salaries	\$ 1,084,834	\$ 1,228,405	\$ -		\$ 1,228,405	\$ 1,027,046	\$ 146,558	\$ 54,802	\$ 4,716	\$ 50,086
	Attendance & Security Salaries	\$ 570,324	\$ 591,639	\$ -		\$ 591,639	\$ 524,552	\$ 59,650	\$ 7,437	\$ 2,783	\$ 4,654
	Extra Work - Non-Cert	\$ 91,741	\$ 107,869	\$ -		\$ 107,869	\$ 83,874	\$ 1,000	\$ 22,995	\$ 10,850	\$ 12,145
	Custodial & Maint. Overtime	\$ 234,510	\$ 199,738	\$ -		\$ 199,738	\$ 210,594	\$ -	\$ (10,856)	\$ 18,169	\$ (29,025)
	Civic activities/Park & Rec	\$ 32,532	\$ 32,000	\$ -		\$ 32,000	\$ 36,086	\$ -	\$ (4,086)	\$ 913	\$ (4,999)
	<b>NON-CERTIFIED SALARIES</b>	<b>\$ 11,209,354</b>	<b>\$ 11,901,440</b>	<b>\$ 2,083</b>	<b>\$ -</b>	<b>\$ 11,903,523</b>	<b>\$ 10,410,282</b>	<b>\$ 1,386,973</b>	<b>\$ 106,269</b>	<b>\$ 19,474</b>	<b>\$ 86,795</b>
	<b>SUBTOTAL SALARIES</b>	<b>\$ 46,681,657</b>	<b>\$ 48,352,266</b>	<b>\$ (51,880)</b>	<b>\$ -</b>	<b>\$ 48,300,386</b>	<b>\$ 39,085,963</b>	<b>\$ 8,906,156</b>	<b>\$ 308,267</b>	<b>\$ 95,869</b>	<b>\$ 212,398</b>

## NEWTOWN BOARD OF EDUCATION

## 2018-19 BUDGET SUMMARY REPORT

FOR THE MONTH ENDING - MAY 31, 2019

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2017 - 2018	2018-19 YTD			YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE	
			APPROVED BUDGET	TRANSFERS 2018 - 2019	CURRENT TRANSFERS						CURRENT BUDGET
<b>200</b>	<b>EMPLOYEE BENEFITS</b>										
	Medical & Dental Expenses	\$ 8,829,256	\$ 8,183,967	\$ -	\$ -	\$ 8,183,967	\$ 8,176,165	\$ -	\$ 7,802	\$ 4,052	\$ 3,750
	Life Insurance	\$ 85,000	\$ 87,134	\$ -	\$ -	\$ 87,134	\$ 77,530	\$ -	\$ 9,604	\$ 7,150	\$ 2,454
	FICA & Medicare	\$ 1,454,800	\$ 1,514,790	\$ -	\$ -	\$ 1,514,790	\$ 1,266,590	\$ -	\$ 248,200	\$ 241,200	\$ 7,000
	Pensions	\$ 683,223	\$ 775,643	\$ -	\$ -	\$ 775,643	\$ 793,260	\$ -	\$ (17,617)	\$ 18,700	\$ (36,317)
	Unemployment & Employee Assist.	\$ 53,823	\$ 87,000	\$ -	\$ -	\$ 87,000	\$ 38,076	\$ -	\$ 48,924	\$ 23,300	\$ 25,624
	Workers Compensation	\$ 498,501	\$ 517,430	\$ -	\$ -	\$ 517,430	\$ 531,929	\$ -	\$ (14,499)	\$ -	\$ (14,499)
	<b>SUBTOTAL EMPLOYEE BENEFITS</b>	<b>\$ 11,604,603</b>	<b>\$ 11,165,964</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 11,165,964</b>	<b>\$ 10,883,550</b>	<b>\$ -</b>	<b>\$ 282,414</b>	<b>\$ 294,402</b>	<b>\$ (11,988)</b>
<b>300</b>	<b>PROFESSIONAL SERVICES</b>										
	Professional Services	\$ 665,344	\$ 615,047	\$ -	\$ -	\$ 615,047	\$ 456,463	\$ 54,223	\$ 104,361	\$ 72,946	\$ 31,415
	Professional Educational Ser.	\$ 194,984	\$ 208,771	\$ 8,670	\$ -	\$ 217,441	\$ 184,090	\$ 13,263	\$ 20,089	\$ 10,000	\$ 10,089
	<b>SUBTOTAL PROFESSIONAL SVCS</b>	<b>\$ 860,328</b>	<b>\$ 823,818</b>	<b>\$ 8,670</b>	<b>\$ -</b>	<b>\$ 832,488</b>	<b>\$ 640,552</b>	<b>\$ 67,486</b>	<b>\$ 124,450</b>	<b>\$ 82,946</b>	<b>\$ 41,504</b>
<b>400</b>	<b>PURCHASED PROPERTY SVCS</b>										
	Buildings & Grounds Services	\$ 707,757	\$ 697,600	\$ -	\$ -	\$ 697,600	\$ 662,808	\$ 26,418	\$ 8,374	\$ 3,600	\$ 4,774
	Utility Services - Water & Sewer	\$ 140,819	\$ 137,650	\$ -	\$ -	\$ 137,650	\$ 111,321	\$ 8,248	\$ 18,081	\$ 22,284	\$ (4,203)
	Building, Site & Emergency Repairs	\$ 490,220	\$ 460,850	\$ -	\$ -	\$ 460,850	\$ 443,645	\$ 91,044	\$ (73,838)	\$ 1,163	\$ (75,001)
	Equipment Repairs	\$ 248,481	\$ 313,324	\$ -	\$ -	\$ 313,324	\$ 252,860	\$ 29,559	\$ 30,905	\$ 17,554	\$ 13,351
	Rentals - Building & Equipment	\$ 265,862	\$ 272,923	\$ 5,550	\$ -	\$ 278,473	\$ 255,358	\$ 18,395	\$ 4,720	\$ -	\$ 4,720
	Building & Site Improvements	\$ 23,773	\$ 292,800	\$ -	\$ -	\$ 292,800	\$ 268,113	\$ 24,687	\$ (0)	\$ 417	\$ (417)
	<b>SUBTOTAL PUR. PROPERTY SER.</b>	<b>\$ 1,876,912</b>	<b>\$ 2,175,147</b>	<b>\$ 5,550</b>	<b>\$ -</b>	<b>\$ 2,180,697</b>	<b>\$ 1,994,105</b>	<b>\$ 198,351</b>	<b>\$ (11,760)</b>	<b>\$ 45,017</b>	<b>\$ (56,777)</b>

## NEWTOWN BOARD OF EDUCATION

## 2018-19 BUDGET SUMMARY REPORT

FOR THE MONTH ENDING - MAY 31, 2019

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2017 - 2018	2018-19		YTD		YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE
			APPROVED BUDGET	TRANSFERS 2018 - 2019	CURRENT TRANSFERS	CURRENT BUDGET					
<b>500</b>	<b>OTHER PURCHASED SERVICES</b>										
	Contracted Services	\$ 570,837	\$ 621,207	\$ 9,534		\$ 630,741	\$ 545,586	\$ 89,360	\$ (4,205)	\$ (7,305)	\$ 3,100
	Transportation Services	\$ 4,091,115	\$ 4,341,927	\$ (100,000)		\$ 4,241,927	\$ 3,650,720	\$ 328,947	\$ 262,261	\$ 204,121	\$ 58,140
	Insurance - Property & Liability	\$ 410,691	\$ 409,907	\$ (5,550)		\$ 404,357	\$ 400,457	\$ -	\$ 3,900	\$ -	\$ 3,900
	Communications	\$ 159,176	\$ 156,649	\$ -		\$ 156,649	\$ 130,923	\$ 16,773	\$ 8,953	\$ (4,600)	\$ 13,553
	Printing Services	\$ 27,387	\$ 33,020	\$ -		\$ 33,020	\$ 20,787	\$ 11,933	\$ 300	\$ -	\$ 300
	Tuition - Out of District	\$ 3,454,767	\$ 3,164,101	\$ 130,000		\$ 3,294,101	\$ 2,840,817	\$ 529,781	\$ (76,498)	\$ (891)	\$ (75,607)
	Student Travel & Staff Mileage	\$ 208,537	\$ 212,976	\$ -		\$ 212,976	\$ 183,185	\$ 24,286	\$ 5,505	\$ 4,600	\$ 905
	<b>SUBTOTAL OTHER PURCHASED S</b>	<b>\$ 8,922,509</b>	<b>\$ 8,939,787</b>	<b>\$ 33,984</b>	<b>\$ -</b>	<b>\$ 8,973,771</b>	<b>\$ 7,772,476</b>	<b>\$ 1,001,080</b>	<b>\$ 200,216</b>	<b>\$ 195,924</b>	<b>\$ 4,291</b>
<b>600</b>	<b>SUPPLIES</b>										
	Instructional & Library Supplies	\$ 767,673	\$ 835,997	\$ 4,486		\$ 840,483	\$ 768,987	\$ 62,784	\$ 8,713	\$ 40,800	\$ (32,087)
	Software, Medical & Office Sup.	\$ 140,088	\$ 188,341	\$ -		\$ 188,341	\$ 145,784	\$ 34,884	\$ 7,673	\$ 5,173	\$ 2,500
	Plant Supplies	\$ 404,991	\$ 375,000	\$ -		\$ 375,000	\$ 297,282	\$ 72,663	\$ 5,055	\$ -	\$ 5,055
	Electric	\$ 1,305,141	\$ 1,498,260	\$ -		\$ 1,498,260	\$ 1,204,061	\$ 228,685	\$ 65,514	\$ 10,229	\$ 55,285
	Propane & Natural Gas	\$ 304,459	\$ 430,300	\$ -		\$ 430,300	\$ 380,259	\$ 43,518	\$ 6,524	\$ 5,515	\$ 1,009
	Fuel Oil	\$ 321,179	\$ 108,860	\$ -		\$ 108,860	\$ 73,075	\$ -	\$ 35,785	\$ 27,426	\$ 8,359
	Fuel For Vehicles & Equip.	\$ 231,624	\$ 254,618	\$ -		\$ 254,618	\$ 208,132	\$ -	\$ 46,486	\$ 48,986	\$ (2,500)
	Textbooks	\$ 25,880	\$ 140,419	\$ (810)		\$ 139,609	\$ 128,826	\$ 11,066	\$ (283)	\$ (903)	\$ 620
	<b>SUBTOTAL SUPPLIES</b>	<b>\$ 3,501,034</b>	<b>\$ 3,831,795</b>	<b>\$ 3,676</b>	<b>\$ -</b>	<b>\$ 3,835,471</b>	<b>\$ 3,206,405</b>	<b>\$ 453,599</b>	<b>\$ 175,466</b>	<b>\$ 137,227</b>	<b>\$ 38,240</b>



NEWTOWN BOARD OF EDUCATION

2018-19 BUDGET SUMMARY REPORT

FOR THE MONTH ENDING - MAY 31, 2019

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2017 - 2018	2018-19		YTD		YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE
			APPROVED BUDGET	TRANSFERS 2018 - 2019	CURRENT TRANSFERS	CURRENT BUDGET					
<b>700</b>	<b>PROPERTY</b>										
	Capital Improvements (Sewers)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Technology Equipment	\$ 547,585	\$ 550,000	\$ -	\$ -	\$ 550,000	\$ 297,901	\$ 198,397	\$ 53,702	\$ 63,702	\$ (10,000)
	Other Equipment	\$ 9,200	\$ 46,247	\$ -	\$ -	\$ 46,247	\$ 35,266	\$ 108,630	\$ (97,649)	\$ 65,000	\$ (162,649)
	<b>SUBTOTAL PROPERTY</b>	<b>\$ 556,785</b>	<b>\$ 596,247</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 596,247</b>	<b>\$ 333,166</b>	<b>\$ 307,028</b>	<b>\$ (43,947)</b>	<b>\$ 128,702</b>	<b>\$ (172,649)</b>
<b>800</b>	<b>MISCELLANEOUS</b>										
	Memberships	\$ 60,808	\$ 69,207	\$ -	\$ -	\$ 69,207	\$ 60,500	\$ 511	\$ 8,196	\$ 1,665	\$ 6,531
	<b>SUBTOTAL MISCELLANEOUS</b>	<b>\$ 60,808</b>	<b>\$ 69,207</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 69,207</b>	<b>\$ 60,500</b>	<b>\$ 511</b>	<b>\$ 8,196</b>	<b>\$ 1,665</b>	<b>\$ 6,531</b>
<b>910</b>	<b>SPECIAL ED CONTINGENCY</b>	<b>\$ -</b>	<b>\$ 100,000</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 100,000</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 100,000</b>	<b>\$ -</b>	<b>\$ 100,000</b>
<b>TOTAL LOCAL BUDGET</b>		<b>\$ 74,064,636</b>	<b>\$ 76,054,231</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 76,054,231</b>	<b>\$ 63,976,718</b>	<b>\$ 10,934,210</b>	<b>\$ 1,143,303</b>	<b>\$ 981,753</b>	<b>\$ 161,550</b>

(Audited)

NEWTOWN BOARD OF EDUCATION  
 2018-19 BUDGET SUMMARY REPORT  
 FOR THE MONTH ENDING - MAY 31, 2019

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2017 - 2018	2018-19 APPROVED BUDGET	YTD TRANSFERS 2018 - 2019	CURRENT TRANSFERS	CURRENT BUDGET	YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE
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<u>BOARD OF EDUCATION FEES &amp; CHARGES - SERVICES</u>	<u>2018-19 APPROVED BUDGET</u>	<u>RECEIVED</u>	<u>BALANCE</u>	<u>% RECEIVED</u>
LOCAL TUITION	\$31,675	\$38,096	(\$6,421)	120.27%
HIGH SCHOOL FEES FOR PARKING PERMITS	\$20,000	\$20,000	\$0	100.00%
MISCELLANEOUS FEES	\$5,000	\$6,566	(\$1,566)	131.32%
<b>TOTAL SCHOOL GENERATED FEES</b>	<b>\$56,675</b>	<b>\$64,661</b>	<b>(\$7,986)</b>	<b>114.09%</b>

NEWTOWN BOARD OF EDUCATION

BUDGET SUMMARY REPORT

"FOR THE MONTH ENDING - May 31, 2019"

OFFSETTING REVENUE INCLUDED IN ANTICIPATED OBLIGATIONS

OBJECT	EXPENSE CATEGORY	BUDGETED	REVISION	REVISED BUDGET	1st ESTIMATE	STATE ESTIMATE - 15-Apr	Feb RECEIVED	May RECEIVED
100	<b>SALARIES</b>	\$ (49,618)	\$ -	\$ (49,618)	\$ (65,366)	\$ (62,484)	\$ (46,857)	\$ (15,627)
200	<b>EMPLOYEE BENEFITS</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
300	<b>PROFESSIONAL SERVICES</b>	\$ (56,105)	\$ -	\$ (56,105)	\$ (13,141)	\$ (7,590)	\$ (5,692)	\$ (1,898)
400	<b>PURCHASED PROPERTY SERV.</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
500	<b>OTHER PURCHASED SERVICES</b>	\$ (1,407,585)	\$ -	\$ (1,407,585)	\$ (1,399,682)	\$ (1,564,730)	\$ (1,173,361)	\$ (391,369)
600	<b>SUPPLIES</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
700	<b>PROPERTY</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
800	<b>MISCELLANEOUS</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL GENERAL FUND BUDGET</b>		\$ (1,513,308)	\$ -	\$ (1,513,308)	\$ (1,478,189)	\$ (1,634,804)	\$ (1,225,910)	\$ (408,894)
<b>100</b>	<b>SALARIES</b>							
	Administrative Salaries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Teachers & Specialists Salaries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Early Retirement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Continuing Ed./Summer School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Homebound & Tutors Salaries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Certified Substitutes	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Coaching/Activities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Staff & Program Development	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>CERTIFIED SALARIES</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Supervisors/Technology Salaries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Clerical & Secretarial salaries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Educational Assistants	\$ (5,326)	\$ -	\$ (5,326)	\$ (8,814)	\$ (9,381)	\$ (7,035)	\$ (2,346)
	Nurses & Medical advisors	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Custodial & Maint Salaries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Non Certified Salary Adjustment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Career/Job salaries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Special Education Svcs Salaries	\$ (44,292)	\$ -	\$ (44,292)	\$ (56,552)	\$ (53,103)	\$ (39,822)	\$ (13,281)
	Attendance & Security Salaries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Extra Work - Non-Cert	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Custodial & Maint. Overtime	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Civic activities/Park & Rec	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>NON-CERTIFIED SALARIES</b>	\$ (49,618)	\$ -	\$ (49,618)	\$ (65,366)	\$ (62,484)	\$ (46,857)	\$ (15,627)
	<b>SUBTOTAL SALARIES</b>	\$ (49,618)	\$ -	\$ (49,618)	\$ (65,366)	\$ (62,484)	\$ (46,857)	\$ (15,627)
<b>200</b>	<b>EMPLOYEE BENEFITS</b>							
	<b>SUBTOTAL EMPLOYEE BENEFITS</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

"FOR THE MONTH ENDING - May 31, 2019"

**OFFSETTING REVENUE INCLUDED IN ANTICIPATED OBLIGATIONS**

OBJECT	EXPENSE CATEGORY	BUDGETED	REVISION	REVISED BUDGET	1st ESTIMATE	STATE ESTIMATE - 15-Apr	Feb RECEIVED	May RECEIVED
<b>300</b>	<b>PROFESSIONAL SERVICES</b>							
	Professional Services	\$ (56,105)		\$ (56,105)	\$ (13,141)	\$ (7,590)	\$ (5,692)	\$ (1,898)
	Professional Educational Ser.	\$ -		\$ -		\$ -		
	<b>SUBTOTAL PROFESSIONAL SVCS</b>	<b>\$ (56,105)</b>	<b>\$ -</b>	<b>\$ (56,105)</b>	<b>\$ (13,141)</b>	<b>\$ (7,590)</b>	<b>\$ (5,692)</b>	<b>\$ (1,898)</b>
<b>400</b>	<b>PURCHASED PROPERTY SVCS</b>							
	<b>SUBTOTAL PUR. PROPERTY SER.</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>		<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>500</b>	<b>OTHER PURCHASED SERVICES</b>							
	Contracted Services	\$ -		\$ -		\$ -		
	Transportation Services	\$ (348,975)		\$ (348,975)	\$ (305,446)	\$ (314,367)	\$ (235,737)	\$ (78,630)
	Insurance - Property & Liability	\$ -		\$ -		\$ -		
	Communications	\$ -		\$ -		\$ -		
	Printing Services	\$ -		\$ -		\$ -		
	Tuition - Out of District	\$ (1,058,610)		\$ (1,058,610)	\$ (1,094,236)	\$ (1,250,363)	\$ (937,624)	\$ (312,739)
	Student Travel & Staff Mileage	\$ -		\$ -		\$ -		
	<b>SUBTOTAL OTHER PURCHASED SI</b>	<b>\$ (1,407,585)</b>	<b>\$ -</b>	<b>\$ (1,407,585)</b>	<b>\$ (1,399,682)</b>	<b>\$ (1,564,730)</b>	<b>\$ (1,173,361)</b>	<b>\$ (391,369)</b>
<b>600</b>	<b>SUPPLIES</b>							
	<b>SUBTOTAL SUPPLIES</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>700</b>	<b>PROPERTY</b>							
	<b>SUBTOTAL PROPERTY</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>800</b>	<b>MISCELLANEOUS</b>							
	Memberships							
	<b>SUBTOTAL MISCELLANEOUS</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
	<b>TOTAL LOCAL BUDGET</b>	<b>\$ (1,513,308)</b>	<b>\$ -</b>	<b>\$ (1,513,308)</b>	<b>\$ (1,478,189)</b>	<b>\$ (1,634,804)</b>	<b>\$ (1,225,910)</b>	<b>\$ (408,894)</b>

75% 25%

Excess Cost and Agency placement Grants are budgeted at 75%. \$ (1,513,308)

The May State estimate is at 73.62% on eligible expenditures for this year. \$ (1,634,804)

Additional beyond budget \$ 121,496



Collaboration

	Sep				Oct				Nov			Dec			Jan				Feb				Mar				Apr			May					Jun					
Unit:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		
Equalities and Inequalities	█																																							
Functions										█																														
Linear Functions													█																											
Systems of Equations and Inequalities																				█																				
Intro to Exponential Functions																												█												
Polynomial Functions																															█									



# Unit Planner: Equalities and Inequalities Algebra I

Tuesday, May 7, 2019 9:11:28 AM

Newtown High School > 2018-2019 > Grade 9 > Mathematics >  
Algebra I > Week 2 - Week 7

Last Updated: Monday, April 15, 2019 by  
Charlotte Cavaturo

## Equalities and Inequalities

Carroll, Megan; Cavaturo, Charlotte; Dominick, Lauren; Giacin III, Richard; Hall, Eugene; Hyman, Paige; Raccio, Keristen; Sherman, Karen

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Linear equations and linear inequalities

- properties of equality
- linear equations
- proportions
- solution
- inequality
- number line
- linear inequalities

Conceptual lens: balance

#### Generalizations / Enduring Understandings

Strand 1: Linear Equations

Concepts:

- properties of equality
- linear equations
- proportions
- solution(s)

Generalization: Properties of equality determine the solution(s) of linear equations and proportions.

Strand 2; Linear Inequalities

Concepts:

- properties of equality
- inequality
- number line
- linear inequalities
- solution(s)

Generalization: Properties of equality determine solutions of linear inequalities.

A number line represents solutions to a linear inequality.

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

Factual:

- What are the properties of equality (S1/S2)
- What is an equation? (S1)
- What is a proportion? (S2)
- What does equality mean? (S1)
- What is an inequality? (S2)
- What is the solution to a linear equation? (S1)
- What is the solution(s) to a linear inequality (S2)
- When does the inequality sign change direction? (S2)
- What are possible types of solutions? (S1/S2)

Conceptual:

- How is a proportion used to solve comparative word problems? (S1)
- What is the difference between a solution(s) for a linear equation and a linear inequality? (S1/S2)
- How are the properties of equality applied to solve linear equations and linear inequalities?

(S1/S2)

- How is a linear inequality represented on a number line? (S2)
- How are the number of solutions identified in an equation or inequality? (S1/S2)

Provocative:

- How can linear equations and linear inequalities be used outside the math classroom? (S1/S2)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

**Quantities**

**HSN-Q.A. Reason quantitatively and use units to solve problems.**

HSN-Q.A.1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

HSN-Q.A.2. Define appropriate quantities for the purpose of descriptive modeling.

HSN-Q.A.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

**CCSS: HS: Algebra**

**Seeing Structure in Expressions**

**HSA-SSE.A. Interpret the structure of expressions.**

HSA-SSE.A.1. Interpret expressions that represent a quantity in terms of its context.

HSA-SSE.A.1b. Interpret complicated expressions by viewing one or more of their parts as a single entity.

HSA-SSE.A.2. Use the structure of an expression to identify ways to rewrite it.

**Creating Equations**

**HSA-CED.A. Create equations that describe numbers or relationships.**

HSA-CED.A.1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

HSA-CED.A.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

**Reasoning with Equations & Inequalities**

**HSA-REI.A. Understand solving equations as a process of reasoning and explain the reasoning.**

HSA-REI.A.1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

**HSA-REI.B. Solve equations and inequalities in one variable.**

HSA-REI.B.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

**Mathematical Practice**

**MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.4. Model with mathematics.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

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### Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will

- solve linear equations and inequalities
- represent the solution to inequalities on a number line
- solve proportions
- solve real-world applications

### Critical Content & Skills

*What students must **KNOW and be able to DO***

Students must be able to:

- Solve linear equations and inequalities by applying properties of equality.
- Construct the solution to an inequality on a number line
- Set up and solve proportions.
- Model a real-world problem with an equation/inequality and interpret the solution

### Core Learning Activities

Solve linear equations and inequalities by applying properties of equality.

- Recognize the proper order of applying properties of equality.
- Demonstrate the process of solving linear equations and linear inequalities
- Interpret the solution to a linear inequality on a number line.

Construct the solution to an inequality on a number line.

- Given the solution to an inequality on a number line write the inequality.
- Represent the solution to an inequality on a number line.

Set up and solve proportions.

- Solve a proportion.
- Write and solve a proportion given a comparative word problem.



	<p>Model a real-world problem with an equation/inequality and interpret the solution</p> <ul style="list-style-type: none"> <li>• Construct and solve an equation or inequality given a real-world problem.</li> <li>• Describe the solution(s) in a sentence.</li> </ul>
<p>Assessments</p> <p><u>Test on solving equations.doc</u></p> <p><u>End of Unit 2 test.doc</u></p>	<p>Resources</p> <p><i>Professional &amp; Student</i></p> <p><b>Professional</b></p> <p>Professional department developed materials</p> <p>Internet</p> <p>Google Drive</p> <p>State of Ct Algebra 1 Moodle</p> <p><b>Student</b></p> <p>internet, handouts</p>
<p>Student Learning Expectation &amp; 21st Century Skills</p> <p><u>Information Literacy</u></p> <p><u>Critical Thinking</u></p> <p><u>Spoken Communication</u></p> <p><u>Written Performance</u></p>	<p>Interdisciplinary Connections</p> <p><i>Interdisciplinary with Science-Literal Equations</i></p> <p>Students will solve scientific equations for a specific variable.</p> <p><i>Interdisciplinary with PE/Health-Choosing a Membership plan at a Health Club</i></p> <p>Students will determine which health club is more cost effective based on the amount of time they plan on being a member.</p>





# Unit Planner: Functions Algebra I

Tuesday, May 1, 2019, 3:17 PM

Newtown High School > 2018-2019 > Grade 9 > Mathematics >  
Algebra I > Week 8 - Week 12

Last Updated: Monday, April 15, 2019 by  
Charlotte Cavatara

## Functions

Carroll, Megan; Cavatara, Charlotte; Dominick, Lauren; Giacin III, Richard; Hall, Eugene; Hyman, Paige; Raccio, Keristen; Sherman, Karen

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Functions

- paired data
- continuous
- discrete
- input
- output
- functions
- relations
- composition
- domain
- range
- function notation

Lens: Relationships

#### Generalizations / Enduring Understandings

##### Strand 1: Relations

Concepts:

- relations
- functions
- paired data
- continuous
- discrete
- domain
- range

Generalization: Paired data creates a variety of continuous or discrete relations or functions. Domain and range describe the nature of a relation.

##### Strand 2: Function Notation

Concepts:

- function notation
- composition

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

##### Factual:

- What is a function? (S1)
- What is a relation? (S1)
- What is function notation? (S2)
- What is the domain/range of a relation? (S1)
- What is continuous/discrete? (S1)
- What is a composition? (S2)

##### Conceptual:

- How can we tell if a relationship is a function from multiple representations? (S1)
- Explain the difference between a relation and a function. (S1)
- How do the graphs of different functions vary? (S1)
- How are the input/outputs related to

- input
- output
- domain
- range

Generalization: Connect input/output to domain/range. Evaluate the composition of functions through function notation.

domain/range? (S2)

- How are compositions evaluated using function notation? (S2)
- 

Provocative:

- How are functions used to model real-world situations? (S1/S2)
- How are functions used to make predictions? (S1/S2)
- How are functions used to solve problems? (S1/S2)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Algebra**

**Mathematical Practice**

**MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

**CCSS: HS: Functions**

**Interpreting Functions**

**HSF-IF.A. Understand the concept of a function and use function notation.**

HSF-IF.A.1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If  $f$  is a function and  $x$  is an element of its domain, then  $f(x)$  denotes the output of  $f$  corresponding to the input  $x$ . The graph of  $f$  is the graph of the equation  $y = f(x)$ .

HSF-IF.A.2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use

function notation in terms of a context.

**HSF-IF.B. Interpret functions that arise in applications in terms of the context.**

HSF-IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

HSF-IF.B.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

**HSF-IF.C. Analyze functions using different representations.**

HSF-IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

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**Objective(s)**

Bloom/ Anderson Taxonomy / DOK Language

Students will

- Interpret functions in applications
- Represent relations using different methods
- Identify domain/range
- Evaluate using function notation

**Critical Content & Skills**

*What students must **KNOW and be able to DO***

Students must be able to:

- Evaluate functions in varied problem situations
- Model relations using different methods
- Interpret and state the domain/range
- Determine function values

**Core Learning Activities**

Interpret and state the domain/range

- Given a relation identify the domain/range.

Evaluate functions in varied problem situations

- Given the equation determine the domain and range.
- Given the graph evaluate for a specific value.
- For a given domain/range within an application interpret the range/domain in a sentence.

Model relations using different methods

- Represent a relation using a mapping diagram, table, ordered pairs, and graph.
- Given a relation identify whether it is a function.
- Given a relation identify whether it is representing discrete/continuous data.

Determine function values

- Using function notation determine input/output values.

<p><b>Assessments</b></p> <p><b>Unit 3 Quiz: Functions</b>  <b>Summative: Written Test</b>  End of Unit Test identifying functions with explanations, Independent/Dependent variables with function rules, domain and range and function notation</p> <p><b>Function Applications Pack</b>  <b>Summative: Group Project</b>  Packet of function application problems including linear, quadratic, cubic, exponential growth, inverse, square root and step</p> <p><b>Function Applications Quiz (Free Throws)</b>  <b>Summative: Written Test</b>  Students use a linear model to create a table, graph and function rule and make predictions.</p> <p><a href="#">Unit 3 Quiz.docx</a>  <a href="#">Functions Applications key.docx</a>  <a href="#">Activity 3.4.3 Free Throws application quiz.docx</a></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i></p> <p><b>Professional</b>  Department developed materials  Internet  Google Drive  SDE Algebra 1 Moodle, computer/projector</p> <p><b>Student</b>  Handouts</p>
<p><b>Student Learning Expectation &amp; 21st Century Skills</b></p> <p><a href="#">Information Literacy</a>  <a href="#">Critical Thinking</a>  <a href="#">Spoken Communication</a>  <a href="#">Written Performance</a></p> <ul style="list-style-type: none"> <li>• Problem Solving</li> </ul>	<p><b>Interdisciplinary Connections</b></p> <p>Art &amp; Engineering-Creating your own function machine.</p>





# Unit Planner: Linear Functions Algebra I

Tuesday, May 7, 2019 3:13 PM

Newtown High School > 2018-2019 > Grade 9 > Mathematics > Algebra I > Week 13 - Week 21

Last Updated: Monday, April 15, 2019 by Charlotte Cavataro

## Linear Functions

Carroll, Megan; Cavataro, Charlotte; Dominick, Lauren; Giacin III, Richard; Hall, Eugene; Hyman, Paige; Raccio, Keristen; Sherman, Karen

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concept: Linear Functions

- slope
- intercepts
- linear inequalities
- two points

Lens: patterns

#### Generalizations / Enduring Understandings

##### Strand 1: Graphing

Concepts:

- slope
- intercepts
- linear inequalities

Generalization: Characteristics of linear equations and inequalities, including slope and intercepts determine the graph of a linear function and inequality.

##### Strand 2: Writing

Concepts:

- two points
- slope

Generalization: Two points define a linear function. A point and a slope define a linear function.

#### Guiding Questions

**Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]**

##### Factual:

- What is slope? (S1)
- What is needed to graph a linear equation? (S1)
- What are the intercepts? (S1)
- What is a linear function? (S1/S2)
- What is the process of writing a linear equation given two points? (S2)
- What is the process of writing a linear equation given a point and a slope? (S2)

##### Conceptual:

- How do representations of linear functions differ? (S2)
- What is the significance of a linear function's slope and y-intercept? (S1/S2)

##### Provocative:

- How may linear functions model real-world situations? (S1/S2)

Standard(s)

*Connecticut Core Standards / Content Standards*

CCSS: Mathematics

CCSS: HS: Algebra

Mathematical Practice

MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

CCSS: HS: Functions

Interpreting Functions

HSF-IF.B. Interpret functions that arise in applications in terms of the context.

HSF-IF.B.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

HSF-IF.C. Analyze functions using different representations.

HSF-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

HSF-IF.C.7a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

HSF-IF.C.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

Linear, Quadratic, and Exponential Models

HSF-LE.A. Construct and compare linear and exponential models and solve problems.

HSF-LE.A.1. Distinguish between situations that can be modeled with linear functions and with exponential functions.

HSF-LE.A.1a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

HSF-LE.A.1b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

HSF-LE.A.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

HSF-LE.B. Interpret expressions for functions in terms of the situation they model.

HSF-LE.B.5. Interpret the parameters in a linear or exponential function in terms of a context.

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### Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will

- Graph linear functions and inequalities
- Write equations of linear functions

### Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to:

- Analyze the graph of a linear function and inequality
- Write equations of linear functions

### Core Learning Activities

Analyze the graph of a linear function and inequality

- Graph a linear equation given standard form.
- Graph a linear equation given slope-intercept form.
- Graph a linear equation given point-slope form.
- Graph a linear inequality given standard form.
- Graph a linear inequality given slope-intercept form.
- Graph a linear inequality given standard form.
- Graph a linear equation given a point and a slope.
- Graph a linear equation given two points.
- Given modeled data, determine the correlation is linear.
- Determine the slope of a line given a graph.
- Graph parallel and perpendicular lines.
- Graph horizontal and vertical lines.
- Model linear applications with a graph.
- Determine if a given function is linear.

Write equations of linear functions

- Write the linear equation given two points.
- Write the linear equation given a point and a slope.
- Write the linear equation given a graph.
- Write the linear equation of a parallel line.
- Write the linear equation of a perpendicular line.
- Write the linear equation of a horizontal line.
- Write the linear equation of a vertical line.
- Write the linear equation in standard form.
- Write the linear equation in point-slope form.
- Write the linear equation in slope-intercept form.
- Write the linear inequality given a graph.
- Model linear applications with an equation.
- Interpret a linear application.
- Determine the line of best fit given data modeling linear correlation.

### Assessments

**Slope and Slope-Intercept Form of a Line Assessment**

### Resources

*Professional & Student*  
**Professional**



<p><b>Summative: Written Test</b>  Test on slope and slope-intercept form including horizontal and vertical lines  <u>22. Linear Unit Test 2017.docx</u></p>	<p>SDE of CT Algebra 1 Moodle  Texas Instruments TI-84+  Google Drive  Department developed materials</p> <p><b>Student</b>  Internet  Handouts  Graphing calculator</p>
<p>Student Learning Expectation &amp; 21st Century Skills  <u>Information Literacy</u>  <u>Critical Thinking</u>  <u>Spoken Communication</u>  <u>Written Performance</u></p>	<p><b>Interdisciplinary Connections</b>  <i>Interdisciplinary with Health-Charting your Calories</i>  Students chart their calorie intake. Graph the average per day on a scatter plot, and draw a line of best fit.</p>





# Unit Planner: Systems of Equations and Inequalities Algebra I

Tuesday, May 7, 2019, 3:23 PM

Newtown High School > 2018-2019 > Grade 9 > Mathematics > Algebra I > Week 22 - Week 26

Last Updated: Monday, April 15, 2019 by Charlotte Cavaturo

## Systems of Equations and Inequalities

Carroll, Megan; Cavaturo, Charlotte; Dominick, Lauren; Giacin III, Richard; Hall, Eugene; Hyman, Paige; Raccio, Keristen; Sherman, Karen

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concept: Systems of Equations and Inequalities

- Consistent
- Inconsistent
- Unique solution
- Solution region
- Graph

Lens: Systems

#### Generalizations / Enduring Understandings

##### Strand 1: Graphical Representation

Concepts:

- Consistent
- Inconsistent
- Unique solution

Generalization: Determining the solution of a system of linear equations by graphing results in a consistent, inconsistent, or a unique solution.

##### Strand 2: Algebraic Representation

Concepts:

- Consistent
- Inconsistent
- Unique solution

Generalization: Determining the solution of a system of linear equations by algebraic means results in a consistent, inconsistent, or a unique solution.

##### Strand 3: Inequalities

Concepts:

- Solution region

#### Guiding Questions

Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]

##### Factual:

- How is the solution to a system defined? (S1/S2/S3)
- How is a consistent solution represented on a graph? (S1)
- How is an inconsistent solution represented on a graph? (S1)
- How is a unique solution represented on a graph? (S1)
- How is a consistent solution represented algebraically? (S2)
- How is an inconsistent solution represented algebraically? (S2)
- How is a unique solution represented algebraically? (S2)
- How is a solution to a system of inequalities represented? (S3)
- How can a system of inequalities whose solution will encompass the entire coordinate plane, be constructed? (S3)

##### Conceptual:

- How can inconsistent solutions be determined by

- Graph

Generalization: Determining the solution of a system of linear inequalities by graphing results in a solution region.

inspection? (S1/S2)

- How can consistent solutions be determined by inspection? (S1/S2)
- How can unique solutions be determined by inspection? (S1/S2)
- How is no solution within a system of inequalities represented? (S3)
- What is the difference between all real numbers and infinitely many solutions? (S1/S2/S3)

Provocative:

- Which type of system, equations or inequalities, is more applicable to everyday life? (S1/S2/S3)
- When is it more appropriate to use a system of equations versus inequalities? (S1/S2/S3)

Standard(s)

Connecticut Core Standards / Content Standards

**CCSS: Mathematics**

**CCSS: HS: Algebra**

### **Creating Equations**

#### **HSA-CED.A. Create equations that describe numbers or relationships.**

HSA-CED.A.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

HSA-CED.A.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

HSA-CED.A.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

### **Reasoning with Equations & Inequalities**

#### **HSA-REI.C. Solve systems of equations.**

HSA-REI.C.5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

HSA-REI.C.6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

#### **HSA-REI.D. Represent and solve equations and inequalities graphically.**

HSA-REI.D.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

HSA-REI.D.11. Explain why the x-coordinates of the points where the graphs of the equations  $y = f(x)$  and  $y = g(x)$  intersect are the solutions of the equation  $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where  $f(x)$  and/or  $g(x)$  are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

HSA-REI.D.12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

### **Mathematical Practice**

**MP.**The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at

**all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

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**Objective(s)**

Bloom/ Anderson Taxonomy / DOK Language

Students will:

- Graph systems of linear equations/inequalities
- Solve systems of linear equations algebraically

**Critical Content & Skills**

*What students must **KNOW and be able to DO***

Students will be able to

- Use a graphing calculator to find intersections.
- Write systems of equations and inequalities to solve applied problems.
- Solve systems using appropriate methods.

**Core Learning Activities**

Use a graphing calculator to find intersections.

- Graph systems by hand and identify solutions.

Solve systems using appropriate methods.

- Solve the system of equation by
  - Graphing
  - Substitution
  - Elimination
- Solve the system of inequalities by graphing

Write systems of equations and inequalities to solve applied problems.

- define variables
- write answers in the context of the problem

<p>Assessments</p> <p><b>Systems of Equations and Inequalities Test Review Summative: Written Test</b></p> <p><u>11. Review for Test on Systems.pdf</u></p>	<p>Resources</p> <p><i>Professional &amp; Student</i></p> <p><b>Professional</b></p> <p>Department developed materials  Google Drive  SDE of Ct Algebra 1 Moodle  TI 84 calculators</p> <p><b>Students</b></p> <p>Handouts  TI-84 Calculators</p>
<p>Student Learning Expectation &amp; 21st Century Skills</p> <p><u>Information Literacy</u>  <u>Critical Thinking</u>  <u>Spoken Communication</u>  <u>Written Performance</u></p>	<p>Interdisciplinary Connections</p> <p><b>Fishing Limits</b></p> <p>Do oceans support unlimited number of fish? Can you mathematics to set fishing limits so so that this valuable food resource is not endangered?  Find article about endangered species and use the information to discuss.</p>





# Unit Planner: Intro to Exponential Functions Algebra I

Tuesday, May 7, 2019, 3:19PM

Newtown High School > 2018-2019 > Grade 9 > Mathematics > Algebra I > Week 27 - Week 31

Last Updated: Monday, April 15, 2019 by Charlotte Cavataro

## Intro to Exponential Functions

Carroll, Megan; Cavataro, Charlotte; Dominick, Lauren; Giacin III, Richard; Hall, Eugene; Hyman, Paige; Raccio, Keristen; Sherman, Karen

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concept: Exponents

- Exponential growth
- Exponential decay
- Compound interest
- Growth
- Decay
- Exponential expressions
- Properties of exponents

Lens: Patterns

#### Generalizations / Enduring Understandings

##### Strand 1: Graphing

Concepts:

- Exponential growth
- Exponential decay

Generalization: Exponential functions model both growth and decay applications.

##### Strand 2: Applications

Concepts:

- Compound interest
- Growth
- Decay

Generalization: Exponential function model real-world applications including compound interest, growth, decay.

##### Strand 3: Properties

Concepts:

- Exponential expressions

#### Guiding Questions

Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]

##### Factual:

- What do the parameters of exponential function represent on a graph? (S1)
- What operations are used to simplify exponential expressions? (S3)
- How are numbers less than one represented using exponents? (S1/S3)
- What are the keywords that signify an exponential growth/decay situation? (S2)
- What is the compound interest formula? (S2)
- What is a half-life? (S2)

##### Conceptual:

- How does growth compare to decay on a graph? (S1)
- When does the order matter for properties of exponents when simplifying exponential expressions? (S3)
- How is linear growth different from exponential

- Properties of exponents

Generalization: Properties of exponents simplify exponential expressions.

growth? (S1/S2)

Provocative:

- What field of science uses exponential growth or decay and in what applications? (S1/S2)
- Why is exponential growth or decay important in sciences? (S1/S2)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Functions**

**Linear, Quadratic, and Exponential Models**

**HSF-LE.A. Construct and compare linear and exponential models and solve problems.**

HSF-LE.A.1. Distinguish between situations that can be modeled with linear functions and with exponential functions.

HSF-LE.A.1a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

HSF-LE.A.1c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

**HSF-LE.B. Interpret expressions for functions in terms of the situation they model.**

HSF-LE.B.5. Interpret the parameters in a linear or exponential function in terms of a context.

**Mathematical Practice**

**MP.The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

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## Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will:

- Graph exponential functions
- Model exponential applications
- Apply properties of exponents

## Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to

- Graph and analyze exponential functions
- Model exponential applications both graphically and algebraically
- Simplify exponential expressions

## Core Learning Activities

Graph and analyze exponential functions

- Graph exponential functions
- Identify parameters of given exponential function
- Write the exponential function given a graph

Model exponential applications both graphically and algebraically

- Given an application, write the exponential function and solve
- Represent the application on a coordinate plane and solve
- Define variables, write the answer in the context of the problem

Simplify exponential expressions

- Apply the properties of exponential expressions including
  - product of powers
  - power of a power
  - quotient of powers
  - zero exponents
  - negative exponents

## Assessments

**Exponential test review**  
**Summative: Written Test**  
[16. Test Review.pdf](#)

## Resources

*Professional & Student*

### **Professional**

Department developed materials  
Google Drive  
SDE of Ct Algebra 1 Moodle  
Online resources

### **Students**

Handouts  
TI-84 Calculator

## Student Learning Expectation & 21st Century Skills

Information Literacy

Critical Thinking

Spoken Communication

Written Performance

## Interdisciplinary Connections

*Interdisciplinary with Personal Finance-**Buying a Car***  
Students will learn how to calculate simple interest and compound interest.

*Interdisciplinary with Science-**Cell Growth/Decay***



- Problem Solving

M&M activity. Students will learn about the growth of a cell in the human body by using M&Ms.



Atlas

Atlas Version 9.3.7

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# Unit Planner: Polynomial Functions Algebra I

Tuesday, May 7, 2019, 3:20 PM

Newtown High School > 2018-2019 > Grade 9 > Mathematics > Algebra I > Week 31 - Week 38

Last Updated: Monday, April 15, 2019 by Charlotte Cavaturo

## Polynomial Functions

Carroll, Megan; Cavaturo, Charlotte; Dominick, Lauren; Giacin III, Richard; Hall, Eugene; Hyman, Paige; Raccio, Keristen; Sherman, Karen

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Polynomials

- Number of terms
- Degree
- Standard form
- Factor
- Vertex
- Axis of Symmetry
- Extrema
- Solution(s)
- Graphical representation
- Algebraic means

Lens: Relationships

#### Generalizations / Enduring Understandings

Strand 1: Fundamentals of polynomials

Concepts:

- Number of terms
- Degree
- Standard form

Generalization: Polynomial expressions simplify to standard form.

The number of terms and degree classify a polynomial.

Strand 2: Factor polynomials

Concepts:

- Factor

Generalization: Factor to change the form of a polynomial.

Strand 3: Graph quadratics

Concepts:

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

Factual:

- How does the classification of the polynomial correspond to the degree of the function? (S1)
- How are polynomial expressions classified? (S1)
- What is the standard form of a polynomial expression? (S1)
- What are the different forms of a quadratic function? (S3)
- What are the different methods of factoring? (S2)
- What methods are used to solve quadratic equations? (S4)
- What is the vertex? (S3)
- What are the intercepts? (S3)
- What is the axis of symmetry? (S3)
- How are solutions represented on a graph? (S4)

Conceptual:

- intercepts
- vertex
- axis of symmetry
- extrema

Generalization: Intercepts, vertices, the axis of symmetry, and extrema construct quadratic graphs.

Strand 4: Solve quadratics

Concepts:

- Solution(s)
- Graphical representation
- Algebraic means

Generalization: The solution(s) of quadratic functions are determined using graphical and algebraic means.

- When are the different methods for solving quadratic equations used? (S4)
- What indicates the most efficient method of factoring a polynomial expression? (S2)
- How do the parameters of the quadratic effect the graph of the curve? (S3)
- How are factoring and solving related? (S2/S3)

Provocative:

- How are quadratic functions used to model real-world situations? (S3/S4)

Standard(s)

Connecticut Core Standards / Content Standards

**CCSS: Mathematics**

**CCSS: HS: Algebra**

**Seeing Structure in Expressions**

**HSA-SSE.A. Interpret the structure of expressions.**

HSA-SSE.A.1a. Interpret parts of an expression, such as terms, factors, and coefficients.

HSA-SSE.A.2. Use the structure of an expression to identify ways to rewrite it.

**HSA-SSE.B. Write expressions in equivalent forms to solve problems.**

HSA-SSE.B.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

HSA-SSE.B.3a. Factor a quadratic expression to reveal the zeros of the function it defines.

**Arithmetic with Polynomials & Rational Functions**

**HSA-APR.A. Perform arithmetic operations on polynomials.**

HSA-APR.A.1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

**HSA-APR.B. Understand the relationship between zeros and factors of polynomials.**

HSA-APR.B.3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

**Reasoning with Equations & Inequalities**

**HSA-REI.B. Solve equations and inequalities in one variable.**

HSA-REI.B.4. Solve quadratic equations in one variable.

HSA-REI.B.4b. Solve quadratic equations by inspection (e.g., for  $x^2 = 49$ ), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as  $a \pm bi$  for real numbers  $a$  and  $b$ .

**Mathematical Practice**

**MP.The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

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### Objective(s)

#### Bloom/ Anderson Taxonomy / DOK Language

Students will:

- Classify polynomials
- Factor polynomials
- Recognize and Solve quadratics
- Graph quadratics
- Simplify Polynomials

### Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to

- Identify degree and number of terms to classify polynomials.
- Factor polynomials
- Recognize and solve quadratic function
- Analyze graphs of quadratic functions

### Core Learning Activities

Identify degree and number of terms to classify polynomials.

- Name polynomial based on the degree
- Name polynomial based on the number of terms
- Simplify and rewrite polynomial in standard form

Factor polynomials

- Factor polynomials by
  - Greatest common factor
  - Grouping
- Factor quadratics by
  - Greatest common factor
  - the difference of perfect squares
  - perfect square trinomial
  - split the middle term/guess and check

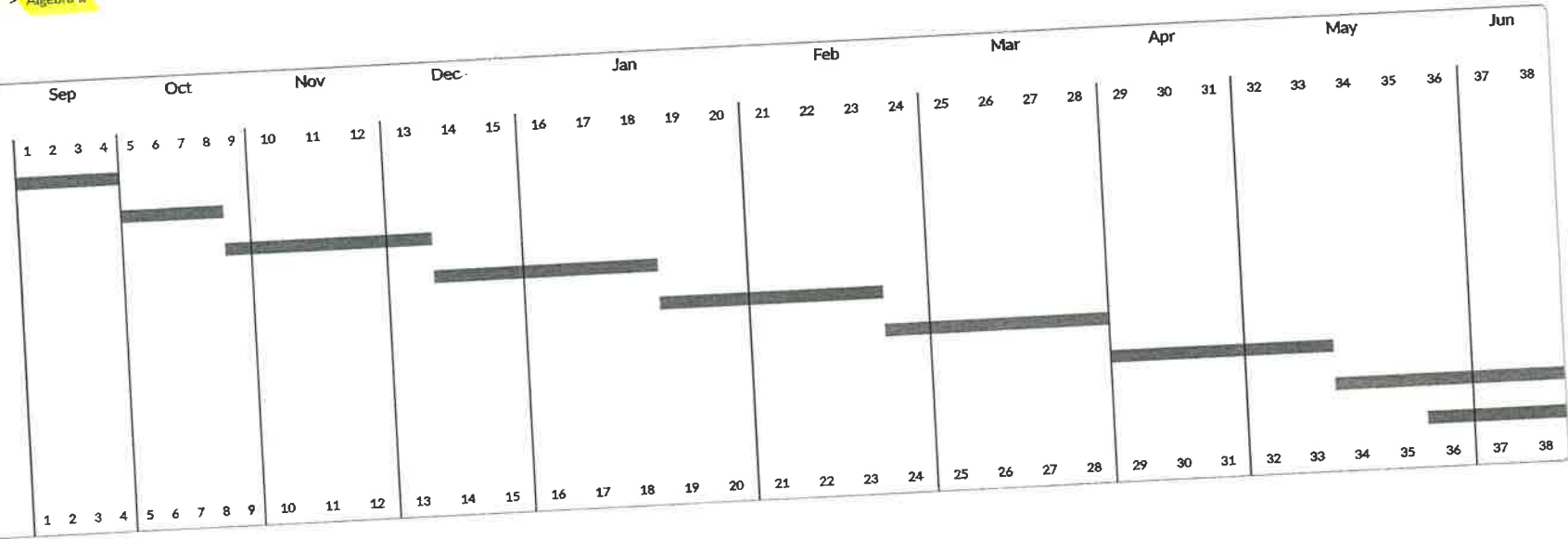
	<p>Recognize and solve a quadratic function</p> <ul style="list-style-type: none"> <li>• Solve quadratic by <ul style="list-style-type: none"> <li>○ graphing</li> <li>○ factoring</li> <li>○ quadratic formula</li> <li>○ square roots</li> </ul> </li> </ul> <p>Analyze graphs of quadratic functions</p> <ul style="list-style-type: none"> <li>• List critical information given a graph</li> <li>• Graph given critical information</li> <li>• Graph quadratic from standard form</li> <li>• Graph quadratic from vertex form</li> </ul>
<p><b>Assessments</b></p> <p><b>Quadratics test review</b>  <b>Summative: Written Test</b>  <u>8. Quadratics Test Review (1).pdf</u></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i></p> <p><b>Professional</b>  Department developed materials  Google Drive  SDE Moodle CCSM core curriculum and activities</p> <p><b>Student</b>  Handouts</p>
<p>Student Learning Expectation &amp; 21st Century Skills</p> <p><u>Information Literacy</u>  <u>Critical Thinking</u>  <u>Spoken Communication</u>  <u>Written Performance</u></p> <ul style="list-style-type: none"> <li>• Problem Solving</li> </ul>	<p><b>Interdisciplinary Connections</b></p> <p><b>Golden Ratio-Performance Task</b>  Connecting the Golden Ratio to student's environment.  Writing a discussion/prompt-What is this number and how can it help decorate your room?</p>





Collaboration

- Probability and Statistics
- Properties of Algebraic Functions
- Systems
- Quadratics
- Polynomials
- Rational Functions
- Radical Functions
- Exponential and Logarithmic Functions
- Trigonometric Sections





# Unit Planner: Probability and Statistics Algebra II

Tuesday, May 7, 2019, 3:28PM

Newtown High School > 2018-2019 > Grade 11 > Mathematics > Algebra II  
> Week 1 - Week 4

Last Updated: Sunday, May 5, 2019 by  
Kelly Murphy

## Probability and Statistics

Carpenter, Lisa; Carroll, Megan; Cavataro, Charlotte; Desrochers, Michael; Dominick, Lauren; Dreher, Zachary; Giacin III, Richard; Hall, Eugene; Hyman, Paige; Manos, Charlotte; Murphy, Kelly; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Probability and Statistics

- multiplication counting principle
- permutations
- combinations
- sample space
- compound events
- conditional probability
- measures of central tendency
- distributions
- normal distribution
- standard deviation
- outliers

Lens: data analysis

#### Generalizations / Enduring Understandings

Strand 1: Counting methods

Concepts:

- multiplication counting principle
- permutations
- combinations
- sample space

Generalization: Multiplication counting principle, permutations, and combinations determine sample space.

Strand 2: Probability

Concepts:

- compound events
- conditional probability

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

Factual:

- What is the multiplication counting principle? (S1)
- What is a permutation? (S1)
- What is a combination? (S1)
- What are ways to diagram the multiplication counting principle? (S1)
- What is independent probability? (S2)
- What is conditional probability? (S2)
- What are compound events? (S2)
- What is standard deviation? (S3)
- What are the measures of central tendency? (S3)
- What makes up a normal distribution? (S3)

Conceptual:

- How can we choose an appropriate method to collect, display, summarize and analyze a data set? (S3)
- What is standard deviation an indicator of and what

Generalization: The probability of compound events requires conditional probability.

### Strand 3: Data analysis

Concepts:

- measures of central tendency
- distributions
- normal distribution
- standard deviation
- outliers

Generalization: Measures of central tendency and standard deviation describe distributions.

Normal distributions describe a set of data and identify outliers.

does standard deviation tell you about the nature of your data set? (S3)

How does the assumption of normal data allow us to make prediction about a population? (S3)

How can the statistical study of a population in general help make predictions about a group in the future and/or quantify the likelihood of a specific outcome? (S3)

What is the value of using statistical methods and models to make decisions and answer questions in a variety of situations? (S3)

How can the reliability of a source/sample be determined? (S3)

#### Provocative:

How can statistics be manipulated to say what statisticians want to say? (S3)

How does the understanding of statistics help a person be a critical consumer of information? (S3)

## Standard(s)

*Connecticut Core Standards / Content Standards*

### **CCSS: Mathematics**

#### **CCSS: HS: Stats/Prob**

#### **Interpreting Categorical & Quantitative Data**

##### **HSS-ID.A. Summarize, represent, and interpret data on a single count or measurement variable**

HSS-ID.A.1. Represent data with plots on the real number line (dot plots, histograms, and box plots).

HSS-ID.A.2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

HSS-ID.A.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

HSS-ID.A.4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets and tables to estimate areas under the normal curve.

##### **HSS-ID.B. Summarize, represent, and interpret data on two categorical and quantitative variables**

HSS-ID.B.6. Represent data on two quantitative variables on a scatter plot and describe how the variables are related.

##### **HSS-ID.C. Interpret linear models**

HSS-ID.C.8. Compute (using technology) and interpret the correlation coefficient of a linear fit.

HSS-ID.C.9. Distinguish between correlation and causation.

#### **Making Inferences & Justifying Conclusions**

##### **HSS-IC.A. Understand and evaluate random processes underlying statistical experiments**

HSS-IC.A.1. Understand that statistics is a process for making inferences about population parameters based on a random sample from that population.

HSS-IC.A.2. Decide if a specified model is consistent with results from a given data-generating process, e.g. using simulation.

#### **Conditional Probability & the Rules of Probability**

##### **HSS-CP.A. Understand independence and conditional probability and use them to interpret data**

HSS-CP.A.2. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.



HSS-CP.A.3. Understand the conditional probability of A given B as  $P(A \text{ and } B)/P(B)$ , and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.

HSS-CP.A.5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.

**HSS-CP.B. Use the rules of probability to compute probabilities of compound events in a uniform probability model**

HSS-CP.B.6. Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A and interpret the answer in terms of the model.

HSS-CP.B.7. Apply the Addition Rule,  $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ , and interpret the answer in terms of the model.

HSS-CP.B.8. (+) Apply the general Multiplication Rule in a uniform probability model,  $P(A \text{ and } B) = P(A)P(B|A) = P(B)P(A|B)$ , and interpret the answer in terms of the model.

HSS-CP.B.9. (+) Use permutations and combinations to compute probabilities of compound events and solve problems.

**Using Probability to Make Decisions**

**HSS-MD.B. Use probability to evaluate outcomes of decisions**

HSS-MD.B.6. (+) Use probabilities to make fair decisions

HSS-MD.B.7.(+) Analyze decisions and strategies using probability concepts

**Mathematical Practice**

**MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

## Objective(s)

### Bloom/ Anderson Taxonomy / DOK Language

Students will

- differentiate between applications requiring combinations or permutations
- calculate probability
- define "random"
- differentiate between population vs. samples
- observe studies vs. experiments, pros/cons, correlations/causation
- illustrate general probability distributions
- interpret margins of error, looking at where 90% or 95% of sample means fall after repeated simulations to estimate a margin of error
- compare distributions from two treatments to estimate significant differences between treatments
- apply percentages using area, spreadsheets, bar graphs

## Critical Content & Skills

*What students must **KNOW** and be able to DO*

Students will be able to

- Create and understand binomial distributions.
- Use counting methods to calculate probability
- Use measures of central tendency
- Analyze data
- Use standard deviation
- Apply normal distributions and probability

## Core Learning Activities

Create and understand binomial distributions.  
Use counting methods to calculate probability.

- differentiate between types of counting methods
  - multiplication counting principle
  - permutations
  - combinations
- calculate combinations and permutations
- calculate independent and conditional probability
- apply binomial theorem

Use measures of central tendency.

- calculate mean, median, mode using technology
- interpret data using technology
- identify outliers

Analyze data.

- interpret data
  - scatterplot
  - double frequency table
  - histogram
- use percentiles to describe data
- determine margin of error

Use standard deviation.

- calculate standard deviation using technology

Apply normal distributions and probability.

- calculate z score

[Calories-AS1.pdf](#)

[Calories-AS2.pdf](#)

[Orbit-AS-Debris.pdf](#)

[Orbit-AS-Effects.pdf](#)

## Assessments

[Statistics Test A.pdf](#)  
[Probability Test A.pdf](#)

## Resources

### Professional & Student

- Text: *Bellman, Bragg, Charles, Hall, Handlin, Kennedy, **Algebra 2***, Prentice Hall, 2009
- Ancillaries
- Math department generated materials
- Department reference books
- Internet resources

## Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

- Problem Solving

## Interdisciplinary Connections

### Writing

- Use formal writing techniques along with precise math vocabulary.
- Express corrections to error analysis problems succinctly.

### Business

- Calculate risk of insuring individuals.

### Biology

- Calculate effectiveness of medical treatments.
- Administering proper doses of medicine based on age and comparative data.
- Determine risk factors of inherited conditions.

### Sports

- Determine profitability of an outcome based on collected data/ previous performances.





# Unit Planner: Properties of Algebraic Functions

## Algebra II

Tuesday, May 7, 2019, 3:29PM

Newtown High School > 2018-2019 > Grade 11 > Mathematics > Algebra II  
> Week 5 - Week 8

Last Updated: Sunday, May 5, 2019 by  
Kelly Murphy

### Properties of Algebraic Functions

Carpenter, Lisa; Carroll, Megan; Cavaturo, Charlotte; Desrochers, Michael; Dominick, Lauren; Dreher, Zachary; Giacini III, Richard; Hall, Eugene; Hyman, Paige; Manos, Charlotte; Murphy, Kelly; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concept: Functions

- paired data
- continuous/discrete
- notation (set/interval)
- transformations
- parent function
- pattern
- reflections
- functions
- restrictions
- composition
- domain/restriction
- notation

Lens: Relationships

#### Generalizations / Enduring Understandings

Strand 1: Domain and range

Concepts:

- paired data
- continuous/discrete function
- notation (set/interval)

Generalization: Paired data creates a variety of continuous or discrete relationships which is clearly defined by using set or interval notation.

Strand 2: Transformations

Concepts:

- transformations
- parent function
- pattern

#### Guiding Questions

**Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]**

Factual:

In what ways can you distinguish between a relation and a function? (S1)

What is domain/range? (S1)

What is the difference between interval and set notation? (S1)

What is a function? (S1)

What are the transformations applied to parent functions? (S2)

How can inverses be proven? (S3)

Conceptual

Why does the composition prove two functions are inverse? (S3)

How come domain restrictions are necessary within piecewise functions? (S4)

How can you compare and contrast different methods to

Generalization: Patterns dictate transformations of parent functions.

Strand 3: Inverse function

Concepts:

- reflections
- functions
- restrictions
- composition

Generalization: A function and its inverse are reflections which may require restrictions and can be proven by composition.

Strand 4: Piecewise function

Concepts:

- domain/restriction
- notation

Generalization: Piecewise functions model authentic relationships.

Piecewise functions are defined by specific domain restrictions and require precise notation.

represent mathematical relationships? (S2)

How can you modify an existing function to create a new one? (S2)

Provocative:

How/where are piecewise functions used outside of the math classroom? (S4)

Why do we need inverse functions? (S3)

How reliable are predictions when using models? (S4)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Functions**

**Interpreting Functions**

**HSF-IF.A. Understand the concept of a function and use function notation.**

HSF-IF.A.1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If  $f$  is a function and  $x$  is an element of its domain, then  $f(x)$  denotes the output of  $f$  corresponding to the input  $x$ . The graph of  $f$  is the graph of the equation  $y = f(x)$ .

HSF-IF.A.2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

HSF-IF.A.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.

**HSF-IF.B. Interpret functions that arise in applications in terms of the context.**

HSF-IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

HSF-IF.B.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

HSF-IF.B.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

**HSF-IF.C. Analyze functions using different representations.**

HSF-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

HSF-IF.C.7a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

HSF-IF.C.7b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

HSF-IF.C.7c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

HSF-IF.C.7d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

HSF-IF.C.7e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

HSF-IF.C.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

HSF-IF.C.8a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

HSF-IF.C.8b. Use the properties of exponents to interpret expressions for exponential functions.

HSF-IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

### **Building Functions**

#### **HSF-BF.A. Build a function that models a relationship between two quantities.**

HSF-BF.A.1. Write a function that describes a relationship between two quantities.

HSF-BF.A.1c. (+) Compose functions.

#### **HSF-BF.B. Build new functions from existing functions.**

HSF-BF.B.4. Find inverse functions.

HSF-BF.B.4b. (+) Verify by composition that one function is the inverse of another.

HSF-BF.B.4c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.

HSF-BF.B.4d. (+) Produce an invertible function from a non-invertible function by restricting the domain.

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### Objective(s)

#### Bloom/ Anderson Taxonomy / DOK Language

Students will

- define relation, function, domain/range
- map diagrams to represent functions and relations
- apply function notation to relations that pass the vertical line test
- restrict domain and range
- represent real world situations using piecewise functions through graphing
- assess functions and any restrictions set on the graph (asymptotes)
- manipulate a function both algebraically and graphically to determine its inverse

## Critical Content & Skills

What students must **KNOW and be able to DO**

Students will be able to:

- Write domain/range using appropriate notation, in multiple forms given varied models.
- Construct piecewise graphs from functions or data.
- Construct piecewise definition from a graph.
- Categorize family of functions by inspection of an equation, a graph, or a set of data.
- Interpret how parameters cause transformations in algebraic functions.
- Apply algebraic and graphical means to prove a function's inverse exists.

## Core Learning Activities

Write domain/range using appropriate notation, in multiple forms given varied models.

- Write domain/range in interval and set notation from modeled relations and functions
- Identify continuous and discrete models

Categorize family of functions by inspection of an equation, a graph, or a set of data.

Interpret how parameters cause transformations in algebraic functions.

- Identify patterns of parent functions
- Use patterns to transform parent functions
- Create definitions from graphs

Construct piecewise graphs from functions or data. Construct piecewise definition from a graph.

- Graph based on definitions
- Write definitions based on graphs
- Write definition given authentic problems

Apply algebraic and graphical means to prove a function's inverse exists.

- Graph by inverting ordered pairs
- Create inverse functions by reflecting over  $y=x$
- Create inverse function algebraically
- Compose functions to prove inverse

\*The inverse section can be included in unit 7 (radical functions)

[HowShouldIMove-AS-Graphs.pdf](#)

[HowShouldIMove-AS-Comparison.pdf](#)

[HowShouldIMove-AS-Questions.pdf](#)

## Assessments

### Functions Equations & Graphs

#### Summative: Written Test

[Sample Functions Test Questions.pdf](#)

## Resources

*Professional & Student*

- Text: *Bellman, Bragg, Charles, Hall, Handlin, Kennedy, **Algebra 2***, Prentice Hall, 2009
- Ancillaries
- Math department generated materials
- Department reference books
- Internet resources

## Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

## Interdisciplinary Connections

### Writing

- Use formal writing techniques along with precise math vocabulary.
- Express corrections to error analysis problems

succinctly.

**Business**

- Analyze a business billing plan with multiple conditions to generalize and write own business billing plan. (*Piecewise functions*)
- Analyze the affects of a sale vs discounted pricing to generalize and write own business sale plan. (*Composition of functions*)



Atlas Version 9.3.7

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# Unit Planner: Systems Algebra II

Tuesday, May 7, 2019, 3:30PM

Newtown High School > 2018-2019 > Grade 11 > Mathematics > Algebra II  
> Week 9 - Week 13

Last Updated: Sunday, May 5, 2019 by  
Kelly Murphy

## Systems

Carpenter, Lisa; Carroll, Megan; Cavaturo, Charlotte; Desrochers, Michael; Dominick, Lauren; Dreher, Zachary; Giacini III, Richard; Hall, Eugene; Hyman, Paige; Manos, Charlotte; Murphy, Kelly; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Systems

- solution
- types of systems
- graphical representation
- algebraic manipulation
- solution
- graphical representation
- algebraic manipulation
- optimization
- system of constraints
- feasible region

Lens: Relationships

#### Generalizations / Enduring Understandings

Strand 1: Linear systems

Concepts:

- solution
- types of systems
- graphical representation
- algebraic manipulation

Generalization: Types of systems determines the number of solutions.

Linear systems are solved using graphical or algebraic means.

Strand 2: Nonlinear systems

Concepts:

- solution
- graphical representation
- algebraic manipulation

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

Factual:

What methods can be used to solve linear systems? (S1)

What method is best suited to solve a particular system? (S1/S2)

What does the solution to a system represent? (S1/S2)

What are the different types of systems? (S1/S2)

What is a constraint? (S3)

What is a feasible region? (S3)

How do you determine the optimal point? (S3)

What is linear programming? (S3)

Conceptual:

What is the connection between the graph of a system and its solution set? (S1/S2)

Which methods can be used to solve both linear and non linear systems? (S1/S2)

What are the limits to some of the methods for solving? (S1/S2)

Generalization: Systems composed of varying function types determine the number of solutions. Nonlinear systems are solved using graphical or algebraic means.

Strand 3: Linear programming  
Concepts:

- optimization
- system of constraints
- feasible region

Generalization: System of constraints calculate optimized output within the feasible region.

How do linear systems enable you to make choices for maximum profit, minimum cost and business applications? (S3)

Provocative:

How/where are systems used to determine the most cost effective option given a number of constraints? (S3)

## Standard(s)

*Connecticut Core Standards / Content Standards*

CCSS: Mathematics

CCSS: HS: Algebra

Creating Equations

HSA-CED.A. Create equations that describe numbers or relationships.

HSA-CED.A.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

HSA-CED.A.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

Reasoning with Equations & Inequalities

HSA-REI.C. Solve systems of equations.

HSA-REI.C.5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

HSA-REI.C.6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

HSA-REI.D. Represent and solve equations and inequalities graphically.

HSA-REI.D.12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

CCSS: HS: Modeling

Mathematical Practice

MP.The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

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## Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will

- define linear functions as a having a constant rate of change and a degree of one
- identify non linear functions
- construct graphs from functions and definitions from graphs
- apply a variety of techniques to solving systems
- apply real world meaning to graphical representations given a situation
- classify systems and how to solve based on information provided
- interpret feasible regions while linear programming
- optimize results in linear programming feasible region

## Critical Content & Skills

*What students must **KNOW** and be able to **DO***

Students will be able to:

- Graph functions
- Use a graphing calculator to find intersections
- Write systems of equations and solve applied problems
- Solve systems using appropriate methods (graphing, substitution, combination)
- Optimize within a feasible region when linear programming

## Core Learning Activities

Graph functions.

Use a graphing calculator to find intersections.

- Graph systems by hand and identify solutions

Solve systems using appropriate methods.

- Identify what method is most appropriate to a given system.
- Solve a system using
  - Graphing
  - Substitution
  - Elimination

Write systems of equations and solve applied problems. Optimize within a feasible region when linear programming.

- Define variables given applied problems
- Graph inequalities with appropriate format
- Use feasible region to determine test points

[Supply-AS-sheet1.pdf](#)

[Supply-AS-sheet2.pdf](#)

## Assessments

**How do we solve systems?**

**Formative: Other Visual Assessments**

White board exercises

**How do we graph system of inequalities?**

**Formative: Other Visual Assessments**

White Board exercises

**Linear Programming Assessment**

**Summative: Written Report**

Take-home quiz

**Unit Test on linear systems**

**Summative: Written Test**

[Sample test questions systems.pdf](#)

[sample test questions - lp.pdf](#)

## Resources

*Professional & Student*

- Text: *Bellman, Bragg, Charles, Hall, Handlin, Kennedy, **Algebra 2***, Prentice Hall, 2009
- Ancillaries
- Math department generated materials
- Department reference books
- Internet resources

Student Learning Expectation & 21st Century Skills

Interdisciplinary Connections

**Writing**

Information Literacy

Critical Thinking

Spoken Communication

Written Performance

- Problem Solving

- Use formal writing techniques along with precise math vocabulary.
- Express corrections to error analysis problems succinctly.

**Business**

- Compare one or more business models seeking optimal time for customer engagement.
- Analyze a business model to maximize profit, minimizing cost. (*Linear Programming*)



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# Unit Planner: Quadratics Algebra II

Tuesday, May 7 2019, 3:31PM

Newtown High School > 2018-2019 > Grade 11 > Mathematics > Algebra II  
> Week 14 - Week 18

Last Updated: Sunday, May 5, 2019 by  
Kelly Murphy

## Quadratics

Carpenter, Lisa; Carroll, Megan; Cavaturo, Charlotte; Desrochers, Michael; Dominick, Lauren; Dreher, Zachary; Giacini III, Richard; Hall, Eugene; Hyman, Paige; Manos, Charlotte; Murphy, Kelly; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- Unit Planner
- Lesson Planner

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Quadratics

- intercepts
- vertex
- axis of symmetry
- extrema
- patterns
- real zeros/roots
- simple radical form
- square roots
- complex numbers
- conjugates
- incomplete quadratic equations
- perfect square trinomial
- quadratic formula
- discriminant

Lens: Relationships

#### Generalizations / Enduring Understandings

##### Strand 1: Graphing

Concepts:

- intercepts
- vertex
- axis of symmetry
- extrema

Generalization: Intercepts, vertices, axis of symmetry, and extrema construct quadratic graphs.

##### Strand 2: Factoring

Concepts:

- patterns

#### Guiding Questions

***Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]***

##### Factual:

- How do you find x-intercepts or solve when  $y=0$ ? (S1)
- What is a perfect square trinomial? (S4)
- What does the discriminant determine? (S4)
- What is the relationship between the number of real roots and the graph of a quadratic equation? (S1)
- What is a conjugate? (S3)
- What is a complex number? (S3)
- What do extrema represent? (S1)

##### Conceptual:

- How are quadratic functions used to model actual data? (S1)
- Why does the relationship between the number of real

- real zeros/roots

Generalization: Factor patterns identify roots.

Strand 3: Square roots

Concepts:

- simple radical form
- square roots
- complex numbers
- conjugates
- incomplete quadratic equations

Generalization: Square root procedures resolve incomplete quadratic equations.

Complex conjugates eliminate the imaginary number.

Simplified radicals rewrite numbers in a consistent form.

Strand 4: Completing the square

Concepts:

- perfect square trinomial
- quadratic formula
- discriminant

Generalization: Completing the square derives the quadratic formula.

The discriminant determines the number and type of solutions.

roots and the graph of a quadratic equation exist? (S1-S4)

Why are conjugates necessary? (S3)

Why might a specific method be chosen to solve a given quadratic equation? (S1-S4)

Provocative:

How do quadratic functions model projectile motion? (S1-S4)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

**The Complex Number System**

**HSN-CN.C. Use complex numbers in polynomial identities and equations.**

HSN-CN.C.7. Solve quadratic equations with real coefficients that have complex solutions.

HSN-CN.C.8. (+) Extend polynomial identities to the complex numbers. For example, rewrite  $x^2 + 4$  as  $(x + 2i)(x - 2i)$ .

HSN-CN.C.9. (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.

**CCSS: HS: Algebra**

**Seeing Structure in Expressions**

**HSA-SSE.B. Write expressions in equivalent forms to solve problems.**

HSA-SSE.B.3a. Factor a quadratic expression to reveal the zeros of the function it defines.

**Reasoning with Equations & Inequalities**

**HSA-REI.B. Solve equations and inequalities in one variable.**

HSA-REI.B.4. Solve quadratic equations in one variable.

HSA-REI.B.4a. Use the method of completing the square to transform any quadratic equation in  $x$  into an equation of the form  $(x - p)^2 = q$  that has the same solutions. Derive the quadratic formula from this form.

HSA-REI.B.4b. Solve quadratic equations by inspection (e.g., for  $x^2 = 49$ ), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the

quadratic formula gives complex solutions and write them as  $a \pm bi$  for real numbers  $a$  and  $b$ .

## CCSS: HS: Functions

### Interpreting Functions

#### HSF-IF.B. Interpret functions that arise in applications in terms of the context.

HSF-IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

#### HSF-IF.C. Analyze functions using different representations.

HSF-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

HSF-IF.C.7a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

HSF-IF.C.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

HSF-IF.C.8a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

HSF-IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

### Linear, Quadratic, and Exponential Models

#### HSF-LE.A. Construct and compare linear and exponential models and solve problems.

HSF-LE.A.3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

HSF-LE.A.4. For exponential models, express as a logarithm the solution to  $ab^{ct} = d$  where  $a$ ,  $c$ , and  $d$  are numbers and the base  $b$  is 2, 10, or  $e$ ; evaluate the logarithm using technology.

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### Objective(s)

#### Bloom/ Anderson Taxonomy / DOK Language

Students will be able to:

- Apply Skill & concepts-solving quadratic equations
- Analyze data tables using strategic thinking/reasoning to determine if quadratic
- Evaluate how to most efficiently solve quadratics by describing, comparing and contrasting solution methods

### Critical Content & Skills

#### What students must **KNOW and be able to DO**

Students will be able to:

- Graph parabolas given standard and vertex form
- Solve all types of quadratic equations for real and/or complex roots
- Analyze a graph for maximum, minimum, y-intercept and x-intercepts
- Factor quadratics
- Apply characteristics of a quadratic function and graph to real-world applications
- Determine best method to solve quadratic equation

### Core Learning Activities

Construct quadratic definition given graph  
Graph parabolas given standard and vertex form.  
Analyze a graph for maximum, minimum, y-intercept and x-intercepts.

- Graph parabolas given both standard and vertex form
- Identify key points of quadratic given quadratic function
- Given key points write definition of a quadratic function

Factor quadratics

- Construct quadratic definition given graph

- Factor by
  - Greatest common factor
  - Difference of perfect squares
  - Perfect square trinomial
  - Lead coefficient
  - Four term polynomial
- Identify best factoring method
- Create factors using zeros

Solve all types of quadratic equations for real and/or complex roots.

Determine best method to solve quadratic equation

- Use discriminant to determine best method to solve
- Simplify square root
- Complete the square
- Factor
- Apply quadratic formula
- Graph
- Simplify complex numbers

Apply characteristics of a quadratic function and graph to real-world applications

[EggLaunch-AS-sheet1.pdf](#)  
[MaxMinZeros-OV-UsingCalc.pdf](#)  
[Regression-OV-UsingCalc\(1\).pdf](#)

### Assessments

**Solving quadratic equation in one variable - factoring**

**Summative: Written Test**

**Use completing the square to solve.**

**Formative: Other Visual Assessments**

Use white boards

**Use completing the square to solve quadratic equation - including complex #**

**Summative: Written Test**

**Solving all types of quadratic equations**

**Formative: Other written assessments**

1 of each problem

**Solving quadratics using all methods**

**Summative: Written Test**

[sample test questions - quadratics.pdf](#)

### Resources

*Professional & Student*

- Text: *Bellman, Bragg, Charles, Hall, Handlin, Kennedy, **Algebra 2***, Prentice Hall, 2009
- Ancillaries
- Math department generated materials
- Department reference books
- Internet resources

### Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

- Problem Solving

### Interdisciplinary Connections

#### Writing

- Use formal writing techniques along with precise math vocabulary.
- Express corrections to error analysis problems succinctly.

#### Physical Education

- Improve game (archery, baseball/softball, basketball, tennis, volleyball, diving)based on



vertical motion.

**Business**

- Maximize/minimize area to maximize profit, minimizing cost.



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# Unit Planner: Polynomials Algebra II

Tuesday, May 7, 2019, 3:32PM

Newtown High School > 2018-2019 > Grade 11 > Mathematics > Algebra II  
> Week 19 - Week 23

Last Updated: Sunday, May 5, 2019 by  
Kelly Murphy

## Polynomials

Carpenter, Lisa; Carroll, Megan; Cavataro, Charlotte; Desrochers, Michael; Dominick, Lauren; Dreher, Zachary; Giacini III, Richard; Hall, Eugene; Hyman, Paige; Manos, Charlotte; Murphy, Kelly; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- Unit Planner
- Lesson Planner

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concept: Polynomials

- end behavior
- zeros
- multiplicity
- degree
- solving
- long division
- synthetic division
- synthetic substitution (remainder theorem)
- factorization
- factor theorem
- remainder theorem
- rational root theorem
- imaginary root theorem
- irrational root theorem
- fundamental theorem of algebra
- binomial theorem

Lens: Interactions

#### Generalizations / Enduring Understandings

Strand 1: Graphing

Concepts:

- end behavior
- zeros
- multiplicity
- degree

Generalization: End behavior, zeros, multiplicity, and degree determine shape of graph.

Strand 2: Factoring by division

Concepts:

#### Guiding Questions

**Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]**

Factual:

- How is degree of a polynomial related to its end behavior? (S1)
- How is degree of a polynomial related to its zeros? (S1)
- What are the special theorems? (S3)
- How does multiplicity effect the graph? (S1)
- Can you use fractions for zeros for synthetic division? (S2)
- How do you determine the multiplicity? (S1)
- What are conjugates? (S3)
- How is the zero determined when applying synthetic division? (S2)
- What is a zero? (S1)

- long division
- synthetic division
- factorization

Generalization: Synthetic and long division aids in the factorization of polynomials.

Strand 3: Special Theorems

Concepts:

- factor theorem
- remainder theorem
- rational root theorem
- imaginary root theorem
- irrational root theorem
- fundamental theorem of algebra
- binomial theorem

Generalization: Factor, remainder, rational root, imaginary root, irrational root, binomial theorems and the fundamental theorem of algebra provide critical information about a polynomial.

Conceptual:

How do the x-intercepts relate to the structure of the polynomial? (S1)  
 What is the relationship between a polynomial function and its graph? (S1)  
 How can we find the characteristics of a polynomial function? (S3)  
 What is the relationship between long division and synthetic division? (S2)  
 How is synthetic division used to factor a polynomial? (S2)  
 What is the relationship between the degree of the original polynomial and its quotient after synthetic division? (S2)  
 Why do some zeros have conjugates while others do not? (S3)  
 What is the difference between a zero and a root? (S1-S3)

Provocative:

Why are conjugates necessary? (S3)  
 How come not every polynomial is factorable? (S2/S3)

Standard(s)

Connecticut Core Standards / Content Standards

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

**The Complex Number System**

**HSN-CN.C. Use complex numbers in polynomial identities and equations.**

HSN-CN.C.7. Solve quadratic equations with real coefficients that have complex solutions.

HSN-CN.C.8. (+) Extend polynomial identities to the complex numbers. For example, rewrite  $x^2 + 4$  as  $(x + 2i)(x - 2i)$ .

HSN-CN.C.9. (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.

**CCSS: HS: Algebra**

**Seeing Structure in Expressions**

**HSA-SSE.A. Interpret the structure of expressions.**

HSA-SSE.A.1. Interpret expressions that represent a quantity in terms of its context.

HSA-SSE.A.1a. Interpret parts of an expression, such as terms, factors, and coefficients.

HSA-SSE.A.1b. Interpret complicated expressions by viewing one or more of their parts as a single entity.

HSA-SSE.A.2. Use the structure of an expression to identify ways to rewrite it.

**Arithmetic with Polynomials & Rational Functions**

**HSA-APR.A. Perform arithmetic operations on polynomials.**

HSA-APR.A.1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

**HSA-APR.B. Understand the relationship between zeros and factors of polynomials.**

HSA-APR.B.2. Know and apply the Remainder Theorem: For a polynomial  $p(x)$  and a number  $a$ , the remainder on

division by  $x - a$  is  $p(a)$ , so  $p(a) = 0$  if and only if  $(x - a)$  is a factor of  $p(x)$ .

HSA-APR.B.3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

**HSA-APR.C. Use polynomial identities to solve problems.**

HSA-APR.C.4. Prove polynomial identities and use them to describe numerical relationships.

HSA-APR.C.5. (+) Know and apply the Binomial Theorem for the expansion of  $(x + y)^n$  in powers of  $x$  and  $y$  for a positive integer  $n$ , where  $x$  and  $y$  are any numbers, with coefficients determined for example by Pascal's Triangle.

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**Objective(s)**

**Bloom/ Anderson Taxonomy / DOK Language**

Students will

- Understand the relationship between a graph and its factors, degree and # of zeros, both real and complex
- Describe, compare and contrast solution methods to find x-intercepts
- Apply long and synthetic division to solve polynomial equations
- Apply long and synthetic division to factor polynomial expressions
- Apply special theorems

**Critical Content & Skills**

*What students must **KNOW and be able to DO***

Students will be able to

- Given a graph, write factors of polynomial
- Given a polynomial, graph
- Given factors, write in standard form
- Use special theorems to identify key criteria about a polynomial

**Core Learning Activities**

Given a graph, write factors of polynomial.

- identify zeros
- identify multiplicity
- identify local min/max using a graphing utility

Given a polynomial, graph.

- identify end behavior
- factor to determine multiplicities and zeros
- plot all intercepts

Given factors, write in standard form.

- state the binomial theorem
- multiply polynomials

Use special theorems to identify key criteria about a polynomial.

- use factor theorem to factor
- use remainder theorem
  - find zeros
  - determine ordered pairs
- use rational root theorem to list possible rational roots
- use imaginary root theorem to find additional conjugate root to create polynomial equations
- use irrational root theorem to find additional conjugate root to create polynomial equations
- use fundamental theorem of algebra to identify

	<p>number of complex solutions</p> <p><a href="#">BuildingPolys-AS-Building.pdf</a>  <a href="#">BuildingPolys-AS-Backwards.pdf</a>  <a href="#">BuildingPolys-AS-HigherDegree.pdf</a></p>
<p><b>Assessments</b></p> <p><a href="#">Sample Assessment Problems.docx</a></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i></p> <ul style="list-style-type: none"> <li>• Text: <i>Bellman, Bragg, Charles, Hall, Handlin, Kennedy, <b>Algebra 2</b></i>, Prentice Hall, 2009</li> <li>• Ancillaries</li> <li>• Math department generated materials</li> <li>• Department reference books</li> <li>• Internet resources</li> </ul>
<p><b>Student Learning Expectation &amp; 21st Century Skills</b></p> <p><a href="#">Information Literacy</a>  <a href="#">Critical Thinking</a>  <a href="#">Spoken Communication</a>  <a href="#">Written Performance</a></p> <ul style="list-style-type: none"> <li>• Problem Solving</li> </ul>	<p><b>Interdisciplinary Connections</b></p> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>• Use formal writing techniques along with precise math vocabulary.</li> <li>• Express corrections to error analysis problems succinctly.</li> </ul> <p><b>Business</b></p> <ul style="list-style-type: none"> <li>• Maximize volume with specified dimensions.</li> </ul>





# Unit Planner: Rational Functions Algebra II

Tuesday, May 7, 2019, 3:33PM

Newtown High School > 2018-2019 > Grade 11 > Mathematics > Algebra II  
> Week 24 - Week 28

Last Updated: Friday, April 26, 2019 by  
Kelly Murphy

## Rational Functions

Carpenter, Lisa; Carroll, Megan; Cavataro, Charlotte; Desrochers, Michael; Dominick, Lauren; Dreher, Zachary; Giacini III, Richard; Hall, Eugene; Hyman, Paige; Manos, Charlotte; Murphy, Kelly; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- Unit Planner
- Lesson Planner

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concept: Rational functions

- lowest term
- operations
- solving
  - extraneous solutions
- reciprocal function
- asymptotes
- end behavior
- discontinuity

Lens: Interpretation

#### Generalizations / Enduring Understandings

Strand 1: Fractions

Concepts:

- lowest terms
- operations
- solving
  - extraneous solutions

Generalization: Operations reduce rationals into lowest terms.

Extraneous solutions may occur when solving rational equations.

Strand 2: Graphing

Concepts:

- reciprocal function
- asymptotes
- end behavior
- discontinuity

Generalization: The reciprocal function is the parent

#### Guiding Questions

**Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]**

Factual:

- What is an asymptote? (S2)
- When is a common denominator necessary? (S1)
- What is an extraneous solution? (S2)
- What rules dictate end behavior asymptotes? (S2)

Conceptual:

- How can we compare the rules for simplifying and performing operations for rational numbers with the related rules for rational expressions? (S1)
- How can we utilize knowledge of critical points, points of discontinuity and end-behavior to predict, visualize and sketch a graph of a rational function? (S2)
- Why do rational equations generate extraneous solutions? (S1)

Provocative:

- How is factoring useful? (S1/S2)

function of all rational functions.  
Removable discontinuities, asymptotes, and end behavior dictate graphs of rational functions.

## Standard(s)

*Connecticut Core Standards / Content Standards*

### **CCSS: Mathematics**

#### **CCSS: HS: Algebra**

#### **Arithmetic with Polynomials & Rational Functions**

##### **HSA-APR.D. Rewrite rational expressions.**

HSA-APR.D.6. Rewrite simple rational expressions in different forms; write  $a(x)/b(x)$  in the form  $q(x) + r(x)/b(x)$ , where  $a(x)$ ,  $b(x)$ ,  $q(x)$ , and  $r(x)$  are polynomials with the degree of  $r(x)$  less than the degree of  $b(x)$ , using inspection, long division, or, for the more complicated examples, a computer algebra system.

HSA-APR.D.7. (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

#### **Reasoning with Equations & Inequalities**

##### **HSA-REI.A. Understand solving equations as a process of reasoning and explain the reasoning.**

HSA-REI.A.2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

##### **HSA-REI.D. Represent and solve equations and inequalities graphically.**

HSA-REI.D.11. Explain why the  $x$ -coordinates of the points where the graphs of the equations  $y = f(x)$  and  $y = g(x)$  intersect are the solutions of the equation  $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where  $f(x)$  and/or  $g(x)$  are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

#### **CCSS: HS: Functions**

#### **Interpreting Functions**

##### **HSF-IF.C. Analyze functions using different representations.**

HSF-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

HSF-IF.C.7d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

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## Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will

- Define rational function.
- Classify reciprocal functions and translations
- Analyze end behavior including asymptotes
- Interpret domain and range restrictions
- Compute products, quotients, sums and differences of rational expressions
- Find removable discontinuities, asymptotes and end behavior of rational functions
- Graph complex rational functions using aforementioned properties
- Compare expressions versus equations, connect manipulation versus alteration
- Solve rational equations
- Investigate extraneous roots

Critical Content & Skills

Core Learning Activities

*What students must **KNOW and be able to DO***

Students will be able to:

- Factor and simplify rational expressions.
- Apply operations on rational expressions, (include simple and complex fractions).
- Solve rational equations and identify extraneous solutions.
- Set-up and solve applications of rational equation problems
- Understand domain/range and restricted domain values.
- Graph and transform reciprocal functions.
- Graph rational functions

Factor and simplify rational expressions.  
Apply operations on rational expressions, (include simple and complex fractions).

- Add/subtract rational expressions.
  - identify lowest common denominator
- Multiply/divide rational expressions.
- Operations with complex fractions

Solve rational equations and identify extraneous solutions.

Set-up and solve applications of rational equation problems

- Identify when to
  - cross multiplication is applicable
  - multiply by the lowest common multiple
- Check for extraneous solutions.

Understand domain/range and restricted domain values.  
Graph and transform reciprocal functions.

Graph rational functions

- Identify all points of discontinuity
  - Holes
  - Vertical asymptotes
- Identify end behavior asymptote
  - may use synthetic division
- Identify all intercepts.
- Test points as needed. (no calculator)

[Grad standard rational functions.pdf](#)

Assessments

[Sample Rational Function Test Questions.pdf](#)

Resources

*Professional & Student*

- Text: *Bellman, Bragg, Charles, Hall, Handlin, Kennedy, **Algebra 2***, Prentice Hall, 2009
- Ancillaries
- Math department generated materials
- Department reference books
- Internet resources

Student Learning Expectation & 21st Century Skills

Information Literacy

Critical Thinking

Spoken Communication

Written Performance

- Problem Solving

Interdisciplinary Connections

**Writing**

- Use formal writing techniques along with precise math vocabulary.
- Express corrections to error analysis problems succinctly.

**Chemistry/Biology**

- Determine time medicine takes to permeate the body.

**Physics**



- Explore relationships between currents (river and air), as related to time.



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# Unit Planner: Radical Functions Algebra II

Tuesday, May 7, 2019, 3:38PM

Newtown High School > 2018-2019 > Grade 11 > Mathematics > Algebra II  
> Week 29 - Week 33

Last Updated: Friday, April 26, 2019 by  
Kelly Murphy

## Radical Functions

Carpenter, Lisa; Carroll, Megan; Cavaturo, Charlotte; Desrochers, Michael; Dominick, Lauren; Dreher, Zachary; Giacini III, Richard; Hall, Eugene; Hyman, Paige; Manos, Charlotte; Murphy, Kelly; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Radical Functions

- index
- simple radical form
- operations
- rationalize
- rational exponent
- inverse operation
- extraneous solution(s)
- inverse
- domain restriction
- transformations

Lens: patterns

#### Generalizations / Enduring Understandings

##### Strand 1: Simplification

Concepts:

- index
- simple radical form
- operations
- rationalize
- rational exponent

Generalization: The index drives simplification of radical expressions including operations and rationalization. Operations with rational exponents transform into simplified radical form.

##### Strand 2: Solving

Concepts:

- inverse operation
- extraneous solution(s)

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

##### Factual:

- What are some of the various methods that can be used to determine if two functions/relations are inverse of each other? (S3)
- What is the number under the radical called? (S1)
- Where is the index located? (S1)
- What is an extraneous solution? (S2)
- Why do denominators need to be rationalized? (S1)
- What is a rational exponent? (S1)
- What is an inverse operation? (S2)
- What type of functions require a domain restriction? (S3)

##### Conceptual:

- What are the key questions that students should ask to determine if a radical expression is in simplest form? (S1)
- How can the techniques and procedure for radical operations be used to manipulate formulas and equations? (S2)

Generalization: Inverse operations often yield extraneous solutions.

### Strand 3: Graphing

Concepts:

- inverse
- domain restriction
- transformations

Generalization: Graphed radical functions represent inverses often requiring domain restrictions. Transformations of parent functions aid in graphing radical functions.

How are radical expressions and rational exponents related? (S1)

What is the value of transforming a radical expression into simplest form? (S1)

How can the inverse of a function help find the set of conditions that produce a certain output? (S3)

Why is an inverse operation needed to solve radical equations? (S2)

Provocative:

Why is a domain restriction necessary in real world applications that lend themselves to radical functions and related inverses? (S3)

## Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

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### **The Real Number System**

**HSN-RN.A. Extend the properties of exponents to rational exponents.**

HSN-RN.A.2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.

**CCSS: HS: Algebra**

---

### **Creating Equations**

**HSA-CED.A. Create equations that describe numbers or relationships.**

HSA-CED.A.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

### **Reasoning with Equations & Inequalities**

**HSA-REI.A. Understand solving equations as a process of reasoning and explain the reasoning.**

HSA-REI.A.2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

**CCSS: HS: Functions**

---

### **Interpreting Functions**

**HSF-IF.B. Interpret functions that arise in applications in terms of the context.**

HSF-IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

HSF-IF.B.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

HSF-IF.B.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

**HSF-IF.C. Analyze functions using different representations.**

HSF-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

HSF-IF.C.7b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

HSF-IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

## Building Functions

### HSF-BF.B. Build new functions from existing functions.

HSF-BF.B.3. Identify the effect on the graph of replacing  $f(x)$  by  $f(x) + k$ ,  $k f(x)$ ,  $f(kx)$ , and  $f(x + k)$  for specific values of  $k$  (both positive and negative); find the value of  $k$  given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

HSF-BF.B.4. Find inverse functions.

HSF-BF.B.4c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.

HSF-BF.B.4d. (+) Produce an invertible function from a non-invertible function by restricting the domain.

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## Objective(s)

### Bloom/ Anderson Taxonomy / DOK Language

Students will

- compute and simplify with radicals, employing rationalization techniques
- calculate then check answers for extraneous solutions when solving
- graph radical functions and their inverses, restricting domain when necessary
- convert rational exponents to radical form; convert radical form to rational exponents
- apply rules of exponents
- apply general and particular equations to phenomena in the real world

## Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to

- Simplify  $n$ th root radical expressions.
- Perform operations on  $n$ th root radical expressions.
- Use rational exponents.
- Solve radical equations, including equations involving rational exponents.
- Use patterns to graph and translate radical functions.
- Find inverses of radical and higher degree polynomials functions.

## Core Learning Activities

Simplify  $n$ th root radical expressions.

- using square roots and  $n$ th roots considering only the real number system and using absolute value for even roots

Perform operations on  $n$ th root radical expressions.

- add/subtract/multiply/divide and rationalize
  - binomial rationalization

Use rational exponents.

- convert between rational exponents and radical expressions
- apply properties of exponents to simplify and perform operations with rational exponents

Solve radical equations, including equations involving rational exponents.

- use inverse operations/reciprocal powers to solve
- check for extraneous solutions

Use patterns to graph and translate radical functions.

	<ul style="list-style-type: none"> <li>• square root functions</li> <li>• cube root functions</li> </ul> <p>Find inverses of radical and higher degree polynomials functions.</p> <ul style="list-style-type: none"> <li>• graphs with their inverses</li> <li>• the use of composition of functions to prove/disprove inverse relations</li> <li>• identify inverse functions through analyzing the domain and range</li> </ul>
<p><b>Assessments</b></p> <p><b>Sample Radical Assessment Questions</b>  <b>Summative: Written Test</b>  <a href="#">Sample Radical Assessment Problems.docx</a>  <a href="#">Additional Radical Assessment Problems.pdf</a></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i></p> <ul style="list-style-type: none"> <li>• Text: <i>Bellman, Bragg, Charles, Hall, Handlin, Kennedy, <b>Algebra 2</b></i>, Prentice Hall, 2009</li> <li>• Ancillaries</li> <li>• Math department generated materials</li> <li>• Department reference books</li> <li>• Internet resources</li> </ul>
<p><b>Student Learning Expectation &amp; 21st Century Skills</b></p> <p><u>Information Literacy</u>  <u>Critical Thinking</u>  <u>Spoken Communication</u>  <u>Written Performance</u></p> <ul style="list-style-type: none"> <li>• Problem Solving</li> </ul>	<p><b>Interdisciplinary Connections</b></p> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>• Use formal writing techniques along with precise math vocabulary.</li> <li>• Express corrections to error analysis problems succinctly.</li> <li>• Address relationship between feasible and impossible solutions as pertaining to a sample scenario. (<i>extraneous solutions</i>)</li> </ul>





# Unit Planner: Exponential and Logarithmic Functions Algebra II

Tuesday, May 7, 2019, 3:37PM

Newtown High School > 2018-2019 > Grade 11 > Mathematics > Algebra II  
> Week 34 - Week 38

Last Updated: Friday, April 26, 2019 by  
Kelly Murphy

## Exponential and Logarithmic Functions

Carpenter, Lisa; Carroll, Megan; Cavaturo, Charlotte; Desrochers, Michael; Dominick, Lauren; Dreher, Zachary; Giacini III, Richard; Hall, Eugene; Hyman, Paige; Manos, Charlotte; Murphy, Kelly; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Exponential and Logarithmic functions

- rate increase/decrease
- growth/decay factor
- graph
- function
- inverse
- properties
- function
- natural log
- common log
- compound interest
- continuously compound interest
- exponential growth/decay
  - half-life
  - radioactivity

Lens: Inverse relationships

#### Generalizations / Enduring Understandings

##### Strand 1: Exponential

Concepts:

- rate increase/decrease
- growth/decay factor
- graph
- function

Generalization: Growth/decay factor dictates the rate of increase/decrease in the graph of an exponential function.

##### Strand 2: Logarithm

Concepts:

- inverse

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

##### Factual:

- What is an exponential function? (S1)
- What is a logarithm? (S2)
- What is the base of a natural log? (S3)
- What is the inverse of a natural log? (S2/S3)
- What are the properties of logs? Where do they come from? (S2)
- What is the compound interest formula? (S3)
- What is the continuously compounded interest formula? (S3)
- What is a half life? (S3)

##### Conceptual:

- What is the difference between an exponential and logarithmic function? (S1)

- properties
- function

Generalization: An exponential function's inverse results in a logarithmic function.

Properties of logarithms simplify logarithmic expressions.

### Strand 3: Mathematical Applications

Concepts:

- natural log
- common log
- compound interest
- continuously compound interest
- exponential growth/decay
  - half-life
  - radioactivity

Generalization: Compound interest and continuously compounding interest formulas may use common and natural logs to calculate exponential growth and decay. Exponential decay is common in half-life radioactive problems.

How can you plan how much time it will take for an initial amount of money to grow to a specific sum? (S3)  
 How can you find the growth/decay rate for something that is changing exponentially, and then use that rate to make predictions about subsequent values? (S3)  
 How are logarithms a different representation of an exponent? (S1)  
 What does it mean if a scientific scale of measure is logarithmic? (S3)

### Provocative:

Why are logarithms a valuable tool to mathematicians, scientists, and others for computational purposes before the advent of technology? (S2/S3)

## Standard(s)

*Connecticut Core Standards / Content Standards*

### **CCSS: Mathematics**

#### **CCSS: HS: Algebra**

#### **Creating Equations**

##### **HSA-CED.A. Create equations that describe numbers or relationships.**

HSA-CED.A.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

HSA-CED.A.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

HSA-CED.A.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

#### **Reasoning with Equations & Inequalities**

##### **HSA-REI.D. Represent and solve equations and inequalities graphically.**

HSA-REI.D.11. Explain why the x-coordinates of the points where the graphs of the equations  $y = f(x)$  and  $y = g(x)$  intersect are the solutions of the equation  $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where  $f(x)$  and/or  $g(x)$  are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

#### **CCSS: HS: Functions**

#### **Interpreting Functions**

##### **HSF-IF.C. Analyze functions using different representations.**

HSF-IF.C.7e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

HSF-IF.C.8b. Use the properties of exponents to interpret expressions for exponential functions.

HSF-IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

### Building Functions

#### HSF-BF.A. Build a function that models a relationship between two quantities.

HSF-BF.A.1c. (+) Compose functions.

#### HSF-BF.B. Build new functions from existing functions.

HSF-BF.B.4. Find inverse functions.

### Linear, Quadratic, and Exponential Models

#### HSF-LE.A. Construct and compare linear and exponential models and solve problems.

HSF-LE.A.4. For exponential models, express as a logarithm the solution to  $ab^{ct} = d$  where  $a$ ,  $c$ , and  $d$  are numbers and the base  $b$  is 2, 10, or  $e$ ; evaluate the logarithm using technology.

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### Objective(s)

#### Bloom/ Anderson Taxonomy / DOK Language

Students will:

- Identify exponential growth/decay functions, and indicate rate of growth or decay
- Model and build functions for a variety of real-world applications (population, half-life, finance, etc.)
- Derive the concept of logarithms from the inverse of an exponential function
- Apply properties of logarithms, as expansion and contraction of log expressions
- Convert between logarithmic and exponential form
- Evaluate logarithms, including solving for missing values in a logarithmic statement
- Solve exponential and logarithmic equations, and test the validity of solutions
- Use common log, natural logs or log with selected base to solve a problem situation.
- Use the change of base formula as needed

### Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to:

- Review and understand basic exponential functions.
- Write exponential functions from rates, given information or points.
- Identify growth/decay function, as well as rate of growth or decay.
- Understand and use the fundamental definition of a logarithm.
- Graphically demonstrate log as inverse of exponential function.
- Evaluate logarithms.
- Convert between exponential and logarithmic form.
- Use properties of logarithms.
- Solve exponential and logarithmic equations.
- Model various real-world exponential growth and decay scenarios.

### Core Learning Activities

Review and understand basic exponential functions.  
Write exponential functions from rates, given information or points.

Identify growth/decay function, as well as rate of growth or decay.

- graph exponential functions
- use systems to write equations of exponential functions

Understand and use the fundamental definition of a logarithm  
Graphically demonstrate log as inverse of exponential function  
Evaluate logarithms  
Convert between exponential and logarithmic form  
Use properties of logarithms.

- expand/condense using properties of logs
- use change of base formula



- For the exponential functions, evaluate and model using interest formulas.

- use technology to verify computations

Solve exponential and logarithmic equations.

- use change of base formula
- use technology to verify computations

Model various real-world exponential growth and decay scenarios.

For the exponential functions, evaluate and model using interest formulas.

- compound interest
- continuous growth
- half life
- population growth/decay
- depreciation

[ComplInterest-AS-SavingsAccount.pdf](#)

[ComplInterest-AS-CreditCard.pdf](#)

[LogarithmsDemystified-AS.pdf](#)

[LogarithmsDemystified-SlideRuleTemplates.pdf](#)

#### Assessments

[Sample Exponential and Logarithm Assessment Problems.docx](#)

#### Resources

*Professional & Student*

- Text: *Bellman, Bragg, Charles, Hall, Handlin, Kennedy, **Algebra 2***, Prentice Hall, 2009
- Ancillaries
- Math department generated materials
- Department reference books
- Internet resources

#### Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

#### Interdisciplinary Connections

##### Writing

- Use formal writing techniques along with precise math vocabulary.
- Express corrections to error analysis problems succinctly.

##### Business

- Compare interest rates on varying banking accounts.
- Analyze differing aspects of banking formulas.

##### Earth Science/Biology

- Predict population growth/decay.
- Determine affects of earthquakes using Richter Scale.

##### Chemistry

	<ul style="list-style-type: none"><li>• Predict via carbon dating.</li></ul>
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# Unit Planner: Conic Sections Algebra II

Tuesday, May 7, 2019, 3:38PM

Newtown High School > 2018-2019 > Grade 11 > Mathematics >  
Algebra II > Week 36 - Week 38

Last Updated: Thursday, February 14, 2019  
by Kelly Murphy

## Conic Sections

Carpenter, Lisa; Carroll, Megan; Cavaturo, Charlotte; Desrochers, Michael; Dominick, Lauren; Dreher, Zachary; Giacini III, Richard; Hall, Eugene; Hyman, Paige; Manos, Charlotte; Murphy, Kelly; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concept: Conics

- center
- radius
- center
- foci
- minor/major axes
- vertices/co-vertices
- center
- foci
- central rectangle
- asymptotes
- transverse/conjugate axes
- vertices
- vertex
- focus
- directrix
- axis of symmetry

Lens: Patterned relationships

#### Generalizations / Enduring Understandings

Strand 1: Circles

Concepts:

- center
- radius

Generalization: The fundamental parts of a circle are its center and radius.

A circle is the locus of points equidistant from one point.

Strand 2: Ellipses

Concepts:

- center

#### Guiding Questions

**Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]**

Factual:

What is a circle? (S1)

What is an ellipse? (S2)

What is a hyperbola? (S3)

What is a parabola? (S4)

What is a foci? (S2-S4)

What is an asymptote of a hyperbola? (S3)

What is a transverse axes of a hyperbola? (S3)

What is a conjugate axes of a hyperbola? (S3)

What is a directrix? (S4)

How is the distance calculated from the focus to the vertex for a parabola? (S4)

- foci
- minor/major axes
- vertices/co-vertices

Generalization: An ellipse is formed by the locus of points whose sum of the distance from the two foci remains constant.

The location of the center, minor axis, major axis, foci, vertices, and co-vertices define an ellipse.

### Strand 3: Hyperbolas

Concepts:

- center
- foci
- central rectangle
- asymptotes
- transverse/conjugate axes
- vertices

Generalization: A hyperbola is formed by the locus of points whose difference of the distance from the two foci remains constant.

The location of the center, central rectangle, foci, vertices, asymptotes, transverse and conjugate axes define a hyperbola.

### Strand 4: Parabolas

Concepts:

- vertex
- focus
- directrix
- axis of symmetry

Generalization: A parabola is formed by the locus of points equidistant from the focus and directrix.

The location of the vertex, focus, directrix, and axis of symmetry define a parabola.

### Conceptual:

How is a conic section formed from a cone? (S1-S4)

How does the definition of each section lead to an algebraic equation? (S1-S4)

How can the conic section be determined based on given critical information? (S1-S4)

### Provocative:

Why are conic sections applicable in optics? (S1-S4)

## Standard(s)

*Connecticut Core Standards / Content Standards*

### **CCSS: Mathematics**

#### **CCSS: HS: Geometry**

#### **Expressing Geometric Properties with Equations**

##### **HSG-GPE.A. Translate between the geometric description and the equation for a conic section**

HSG-GPE.A.1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

HSG-GPE.A.2. Derive the equation of a parabola given a focus and directrix.

HSG-GPE.A.3. (+) Derive the equations of ellipses and hyperbolas given two foci for the ellipse, and two directrices of a hyperbola.

##### **HSG-GPE.B. Use coordinates to prove simple geometric theorems algebraically**

HSG-GPE.B.4. Use coordinates to prove simple geometric theorems algebraically.

## Geometric Measurement & Dimension

### HSG-GMD.B. Visualize the relation between two-dimensional and three-dimensional objects

HSG-GMD.B.4. Identify cross-sectional shapes of slices of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

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#### Objective(s)

#### Bloom/ Anderson Taxonomy / DOK Language

Students will

- write equations of conic sections
- write equations of transverse axes
- graph critical information
- graph conic sections
- use critical information to identify types of conic sections
- identify type of conic section in algebraic form
- convert equations from standard form into graphing form

#### Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to

- Write equations of conic sections.
- Calculate distance from center to foci of ellipses and hyperbolas.
- Graph conic sections.
- Use critical information to identify types of conic sections.
- Identify type of conic section in algebraic form.

#### Core Learning Activities

Write equations of conic sections.

- Write the equation of conic section in standard form and general form given a graph.
- Write the equation of appropriate conic section in standard form and general form given critical information.
- Convert between standard and general form of conic sections.

Calculate distance from center to foci of ellipses and hyperbolas.

- Calculate the distance from center to foci of ellipse using the difference of the squares of half the length of the major and minor axes.
- Calculate the distance from center to foci of hyperbola using the sum of the squares of half the length of the transverse and conjugate axes.

Graph conic sections.

- Graph all features of the appropriate conic section using critical information.
- Graph all features of a conic section given an equation in either form.

Use critical information to identify types of conic sections.

- Write the equation of a circle given
  - center, radius, diameter, end points of diameter, three points, area, and/or circumference
- Write the equation of an ellipse given
  - center, end points of major/minor axis,

	<p>vertices/co-vertices, and/or foci</p> <ul style="list-style-type: none"> <li>• Write the equation of a hyperbola given <ul style="list-style-type: none"> <li>◦ center, perimeter of central rectangle, transverse axes, foci, and/or vertices</li> </ul> </li> <li>• Write the equation of parabola given <ul style="list-style-type: none"> <li>◦ focus, directrix, three points, opening direction and/or vertex</li> </ul> </li> </ul> <p>Identify type of conic section in algebraic form.</p>
<p><b>Assessments</b>  <a href="#">sample test questions - conics.pdf</a></p>	<p><b>Resources</b>  <i>Professional &amp; Student</i></p> <ul style="list-style-type: none"> <li>• Text: <i>Bellman, Bragg, Charles, Hall, Handlin, Kennedy, <b>Algebra 2</b></i>, Prentice Hall, 2009</li> <li>• Ancillaries</li> <li>• Math department generated materials</li> <li>• Department reference books</li> <li>• Internet resources</li> </ul>
<p><b>Student Learning Expectation &amp; 21st Century Skills</b>  <u>Information Literacy</u>  <u>Critical Thinking</u>  <u>Spoken Communication</u>  <u>Written Performance</u></p> <ul style="list-style-type: none"> <li>• Problem Solving</li> </ul>	<p><b>Interdisciplinary Connections</b></p> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>• Use formal writing techniques along with precise math vocabulary.</li> <li>• Express corrections to error analysis problems succinctly.</li> </ul> <p><b>Theater/Fine Arts</b></p> <ul style="list-style-type: none"> <li>• Move sound waves with parabolic microphones.</li> <li>• Converge light beams at the focus of a parabola.</li> </ul> <p><b>Biology</b></p> <ul style="list-style-type: none"> <li>• Diagnose vision impairments using hyperbolic data.</li> </ul> <p><b>Astronomy</b></p> <ul style="list-style-type: none"> <li>• Predict planetary locations based on positions within orbits.</li> <li>• Focus the lens of a telescope with an understanding of hyperbolic and parabolic mirrors.</li> </ul>





Collaboration

	Sep				Oct					Nov			Dec			Jan					Feb				Mar				Apr			May					Jun	
Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Geometry Basics, Logic, and Reasoning	█																																					
Polygons					█																																	
Similarity and Congruence										█			█			█																						
Right Triangles and Trigonometry																					█																	
Circles and Other Conic Sections																									█													
Three - Dimensional Geometry																																	█					



# Unit Planner: Geometry Basics, Logic, and Reasoning

## Geometry

Tuesday, May 7, 2019, 3:45PM

Newtown High School > 2018-2019 > High School > Mathematics > Geometry > Week 1 - Week 5

Last Updated: Today by Eugene Hall

### Geometry Basics, Logic, and Reasoning

Carroll, Megan; Cavaturo, Charlotte; Dominick, Lauren; Dreher, Zachary; Hall, Eugene; Hyman, Paige; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concept: Geometry Basics, Logic, and Reasoning

- point
- line
- plane
- collinear/coplanar
- intersecting/parallel/skew
- postulate
- properties
- theorem
- Pythagorean Theorem
- Formulas
- truth-value
- hypothesis
- conclusion
- Logic Statements
- definition
- deductive reasoning

Lens: Origins

#### Generalizations / Enduring Understandings

Strand 1: Geometry Basics

Concepts:

- point
- line
- plane
- collinear/coplanar
- intersecting/parallel/skew
- postulate
- properties
- theorem
- Pythagorean Theorem
- Distance Formula
- Midpoint Formula

#### Guiding Questions

**Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]**

Factual:

- What postulates are used to relate points, lines, and planes? (S1)
- What does it mean to be collinear/coplanar? (S1)
- What is the distance formula? (S1)
- What is the midpoint formula? (S1)
- What is a hypothesis? Conclusion? (S2)
- What is a conditional statement? converse? biconditional? (S2)
- How dose a converse relate to a conditional? (S2)
- What is deductive reasoning? (S3)
- What is the segment additional postulate? angle addition postulate? (S3)
- What are the special angle relationships for parallel



**Generalization:**

Geometry relies on the fundamental undefined concepts point, line, and plane.

Postulates and properties are accepted statements of fact that do not require proof.

Theorems derive from postulates and require formal proof.

Collinear, coplanar, intersecting, parallel, and skew are terms that describe relationships between points, lines, and planes.

The Distance Formula is derived from the Pythagorean Theorem.

The midpoint of a segment is the average of the numbers at its endpoints.

The average of the numbers at the end of a segment results in the midpoint.

Strand 2: Logic

Concepts:

- hypothesis
- conclusion
- truth-value
- statement
- negation
- conditional statements
- logical equivalence
- biconditional statements
- definitions
- Truth-tables
- Laws of Logic

**Generalization:**

A conditional statement connects a hypothesis and conclusion.

A biconditional is used to show logical equivalence and can be proven through truth-tables.

Any statement has a negation which has the opposite truth-value.

Laws of logic allow us to combine statements and draw logical conclusions.

Good definitions can be written as biconditional statements.

Strand 3: Reasoning with Postulates and Theorem

Concepts:

- deductive reasoning
- Segment/Angle Addition Postulate
- parallel line postulates and theorems

**Generalization:**

Application of segment and angle addition postulates rely on elemental number sense.

Deductive reasoning proves parallel line theorems.

lines? (S3)

Conceptual:

How are points, lines, and planes described? (S1)

How are postulates used to prove theorems? (S1)

What are the different relationships between points, lines, and planes? (S1)

How does the distance formula relate to the Pythagorean Theorem? (S1)

How can the midpoint formula be extended to other ratios? (S1)

How do you know when a biconditional is true? (S2)

How can deductive reasoning be used to prove lines parallel? (S3)

Provocative:

How can the postulates of points, lines, and planes be applied outside of the classroom? (S1)

How do points, lines, and planes theorems extend to multiple dimensions? (S1)

How can we use logic and reasoning to solve complex problems? (S2,S3)

How can geometric concepts apply in modeling situations? (S1)

**Standard(s)**

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity****The Complex Number System****HSN-CN.B. Represent complex numbers and their operations on the complex plane.**

HSN-CN.B.6. (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.

**CCSS: HS: Geometry****Congruence****HSG-CO.A. Experiment with transformations in the plane**

HSG-CO.A.1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

**HSG-CO.C. Prove geometric theorems**

HSG-CO.C.9. Prove theorems about lines and angles.

**HSG-CO.D. Make geometric constructions**

HSG-CO.D.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

**Expressing Geometric Properties with Equations****HSG-GPE.B. Use coordinates to prove simple geometric theorems algebraically**

HSG-GPE.B.6. Find the point on a directed line segment between two given points that divide the segment in a given ratio.

**Mathematical Practice**

**MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

## Objective(s)

### Bloom/ Anderson Taxonomy / DOK Language

Students will:

- conceptualize the three undefined geometric terms
- understand and apply the basic geometric postulates
- derive and apply the distance formula
- apply midpoint formula
- write logical statements
- determine truth-value
- write strong definitions
- apply deductive reasoning and proof
- apply the segment/angle addition postulates
- understand and apply parallel line postulates and theorems

## Critical Content & Skills

*What students must **KNOW** and **be able to DO***

Students will be able to:

- describe points, lines, and planes.
- apply postulates to identify relationships.
- apply the distance and midpoint formulas in the coordinate plane.
- create logical statements using a hypothesis and conclusion.
- determine the truth-value of statements.
- create strong definitions.
- use deductive reasoning for proof.
- solve problems using the segment and angle addition postulates.
- identify and apply parallel line postulates and theorems.

## Core Learning Activities

Describe points, lines, and planes

- name points, lines, and planes
- define parts of a line

Apply postulates to identify relationships.

- determine whether lines and planes are intersecting, parallel, or skew.
- find the point or line of intersection.

Apply the distance and midpoint formulas in the coordinate plane.

- derive the distance formula from the Pythagorean Theorem
- find the distance between two points
- find the midpoint given two endpoints
- find an endpoint given the midpoint and one endpoint.

Create logical statements using a hypothesis and conclusion.

- write condition, converse, and biconditional statements using a hypothesis and conclusion.

Determine the truth-value of statements.

- understand the truth-value of a conditional statement and its converse.
- be able to write a biconditional based on the truth-value of a conditional statement and its converse.

Create strong definitions.

- given a conditional and its converse are true,

	<p>write a definition using a biconditional statement.</p> <ul style="list-style-type: none"> <li>• use precise language and clearly understood terms to write definitions.</li> </ul> <p>Use deductive reasoning for proof.</p> <ul style="list-style-type: none"> <li>• given a hypothesis, use deductive reasoning to reach a conclusion</li> </ul> <p>Solve problems using the segment and angle addition postulates. Identify and apply parallel line postulates and theorems.</p> <ul style="list-style-type: none"> <li>• identify special angle pairs</li> <li>• set up and solve equations using parallel lines theorems and postulates.</li> </ul>
<p><b>Assessments</b></p> <p><b>Transformation unit assessment</b> <b>Summative: Written Test</b> <b>Construction Project</b> <b>Lab Assignment</b> <u>Sample Assessment problems for Building blocks of geometry.pdf</u></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i> Department developed materials text: Pearson's <i>Geometry, 2007</i> Geometer sketchpad online resources</p>
<p><b>Student Learning Expectation &amp; 21st Century Skills</b></p> <p><u>Information Literacy</u> <u>Critical Thinking</u> <u>Spoken Communication</u> <u>Written Performance</u></p> <ul style="list-style-type: none"> <li>• Problem Solving</li> </ul>	<p><b>Interdisciplinary Connections</b></p> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>• Use formal writing techniques along with precise math vocabulary.</li> <li>• Express correction to error analysis problems succinctly.</li> </ul> <p><b>Art</b></p> <ul style="list-style-type: none"> <li>• Use only a compass and a straight edge to make a mandala.</li> </ul> <p><b>Science</b></p> <ul style="list-style-type: none"> <li>• Use the distance formula, midpoint formula, and Pythagorean Theorem as related to applications in science.</li> </ul>





# Unit Planner: Polygons Geometry

Tuesday, May 7, 2019, 3:47PM

Newtown High School > 2018-2019 > High School > Mathematics >  
Geometry > Week 6 - Week 10

Last Updated: Thursday, April 11, 2019 by  
Keristen Raccio

## Polygons

Carroll, Megan; Cavataro, Charlotte; Dominick, Lauren; Dreher, Zachary; Hall, Eugene; Hyman, Paige; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Polygons

- triangle theorems
- segments in triangles
- special quadrilaterals
- coordinate plane
- polygon angle sum
- polygon names

Lens: Relationships

#### Generalizations / Enduring Understandings

##### Strand 1: Polygons

Concepts:

- classifying polygons
- polygon angle sum

Generalization:

A polygon can be classified by number of sides and its concavity.

The interior angle sum of a polygon depends on the number of sides.

##### Strand 2: Triangles

Concepts:

- triangle angle sum theorem
- triangle exterior angle theorem
- isosceles and equilateral triangles theorems
- triangle inequality theorems
- segments in triangles

Generalization:

The triangle angle sum theorem and triangle exterior angle theorem are derived from the polygon angle sum theorem.

#### Guiding Questions

***Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]***

Factual:

- What are the triangle theorems? (S1)
- What are the different segments in triangles? (S1)
- What are the special quadrilaterals? (S2)
- What are the properties for each special quadrilateral? (S2)
- What is the polygon angle sum? (S3)

Conceptual:

- How are constructions used to prove triangle theorems? (S1)
- How do you use coordinate geometry to prove special quadrilaterals? (S2)
- How do the number of sides relate to the name of a polygon? (S3)
- How can triangle theorems prove the polygon angle sum theorem? (S1/S3)

Provocative:

- How can polygons relate to the world around us? (S1-S3)
- How have triangles been used throughout history? (S1-S3)
- How can we use coordinates to prove simple geometric

Equilateral triangles are a subset of isosceles triangles. Triangle inequalities connect the angles of triangles and their opposite sides. Segments in triangles identify special relationships in triangles.

### Strand 3: Quadrilaterals

Concepts:

- special quadrilaterals
- coordinate plane

Generalization:

Angles and sides define specific properties of special quadrilaterals.

Coordinate geometry proves special quadrilateral properties.

theorems algebraically? (S1-S3)

## Standard(s)

*Connecticut Core Standards / Content Standards*

### **CCSS: Mathematics**

#### **CCSS: HS: Geometry**

#### **Congruence**

##### **HSG-CO.C. Prove geometric theorems**

HSG-CO.C.10. Prove theorems about triangles.

HSG-CO.C.11. Prove theorems about parallelograms.

##### **HSG-CO.D. Make geometric constructions**

HSG-CO.D.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

HSG-CO.D.13. Construct an equilateral triangle, a square and a regular hexagon inscribed in a circle.

#### **Expressing Geometric Properties with Equations**

##### **HSG-GPE.B. Use coordinates to prove simple geometric theorems algebraically**

HSG-GPE.B.4. Use coordinates to prove simple geometric theorems algebraically.

HSG-GPE.B.7. Use coordinates to compute perimeters of polygons and areas for triangles and rectangles, e.g. using the distance formula.

#### **Mathematical Practice**

**MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

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### Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will:

- apply all the theorems of triangles
- identify segments in triangles and their properties
- identify special quadrilaterals and their properties
- apply all the properties of special quadrilaterals
- use the coordinate plane for geometric proof
- find the sum of the measures of the angles in any polygon
- name polygons

### Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to:

- identify and apply basic triangle theorems and segments in triangles theorems.
- identify and apply special quadrilateral theorems.
- use coordinate geometry to prove special quadrilaterals.
- apply Polygon-Angle sum theorem.
- name polygons.

### Core Learning Activities

Identify and apply basic triangle theorems and segments in triangles theorems.

- use constructions to prove theorems about triangles and their segments.
- given a triangle determine its characteristics.
- solve for missing information in a given triangle.
- construct special triangles and triangle segments using geometry tools.

Identify and apply special quadrilateral theorems.

- given a quadrilateral determine its characteristics.
- solve for missing information in a given quadrilateral.

Use coordinate geometry to prove special quadrilaterals.

- use the distance and midpoint formulas to determine type of quadrilateral in coordinate

	<p>plane.</p> <p>Apply Polygon-Angle sum theorem.</p> <ul style="list-style-type: none"> <li>• solve for missing angle measure given number of sides.</li> <li>• solve for the number of sides given the sum of the interior angles.</li> </ul> <p>Name polygons.</p> <ul style="list-style-type: none"> <li>• classify polygons based on characteristics of given polygon.</li> </ul>
<p><b>Assessments</b></p> <p><b>quadrilaterals quiz</b>  <b>Formative: Written Test</b>  <b>Polygon Sum investigation</b>  <b>Formative: Lab Assignment</b>  <a href="#">Sample Assessment Problems-Unit Polygons (1).pdf</a></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i>  Department developed materials  Text: Pearson's Geometry, 2007  Online resources  Geometer sketchpad</p>
<p>Student Learning Expectation &amp; 21st Century Skills</p> <p><u>Information Literacy</u>  <u>Critical Thinking</u>  <u>Spoken Communication</u>  <u>Written Performance</u></p> <ul style="list-style-type: none"> <li>• Problem Solving</li> </ul>	<p><b>Interdisciplinary Connections</b></p> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>• Use formal writing techniques along with precise math vocabulary.</li> <li>• Express correction to error analysis problems succinctly.</li> </ul> <p><b>Engineering</b></p> <ul style="list-style-type: none"> <li>• Examine the use of triangles and other polygons in structures.</li> <li>• Test to find the strength of different polygons.</li> </ul>







# Unit Planner: Similarity and Congruence Geometry

Tuesday, May 7, 2019, 3:48PM

Newtown High School > 2018-2019 > High School > Mathematics > Geometry >  
Week 11 - Week 18

Last Updated: Today by  
Eugene Hall

## Similarity and Congruence

Carroll, Megan; Cavataro, Charlotte; Dominick, Lauren; Dreher, Zachary; Hall, Eugene; Hyman, Paige; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concept: Similarity and Congruence

- congruent figures
- triangle congruence
- theorems and postulates
- ratios and proportions
- similar figures
- similar triangles
- similarity theorems
- image
- pre-image
- isometry
- vectors
- composition
- dilation

Lens: Balance

#### Generalizations / Enduring Understandings

##### Strand 1: Congruence

Concepts:

- congruent figures
- triangle congruence
- theorems and postulates

Generalizations:

Congruent figures are exact images of each other.  
Congruent triangle theorems and postulates determine triangle congruence.

##### Strand 2: Transformations

Concepts:

- image and pre-image
- translation
- rotation

#### Guiding Questions

**Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]**

Factual:

- What are the triangle congruence theorems and postulates? (S1)
- What makes figures congruent? (S1)
- What are the similarity theorems? (S2)
- What is a ratio? proportion? (S2)
- What makes a transformation a translation? rotation? reflection? (S3)
- How do you represent transformations in the coordinate plane? (S3)
- What is a vector? (S3)
- What is a composition of transformations (S3)
- What is an image? pre-image? (S3)
- What is a dilation? (S3)

Conceptual:

- How are constructions used to prove congruence? (S1)

- reflection
- isometry
- dilation
- vectors
- composition

**Generalizations:**

Transformations are functions, expressed as vectors, that map a pre-image onto an image. Isometries transform a figure preserving size and shape through translation, rotation, and reflection. Sequences of transformations result in compositions. Dilations transform a figure preserving shape.

**Strand 3: Similarity**

**Concepts:**

- ratios and proportions
- similar figures
- similar triangles
- similarity theorems

**Generalizations:**

Ratios and proportions dictate similarity of triangles and other figures. Similarity theorems prove similar triangles and other figures.

What does it mean to be proportional? (S2)  
 How can you change a figure's position without changing its size and shape? (S3)  
 How do an image and pre-image relate? (S3)  
 What properties are preserved by transformations? (S3)  
 How do isometries and congruence relate? (S1,S2)

**Provocative:**

How is motion explained based on transformations? (S3)

**Standard(s)**

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Geometry**

**Congruence**

**HSG-CO.A. Experiment with transformations in the plane**

HSG-CO.A.2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).

HSG-CO.A.3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

HSG-CO.A.4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

HSG-CO.A.5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

**HSG-CO.B. Understand congruence in terms of rigid motions**

HSG-CO.B.6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.

HSG-CO.B.7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.

HSG-CO.B.8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

**HSG-CO.C. Prove geometric theorems**

HSG-CO.C.10. Prove theorems about triangles.

### **HSG-CO.D. Make geometric constructions**

HSG-CO.D.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

### **Similarity, Right Triangles, & Trigonometry**

#### **HSG-SRT.A. Understand similarity in terms of similarity transformations**

HSG-SRT.A.1. Verify experimentally the properties of dilations:

HSG-SRT.A.1a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.

HSG-SRT.A.1b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

HSG-SRT.A.2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all pairs of angles and the proportionality of all pairs of sides.

HSG-SRT.A.3. Use the properties of similarity transformations to establish the AA criterion for similarity of triangles.

#### **HSG-SRT.B. Prove theorems involving similarity**

HSG-SRT.B.4. Prove theorems about triangles using similarity transformations.

HSG-SRT.B.5. Use triangle congruence and similarity criteria to solve problems and to prove relationships in geometric figures.

#### **HSG-SRT.C. Define trigonometric ratios and solve problems involving right triangles**

HSG-SRT.C.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

### **Mathematical Practice**

**MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

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## Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will:

- identify triangles and other figures congruent
- identify similar figures and triangles
- apply similarity theorems
- identify the properties of all transformations
- recognize image and pre-image
- define isometry
- define dilation
- compose transformations

## Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to:

- identify congruent figures and apply definition.
- identify congruent triangles.
- identify similar figures
- apply triangle similarity theorems
- identify the properties of transformations.
- write a function describing a transformation in the coordinate plane.
- use transformations or a composition of transformation to map a pre-image onto an image.
- identify and apply dilation

## Core Learning Activities

Identify congruent figures and apply definition.

- given two congruent figures solve for missing information.
- determine if figures are congruent.

Identify congruent triangles.

- use theorems to determine if triangles are congruent.
- identify missing characteristics to prove triangle congruence by specific theorem.

Identify similar figures

- given two similar figures solve for missing information.
- determine if figures are similar.
- given two similar figures, write a similarity statement and identify similarity ratio.

Apply triangle similarity theorems

- use theorems to determine if triangles are similar.
- use similarity theorems to solve for missing information.

Identify the properties of transformations.

- identify properties of translations, rotations, and reflections.
- determine type of transformation from image

	<ul style="list-style-type: none"> <li>• determine type of transformation from rule</li> </ul> <p>Write a function describing a transformation in the coordinate plane.</p> <ul style="list-style-type: none"> <li>• write a vector rule to describe a transformation.</li> <li>• combine vector rules to describe a composition of transformations.</li> </ul> <p>Use transformation or a composition of transformation to map a pre-image onto an image.</p> <ul style="list-style-type: none"> <li>• construct an image given a graph.</li> <li>• construct an image given a rule.</li> </ul> <p>Identify and apply dilation</p> <ul style="list-style-type: none"> <li>• given a figure on a graph, dilate it.</li> <li>• given a figure and its dilation, determine the similarity ratio.</li> </ul>
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<p><b>Assessments</b></p> <p><a href="#">Sample Questions for Similarity and Congruence (3).pdf</a></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i></p>
<p><b>Student Learning Expectation &amp; 21st Century Skills</b></p> <p><a href="#">Information Literacy</a></p> <p><a href="#">Critical Thinking</a></p> <p><a href="#">Spoken Communication</a></p> <p><a href="#">Written Performance</a></p>	<p><b>Interdisciplinary Connections</b></p> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>• Use formal writing techniques along with precise math vocabulary.</li> <li>• Express correction to error analysis problems succinctly.</li> </ul> <p><b>Art</b></p> <ul style="list-style-type: none"> <li>• Use isometric transformations to create a tessellation.</li> <li>• Use dilation to create a mural.</li> </ul> <p><b>Science</b></p> <ul style="list-style-type: none"> <li>• Use the golden ratio to study naturally occurring patterns.</li> </ul> <p><b>Engineering</b></p> <ul style="list-style-type: none"> <li>• Use similarity to determine the height of objects.</li> </ul>





# Unit Planner: Right Triangles and Trigonometry Geometry

Tuesday, May 7, 2019, 3:49PM

Newtown High School > 2018-2019 > High School > Mathematics > Geometry >  
Week 20 - Week 28

Last Updated: Today by  
Eugene Hall

## Right Triangles and Trigonometry

Carroll, Megan; Cavataro, Charlotte; Dominick, Lauren; Dreher, Zachary; Hall, Eugene; Hyman, Paige; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Right Triangles and Trigonometry

- Pythagorean Theorem
- Special Right Triangles
- Six basic trigonometric functions
- Law of Sines
- Law of Cosines
- radian/degree measure
- co-terminal angles
- Pythagorean identities

Lens: Similar Ratios

#### Generalizations / Enduring Understandings

##### Strand 1: Solving Triangles

Concepts:

- Pythagorean Theorem
- special right triangles
- six basic trigonometric functions
- Law of Sines
- Law of Cosines

Generalization:

Pythagorean Theorem, special right triangles, and the six basic trigonometric functions determine missing sides in right triangles.

Law of Sines and Cosines determine missing sides and angles in non-right triangles.

##### Strand 2: Unit Circle Trigonometry

Concept:

- radian/degree
- co-terminal angles
- Pythagorean identities

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

Factual:

- What is the Pythagorean Theorem? (S1)
- What are Special Right Triangles? (S1)
- What does the converse of the Pythagorean theorem determine? (S1)
- What are the three basic trigonometric ratios? (S1)
- What is the Law of Sines? Cosines? (S1)
- What is the unit circle? (S2)
- How do you construct the unit circle? (S2)
- How do you convert between radians and degrees? (S2)
- What are co-terminal angles? (S2)
- What are the Pythagorean identities? (S2)

Conceptual:

- How do you use the Pythagorean Theorem? (S1)
- How do you use Special Right Triangles? (S1)
- How do you apply the basic trigonometric ratios to find missing sides and angles? (S1)
- How do you apply the trigonometry to real world problems? (S1)
- How are the three Pythagorean identities linked? (S2)
- How does symmetry play a role in the unit circle? (S2)
- How is trigonometry linked to similarity? (S1)

Generalization:  
Radians and/or degrees measure angles and co-terminal angles in the unit circle.  
Pythagorean identities derive from the unit circle.

Provocative:  
How are the dimensions of real world objects that are not easily measured calculated? (S1-S2)

## Standard(s)

*Connecticut Core Standards / Content Standards*

### **CCSS: Mathematics**

#### **CCSS: HS: Functions**

##### **Trigonometric Functions**

###### **HSF-TF.A. Extend the domain of trigonometric functions using the unit circle.**

HSF-TF.A.3. (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for  $\pi/3$ ,  $\pi/4$  and  $\pi/6$ , and use the unit circle to express the values of sine, cosines, and tangent for  $x$ ,  $\pi + x$ , and  $2\pi - x$  in terms of their values for  $x$ , where  $x$  is any real number.

#### **CCSS: HS: Geometry**

##### **Similarity, Right Triangles, & Trigonometry**

###### **HSG-SRT.A. Understand similarity in terms of similarity transformations**

HSG-SRT.A.2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all pairs of angles and the proportionality of all pairs of sides.

###### **HSG-SRT.B. Prove theorems involving similarity**

HSG-SRT.B.5. Use triangle congruence and similarity criteria to solve problems and to prove relationships in geometric figures.

###### **HSG-SRT.C. Define trigonometric ratios and solve problems involving right triangles**

HSG-SRT.C.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

HSG-SRT.C.7. Explain and use the relationship between the sine and cosine of complementary angles.

HSG-SRT.C.8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

###### **HSG-SRT.D. Apply trigonometry to general triangles**

HSG-SRT.D.10. (+) Prove the Laws of Sines and Cosines and use them to solve problems.

HSG-SRT.D.11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

##### **Modeling with Geometry**

###### **HSG-MG.A. Apply geometric concepts in modeling situations**

HSG-MG.A.1. Use geometric shapes, their measures and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

HSG-MG.A.2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

HSG-MG.A.3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy constraints or minimize cost; working with typographic grid systems based on ratios).

##### **Mathematical Practice**

**MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

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### Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will:

- use the Pythagorean theorem and its converse
- apply properties of special right triangles
- apply right triangle trigonometry
- apply Law of Sines and Cosines
- construct a unit circle
- convert between radians and degrees

### Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to:

- identify and apply the Pythagorean Theorem and its converse.
- apply properties of special right triangles.
- apply right triangle trigonometry.
- apply law of Sines and Cosines to non right triangles.
- construct, interpret, and apply the unit circle.
- convert between radians and degrees.

### Core Learning Activities

Identify and apply the Pythagorean Theorem and its converse.

- Use the Pythagorean Theorem to solve for missing side lengths.
- Identify Pythagorean triples.
- Use the converse of the Pythagorean Theorem to classify triangles.
- Use the converse of the Pythagorean Theorem to determine range of possible side lengths.

Apply properties of special right triangles.

- Use properties of special right triangles to determine exact measure of side length.

Apply right triangle trigonometry.

- Given a triangle with side lengths, list basic trigonometric ratios.



	<ul style="list-style-type: none"> <li>• Use right triangle trigonometry to solve for missing side length or angle measure.</li> <li>• Apply trigonometry to solve real world applications.</li> <li>• Given a trigonometric ratio, use Pythagorean Theorem to find remaining 5 ratios.</li> </ul> <p>Apply Law of Sines and Cosines to non right triangles.</p> <ul style="list-style-type: none"> <li>• Use Law of Sines and Law of Cosines to solve for missing angle measures and side lengths in a given non right triangle.</li> </ul> <p>Construct, interpret, and apply the unit circle.</p> <ul style="list-style-type: none"> <li>• Construct the unit circle in degree and radians using special right triangles and symmetry.</li> <li>• Solve for trigonometric ratios using the unit circle.</li> <li>• Apply the unit circle to derive the Pythagorean identities.</li> </ul> <p>Convert between radians and degrees.</p> <ul style="list-style-type: none"> <li>• Use proportions to convert between radians and degrees.</li> </ul>
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<p><b>Assessments</b></p> <p><b>Proportions in Triangles</b>  <b>Formative: Written Test</b></p> <p><b>Similar right triangles</b>  <b>Formative: Written Test</b></p> <p><b>Indirect measurement</b>  <b>Summative: Group Project</b></p> <p><b>Cumulative Standards</b>  <b>Summative: Written Test</b></p> <p><u><a href="#">Sample assessment problems for right triangles and trig.pdf</a></u></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i></p> <p>Department developed materials  Text: Pearson's Geometry, 2007  Online resources  Geometer sketchpad</p>
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<p><b>Student Learning Expectation &amp; 21st Century Skills</b></p> <p><u><a href="#">Information Literacy</a></u>  <u><a href="#">Critical Thinking</a></u>  <u><a href="#">Spoken Communication</a></u>  <u><a href="#">Written Performance</a></u></p> <ul style="list-style-type: none"> <li>• Problem Solving</li> </ul>	<p><b>Interdisciplinary Connections</b></p> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>• Use formal writing techniques along with precise math vocabulary.</li> <li>• Express correction to error analysis problems succinctly.</li> </ul> <p><b>Science</b></p> <ul style="list-style-type: none"> <li>• Use trigonometry and distance to calculate the height of tides.</li> <li>• Use trig to determine linear and angular velocity with vectors.</li> </ul> <p><b>Engineering</b></p> <ul style="list-style-type: none"> <li>• Use the Pythagorean Theorem to determine if a</li> </ul>
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building is structurally sound.

**Music**

- Use trigonometry to determine the level of pitch of a sound note.



Atlas

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# Unit Planner: Circles and Other Conic Sections Geometry

Tuesday, May 7, 2019, 3:50PM

Newtown High School > 2018-2019 > High School > Mathematics >  
Geometry > Week 29 - Week 33

Last Updated: Tuesday, February 26, 2019  
by Keristen Raccio

## Circles and Other Conic Sections

Carroll, Megan; Cavataro, Charlotte; Dominick, Lauren; Dreher, Zachary; Hall, Eugene; Hyman, Paige; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Circles and Other Conics

- area
- circumference
- arc measure
- length
- sector
- segment
- radius
- diameter
- angles
- tangent/point of tangency
- inscribed
- circumscribed
- arcs
- chords
- segments
- locus of points
- parabola
- circle
- ellipse
- hyperbola

Lens: Ratio

#### Generalizations / Enduring Understandings

Strand 1: Area and Circumference

Concept:

- area
- circumference
- arc measure
- length
- sector
- segment

Generalization:

#### Guiding Questions

***Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]***

Factual:

What is the area formula? circumference formula? (S1)

What is the arc length formula? Area of a sector formula? (S1)

When segments intersect a circle or within a circle, how do you find the measures of the resulting angles, arcs and segments? (S2)

Can you sketch a circle and its tangent at a given point of tangency? (S2)

Can you sketch the situation in which two secant

Ratios calculate the arc length and area of a sector based on the circumference and area of a circle respectively.

Strand 2: Angles and Segments

Concept:

- radius
- diameter
- angles
- tangent/point of tangency
- inscribed
- circumscribed
- arcs
- chords
- segments

Generalization:

The radius and tangent of a specific circle at the point of tangency relate uniquely.

Triangles inscribed in and circumscribed about a circle relate distinctly.

Angles in a specific circle relate uniquely.

Arcs, chords, segments characterize the circle.

Strand 3: Conics

Concept:

- locus of points
- parabola
- circle
- ellipse
- hyperbola

Generalization:

Locus points aid in the characterization of parabolas, circles, ellipses, and hyperbolas.

segments intersect at a given point outside the circle? (S2)

Can you write the equation of a parabola using the focus and directrix? (S3)

Can you write the equation of an ellipse or hyperbola as defined by a locus of points? (S3)

How can the equation of a circle be written from information on the coordinate plane? (S3)

Conceptual:

How are arc length and area of sectors representative of a ratio? (S1)

What is the difference between arc measure and arc length? (S1)

What is the relationship between segments and arcs in a circle? (S2)

What is the relationship between angles and arcs in a circle? (S2)

What is the relationship between angles and segments in a circle? (S2)

How can you prove relationships between angles and arcs in a circle? (S2)

What is the difference between inscribed and circumscribed polygons? (S2)

How can a circle be discussed as a locus of points? (S3)

Provocative:

How are arcs and circles used in everyday life? (S1-S2)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Functions**

**Trigonometric Functions**

**HSF-TF.A. Extend the domain of trigonometric functions using the unit circle.**

HSF-TF.A.1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.

**CCSS: HS: Modeling**

**Mathematical Practice**

**MP.The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.2. Reason abstractly and quantitatively.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

## **CCSS: HS: Geometry**

### **Congruence**

#### **HSG-CO.A. Experiment with transformations in the plane**

HSG-CO.A.1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

### **Circles**

#### **HSG-C.A. Understand and apply theorems about circles**

HSG-C.A.1. Prove that all circles are similar.

HSG-C.A.2. Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

HSG-C.A.3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

HSG-C.A.4. (+) Construct a tangent line from a point outside a given circle to the circle.

#### **HSG-C.B. Find arc lengths and areas of sectors of circles**

HSG-C.B.5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.

### **Expressing Geometric Properties with Equations**

#### **HSG-GPE.A. Translate between the geometric description and the equation for a conic section**

HSG-GPE.A.1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

HSG-GPE.A.2. Derive the equation of a parabola given a focus and directrix.

HSG-GPE.A.3. (+) Derive the equations of ellipses and hyperbolas given two foci for the ellipse, and two directrices of a hyperbola.

#### **HSG-GPE.B. Use coordinates to prove simple geometric theorems algebraically**

HSG-GPE.B.4. Use coordinates to prove simple geometric theorems algebraically.

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### **Objective(s)**

#### **Bloom/ Anderson Taxonomy / DOK Language**

Students will:

- Apply area, circumference, arc length, and sector area formulas
- Define tangents, secants and chords
- Define special angles and arcs
- Find the measures of angles, arcs and segments formed by intersecting segments within or with a circle.
- Write the equations of a conic from a locus of points

## Critical Content & Skills

What students must **KNOW and be able to DO**

Students will be able to:

- apply area, circumference, arc length, and sector area formulas.
- identify and apply theorems about tangents, secants and chords in a circle.
- identify and apply theorems about special angles and arcs
- write the equations of a conic from a locus of points.

## Core Learning Activities

Apply area, circumference, arc length, and sector area formulas.

- Given key information apply area and circumference formulas.
- Use ratios to determine arc length and sector area in exact form.
- Given arc length or sector area, find radius/diameter.
- Use sector area and area of a triangle to find the area of a segment in exact form.
- Apply area formulas to find the area of a shaded region in a given figure in exact form.

Identify and apply theorems about tangents, secants and chords in a circle.

- Given a situation or diagram, find the missing characteristics using circle theorems.

Identify and apply theorems about special angles and arcs.

- Given a diagram, find the missing characteristics using theorems about special angles and arcs.

Write the equations of a conic from a locus of points.

- Given a graph, write the equation of a conic.
- Given specific characteristics, identify and write the equation of a conic.
- Given conic equation, identify and graph the conic.

## Assessments

**Segments Related to Circles**

**Summative: Written Test**

**Angles, Arcs and Segments measures**

**Summative: Group Project**

**Conic Sections**

**Summative: Personal Project**

[Sample Questions-Circles and Other Conics \(1\).pdf](#)

## Resources

*Professional & Student*

Text: Pearson's Geometry, 2007

Ancillaries

Department developed materials

## Student Learning Expectation & 21st Century Skills

Information Literacy

Critical Thinking

Spoken Communication

Written Performance

- Problem Solving

## Interdisciplinary Connections

### Writing

- Use formal writing techniques along with precise math vocabulary.
- Express corrections to error analysis problems succinctly.

### Theater/Fine Arts

- Move sound waves with parabolic microphones.
- Converge light beams at the focus of a parabola.

- Create crop circles using conic sections.

### **Biology**

- Diagnose vision impairments using hyperbolic data.

### **Astronomy**

- Predict planetary locations based on positions within orbits.
- Focus the lens of a telescope with an understanding of hyperbolic and parabolic mirrors.



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# Unit Planner: Three - Dimensional Geometry Geometry

Tuesday, May 7, 2019, 3:53PM

Newtown High School > 2018-2019 > High School > Mathematics >  
Geometry > Week 34 - Week 37

Last Updated: Tuesday, February 26, 2019  
by Keristen Raccio

## Three - Dimensional Geometry

Carroll, Megan; Cavataro, Charlotte; Dominick, Lauren; Dreher, Zachary; Hall, Eugene; Hyman, Paige; Pickering, Debra; Raccio, Keristen; Sherman, Karen; vonOy, Suzanne

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Concept: Three - Dimensional Geometry

- area
- surface area
- volume
- cross section
- similarity ratios
- area ratio
- volume ratio

Lens: Dimensions

#### Generalizations / Enduring Understandings

Strand 1: Area, Surface Area, and Volume

Concepts:

- area
- surface area
- volume
- cross section

Generalization:

The summation of the area of the surfaces of a three-dimensional shape yields the surface area.

The summation of the cross sectional areas of a three-dimensional shape yields the volume.

Strand 2: Similar Figures

Concepts:

- similarity ratios
- area ratio
- volume ratio

Generalization:

Squaring the similarity ratio yields the area ratio.

Cubing the similarity ratio yields the volume ratio.

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

Factual:

What is surface area? (S1)

What is volume? (S1)

How do you find the surface area of a 3-D figure? (S1)

How do you find the volume of a 3-D figure? (S1)

What is a cross section? (S1)

What is a similarity ratio? area ratio? volume ratio? (S2)

Conceptual:

How can volume be determined using cross sections? (S1)

How do the similarity ratio and area ratio compare? (S2)

How do the similarity ratio and volume ratio compare? (S2)

How can you use the similarity ratio to find the volume of a figure? (S2)

Provocative:

How can the concept of volume be extended in terms of infinity? (S1)



## Standard(s)

*Connecticut Core Standards / Content Standards*

### **CCSS: Mathematics**

#### **CCSS: HS: Geometry**

##### **Geometric Measurement & Dimension**

###### **HSG-GMD.A. Explain volume formulas and use them to solve problems**

HSG-GMD.A.1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.

HSG-GMD.A.2. (+) Given an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.

HSG-GMD.A.3. Use volume formulas for cylinders, pyramids, cones and spheres to solve problems.

##### **Modeling with Geometry**

###### **HSG-MG.A. Apply geometric concepts in modeling situations**

HSG-MG.A.2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

##### **Mathematical Practice**

**MP.The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.**

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

MP.8. Look for and express regularity in repeated reasoning.

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## Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will:

- find the area of 2-dimensional objects.
- find the surface area of 3-dimensional objects.

- find the volume of 3-dimensional objects.
- apply similarity ratios to find area, surface area, and volume.

### Critical Content & Skills

*What students must **KNOW and be able to DO***

Students will be able to:

- solve for the area and other characteristics of 2-dimensional objects.
- solve for the surface area of 3-dimensional objects.
- solve for the volume of 3-dimensional objects.
- apply similarity ratios to find area, surface area, and volume.

### Core Learning Activities

Solve for the area and other characteristics of 2-dimensional objects.

- apply special right triangles to find the volume of regular hexagons and equilateral triangles.
- given the area of a figure, determine the missing characteristics.

Solve for the surface area of 3-dimensional objects.

- use area of 2-dimensional figures to find the surface area of 3-dimensional figures.

Solve for the volume of 3-dimensional objects.

- use the area of 2-dimensional figures to find the volume of 3-dimensional figures.

Apply similarity ratios to find area, surface area, and volume.

- convert between similarity ratio, area ratio, and volume ratio.
- given a specific ratio, find the area, surface area, or volume of a similar figure.

### Assessments

**survey project**

**Summative: Group Project**

**Permutation /Combination**

**Formative: Written Test**

**performance task**

**Summative: Personal Project**

[Sample Questions for Three-Dimensional Figures.pdf](#)

### Resources

*Professional & Student*

Pearson's Geometry 2007

department generated materials

online resources

### Student Learning Expectation & 21st Century Skills

Information Literacy

Critical Thinking

Spoken Communication

Written Performance

- Information Literacy
- Problem Solving

### Interdisciplinary Connections

#### Writing

- Use formal writing techniques along with precise math vocabulary.
- Express corrections to error analysis problems succinctly.

#### Science

- Use volume and surface area formulas with applications for science.

#### Art

- Make a three-dimensional octahedra.



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# PRELIMINARY 2019-20 BUDGET ADJUSTMENTS

<u>Acnt Number</u>	<u>Acnt Desc</u>	<u>LC Budget</u>	<u>Recommended Budget</u>	<u>Changes</u>	<u>Notation</u>
<b>CERTIFIED SALARIES</b>					
1-001-10-038-1121-0000	TEACHERS - CLASSROOM	\$1,356,522	\$1,416,678	\$60,156	ADDITIONAL HAWLEY FOURTH GRADE TEACHER
1-001-75-058-1131-0000	SPECIALISTS - SP/HEAR. PUBLIC	\$729,550	\$789,706	\$60,156	ADDITIONAL SPEECH POSITION FOR PRESCHOOL
1-001-75-061-1121-0000	TEACHERS - SP, ED. PREK-8	\$1,993,835	\$2,053,991	\$60,156	ADDITIONAL TEACHER FOR PRESCHOOL
1-001-75-063-1121-0000	TEACHERS - SP, ED. H.S.	\$475,411	\$535,567	\$60,156	ADDITIONAL H.S. SPECIAL ED. TEACHER
1-001-84-088-1151-0000	CERTIFIED SALARY ADJ.	(\$195,422)	(\$248,189)	(\$52,767)	INCREASE TURNOVER SAVINGS TO \$298,865, ALLOCATE ALLOWANCE FOR ASST. SUPERINTENDENT
				\$187,857	
1-001-60-038-1312-0000	TUTORS - HOMEBOUND	\$60,000	\$55,000	(\$5,000)	REDUCTION IN TUTORING
1-001-75-054-1311-0000	TUTORS - IN SCHOOL	\$50,000	\$10,000	(\$40,000)	REDUCTION IN TUTORING
1-001-75-054-1312-0000	TUTORS - HOMEBOUND	\$43,000	\$35,000	(\$8,000)	REDUCTION IN TUTORING
				(\$53,000)	
1-001-82-082-1111-0000	ADMIN. SALARIES - SUPER.	\$488,687	\$500,287	\$11,600	INCREASE RATE FOR NEW ASSISTANT SUPERINTENDENT
				\$11,600	

## NON-CERTIFIED SALARIES

### ADJUSTMENT FOR NEW SECRETARIAL CONTRACT

1-001-81-085-1210-0000	STAFF SALARIES - INFO. TECH.	\$494,707	\$500,924	\$6,217	NEW CONTRACT RATES & INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-10-001-1221-0000	CLERICAL - ADMIN.	\$81,211	\$83,001	\$1,790	NEW CONTRACT RATES
1-001-20-001-1221-0000	CLERICAL - ADMIN.	\$79,503	\$81,287	\$1,784	NEW CONTRACT RATES
1-001-30-001-1221-0000	CLERICAL - ADMIN.	\$80,603	\$82,387	\$1,784	NEW CONTRACT RATES
1-001-40-001-1221-0000	CLERICAL - ADMIN.	\$81,611	\$83,401	\$1,790	NEW CONTRACT RATES
1-001-45-001-1221-0000	CLERICAL - ADMIN.	\$148,973	\$152,252	\$3,279	NEW CONTRACT RATES
1-001-45-034-1221-0000	CLERICAL - LIBRARY	\$23,728	\$24,257	\$529	NEW CONTRACT RATES
1-001-45-040-1221-0000	CLERICAL - GUIDANCE	\$34,530	\$35,309	\$779	NEW CONTRACT RATES
1-001-50-001-1221-0000	CLERICAL - ADMIN.	\$152,817	\$156,199	\$3,382	NEW CONTRACT RATES
1-001-50-034-1221-0000	CLERICAL - LIBRARY	\$40,936	\$41,825	\$889	NEW CONTRACT RATES
1-001-50-040-1221-0000	CLERICAL - GUIDANCE	\$62,436	\$62,919	\$483	NEW CONTRACT RATES
1-001-60-001-1221-0000	CLERICAL - ADMIN.	\$334,339	\$341,752	\$7,413	NEW CONTRACT RATES
1-001-60-010-1221-0000	CLERICAL - ENGLISH	\$18,294	\$18,173	(\$121)	NEW CONTRACT RATES, ADJUSTED ALLOCATION BETWEEN ENGLISH & SCIENCE
1-001-60-028-1221-0000	CLERICAL - SCIENCE	\$17,265	\$18,173	\$908	NEW CONTRACT RATES, ADJUSTED ALLOCATION BETWEEN ENGLISH & SCIENCE
1-001-60-034-1221-0000	CLERICAL - LIBRARY	\$37,481	\$38,297	\$816	NEW CONTRACT RATES
1-001-60-040-1221-0000	CLERICAL - GUIDANCE	\$127,715	\$130,535	\$2,820	NEW CONTRACT RATES
1-001-75-050-1221-0000	CLERICAL - PUPIL SERV.	\$177,573	\$181,487	\$3,914	NEW CONTRACT RATES
1-001-77-041-1222-0000	SECRETARIAL - HEALTH ADMIN.	\$32,886	\$33,628	\$742	NEW CONTRACT RATES
1-001-81-085-1222-0000	SECRETARIAL - INFO. TECH.	\$50,785	\$51,904	\$1,119	NEW CONTRACT RATES

# PRELIMINARY 2019-20 BUDGET ADJUSTMENTS

<u>Acnt Number</u>	<u>Acnt Desc</u>	<u>LC Budget</u>	<u>Recommended Budget</u>	<u>Changes</u>	<u>Notation</u>
1-001-82-082-1222-0000	SECRETARIAL - SUPER.	\$283,301	\$285,539	\$2,238	NEW CONTRACT RATES
1-001-84-086-1221-0000	CLERICAL - BUS. SERV.	\$290,674	\$295,496	\$4,822	NEW CONTRACT RATES
1-001-84-086-1222-0000	SECRETARIAL - BUS. SERV.	\$52,712	\$53,886	\$1,174	NEW CONTRACT RATES
1-001-90-092-1222-0000	SECRETARIAL - B&G ADMIN.	\$50,418	\$51,537	\$1,119	NEW CONTRACT RATES
1-001-94-084-1221-0000	BOOKKEEPER/COMPUTER AST.	\$26,238	\$26,812	\$574	NEW CONTRACT RATES
1-001-84-088-1271-0000	NON-CERT SALARY ADJ.	\$51,089	\$0	(\$51,089)	ALLOCATE ADJUSTMENT ALLOWANCE FOR SECRETARIAL CONTRACT
				(\$845)	

## ADJUSTMENT FOR NEW CUSTODIAL CONTRACT

1-001-90-094-1258-0000	MAINTENANCE SALARIES	\$364,532	\$372,644	\$8,112	NEW CONTRACT RATES
1-001-90-096-1251-0000	CUSTODIAL SALARIES - H.	\$164,398	\$168,066	\$3,668	NEW CONTRACT RATES
1-001-90-096-1252-0000	CUSTODIAL SALARIES - S.H.	\$270,528	\$276,502	\$5,974	NEW CONTRACT RATES
1-001-90-096-1253-0000	CUSTODIAL SALARIES - M.G.	\$220,212	\$225,034	\$4,822	NEW CONTRACT RATES
1-001-90-096-1254-0000	CUSTODIAL SALARIES - HOM.	\$166,598	\$170,266	\$3,668	NEW CONTRACT RATES
1-001-90-096-1255-0000	CUSTODIAL SALARIES - RIS.	\$436,310	\$445,910	\$9,600	NEW CONTRACT RATES
1-001-90-096-1256-0000	CUSTODIAL SALARIES - M.S.	\$485,725	\$496,478	\$10,753	NEW CONTRACT RATES
1-001-90-096-1257-0000	CUSTODIAL SALARIES - H.S.	\$856,773	\$875,722	\$18,949	NEW CONTRACT RATES
1-001-90-096-1259-0000	CUSTODIAL SALARIES - DIST.	\$105,030	\$107,336	\$2,306	NEW CONTRACT RATES
1-001-84-088-1271-0000	NON-CERT SALARY ADJ.	\$67,936	\$0	(\$67,936)	ALLOCATE ADJUSTMENT ALLOWANCE FOR CUSTODIAL CONTRACT
				(\$84)	

## NON-SALARIES BUDGET ADJUSTMENTS

1-001-86-090-2700-0000	WORKERS COMP.	\$482,352	\$461,352	(\$21,000)	DECREASE IN WORKERS COMPENSATION PREMIUM
1-001-85-088-3300-0000	REPAIRS - SECURITY	\$11,000	\$5,000	(\$6,000)	REDUCTION IN CAMERA REPAIRS
1-001-85-088-4000-0000	CONTRACTED SERV. - SECURITY	\$23,555	\$8,555	(\$15,000)	REDUCTION IN CAMERA DEVICE LICENSE & SERVICE
1-001-85-088-7200-0000	EQUIPMENT - SECURITY	\$40,462	\$106,282	\$65,820	INCREASE FOR LEASE OF CAMERA EQUIPMENT
1-001-60-037-4160-0000	TUITION - OUT-OF-DISTRICT REG. ED.	\$190,220	\$156,380	(\$33,840)	REDUCTION IN ACES-ECA STUDENTS FROM 15 TO 8 AND RATE INCREASE
1-001-92-087-4112-0000	TRANS. - MAGNET SCH.	\$76,286	\$85,386	\$9,100	REDUCTION IN MAGNET SCHOOL TRANSPORTATION GRANT DUE TO DECREASE IN STUDENTS
1-001-92-087-4115-0000	TRANS. - LOCAL SPECIAL ED	\$578,344	\$521,899	(\$56,445)	REDUCTION OF A TYPE II 30 PASSENGER BUS, INCREASE IN ESY TRANSPORTATION
1-001-80-080-5600-0000	OTHER SUPPLIES - STAFF DEVELOP.	\$93,035	\$53,113	(\$39,922)	PLTW BIO MEDICAL CURRICULUM, COURSE NOT BEING ADDED
1-001-92-087-6600-0000	FUEL FOR VEHICLES - TRANS.	\$243,641	\$190,135	(\$53,506)	PROPANE BID AT \$1,0759 LOWER THAN \$1.39 BUDGETED
1-001-82-082-8900-0000	MEMBERSHIPS - SUPER.	\$7,486	\$9,981	\$2,495	SUPERINTENDENT'S ROUNDTABLE
1-001-84-083-8900-0000	MEMBERSHIPS - B.O.E.	\$23,300	\$26,070	\$2,770	INCREASE IN EDADVANCE DUES
				(\$145,528)	
				\$0	

\* PORTION OF NON-CERTIFIED SALARY ADJUSTMENT BUDGET FOR UNION CONTRACT SETTLEMENT

# SALARY 2019-20 BUDGET ADJUSTMENTS

<u>Acnt Number</u>	<u>Acnt Desc</u>	<u>LC Budget</u>	<u>Recommended Budget</u>	<u>Changes</u>	<u>Notation</u>
<b>ADJUSTMENTS FOR INDIVIDUALLY CONTRACTED STAFF</b>					
<b>CERTIFIED SALARIES</b>					
1-001-82-082-1111-0000	ADMIN. SALARIES - SUPER.	\$500,287 *	\$502,818	\$2,531	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-84-088-1151-0000	CERTIFIED SALARY ADJ.	(\$248,189) *	(\$250,720)	(\$2,531)	ALLOCATE ADJUSTMENT FOR INDIVIDUALLY CONTACTED STAFF
				\$0	
<b>NON-CERTIFIED SALARIES</b>					
1-001-94-084-1143-0000	CONTINUING ED. DIRECTOR	\$48,272	\$49,358	\$1,086	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-77-041-1210-0000	SUPERVISOR - HEALTH ADMIN.	\$46,697	\$47,747	\$1,050	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-77-049-1240-0000	NURSES SALARIES - H.S.	\$135,661	\$136,227	\$566	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-81-085-1210-0000	STAFF SALARIES - INFO. TECH.	\$500,924 *	\$505,788	\$4,864	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-84-086-1210-0000	SUPERVISORS - BUS. SERV.	\$131,956	\$133,763	\$1,807	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-90-092-1210-0000	SUPERVISORS - B&G ADMIN.	\$211,672	\$213,496	\$1,824	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-82-082-1222-0000	SECRETARIAL - SUPER.	\$285,539 *	\$289,668	\$4,129	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-84-086-1221-0000	CLERICAL - BUS. SERV.	\$295,496 *	\$297,128	\$1,632	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-90-094-1259-0000	COURIER SALARY	\$44,782	\$46,133	\$1,351	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-60-008-1263-0000	SCHOOL-TO-CAREER COORDINATOR	\$32,804	\$33,542	\$738	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-60-032-1261-0000	ATHLETIC TRAINER - SPORTS	\$52,275	\$53,451	\$1,176	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-75-051-1263-0000	THERAPISTS - OT/PT	\$407,118	\$416,352	\$9,234	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-75-061-1263-0000	BEHAVIORAL ANAL. - SP. ED. PREK-8	\$223,173	\$228,194	\$5,021	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-75-061-1266-0000	BEHAVIORAL THERAP. - SP. ED. PREK-8	\$570,518	\$573,856	\$3,338	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-75-066-1262-0000	JOB COACHES - TRANSITION	\$21,660	\$23,402	\$1,742	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-84-088-1261-0000	ATTENDANCE - SUB. CALLING	\$12,178	\$12,452	\$274	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-85-088-1264-0000	SECURITY SALARIES	\$287,714	\$293,027	\$5,313	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-85-088-1265-0000	ARMED SECURITY OFFICERS	\$277,822	\$294,061	\$16,239	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-60-026-1313-0000	TUTORS - READING	\$60,868	\$62,236	\$1,368	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-85-088-1423-0000	EXTRA WORK - SECURITY	\$26,198	\$26,760	\$562	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-85-088-1425-0000	EXTRA WORK - ARMED OFFICERS	\$3,250	\$4,500	\$1,250	INDIVIDUALLY CONTRACTED RATE INCREASES
1-001-90-096-1552-0000	CUSTODIAL O.T. - S.H.	\$7,000	\$16,000	\$9,000	ADJUST OVERTIME BASED ON HISTORY AND RATE INCREASES
1-001-90-096-1554-0000	CUSTODIAL O.T. - HOM.	\$7,000	\$9,000	\$2,000	ADJUST OVERTIME BASED ON HISTORY AND RATE INCREASES
1-001-90-096-1555-0000	CUSTODIAL O.T. - RIS.	\$15,000	\$23,000	\$8,000	ADJUST OVERTIME BASED ON HISTORY AND RATE INCREASES
1-001-90-096-1556-0000	CUSTODIAL O.T. - M.S.	\$20,000	\$21,000	\$1,000	ADJUST OVERTIME BASED ON HISTORY AND RATE INCREASES
1-001-90-096-1557-0000	CUSTODIAL O.T. - H.S.	\$50,448	\$66,448	\$16,000	ADJUST OVERTIME BASED ON HISTORY AND RATE INCREASES
1-001-84-088-1271-0000	NON-CERT SALARY ADJ.	\$100,564	\$0	(\$100,564)	ALLOCATE ADJUSTMENT FOR INDIVIDUALLY CONTACTED STAFF
				\$0	

\* BUDGET AFTER PRELIMINARY BUDGET ADJUSTMENTS

**NEW PROGRAM/PILOT and RESEARCH PROJECT APPLICATION**  
Newtown Public Schools  
**ALL new programs/pilots and research projects MUST be approved by the  
Newtown BOE.**

**What will the program/pilot or research project be called?**

Possible: Project Adventure and Beyond

**Give a brief description of the program/pilot or research project:**

The Project Adventure and Beyond course at Reed Intermediate School will incorporate all elements of Project Adventure and applied Social Emotional Learning competencies. Connections will be made between the skills learned and practiced in Project Adventure to situations students experience in their typical daily life.

This concept-based curriculum will be broken into five units, using the Social Emotional Learning (SEL) Competencies (as identified by CASEL, Collaborative for Academic, Social, and Emotional Learning) as lenses.

- Building Community
- Self-Awareness & Self- Management
- Social Awareness
- Relationship Skills
- Responsible Decision-Making

By taking the current Project Adventure curriculum and looking at each lesson through the lens of an SEL competency, students will be able to reflect, form generalizations and transfer the learning to their real life experiences. An extension of learning from the hands-on experiences through adventure will take place in the classroom. The purpose of these lessons is to dive deeper into the learning and practice around the topics of personal mission statements, goal setting and action plans, growth mindset, real-world problem solving and mindfulness and self-care. Additionally, in the classroom sessions, lessons from Second Step in compassion and empathy will support the work that cluster teachers are teaching from that program.

Goals of the course:

1. Create a community built on trust, respect and caring for self and others.
2. Develop self-awareness and self-management skills to achieve school and life success.
3. Use social awareness and interpersonal (i.e. relationship) skills to establish and maintain positive relationships.
4. Demonstrate decision-making skills and responsible behaviors in personal, school and community contexts.

## PLANNING

Please answer the following questions:

1. What is the documented need for the program/pilot or research project?

“More than two decades of research demonstrates that education promoting social and emotional learning (SEL) gets results. The findings come from multiple fields and sources, including student achievement, neuroscience, health, employment, psychology, classroom management, learning theory, economics, and the prevention of youth problem behaviors.” ([casel.org](http://casel.org))

2. What research is available about the effectiveness of this program/pilot or research project?

1. “SEL interventions that address CASEL’s five core competencies increased students’ academic performance by 11 percentile points, compared to students who did not participate in such SEL programs. Students participating in SEL programs also showed improved classroom behavior, an increased ability to manage stress and depression, and better attitudes about themselves, others, and school.” The 2011 [meta-analysis](#) of 213 studies involving 270,000+ students is attached.

2. “SEL programming can have a positive impact up to 18 years later on academics, conduct problems, emotional distress, and drug use.” The 2017 [meta-analysis](#) of 82 research studies involving 100,000 students worldwide is attached.

3. “Previous studies suggest that adding an SEL program is likely to be a wise choice. For example, 57% more students in schools with an SEL program improved their skills compared to students in schools without an SEL program, 27% more improved their academic performance, and 24% more improved their emotional well-being and social behavior. In sum, current data collected from many studies indicates that adding an SEL program to the school curriculum can lead to several real-life benefits for students.” The 2018 [study and analysis](#) by J. L. Mahoney, J. A. Durlak, and R. P. Weissberg is attached.

4. “The average return on investment for six evidence-based programs is 11 to 1, meaning for every dollar invested there is an \$11 return.” Read the 2015 [review](#) from Columbia University.

5. “SEL competencies are critically important for the long-term success of all students in today’s economy. A bipartisan 2015 report recommends several steps to scale up high-quality, evidence-based SEL programs as a core component of children’s education.” Read the [report](#) from American Enterprise Institute and Brookings Institution.

6. “There are statistically significant associations between SEL skills in kindergarten and key outcomes for young adults years later. SEL decreased the likelihood of living in or being on a waiting list for public housing, receiving public assistance, having any involvement with police before adulthood, and ever spending time in a detention facility.” Read the 2015 [national study](#) published in the *American Journal of Public Health*.

3. How does the program/pilot or research project align with the core beliefs of the Newtown Public Schools?



The District adopted CASEL's social and emotional learning competencies last year. By using each competency as a lens to look at each unit conceptually, this will align with the district's Social Emotional Learning plan. Additionally, Reed Intermediate School adopted Project Adventure's Full Value Contract as the way in which we strive to be each and every day. Having this program will support this vision of being a Full Value school.

4. **Who have you communicated with about the program/pilot or research project and what are the responses? (ex. Building leadership team, department chair).**

I have been in discussion with the leadership at RIS (Anne Uberti and Jill Beaudry) for over a year about the importance of revising the current Project Adventure curriculum to include the SEL competencies. They both had a positive response and agree that 21st century skills are taught in all subjects in our school so the need for the 21st Century skills class is no longer needed. They also see the need for more instruction in SEL to help support the work done by the cluster teachers and guidance counselors.

5. **Was the program/pilot or research project critiqued by a curriculum committee? What were their comments?**

No

6. **Which staff and students will participate in the first year of the program/pilot or research project? How will they be selected?**

All students in grades five and six will participate in this class.

7. **What are the staffing implications?**

None

8. **Do you anticipate that this will become a mandated program/pilot or research project?**

No.

9. **When and how will the initial, start-up curriculum be written prior to initiation of the program/pilot or research project?**

Curriculum is scheduled to be written this summer, starting June 18th.

10. **What is the plan for pre-implementation training and follow-up training?**

Continued professional development is very important to ensure that best practices are being used in this ever-growing field of study. Money is set aside in the budget so that I may attend at least one Project Adventure or Social Emotional Learning workshop a year.

11. **What are the projected costs for planning and future implementation? (i.e. curriculum development, instruction recourses, staff training).**

Curriculum writing was already included in this year's budget. Less than \$1,000 a year for professional development, if needed. It is my hope that either through grant money, PE budget and/or PTA budget money that more equipment for an outdoor low-element adventure course may be purchased so that we are in alignment with what is offered to students at the middle and high school in Project Adventure.

**MEASURING EFFECTS**

12. **How will you measure the program/pilot or research project effectiveness?**

There are several possible measures for gathering feedback on the project. The use of analytical rubrics in teamwork and living up to the Full Value Commitment, both completed by the teacher and by students, provide feedback on the effectiveness of the program. Additionally, climate and culture surveys taken in the fall and spring show potential areas for growth in the SEL competencies. Lastly, observation of both group and individual interactions provides the teacher with in-the-moment feedback and allows for immediate reflection of the effectiveness of the program.

13. **Who will use the information to decide if the program/pilot or research project will be continued?**

Building administration in conjunction with key members of faculty, including our new Director of Teaching and Learning will evaluate the effectiveness of the course throughout the 19-20 school year.

14. **When and how will the results be communicated to the Board?**

Reed administration and I will provide a mid-year review and end of year update to the C & I Subcommittee of the Board.

**CONTACT PERSON:** \_\_\_\_\_ Sara Strait      **DATE** \_\_\_\_\_ 6/7/19 \_\_\_\_\_

**NEWTOWN BOARD OF EDUCATION  
SUMMARY - CAPITAL IMPROVEMENT PLAN  
2020/21 TO 2024/25**

**Sub-Committee  
Recommendation to BOE 6/5/19**

**INITIAL FIVE YEARS**

CIP Item #	Location	Description of Project	underway 2019/20	Year 1	Year 2	Year 3	Year 4	Year 5	TOTALS
				2020/21	2021/22	2022/23	2023/24	2024/25	
	<i>underway</i>	<i>Hawley Elem. Replace boiler, steam to HW, 1921 section &amp; Lighting energy project, Less Energy Incentive Payment</i>	\$783,200 <del>-\$38,961</del> \$744,239						
1	Hawley Elem.	Ventilation, HVAC Renovations, partial A/C, focus on '21 section		\$3,962,000					
7	Hawley Elem.	Generator						\$1,000,000	\$4,962,000
6	Middle Gate Elem	Window modifications						\$1,000,000	\$1,000,000
5	Head O'Meadow	Lighting, efficiency, variable frequency drivers & pumps					\$997,672		\$997,672
4	Reed Intermediate	Install high efficiency gas boilers & LED lighting conversion				\$1,452,730			\$1,452,730
3	Middle School	II - Ventilation, HVAC, AC Auditorium & Café, replace rooftop units '98			\$3,475,632				\$3,475,632
	<i>underway</i>	<i>High School Main boiler replacements - High Efficiency Gas, lighting &amp; and controls, Less Energy Incentive PAYMENT</i>	\$2,702,000 <del>-\$463,435</del> \$2,238,565						
2	High School	Replace/restore stadium turf field (11th year)			\$1,191,016				\$1,191,016
<b>TOTAL COSTS OF ALL PROJECTS</b>			\$3,485,200	\$3,962,000	\$4,666,648	\$1,452,730	\$997,672	\$2,000,000	\$13,079,050
<b>TOTAL TO BE BONDED</b>				\$3,962,000	\$4,666,648	\$1,452,730	\$997,672	\$2,000,000	\$13,079,050
<i>School Building Grant Eligible 2017-18 Reimbursement rate 36.43%</i>									

Eligibility for project inclusion on the CIP is that the cost must exceed \$200,000.  
Estimates on file are increased by 6% from last year.

6.0%

**NEWTOWN BOARD OF EDUCATION  
SUMMARY - CAPITAL IMPROVEMENT PLAN  
2025/26 TO 2029/30**

**Sub-Committee  
Recommendation to BOE 6/5/19**

**SECOND FIVE YEARS**

CIP Item #	Location	Description of Project	Year 6	Year 7	Year 8	Year 9	Year 10	TOTALS	
			2025/26	2026/27	2027/28	2028/29	2029/30		
	Hawley Elem.	Classroom renovations '21 section (ceilings, lighting, floors, etc.) Purchase unsightly House/land adjacent to school (1.06 acres) Repave entire parking lot, curbing, sidewalks Elevator to café	\$450,000	\$300,000	\$954,000	\$1,300,000		\$3,004,000	
	Sandy Hook							\$0	
	Middle Gate Elem	Repave entire parking lot, curbing, sidewalks Complete kitchen renovation			\$1,300,000	\$375,000		\$1,675,000	
	Head O'Meadow	Gas and water lines to school Replace/update A/C Re roofing/restoration		\$3,180,000	\$2,544,000	\$5,830,000		\$11,554,000	
	Reed Intermediate	Repave entire parking lot, curbing, sidewalks Re roof entire building (solar remove & reinstall \$225K)		\$3,500,000	\$2,000,000			\$5,500,000	
	Middle School	Repave entire parking lot, curbing, sidewalks Window replacements Library and science lab renovations Complete kitchen renovation		\$750,000	\$3,500,000	\$1,590,000		\$5,840,000	
	High School	Re roofing/restoration HVAC equipment replacements Fuel Cell Athletic/Stadium field house and storage Practice fields facilities and storage	\$954,000	\$2,756,000 \$848,000	\$1,590,000		\$5,000,000	\$11,148,000	
<b>TOTAL COSTS OF ALL PROJECTS</b>			\$0	\$1,404,000	\$11,334,000	\$11,888,000	\$9,095,000	\$5,000,000	\$38,721,000
<b>TOTAL TO BE BONDED</b>				\$1,404,000	\$11,334,000	\$11,888,000	\$9,095,000	\$5,000,000	\$38,721,000

## Students

### First Aid/Emergency Medical Care

#### Use of Automatic External Defibrillators (AEDs)

The Newtown School District strives to provide a safe environment for students, staff, parents and community as they learn and recreate in school facilities. In order to assist individuals who may experience cardiac arrest on school property, the Newtown Board of Education has acquired automatic external defibrillators (AEDs) ~~In achieving a safe environment, automatic external defibrillators (AEDs) shall~~ to be placed at each school within the District if funding is available. The AED and trained personnel shall be available during (1) the school's normal operational hours, (2) school-sponsored athletic events and practices on school grounds, and (3) school-sponsored events not taking place during normal school operational hours. The automatic external defibrillators ~~shall be used in emergency situations when sudden cardiac arrest occurs~~ shall be used in emergency situations warranting its use. Each school shall have school staff trained in the use of AEDs and in cardiopulmonary resuscitation (CPR). Such training shall be in accordance with the standards set forth by the American Red Cross or the American Heart Association.

~~**Optional language to consider:** Two or more persons in each building including the school nurse or nurse's assistant, will be trained and certified in the use of an AED.~~

The AED will be stored in an accessible location in each school. The defibrillators shall be maintained and tested in accordance with the operational guidelines of the manufacturer and monitored by the school nurse. (or medical advisor, athletic director, safety coordinator, etc.)

~~Students who inappropriately access and/or use an AED will be deemed to have violated the school's conduct code and subject to disciplinary action.~~

~~**Optional language to consider:** Automatic external defibrillators will be maintained according to manufacturers' specifications on the premises of each building in the District if funding is available. The AED will be used in emergency situations warranting its use by individuals specifically trained in the application of the device (AED) and in cardiopulmonary resuscitation (CPR) through a training program meeting standards set forth by the American Red Cross or the American Heart Association and the Connecticut Department of Public Health.~~

The Emergency Medical Service System is to be activated immediately upon discovery of a situation in which the use of an AED is anticipated, as required. Activation will be via the 911 emergency telephone system. The activation of the Emergency Medical Service System must not be delayed due to the actual or anticipated use of an AED.

## Students

### First Aid/Emergency Medical Care

#### Use of Automatic External Defibrillators (AEDs) (continued)

~~Each AED within the District shall be registered with the Town's Emergency Medical Service provider and with the Connecticut Office of Emergency Medical Services. A report shall be forwarded to the local EMS provider for medical review (and to the District's Medical Advisor) each time an AED is activated.~~

~~The [Medical Advisor, Principal, Superintendent, etc.] may specify that an authorized user may bring an AED to other areas of a school or its grounds for the purpose of standing by at specific events or activities. A communication mechanism will be established for the purpose of notifying trained authorized users within each building of the relocation of an AED from its usual place of storage.~~

~~A regulation will delineate the procedures to be followed when using an AED. The procedure constitutes a physician's order and is to be written by the District's Medical Advisor.~~

*Alternative language to consider:* The Superintendent of Schools shall establish administrative guidelines that will outline the specific responsibilities, training, management and procedures for the use of the District's automatic external defibrillators.

*or*

~~The Superintendent is directed to promulgate such procedures/regulations as are necessary to provide for the installation and maintenance of such defibrillators and for the training of District personnel whose duties include operation of such devices.~~

Teachers and other school personnel, who have fulfilled the training requirements of this policy, providing emergency first aid involving the use of an AED shall be immune from liability if they meet the statutory requirements for immunity, which include a course in first aid that includes CPR and training in the use of AEDs provided in accordance with the standards of the American Red Cross or the American Heart Association.

It is the policy of the Board of Education to support the use of automatic external defibrillators and trained school personnel during medically appropriate circumstances.

The Board recognizes that in accordance with applicable legislation, it does not have to comply with these provisions if state, federal, or private funding is not available to it for AED purchasing and for school personnel training.

## **Students**

### **First Aid/Emergency Medical Care**

#### **Use of Automatic External Defibrillators (AEDs) (continued)**

#### **Emergency Action Response Plans**

Each school shall develop an emergency action response plan addressing the appropriate use of school personnel to respond to incidents involving an individual experiencing sudden cardiac arrest or a similar life-threatening emergency while on school grounds. Also, each school with an athletic department or organized athletic program shall develop an emergency action response plan addressing appropriate school personnel response to the same circumstances while attending or participating in an athletic event or practice on school grounds.

(cf. 5141 - Student Health Services)

(cf. 5141.1 - Care of Accidents)

~~(cf. 5141.26 – Emergency Situation with No Nurse in School)~~

(cf. 5141.3 - Health Assessments and Immunizations)

(cf. 5142 - Safety)

Legal Reference: Connecticut General Statutes  
19a-175 Definitions  
10-212d Availability of automatic external defibrillators in schools  
10-221 Boards of education to prescribe rules.  
52-557b “Good Samaritan law.” Immunity from liability for emergency medical assistance, first aid or medication by injection. School personnel not required to administer or render (as amended by P.A. 09-59).  
Public Law 106-505 Cardiac Arrest Survival Act.  
Public Law 105-170 Aviator Medical Assistance Act.  
Public Law 107-188 The Public Health Security and Bioterrorism Response Act.

Policy adopted:

## **Students**

### **Health Assessments and Immunizations**

The Board of Education recognizes the importance of periodic health assessments, including oral health assessments, according to state health regulations.

To determine health status of students, facilitate the removal of disabilities to learning and find whether some special adaptation of the school program may be necessary, the Board of Education requires that students have health assessments.

The Board of Education adheres to those state laws and regulations that pertain to school immunizations and health assessments, including oral health assessments. It is the policy of the Board of Education to insure that all enrolled students are adequately immunized against communicable diseases. The Board may deny continued attendance in school to any student who fails to obtain the health assessments required under C.G.S. 10-206, as may be periodically amended.

The Superintendent shall designate the school nurse to receive reports of health assessments and immunizations from health care providers.)

Parents wishing their children exempted or excused from health assessments must request such exemption to the Superintendent of Schools in writing. This request must be signed by the parent/guardian.

Parents/guardians wanting their children excused from immunizations on religious grounds (prior to kindergarten entry and grade 7 entry) must request such exemption in writing to the Superintendent of Schools if such immunization is contrary to the religious beliefs of the child or of the parent/guardian of the child. The request must be officially acknowledged by a notary public or a judge, a clerk or deputy clerk of a court having a seal, a town clerk, a justice of the peace, a Connecticut-licensed attorney ~~or a school nurse.~~

It is the responsibility of the Principal to insure that each student enrolled has been adequately immunized and has fulfilled the required health assessments. The school nurse shall check and document immunizations and health assessments on all students enrolling in school and to report the status to the school principal. The school nurse shall also contact parents or guardians to make them aware if immunizations and/or health assessments are insufficient or not up-to-date. The school nurse will maintain in good order the immunization and health assessment records of each student enrolled.



## Students

### Health Assessments and Immunizations (continued)

#### Health Assessment for Interscholastic Sports

Health assessment is required for interscholastic participation in sports at the middle and high school level.

The health assessment for sports must be completed prior to the first training session of the sports season. Health assessments are valid for 13 months. Registration through the Family ID program must be completed by the parent of guardian prior to participation in each sport.

Students who are not in compliance with a valid health assessment, Family ID registration including permission from their parent/guardian will not be allowed to participate.

Note: P.A 18-168 requires boards of education to request that students have an oral health assessment prior to public school enrollment, in grade 6 or 7, and in grade 9 or 10. The legislation establishes related requirements on providers authorized to perform the assessments, parental consent assessment forms, and records access. The specifics are detailed in the administrative regulation pertaining to this policy.

(cf. 5111 - Admission)  
(cf. 5141.31 - Physical Examinations for School Programs)  
(cf. 5125 - Student Records)  
(cf. 5125.11 - Health/Medical Records – HIPAA)  
(cf. 5141 - Student Health Services)

Legal Reference:      Connecticut General Statutes

- 10-204a Required immunizations (as amended by P.A. 15-174 and P.A. 15-242)
- 10-204c Immunity from liability
- 10-205 Appointment of school medical adviser
- 10-206 Health assessments (as amended by P.A.17-146 and PA 18-168)
- 10-206a Free health assessments
- 10-207 Duties of medical advisors
- 10-208 Exemption from examination or treatment
- 10-208a Physical activity of student restricted; board to honor notice
- 10-209 Records not to be public. Provision of reports to schools.
- 10-212 School nurses and nurse practitioners
- 10-214 Vision, audiometric and postural screenings. When required. Notification of parents re defects; record of results. (as amended by PA 17-146)

## **Students**

### **Health Assessments and Immunizations**

#### Legal Reference (continued)

Department of Public Health, Public Health Code, 10-204a-2a, 10-204a-3a, 10-204a-4

Section 4 of P.A. 14-231

Federal Family Educational Rights and Privacy Act of 1974 (section 438 of the General Education Provisions Act, as amended, added by section 513 of P.L. 93-568, codified at 20 U.S.C. 1232g)

42 U.S.C. 1320d-1320d-8, P.L. 104-191, Health Insurance Portability and Accountability Act of 1996 (HIPAA)

P.A. 17-146 “An Act Concerning the Department of Public Health’s Various Revisions to the Public Health Statutes,” Section 5, effective 10/1/17

PA 18-168 An Act Concerning the Department of Public Health’s Recommendations Regarding Various Revisions to the Public Health Statutes, Sections 7-9, 539 & 540

## Students

### Health Assessments and Immunizations

In accordance with Connecticut General Statutes 10-206, as amended, 10-204a, and 10-214, the following health assessment procedures are established for students in the district:

- 1) Proof of immunization shall be required prior to school entry. A "school-aged child" also includes any student enrolled in an adult education program that leads to a high school diploma. This immunization verification is mandatory for all new school enterers and must include complete documentation of those immunizations requiring a full series. Documentation of immunizations must include all immunizations as outlined on the "Immunization Requirements for Enrolled Students in Connecticut Schools."

[Click here for list:](#)

[CT School Immunization Requirements](#)

- Immunization requirements are satisfied if a student:
  - (i) presents verification of the above mentioned required immunizations;
  - (ii) presents a certificate from a physician, physician assistant, advanced practice registered nurse or a local health agency stating that initial immunizations have been administered to the child and additional immunizations are in process;
  - (iii) presents a certificate from a physician stating that in the opinion of the physician immunization is medically contraindicated in accordance with the current recommendation of the National Centers for Disease Control and Prevention Advisor Committee on Immunization Practices because of the physical condition of the child;
  - (iv) presents a written statement officially acknowledged by a notary public or a judge, family support magistrate, clerk/deputy clerk of a court having a seal, a town clerk, a justice of the peace, a Connecticut-licensed attorney ~~or a school nurse~~ from the parents or guardian of the child that such immunization would be contrary to religious beliefs of the child or his/her parents/guardians;
  - (v) he/she has had a natural infection confirmed in writing by a physician, physician assistant, advanced practice registered nurse or laboratory.

Health assessment and health screening requirements are waived if the parent legal guardian of the student or the student (if he or she is an emancipated minor or is eighteen years of age or older) notifies the school personnel in writing that the parent, guardian or student objects on religious grounds. (CGS 10-204a)

Students failing to meet the above requirements shall not be allowed to attend school.



## STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

### IMMUNIZATION REQUIREMENTS FOR ENROLLED STUDENTS IN CONNECTICUT SCHOOLS 2019-2020 SCHOOL YEAR



#### PRESCHOOL

DTaP:	4 doses (by 18 months for programs with children 18 months of age)
Polio:	3 doses (by 18 months for programs with children 18 months of age)
MMR:	1 dose on or after 1 <sup>st</sup> birthday
Hep B:	3 doses, last one on or after 24 weeks of age
Varicella:	1 dose on or after 1 <sup>st</sup> birthday or verification of disease
Hib:	1 dose on or after 1 <sup>st</sup> birthday
Pneumococcal:	1 dose on or after 1 <sup>st</sup> birthday
Influenza:	1 dose administered each year between August 1 <sup>st</sup> -December 31 <sup>st</sup> (2 doses separated by at least 28 days required for those receiving flu for the first time)
Hepatitis A:	2 doses given six calendar months apart, 1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday

#### KINDERGARTEN

DTaP:	At least 4 doses. The last dose must be given on or after 4 <sup>th</sup> birthday
Polio:	At least 3 doses. The last dose must be given on or after 4 <sup>th</sup> birthday
MMR:	2 doses separated by at least 28 days, 1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday
Hep B:	3 doses, last dose on or after 24 weeks of age
Varicella:	2 doses separated by at least 3 months-1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday, or verification of disease
Hib:	1 dose on or after 1 <sup>st</sup> birthday for children less than 5 years old
Pneumococcal:	1 dose on or after 1 <sup>st</sup> birthday for children less than 5 years old
Hepatitis A:	2 doses given six calendar months apart, 1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday

#### GRADES 1-6

DTaP/Td:	At least 4 doses. The last dose must be given on or after 4 <sup>th</sup> birthday. Students who start the series at age 7 or older only need a total of 3 doses.
Polio:	At least 3 doses. The last dose must be given on or after 4 <sup>th</sup> birthday
MMR:	2 doses separated by at least 28 days, 1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday
Hep B:	3 doses, last dose on or after 24 weeks of age
Varicella:	2 doses separated by at least 3 months-1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday, or verification of disease
Hepatitis A:	2 doses given six calendar months apart, 1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday

#### GRADE 7

Tdap/Td:	1 dose for students who have completed their primary DTaP series. Students who start the series at age 7 or older only need a total of 3 doses of tetanus-diphtheria containing vaccine, one of which must be Tdap
Polio:	At least 3 doses. The last dose must be given on or after 4 <sup>th</sup> birthday
MMR:	2 doses separated by at least 28 days, 1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday
Meningococcal:	1 dose
Hep B:	3 doses, last dose on or after 24 weeks of age
Varicella:	2 doses separated by at least 3 months-1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday, or verification of disease
Hepatitis A:	2 doses given six calendar months apart, 1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday

**GRADES 8-12**

Tdap/Td:	1 dose for students who have completed their primary DTaP series. Students who start the series at age 7 or older only need a total of 3 doses of tetanus-diphtheria containing vaccine, one of which must be Tdap
Polio:	At least 3 doses. The last dose must be given on or after 4 <sup>th</sup> birthday
MMR:	2 doses separated by at least 28 days, 1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday
Meningococcal:	1 dose
Hep B:	3 doses, last dose on or after 24 weeks of age
Varicella:	2 doses separated by at least 3 months-1 <sup>st</sup> dose on or after 1 <sup>st</sup> birthday; or verification of disease

- DTaP vaccine is not administered on or after the 7<sup>th</sup> birthday.
- Tdap can be given in lieu of Td vaccine for children 7 years and older unless contraindicated.
- Hib is required for all Pre-K and K students less than 5 years of age.
- Pneumococcal Conjugate is required for all Pre-K and K students less than 5 years of age.
- Hep A requirement for school year 2019-2020 applies to all Pre-K through 7<sup>th</sup> graders born 1/1/07 or later.
- Hep B requirement for school year 2019-2020 applies to all students in grades K-12.  
Spacing intervals for a valid Hep B series: at least 4 weeks between doses 1 and 2; 8 weeks between doses 2 and 3; at least 16 weeks between doses 1 and 3; dose 3 must be administered at 24 weeks of age or later.
- Second MMR for school year 2019-2020 applies to all students in grades K-12.
- Meningococcal Conjugate requirement for school year 2019-20 applies to all students in grades 7-12
- Tdap requirement for school year 2019-2020 applies to all students in grades 7-12
- If two live virus vaccines (MMR, Varicella, MMRV, Intra-nasal Influenza) are not administered on the same day, they must be separated by at least 28 days (there is no 4 day grace period for live virus vaccines). If they are not separated by at least 28 days, the vaccine administered second must be repeated.
- Lab confirmation of immunity is **only** acceptable for Hep A, Hep B, Measles, Mumps, Rubella, and Varicella.
- **VERIFICATION OF VARICELLA DISEASE:** Confirmation in writing by a MD, PA, or APRN that the child has a previous history of disease, based on family or medical history.

For the full legal requirements for school entry visit:

<https://portal.ct.gov/DPH/Immunizations/Immunization--Laws-and-Regulations>

If you are unsure if a child is in compliance, please call the Immunization Program at (860) 509-7929.

**New Entrant Definition:**

\*New entrants are any students who are new to the school district, including all preschoolers and all students coming in from Connecticut private, parochial and charter schools located in the same or another community. **All pre-schoolers, as well as all students entering kindergarten**, including those repeating kindergarten, and those moving from any public or private pre-school program, even in the same school district, **are considered new entrants**. The one exception is students returning from private approved special education placements—they are not considered new entrants.

**Commonly Administered Vaccines:**

<b><u>Vaccine:</u></b>	<b><u>Brand Name:</u></b>	<b><u>Vaccine:</u></b>	<b><u>Brand Name:</u></b>
DTaP-IPV-Hib	Pentacel	MMRV	ProQuad
DTaP-HIB	TriHibit	PCV7	Prevnar
HIB-Hep B	Comvax	PCV13	Prevnar 13
DTaP-IPV-Hep B	Pediarix	DTaP-IPV	Kinrix, Quadracel
Hepatitis A	Havrix, Vaqta	Influenza	Fluzone, FluMist, Fluviron, Fluarix, FluLaval Flucelvax, Afluria

## Students

### Health Assessments and Immunizations (continued)

- 2) A physical examination including blood pressure, height, weight, hematocrit or hemoglobin, and a chronic disease assessment which shall include, but not be limited to, asthma and which must include public health related screening questions for parents to answer and other screening questions for providers and screenings for hearing, vision, speech, gross dental and posture shall be required for all new school enterers, and students in grade 6 and grade 9 or 10. This health assessment must be completed either prior to school entry or 30 calendar days after the beginning of school for new school enterers. This assessment must be conducted within the school year for students in grade 6 ~~or~~ and grade 9 ~~or 10~~. Parents of students in grade 6 and grade 9 ~~or 10~~ shall be notified, in writing, of the requirement of a health assessment and shall be offered an opportunity to be present at the time of assessment.

The assessment shall also include tests for tuberculosis, sickle cell anemia or Cooley's anemia and test for lead levels in the blood when the Board of Education, after consultation with the school medical advisor and the local health department, determine such tests are necessary.

A test for tuberculosis, as indicated above, is not mandatory, but should be performed if any of the following risk factors prevail:

1. birth in a high risk country of the world (~~to include all countries in Africa, Asia, the former Soviet Union, Eastern Europe, Central and South America, Dominican Republic and Haiti, see list of countries in Appendix B~~) (per WHO list of TB high burden countries) and do not have a record of a TST (tuberculin skin test) or IGRA (interferon-gamma release assay) performed in the United States.
2. travel to a high risk country staying at least one week with substantial contact with the indigenous population since the previously required examination;
3. extensive contact with persons who have recently come to the United States from high risk countries since the previously required examination;
4. contact with persons suspected to have tuberculosis; or
5. lives with anyone who has been in a homeless shelter, jail or prison, uses illegal drugs or has HIV infection.

## Students

### Health Assessments and Immunizations (continued)

~~The results of the risk assessment and testing, when done, should be recorded on the State of Connecticut Health Assessment Record (HAR-3) or directly in the student's Cumulative Health Record (CHR-1).~~

Health assessments completed within one calendar year of new school entry or grades 6 or grade 9 will be accepted by the school system. Failure of students to satisfy the above mentioned health assessment timeliness and/or requirements shall result in exclusion from school.

- 3) Parents or guardians of students being excluded from school due to failure to meet health assessment requirements shall be given a thirty calendar day notice in writing, prior to any effective date of school exclusion. Failure to complete required health assessment components within this thirty-day grace period shall result in school exclusion. This exclusion shall be verified, in writing, by the Superintendent of Schools or his/her designee. Parents of excluded students may request administrative hearing of a health assessment-related exclusion within five days of final exclusion notice. An administrative hearing shall be conducted and a decision rendered within fifteen calendar days after receipt of request. A subcommittee of the Board of Education shall conduct an administrative hearing and will consider written and/or oral testimony offered by parents and/or school officials.
- 4) Health screenings shall be required for all students according to the following schedule:

Vision Screening	Grades K, 1, 3, 4, 5
Audiometric Screening	Grades K, 1, 3, 4, 5
Postural Screening	Grades 5 and 7 for female students Grades 8 or 9 for male students

The school system shall provide these screening to students at no cost to parents. Parents shall be provided an annual written notification of screenings to be conducted. Parents wishing to have these screenings to be conducted by their private physician shall be required to report screening results to the school nurse.

(Health assessments may be conducted by a licensed physician, advanced practice registered nurse, registered nurse, physician assistant or by the School Medical Advisor.)

## Students

### Health Assessments and Immunizations (continued)

- 5) Parents of students failing to meet standards of screening or deemed in need of further testing shall be notified by the Superintendent of Schools. A written notice shall be given to the parent/guardian of each student who is found to have any defect of vision or disease of the eyes, with a brief statement describing such defect or disease and a recommendation for the student to be examined by a licensed optometrist or licensed ophthalmologist. A written statement shall also be provided to the parent/guardian of any student who did not receive the vision screening with a brief statement explaining the reason.

Students eligible for free health assessments shall have them provided by the health services staff. School District may refer student to local health resources to provide free assessments.

- 6) Health records shall be maintained in accordance with Policy #5125.
- 7) All candidates for all athletic teams shall be examined annually by a legally qualified practitioner of medicine. ~~the designated school physician at a time and place determined by the Director of Athletics and/or coach.~~

No candidate will be permitted to engage in either a practice or a contest unless this requirement has been met, and he or she has been declared medically fit for athletics.

An athlete need not be re-examined upon entering another sport unless the coach requests it.

If a student is injured, either in practice, a contest, or from an incident outside of school activities at requires him or her to forego either a practice session or contest, that student will not be permitted to return to athletic activity until a legally qualified practitioner of medicine ~~the school physician~~ examines the student and pronounces him/her medically fit for athletics.



## Students

### Health Assessments and Immunizations (continued)

#### Oral Health Assessments

Parents are encouraged to have oral health assessments for their child(ren) prior to public school enrollment, in grade 6 and in grade 9. Such assessment may be conducted by a dentist, dental hygienist, physician, physician assistant (PA), or an advanced practice registered nurse (APRN), if he or she is trained in conducting such assessments as part of a DPH-approved training program. When conducted by a dentist the oral assessment must include a dental examination. If another such provider conducts the assessment, it must include a visual screening and risk assessment.

Parent/guardian consent is required prior to the oral health assessment. The assessment is to be made in the presence of the parent/guardian or another school employee. The parent/guardian must receive prior written notice and have a reasonable opportunity to opt his/her child out of the assessment, be present at the assessment, or provide for the assessment himself or herself.

A child's public school enrollment continued attendance shall not be denied for his/her failure to receive the oral health assessment.

The District may host a free oral health assessment event at which a qualified provider performs such oral health assessments. Parents/guardians will be given prior notice of such a free screening event providing the parents/guardians the opportunity to opt their children out of the assessment event. If the parent/guardian does not do so, the child must receive an assessment free of charge. The child is prohibited by the legislation from receiving any dental treatment as part of the assessment event without the parent's/guardian's informed consent.

The results of an oral health assessment shall be recorded on forms supplied by the State Board of Education. The provider performing the assessment must completely fill out and sign the form. Recommendations by the provider shall be in writing. For any child who receives an oral health assessment, the results must be included in the child's cumulative health record.

Appropriate school health personnel shall review the assessment results. If it is determined that a child needs further testing or treatment, the Superintendent shall give written notice to the child's parent/guardian and make reasonable efforts to ensure that further testing or treatment is provided. Such efforts include determining whether the parent/guardian obtained the necessary testing or treatment for the child and, if not, advising the parent or guardian on how to do so. The results of the further testing or treatment must be recorded on the assessment forms and reviewed by school health personnel.

As with other school health assessments no records of oral health assessments may be open to public inspection; and each provider who conducts an assessment for a child seeking to enroll in a public school must provide the assessment results to the school district's designated representative and a representative of the child.

## **Students**

### **Health Assessments and Immunizations**

Legal Reference: Connecticut General Statutes

- 10-204a Required immunizations (as amended by P.A. 15-174 and P.A. 15-242)
- 10-204c Immunity from liability
- 10-205 Appointment of school medical adviser
- 10-206 Health assessments (as amended by June Special Session PA 01-4, PA 01-9, PA 05-272, PA 07-58 and PA 18-168)
- 10-207 Duties of medical advisers
- 10-206a Free health assessments (as amended by June Special Session PA 01-1)
- 10-208 Exemption from examination or treatment
- 10-208a Physical activity of student restricted; board to honor notice
- 10-209 Records not to be public. Provision of reports to schools.
- 10-212 School nurses and nurse practitioners
- 10-214 Vision, audiometric and postural screenings. When required. Notification of parents re defects; record of results, as amended by PA 17-173

Department of Public Health, Public Health Code, 10-204a-2a,10-204a-3a and 10-204a-4

Regulation approved:

rev 9/11  
rev 7/15  
rev 6/17  
rev 6/18

## R5141.3

*A succinct sample regulation to consider.*



### Health Assessments and Immunizations

A complete immunization record must be presented before a child enters any District school. For all students, this record must show dates of adequate immunizations against:

- Diphtheria;
- Pertussis;
- Tetanus;
- Poliomyelitis (initial series plus booster given on or after the fourth birthday); and
- Hepatitis B (three doses).

In addition, the following immunizations are also required:

<b>Hib</b>	1 dose given on or after the first birthday for students under five years of age.
<b>Pneumococcal</b>	1 dose given on or after the first birthday for students under five years of age who were born on or after January 1, 2007 and are enrolled in Pre-Kindergarten or Kindergarten on or after August 1, 2011.
<b>Hepatitis A</b>	2 doses for all students born on or after January 1, 2007 who are enrolled in Pre-Kindergarten or Kindergarten, on or after August 1, 2011. First dose given on or after the first birthday.
<b>Influenza</b>	1 dose for students under five years of age enrolled in pre-school, on or after August 1, 2011. Vaccine should be administered annually between August 1 and December 31 <sup>st</sup> . Individuals receiving the vaccine for the first time require two doses.
<b>Measles, Mumps, Rubella</b>	2 doses for all students enrolled in Kindergarten through grade 12, on or after August 1, 2011. First dose given on or after the first birthday.
<b>Varicella</b>	2 doses for those enrolled in Kindergarten or 7 <sup>th</sup> grade, on or after August 1, 2011. First dose given on or after the first birthday.
<b>Tdap</b>	1 dose, given after the 7 <sup>th</sup> birthday, of diphtheria, tetanus and pertussis vaccine for those enrolled in 7 <sup>th</sup> grade, on or after August 1, 2011.
<b>Meningococcal</b>	1 dose for those enrolled in 7 <sup>th</sup> grade, on or after August 1, 2011.

Under certain circumstances, proof of immunity based upon specific blood testing or disease certification is acceptable in lieu of immunization. Parents/guardians should be instructed to contact the school nurse for further information.

Regulation approved:

cps 6/11

Sample policies are distributed for demonstration purposes only. Unless so noted, contents do not necessarily reflect official policies of the Connecticut Association of Boards of Education, Inc.

**STATE OF CONNECTICUT**  
**Department of Public Health**

**IMMUNIZATION REQUIREMENTS FOR ENROLLED STUDENTS IN  
CONNECTICUT SCHOOLS FOR 2014-2015 SCHOOL YEAR**

**See separate PDF file in Series 5000**  
**5141.3 Appendix – School Immunizations**

## 5141.3 Appendix B

**List of High Risk<sup>1</sup> Tuberculosis Countries**

Afganistan	Georgia	Paraguay
Algeria	Ghana	Peru
Angola	Guam	Philippines
Anguilla	Guatemala	Poland
Argentina	Guinea	Portugal
Armenia	Guinea-Bissau	Qatar
Azerbaijan	Guyana	Republic of Korea
Bahrain	Haiti	Republic of Moldova
Bangladesh	Honduras	Romania
Belarus	India	Russian Federation
Belize	Indonesia	Rwanda
Benin	Iraq	Saint Vincent and the Grenadines
Bhutan	Japan	Sao Tome and Principe
Bolivia (Plurinational State of)	Kazakhstan	Senegal
Bosnia and Herzegovina	Kenya	Serbia
Botswana	Kiribati	Seychelles
Brazil	Kuwait	Sierra Leone
Brunei Darussalam	Kyrgyzstan	Singapore
Bulgaria	Lao Peoples Democratic Republic	Solomon Islands
Burkina Faso	Latvia	Somalia
Burundi	Lesotho	South Africa
Cambodia	Liberia	Sri Lanka
Cameroon	Libyan Arab Jamahiriya	Sudan
Cape Verde	Madagascar	Suriname
Central African Republic	Malawi	Swaziland
Chad	Malaysia	Syrian Arab Republic
China	Maldives	Tajikistan
China, Hong Kong Sp. Admin. Region	Mali	Thailand
China, Macao Administrative Region	Marshall Islands	The former Yugoslav Rep. of Macedonia
Colombia	Mauritius	Timor-Leste
Comoros	Micronesia (Federated States of)	Togo
Cong	Mongolia	Tonga
Cook Islands	Montenegro	Trinidad and Tobago
Cote d'Ivoire	Morocco	Tunisia
Croatia	Mozambique	Turkey
Democratic People's Rep. of Korea	Myanmar	Turkmenistan
Democratic Republic of the Congo	Namibia	Tuvalu
Djibouti	Nepal	Uganda
Dominican Republic	New Caledonia	Ukraine
Ecuador	Nicaragua	United Republic of Tanzania
El Salvador	Niger	Uruguay
Equatorial Guinea	Northern Mariana Islands	Uzbekistan
Eritrea	Pakistan	Vanuatu
Estonia	Palau	Venezuela (Bolivarian Republic of)
French Polynesia	Panama	Viet Nam
Gabon	Papua New Guinea	Yemen
Gambia	Paraguay	Zambia
		Zimbabwe

<sup>1</sup>Greater than 20/100,000 population

Estimates can be found at <http://apps.who.int/ghodata/?vid=500>

**STATE OF CONNECTICUT  
DEPARTMENT OF EDUCATION  
Health Assessment Record**

To Parent or Guardian:

In order to provide the best educational experience, school personnel must understand your child's health needs. This form requests information from you (Part I) which will also be helpful to the health care provider when he or she completes the medical evaluation (Part II).

State law requires complete primary immunization and a health assessment by a legally qualified practitioner of medicine, an advanced practice registered nurse or registered nurse, a physician assistant or the school medical advisor prior to school entrance in Connecticut (C.G.S. Secs. 10-204a and 10-206). An immunization update and additional health assessments are required in the 6<sup>th</sup> or 7<sup>th</sup> grade and in the 10<sup>th</sup> or 11<sup>th</sup> grade. Specific grade level will be determined by the local board of education.

<b>Name of Student (Last, First, Middle)</b>	Social Security No.	Birth Date	Sex
Address (Street)		Home Telephone Number	
Town and Zip Code	School		Grade
Parent/Guardian (Last, First, Middle)			
Medicaid Number*		Health Insurance Company Number*	

\*If applicable

**PART I – To be Completed by Parent**

**Important: Complete Part I before your child is examined.**

**Take this form with you to the health care provider's office.**

(Please check answers to the following questions in columns on the left.

(Explain all "yes" answers in the space provided below.)

1.    Yes    No    Do you have any concerns about your child's general health (eating and sleeping habits, weight, teeth, etc.)?
2.    Yes    No    Does your child have any other specific illness or problem?
3.    Yes    No    Does your child have any allergies (food, insects, medication, etc.)?
4.    Yes    No    Does your child have take any medication (daily or occasionally)?
5.    Yes    No    Does your child have any problems with vision, hearing or speech (glasses, contacts, ear tubes, hearing aids)?
6.    Yes    No    Has your child had any hospitalization, operation, or major illness (specify problem)?
7.    Yes    No    Has your child had any significant injury or accident (specify problem)?
8.    Yes    No    Would you like to discuss anything about your child's health with the school nurse?

(Please explain any "yes" answers here. For illnesses/injuries/etc., include the year and/or your child's age at the time)

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I give permission for release of information on this form for confidential use in meeting my child's health and educational needs in school.

Signature of Parent/Guardian \_\_\_\_\_ Date \_\_\_\_\_

**PART II – Medical Evaluation To the Health Care Provider: Please Complete and Sign**

\_\_\_\_\_ has had a complete history and physical exam on \_\_\_\_\_

Student's Name

Birth Date

Month/Day/Year

**Findings for this student are as follows:**

Screening/Test Results					
Note: *Mandated Screening/Tests/Immunizations under Connecticut State Law.					
*Height	*Vision			*Auditory	
*Weight	With glasses	R 20/	L 20/	R	Pass/Fail
*B/P	Without glasses	R 20/	L 20/	L	
Pulse:					
*HCT/HGB					
Urinalysis:	Type of Screening:		Type of Screening:		
*Gross dental (teeth and gums)					

\*Postural:  Normal  Abnormal Min. \_\_\_\_\_  
Slight \_\_\_\_\_  
 Referral Mod. \_\_\_\_\_  
Marked \_\_\_\_\_

Other Test Results (TB, Sickle Cell, etc.)		
Test	Date	Results

This student has the following problems which may adversely affect his or her educational experience:

- Vision  Auditory  Speech/Language  Physical Dysfunction  Emotional/Social  Behavior

The student has a health condition which may require emergency action at school e.g., seizures, allergies. *Specify below.*

The student in on long-term medication. *Specify below.*

**Comments and recommendations (attach additional sheet if necessary):** \_\_\_\_\_

- This student may participate fully in the school program, including physical education activities.  
 This student may participate in the school program and physical education with the following restriction/adaptation. *(specify this reason and restriction)*

Yes  No Based on this comprehensive health history and physical examination, this student has maintained his/her level of wellness.

I would like to discuss information in this report with the school nurse.

Immunization Record						
Vaccine (Month/Day/Year) Note: *Minimum requirements prior to school enrollment. At subsequent exams, note booster shots only.						
	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6
DTP	*	*	*	*		
DTP/Hi b						
DtaP						
DT/Td						
OPV	*	*	*			
IPV						
MMR						
Measles	*			Booster for entry into 7 <sup>th</sup> grade		
Mumps	*					
Rubella	*					
HIB	*			For students younger than age 5		
HBV	*	*	*	For students born 1-9-94 or later		
Varicella						
Other Vaccines (Specify)						
Disease Hx _____						
of above (Specify) (Date) (Confirmed by)						
Exemption						
Religious ___ Medical: Permanent ___ Temporary ___ Date _____						
Recertify Date _____ Recertify Date _____ Recertify Date _____						

Signature of health care provider	Name (Please type or print.)	Phone Number
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## **Students**

### **Reporting Child Abuse, Neglect and Sexual Assault**

Connecticut General Statutes §17a-101, as amended by Public Acts 02-138, 11-93, and 15-205 requires all school employees including the Superintendent of Schools, school teachers, substitute teachers, administrators, school guidance counselors, school counselors, school paraprofessionals, licensed nurses, physicians, psychologists, social workers, behavior analysts, coaches of intramural or interscholastic athletics, or any other person, who in the performance of his/her duties, has regular contact with students and who provides services to District students, who have reasonable cause to suspect or believe that a child has been abused, neglected, placed in imminent risk of serious harm, or sexually assaulted by a school employee to report such abuse, neglect and sexual assault in compliance with applicable state statutes.

An oral report by telephone or in person shall be made as soon as possible but no later than 12 hours to the Commissioner of Children and Families and to the Superintendent of Schools or his/her designee followed within 48 hours by a written report to the Department of Children and Families.

The Board of Education will post the telephone number of the Department of Children and Families' child abuse hotline, Careline, and the Internet web address that provides information about the Careline in each District school in a conspicuous location frequented by students. Such posting shall be in various languages most appropriate for the students enrolled in the school.

Reporting suspected abuse and/or neglect of children or sexual assault, in addition to the requirements pertaining to staff training, record keeping and dissemination of this policy, shall be in accordance with the procedures established and set forth in the Administrative Regulation 5151.4.

(cf. 4112.6/4212.6 – Personnel Records)

(cf. 5145.511 – Sexual Abuse Prevention and Education Program)

Legal Reference: Connecticut General Statutes

10-220a Inservice training. Professional development committees. Institutes for educators. Cooperating teacher program, regulations (as amended by PA 11-93)

10-221d Criminal history records check of school personnel. Fingerprinting. Termination or dismissal (as amended by PA 11-93)

10-221s Investigations of child abuse and neglect. Disciplinary action. (as amended by PA 16-188)

## **Students**

### **Reporting Child Abuse, Neglect and Sexual Assault**

Legal Reference: Connecticut General Statutes (continued)

17a-28 Definitions. Confidentiality of and access to records; exceptions. Procedure for aggrieved persons. Regulations (as amended by PA 11-93 and PA 14-186)

17a-101 Protection of children from abuse. Reports required of certain professional persons. When child may be removed from surroundings without court order. (as amended by PA 96-246, PA 00-220, PA 02-106, PA 03-168, PA 09-242, PA 11-93, PA 05-205, PA 18-15 and PA 18-17)

17a-101a Report of abuse or neglect by mandated reporters. (as amended by PA 02-106, PA 11-93, and PA 15-205)

17a-106 Cooperation in relation to prevention, identification and treatment of child abuse/neglect.

PA 11-93 An Act Concerning the Response of School Districts and the Departments of Education and Children and Families to Reports of Child Abuse and Neglect and the Identification of Foster Children in a School District

PA 14-186 An Act Concerning the Department of Children and Families and the Protection of Children

PA 15-205 An Act Protecting School Children

Policy adopted:

## **Students**

### **Reporting of Child Abuse/Neglect or Sexual Assault**

#### **a. What Must be Reported**

A report must be made when any mandated reporter of the Board of Education, in his/her professional capacity, has reasonable cause to suspect or to believe that a child under the age of eighteen: *(Mandated reporters include all school employees, the Superintendent, administrators teachers, substitute teachers, guidance counselors, school counselors, behavior analysts, school paraprofessionals, coaches of intramural and interscholastic athletics, as well as licensed nurses, physicians, psychologists and social workers either employed by the Board or working in one of the District schools, or any other person who, in the performance of his or her duties, has regular contact with students and who provides services to or on behalf of students enrolled in District schools.)*

1. Is in danger of being or has been abused;
2. Has had non-accidental physical injuries or physical injuries which are at variance with the history given for them, inflicted by a person responsible for the child's health, welfare or care, or by a person given access to such child by a responsible person;
3. Has been neglected;
4. Has been sexually assaulted; or
5. Has been placed in imminent risk of serious harm.

A mandated reporter's suspicions may be based on such factors as observations, allegations, and facts by a child, victim or third party. Suspicion or belief does not require certainty or probable cause.

#### **Definitions**

**“Abused”** means that a child (a) has had physical injury or injuries inflicted upon him or her other than by accidental means, or (b) has injuries which are at variance with the history given of them, or (c) is in a condition which is the result of maltreatment, such as, but not limited to, malnutrition, sexual molestation or exploitation, deprivation of necessities, emotional maltreatment or cruel punishment.

**“Neglected”** means that a child (a) has been abandoned, or (b) is being denied proper care and attention, physically, educationally, emotionally or morally, or (c) is being permitted to live under conditions, circumstances or associations injurious to his well-being, or (d) has been abused.

## Students

### Reporting of Child Abuse/Neglect or Sexual Assault

#### Definitions (continued)

**“School employee”** (a) a teacher, substitute teacher, school administrator, school superintendent, guidance counselor, psychologist, social worker, nurse, physician, school paraprofessional or coach employed by the Board or who is working in an elementary, middle or high school; or (b) any other person who, in the performance of his or her duties, has regular contact with students and who provides services to or on behalf of students enrolled in the Newtown Public Schools, pursuant to a contract with the Board.

**“Sexual assault”** means for the purposes of mandatory reporting laws and this policy; a violation of Sections 53a-70a, 53a-71, 53a-72a, 53a-72b or 53a-73a of the Connecticut General Statutes.

**“Statutory mandated reporter”** means an individual by CGS Sec. 17a-101 to report suspected abuse and/or neglect of children or sexual assault by a school employee. The term, “statutory mandated reporter” includes all school employees, as defined above.

#### b. Reporting Procedures for Statutory Mandated Reporters

The following procedures apply only to statutory mandated reporters, as defined above.

1. When an employee of the Board of Education suspects or believes that a child has been abused, neglected, has been placed in imminent risk of serious harm, or sexually assaulted by a school employee, the following steps shall be taken:
  - (a) The employee shall immediately, upon having reasonable cause to suspect or believe that a child has been abused, neglected, or placed in imminent danger of serious harm, or has had non-accidental physical injury or injury which is at variance with the history or such injury, or sexually assaulted by a school employee and in no case later than twelve (12) hours after having such a suspicion or belief, make an oral report by telephone or in person to the Commissioner of Children and Families or the local law enforcement agency. The Department of Children and Families has established a 24 hour Child Abuse and Neglect Hotline at 1-800-842-2288 for the purpose of making such oral reports.
  - (b) The employee shall also immediately make an oral report to the Building Principal or his/her designee and/or the Superintendent or his/her designee. If the building principal is the alleged perpetrator of the abuse/neglect, then the employee shall notify the Superintendent or his/her designee directly.
  - (c) If a report prepared in accordance with Section (a) above concerns suspected abuse, neglect or sexual assault by a school employee, the Superintendent or his/her designee, shall immediately notify the child’s parent or guardian that such a report has been made.

## **Students**

### **Reporting of Child Abuse/Neglect or Sexual Assault**

#### **b. Reporting Procedures for Statutory Mandated Reporters (continued)**

- (d) Not later than 48 hours of making an oral report, the employee shall submit a written report to the Commissioner of Children and Families, or his/her representative, containing all of the required information. The written reports should be submitted on the DCF-136 form or any other form designated for that purpose.
- (e) The employee shall immediately, submit a copy of the written report to the Principal and/or Superintendent or the Superintendent's designee.
- (f) If a report prepared in accordance with Section (c) above, concerns suspected abuse, neglect or sexual assault by a school employee who possesses a certificate, permit or authorization issued by the State Board of Education, the Superintendent shall submit a copy of the written report to the Commissioner of Education, or his/her representative.

#### **c. Contents of Reports**

Any report made pursuant to this policy shall contain the following information, if known:

1. The names and addresses of the child and his/her parents or other persons responsible for his/her care;
2. The age of the child;
3. The gender of the child;
4. The nature and the extent of the child's injury or injuries, maltreatment or neglect;
5. The approximate date and time the injury or injuries, maltreatment or neglect occurred;
6. Information concerning any previous injury or injuries to, or maltreatment or neglect of, the child or his/her siblings;
7. The circumstances in which the injury or injuries, maltreatment or neglect came to be known to the reporter;
8. The name of the person or persons suspected to be responsible for causing such injury or injuries, maltreatment or neglect;
9. The reasons such person or persons are suspected of causing such injury or injuries, maltreatment or neglect;
10. Any information concerning any prior cases in which such person or persons have been suspected of causing an injury, maltreatment or neglect of a child; and
11. Whatever action, if any, was taken to treat, provide shelter or otherwise assist, the child.

## **Students**

### **Reporting of Child Abuse/Neglect or Sexual Assault**

#### **c. Contents of Reports (continued)**

For purposes of this section pertaining to the required reporting, a child includes any victim under eighteen years of age educated in a technical high school or District school. Any person who intentionally and unreasonably interferes with or prevents the making of the required report or attempts to conspire to do so shall be guilty of a class D felony, unless such individual is under eighteen years of age or educated in the technical high school system or in a district school, other than part of an adult education program. The mandatory reporting requirement regarding the sexual assault of a student by a school employee applies based on the person's status as a student, rather than his or her age.

#### **d. Investigation of the Report**

If the suspected abuser is a school employee, the Superintendent or his/her designee shall thoroughly investigate the report, provided that such investigation does not interfere with or impede the investigation by the Department of Children and Families or by a law enforcement agency. To the extent feasible, this investigation shall be coordinated with the Commissioner of Children and Families or the police in order to minimize the number of interviews of any child and to share information with other persons authorized to conduct an investigation of child abuse and neglect. When investigating a report, the Superintendent or his/her designee shall endeavor to obtain, when possible, the consent of parents or guardians or other persons responsible for the care of the child, to interview the child, except in those cases in which there is reason to believe that the parents or guardians or other persons responsible for the care of such child are the perpetrators or the alleged abusers.

The investigation shall include an opportunity for the suspected abuser to be heard with respect to the allegations contained within the report. During the course of an investigation of suspected abuse by a school employee, the Superintendent may suspend the employee with pay or may place the employee on administrative leave with pay pending the outcome of the investigation.

A person reporting child abuse, neglect or sexual assault shall provide any person authorized to conduct an investigation into such claim with all information related to the investigation that is in the possession or control of the person reporting child abuse, neglect, or sexual assault except as expressly prohibited by state or federal law.

## **Students**

### **Reporting of Child Abuse/Neglect or Sexual Assault**

#### **d. Investigation of the Report (continued)**

1. **Evidence of Abuse by Certain School Employees.** After an investigation has been completed, if the Commissioner of Children and Families, based upon the results of such investigation, has reasonable cause to believe that a child has been abused, neglected or sexually assaulted by an employee who has been entrusted with the care of a child or has recommended that such employee be placed on the Department of Children and Families abuse and neglect registry, the Commissioner shall notify within five (5) working days after the completion of the investigation into child abuse, neglect or sexual assault by a school employee, the Superintendent, the school employee, and the Commissioner of Education of such finding and shall provide records, whether or not created by the Department of Children and Families, concerning such investigation to the Superintendent and the Commissioner of Education. The Superintendent shall suspend the employee, if not previously suspended, with pay and without diminution or termination of benefits if DCF has reasonable cause that the employee abused or neglected a child and recommends the employee be placed on the DCF child abuse and neglect registry. Not later than 72 hours after such suspension, the Superintendent shall notify the Board of Education and the Commissioner of Education, or his/her representative, of the reasons for the conditions of suspension. The Superintendent shall disclose records received from the Department of Children and Families to the Commissioner of Education and the Board of Education, or its attorney, for the purposes of review of employment status, certification, permit or authorization. Any decision of the Superintendent concerning such suspension shall remain in effect until the Board of Education Acts, pursuant to the provisions of Connecticut General Statutes. The Commissioner of Education shall also be notified if such certified person resigns from his/her employment in the District. Regardless of the outcome of any investigation by DCF and/or the police, the Superintendent and/or the Board, as appropriate, may take disciplinary action up to and including termination of employment in accordance with the provisions of any applicable statute, if the Superintendent's investigation produces evidence that a child has been abused by a certified, permit or authorized school staff member.

If the contract of employment of a certified school employee holding a certificate, permit or authorization issued by the State Board of Education is terminated as a result of an investigation into reports of child abuse and neglect, the Superintendent shall notify the Commissioner of Education, or his/her representative, within 72 hours of such termination.

## Students

### Reporting of Child Abuse/Neglect or Sexual Assault

#### d. Investigation of the Report (continued)

2. **Evidence of Abuse by Other School Staff.** If the investigation by the Superintendent and/or Commissioner of Children and Families did produce evidence that a child has been abused by a non-certified school staff member the Superintendent and/or the Board, as appropriate, may take disciplinary action up to and including termination of employment.
3. The District shall maintain records of allegations, investigations and reports that a child has been abused or neglected by a school employee. Such records will be maintained in the District's Central Office. The records shall include any reports made to the Department of Children and Families. The State Department of Education is to have access to all such records.
4. The Board shall provide to the Commissioner of Children and Families, upon request for the purposes of an investigation by the Commissioner of Children and Families of suspected child abuse or neglect by a teacher employed by the Board, any records maintained or kept in District files. Such records shall include, but not be limited to, supervisory records, reports of competence, personal character and efficiency maintained in such teacher's personnel file with reference to evaluation of performance as a professional employee of such board of education, and records of the personal misconduct of such teacher. (*"Teacher" includes each certified professional employee below the rank of Superintendent employed by a Board of Education in a position requiring a certificate issued by the State Board of Education.*)
5. The Board of Education shall permit and give priority to any investigation conducted by the Commissioner of Children and Families or the appropriate local law enforcement agency that a child has been abused or neglected. The Board shall conduct its own investigation and take any disciplinary action, in accordance with the provisions of section 17a-101i of the general statutes, as amended, upon notice from the Commissioner or the appropriate local law enforcement agency that the Board's investigation will not interfere with the investigation of the Commissioner or such local law enforcement agency.
6. The Department of Children and Families will review, at least annually, with the State Department of Education all records and information relating to reports and investigations that a child has been abused and neglected by a school employee, in the Department of Children and Families' possession to ensure that records and information are being shared properly.



## **Students**

### **Reporting of Child Abuse/Neglect or Sexual Assault (continued)**

**e. Delegation of Authority by Superintendent**

The Superintendent may appoint a designee for the purposes of receiving and making reports, notifying and receiving notification, or investigating reports pursuant to this policy.

**f. Special Reporting Procedures Concerning Suspected Abuse or Neglect of Intellectually Disabled Persons**

In addition to the reporting procedures set forth above, Connecticut General Statutes require that certain school personnel, including teachers, licensed nurses, psychologists and social workers, report any suspected abuse or neglect of intellectually disabled persons over the age of 18. It is policy of the Board of Education to require ALL EMPLOYEES of the Board of Education to comply with the following procedures in connection with the suspected abuse or neglect, as defined below, of any mentally retarded person over the age of 18.

**1. Definitions.** For the purposes of this policy:

“**Abuse**” means the willful infliction of physical pain or injury or willful deprivation by a caretaker of services which are necessary to the person’s health or safety.

“**Neglect**” means a situation where an intellectually disabled person either is living alone or is not able to provide for him/herself the services which are necessary to maintain his/her physical and mental health, or is not receiving such necessary services from the caretaker.

**2. Reporting Procedures.** If an employee has reasonable cause to suspect that an intellectually disabled person has been abused or neglected, he/she shall, within five calendar days, make an oral report to the Director of the Office of Protection and Advocacy for Persons with Disabilities, to be followed by a written report within five additional calendar days, or shall immediately notify the Superintendent in order for the Superintendent to make such oral and written reports to the Office of Protection and Advocacy. In the event that an employee makes a report to the

Office of Protection and Advocacy, the employee shall immediately notify the Superintendent.

## Students

### Reporting of Child Abuse/Neglect or Sexual Assault

**f. Special Reporting Procedures Concerning Suspected Abuse or Neglect of Intellectually Disabled Persons** (continued)

3. **Contents of Report.** Any such report shall contain the following information:

- (a) The name and address of the allegedly abused or neglected person;
- (b) A statement from the reporter indicating a belief that the person is intellectually disabled, together with information indicating that the person is unable to protect himself or herself from abuse or neglect;
- (c) Information concerning the nature and extent of the abuse or neglect; and
- (d) Any additional information, which the reporter believes, would be helpful in investigating the report or in protecting the intellectually disabled person.

4. **Investigation of Report.** If the suspected abuser is a school employee, the Superintendent shall thoroughly investigate the report following the procedures regarding the investigation of reports of child abuse set forth in paragraph e above.

If the investigation by the Superintendent and/or the Office of Protection and Advocacy produces evidence that an intellectually disabled person has been abused by a school employee, the Superintendent and/or the Board, as appropriate, may take disciplinary Action, up to and including termination of employment.

**g. Disciplinary Action for Failure to Follow Policy**

Any employee who fails to comply with the requirements of this policy shall be subject to discipline, up to and including termination of employment.

**h. Non-Discrimination Policy**

The Board of Education shall not discharge or in any manner discriminate or retaliate against any employee who, in good faith, makes a report pursuant to this policy or testifies or is about to testify in any proceeding involving abuse or neglect.

**i. Training**

All District employees are required to complete a training program pertaining to the accurate and prompt reporting of abuse and neglect, made available by the Commissioner of Children and Families. In addition, all employees must complete a refresher program at least once every three years. Employees hired before July 1, 2011 must complete the refresher training program by July 1, 2012 and must retake it once every three years thereafter.

## **Students**

### **Reporting of Child Abuse/Neglect or Sexual Assault**

**i. Training** (continued)

The School Principal shall annually certify to the Superintendent that each school employee working at his/her school has completed the required initial training and the refresher training.

**j. Foster Care**

Upon request of the Board of Education, the Department of Children and Families shall provide the name, date of birth and school of origin for each child in the custody of the Department of Children and Families who has been placed in foster care and is attending a District school.

### **Confidential Rapid Response Team**

The District will establish, not later than January 1, 2016, a confidential rapid response team to coordinate with DCF to (1) ensure prompt reporting of suspected child abuse or neglect; or 1st, 2nd, 3rd, or 4th degree sexual assault; 1st degree aggravated sexual assault; or 3rd degree sexual assault with a firearm of a student not enrolled in adult education by a school employee; and (2) provide immediate access to information and individuals relevant to DCF's investigation of such cases.

The confidential rapid response team consists of a local teacher, the Superintendent, a local police officer, and any other person the Board of Education deems appropriate.

DCF, along with a multidisciplinary team, is required to take immediate action to investigate and address each report of child abuse, neglect or sexual abuse in any school.

### **Hiring Prohibitions**

The Board of Education will not employ anyone who was terminated or resigned after a suspension based on DCF's investigation, if he or she has been convicted of (1) child abuse or neglect; or (2) 1st, 2nd, 3rd, or 4th degree sexual assault; 1st degree aggravated sexual assault; or 3rd degree sexual assault with a firearm of a student who is not enrolled in adult education.

The Board of Education will not employ an individual who was terminated or resigned, if he or she (1) failed to report the suspicion of such crimes when required to do so; or (2) intentionally and unreasonably interfered with or prevented a mandated reporter from carrying out this obligation or conspired or attempted to do so. This applies regardless of whether an allegation of abuse, neglect, or sexual assault has been substantiated.

## **Students**

### **Reporting of Child Abuse/Neglect or Sexual Assault (continued)**

#### **Posting of DCF's "Careline"**

The Board of Education will post the telephone number of the Department of Children and Families' child abuse hotline, Careline, and the Internet web address that provides information about the Careline in each District school in a conspicuous location frequented by students. Such posting shall be in various languages most appropriate for the students enrolled in the school.

(cf. 4112.5/4212.6 – Personnel Records)

(cf. 5145.511 – Sexual Abuse Prevention and Education Program)

Legal Reference: Connecticut General Statutes

10-220a Inservice training. Professional development committees. Institutes for educators. Cooperating teacher program, regulations (as amended by PA 11-93)

10-221d Criminal history records check of school personnel. Fingerprinting. Termination or dismissal (as amended by PA 11-93)

10-221s Investigations of child abuse and neglect. Disciplinary action. (as amended by PA 16-188)

17a-28 Definitions. Confidentiality of and access to records; exceptions. Procedure for aggrieved persons. Regulations (as amended by PA 11-93 and PA 14-186)

17a-101 Protection of children from abuse. Reports required of certain professional persons. When child may be removed from surroundings without court order. (as amended by PA 96-246, PA 00-220, PA 02-106, PA 03-168, PA 09-242, PA 11-93, PA 15-205, PA 18-15 and PA 18-17)

17a-101a Report of abuse or neglect by mandated reporters. (as amended by PA 02-106, PA 11-93, and PA 15-205)

17a-101i Abuse of child by school employee or staff member of public or private institution or facility providing care for children. Suspension. Notification of state's attorney re: conviction. Boards of education to adopt written policy re: reporting of child abuse by school employee.

17a-102 Report of danger of abuse. (as amended by PA 02-106)

17a-106 Cooperation in relation to prevention, identification and treatment of child abuse/neglect.

10-151 Teacher Tenure Act

## **Students**

### **Reporting of Child Abuse/Neglect or Sexual Assault**

Legal Reference: Connecticut General Statutes (continued)

PA 11-93 An Act Concerning the Response of School Districts and the Departments of Education and Children and Families to Reports of Child Abuse and Neglect and the Identification of Foster Children in a School District

PA 14-186 An Act Concerning the Department of Children and Families and the Protection of Children

PA 15-112 An Act Concerning Unsubstantiated Allegations of Abuse and Neglect by School Employees

PA 15-205 An Act Protecting School Children

Regulation approved:

## **Students**

### **Dealing With The Effect Of A Death**

#### **Guidelines**

##### **Introduction**

A death in the school community has an impact on everyone. Since death is a part of life, educators are in a unique position to help students learn to cope with death in a healthy way.

The initial reaction to a death is often shock, particularly when the death is sudden or violent. Current literature and professional thinking emphasize 1) the need for an established plan and 2) a team approach for dealing with a school related death. These practices relieve any one person from having to take a total responsibility for handling a traumatic situation. Having a plan and a crisis team in place allows administrators and school staff to react more quickly and to deal more effectively with the impact of a death.

The primary goals of a successful plan are to:

- facilitate communication
- encourage the healthy expression of feelings
- provide outreach and support to those in special need
- identify students at risk
- help all students and staff deal with the reality of death in a positive way

The procedure outlined in this guide should serve as a base from which to work as each school develops an action plan that meets its specific needs. A plan should be flexible enough so that it can take into account the differences in each situation. Every school should have a crisis team in place which will then be activated whenever a crisis occurs.

Although this guide was developed to deal with a school related death, it can be adapted or applied to other traumas.

##### **School Based Crisis Team**

The school based Crisis Teams are flexible in structure. The Principal will chair each school based team, although another staff member may serve as the Chairman at the request of the Principal. ~~Permanent team members will review the procedures outlined in this document at least on an annual basis.~~ The school based teams will be likely to have at least one counselor and the school nurse. Certified as well as non-certified staff, parents, students, and community members may join the teams where appropriate. There is no limit as to the number of members on the school based Crisis Team.

## **Students**

### **Dealing With The Effect Of A Death**

#### **Staff-Wide Role**

Although the Crisis Team and School Principal often play the most direct part in dealing with a school death, all other staff members have their roles, too. These include serving as a sounding board for student feelings and information, receiving and communicating helpful knowledge about student welfare, and acting as a role model for students. Staff members should stay alert over a period of time to the effect of a death, serious injury, or suicide attempt on students with whom they come in contact. The on-going role of the total staff is to help the school as a whole cope with the crisis situation.

Legal References:     Connecticut General Statutes  
                              10-221(e) Boards of education to prescribe rules.

Policy adopted:





## Students

### Dealing With The Effect Of A Death

#### Response Timeline for Student Death

*Immediately upon notification of death:*

- Talk to family about the information that they would like to be shared
- Notify the Superintendent
- Notify other principals in the district (encourage them to get their buildings' support staff ready)
- Notify the school's PPS support staff
- Notify the school's staff/faculty

<u>Domain</u>	<u>Action/Considerations</u>	<u>Details</u>
<u>Family</u>	Respect the family's wishes first	<ul style="list-style-type: none"> <li>• Ask family about what they would like you to tell staff, students</li> <li>• Make sure family is aware of and alright with your decisions, next steps</li> </ul>
	Initial message to family	<ul style="list-style-type: none"> <li>• From administrators on behalf of the faculty</li> </ul>
	Religious services	<ul style="list-style-type: none"> <li>• Find out if there are any prayer/religious services scheduled in the community</li> </ul>
	Visit to the home from administrators and student's teacher	<ul style="list-style-type: none"> <li>• Let family know of your desire of visit them when the time is right</li> <li>• Ask them about their availability and wishes for this</li> </ul>
<u>Next school day after the death</u>	Desk and personal belongings	<ul style="list-style-type: none"> <li>• Leave in place</li> </ul>
	Prepare for the return of student's siblings	
	Prepare a support plan for student's classroom and teacher	<ul style="list-style-type: none"> <li>• Secure substitute coverage for teacher</li> </ul>
	Prepare a support plan for student's siblings' classrooms and teachers	
<u>Funeral/Wake</u>	Get details of wake and funeral from family	<ul style="list-style-type: none"> <li>• Ask family how they would like the details to be communicated, and to whom</li> <li>• Notify appropriate staff members of details</li> </ul>
	Coverage for staff	<ul style="list-style-type: none"> <li>• Find out who would like to attend the services and get staff sub coverage</li> </ul>

**Students**

**Dealing With The Effect Of A Death**

**Response Timeline for Student Death (continued)**

<u>Domain</u>	<u>Action/Considerations</u>	<u>Details</u>
<u>Community</u>	Inform other schools in the district; other staff and families as appropriate	
	Prepare for media inquires	<ul style="list-style-type: none"> <li>From administrators on behalf of the faculty</li> </ul>
	Email to parents	<ul style="list-style-type: none"> <li>Include information on loss and grief, what is developmentally appropriate for their children</li> <li>Notify parents of how the school will proceed in the coming school days, plan</li> <li>Give parents contact information of PPS support staff</li> <li>Create a list of parents/students that need to be told individually, before the general community email is sent.</li> </ul>
	Outside activities the student was involved with) how will their death impact the great community)?	<ul style="list-style-type: none"> <li>Did the family attend religious services somewhere?</li> <li>Was the student involved in any sports?</li> <li>Was the student involved in any clubs (e.g. Cub Scouts, 4-H, etc)?</li> </ul>
<u>Bus</u>	Notify the bus company of student's death	
<u>Student Support</u>	Comfort dogs	<ul style="list-style-type: none"> <li>As needed</li> </ul>
	Extra support staff	<ul style="list-style-type: none"> <li>Limit the number of unfamiliar faces in the school building</li> </ul>
	Create plan for days after death	<ul style="list-style-type: none"> <li>Notify the parents of every student who requires small group/individual support</li> <li>Assign PPS staff to every classroom/grade level</li> <li>Get extra PPS staff from the other buildings in the district, if necessary</li> <li>Locate rooms where small group support can occur with PPS staff</li> </ul>
	Student support plan	<ul style="list-style-type: none"> <li>Tiered level of approach</li> <li>Tier 1: Classroom discussion (developmental appropriate); class room activity, depending on the</li> </ul>
		<ul style="list-style-type: none"> <li>closeness of the class to the student; create script for how the teacher will open the discussion/ what to say to the students</li> <li>Tier 2: small group activity in another room</li> <li>Tier 3: individual session with PPS staff</li> </ul>
	Create efficient means of communication	<ul style="list-style-type: none"> <li>Group text chain (in school)</li> <li>Get cell phone numbers of team members</li> </ul>

<b><u>PPS Supports</u></b>	Create a script for the teacher to use with the students to explain what happened	
	Create a list of parents/students that need to be told individually before general community email is sent	<ul style="list-style-type: none"> <li>Utilize support staff (within building)</li> </ul>
<b><u>Personal belongings</u></b>	Create a plan (in collaboration with parents) on what to do with students belongings	<ul style="list-style-type: none"> <li>Do not remove belongings soon after the loss</li> <li>After a week, clean out the contents of the desk but leave the desk, cubby, chair, etc. in the classroom</li> <li>Put belongings in a nice box (not a cardboard box) for the family when they are ready to receive it</li> <li>Other items to give to parents: list of books the child checked out from the library, favorite books from the classroom/library, card from the staff/students to the family, pictures students drew for the family, classroom work completed by the student, etc.</li> </ul>
<b><u>Memorialization</u></b>	Create a plan for how to remember the student	<ul style="list-style-type: none"> <li>Ask the student's class/grade if they have any ideas</li> <li>Include the family on the plans</li> </ul>
<b><u>Staff/Faculty Supports</u></b>	Staff meeting	<ul style="list-style-type: none"> <li>Info on grief and loss and developmental differences</li> <li>Information on self-help/self-care for staff support groups of staff</li> <li>Script for teachers on how to talk to classrooms (concrete verbiage)</li> <li>Staff coverage</li> <li>Plan for tiered PPS intervention supports, kids accessing support</li> <li>Conversation about the layers of community's grief</li> <li>Breakfast for staff</li> </ul>
	Generate a list of staff who will be most affected by the loss	<ul style="list-style-type: none"> <li>Reading interventionist, class room teacher, paraeducator close to student, etc.</li> </ul>
	Substitute coverage	<ul style="list-style-type: none"> <li>Make list of staff members available to cover a classroom teacher, if it is needed (including PPS supports to help emotionally support a room)</li> <li>Give subs walkie-talkies</li> </ul>
	Initial message to staff	<ul style="list-style-type: none"> <li>Find out from family the details that they would like shared with the staff</li> <li>Include info about the student's status/death</li> <li>Notify them of staff meeting</li> </ul>
	Student's teacher (and teachers of siblings)	<ul style="list-style-type: none"> <li>Provide extra adult support in the room to assist them</li> </ul>

## **Students**

### **Dealing With The Effect Of A Death**

#### **Grief and Children**

##### **Ages 5-9:**

Children between the ages of 5-9 begin to understand that death is permanent, although they do not always believe it is something that can happen to them. Children in this age group with a medical condition may be more likely to internalize that death can happen to them.

##### **Ages 9-11:**

Children between the ages 9-11 begin to understand that life is fragile and death can happen to them. Kids this age may be more interested in the details of things like cause of death, and the biological aspects of the causes of death.

#### **School age children may show the following behaviors when learning about death:**

- Crying or sobbing
- Anxiety
- Headaches
- Abdominal pain
- Denial of death
- Hostile reaction toward deceased person
- Guilt

#### **Adults can be help by:**

- Providing age appropriate information when questions are asked
- Physically and verbally comforting students as appropriate – acknowledge their pain
- Admitting that adults do not always know why certain things happen
- Linking children and adolescents to counseling services as needed

#### **Teens/Older Adolescents**

Older adolescents/teens may have a much greater understanding of death than younger children. Therefore, they may exhibit visible signs of stress and depression when they are faced with loss, whether that is the loss of a family member, close friends, or other peer. Behaviors following loss may be characterized by:

- Social isolation
- Discomfort talking about the loss with another adult or outside counselor
- Reliance on the internet of social media to “find answers” or seek comfort
- Behavioral changes (acting out), substance abuse, or eating disorders
- Strong emotions, such as sadness, anger, worry, or guilt
- Physical reactions, such as having stomach aches or not sleeping

Regulation adopted:



## **Students**

### **Student Sports – Concussions**

The Board of Education recognizes that concussions and head injuries are commonly reported injuries in children and adolescents who participate in sports and other recreational activities. The Board acknowledges the risk of catastrophic injuries or deaths are significant when a concussion or head injury is not properly evaluated and managed.

Commencing July 1, 2010, and each school year thereafter, any coach of intramural or interscholastic athletics employed by the District shall complete an initial training course, approved by the State Board of Education, regarding concussions which are a type of brain injury prior to commencing the coaching assignment for the season. Such training course shall include, but not be limited to (1) the recognition of the signs and symptoms of a concussion; (2) the means of obtaining proper medical treatment for a person suspected of having a concussion; (3) the nature and risk of concussions, including the danger of continuing to engage in athletic activity after sustaining a concussion; and (4) the proper method of allowing a student athlete who has sustained a concussion to return to athletic activity.

Each school year any coach who has completed the initial training course regarding concussions shall annually review current and relevant information, developed or approved by the State Board of Education, regarding concussions prior to the start of the coaching assignment. This annual review is not required in any year the coach is required to complete a refresher course. Beginning July 1, 2015, and each school year thereafter, a coach must complete an approved refresher course not later than five years after the initial training course in order to maintain his/her coaching permit and to coach in the District.

Annually the District will distribute a head injury and concussion information sheet to all parents/guardians of student participants in competitive sport activities. The parent/guardian and student must return a signed acknowledgement indicating that they have reviewed and understand the information provided before the student participates in any covered activity. This acknowledgement form must be returned and be on file with the District in order for the student to be allowed to practice or compete in the sports activity.

All coaches will complete training pertaining to the District's procedures.

The required refresher course regarding concussions shall include, but not be limited to, an overview of key recognition and safety practices, an update of medical developments, current best practices in the field of concussion research, and prevention and treatment. Said refresher course shall also contain an update on new relevant federal, state and local laws and regulations, and for football coaches, current best practices regarding coaching the sport of football, including, but not limited to, frequency of games and full contact practices and scrimmages as identified by the governing authority for intramural and interscholastic athletics (CIAC).

## Students

### Student Sports – Concussions (continued)

The District, after January 1, 2015, shall implement the “*Concussion Education Plan and Guidelines for Connecticut Schools*,” developed by the State Board of Education per the stipulations of P.A. 14-66. Written materials, online training or videos, or in person training shall address, at a minimum, the recognition of signs or symptoms of concussion, means of obtaining proper medical treatment for a person suspected of sustaining a concussion, the nature and risks of concussions, including the danger of continuing to engage in athletic activity after sustaining a concussion, proper procedures for return to athletic activity and current best practices in the prevention and treatment of a concussion.

~~The Board recognizes that commencing July 1, 2015, the CIAC prohibits student athletes from participation in any intramural or interscholastic activity unless the student athlete and his/her parent/guardian completes the concussion education plan of the State Board of Education and its contributing organizations to such plan. Prior to participating in any intramural or interscholastic athletic activity students must (1) read written materials, (2) view online training videos, or (3) attend in person training regarding the District’s concussion education plan provided by the Board of Education.~~

~~Prior to participating in any intramural or interscholastic athletic activity for the school year beginning July 1, 2015 and thereafter, a parent/guardian of each student athlete must (1) read written materials, (2) view online training videos, or (3) attend in person training regarding the District’s concussion education plan.~~

<p><del><b>Note:</b> CIAC recommends that, whenever possible, in person training is utilized at the required pre-season meeting for parents/guardians and athletes. Schools may use any or all of the delivery methods mentioned above to develop a plan that best fits the district’s demographics.</del></p>
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The District, commencing July 1, 2015, will utilize the consent form developed or approved by the State Board of Education with parent/guardians of student athletes in intramural or interscholastic activities regarding concussions. This form shall provide a summary of the concussion education plan developed or approved by the State Board of Education and a summary of the Board’s policy regarding concussions. The consent form shall be returned to the appropriate school authorities, signed by the parent/guardian, attesting to the receipt of such form and authorizing the student athlete to participate in the athletic activity.

## Students

### Student Sports – Concussions (continued)

Further, in compliance with applicable state statutes, the coach of any intramural or interscholastic athletics shall immediately remove any student athlete participating in intramural or interscholastic athletics who (1) is observed to exhibit signs, symptoms or behaviors consistent with a concussion following an observed or suspected blow to the head or body during a practice, game or competition, (2) is diagnosed with a concussion, or (3) is otherwise suspected of having sustained a concussion because such student athlete is observed to exhibit signs, symptoms or behaviors consistent with a concussion regardless of when such concussion or head injury may have occurred. Upon such removal, the coach or other qualified school employee defined in Connecticut General Statutes 10-212a, shall notify the student athlete's parent/guardian that the student athlete has exhibited such signs, symptoms, or behaviors consistent with a concussion or has been diagnosed with a concussion. Such notification shall be provided not later than twenty-four hours after such removal. However, a reasonable effort shall be made to provide such notification immediately after such removal.

The coach shall not permit such student athlete to participate in any supervised athletic activities involving physical exertion, including, but not limited to, practices, games or competitions, until such student athlete receives written clearance to participate in such supervised athletic activities involving physical exertion from a licensed health care professional<sup>\*</sup> trained in the evaluation and management of concussions.

Following medical clearance, the coach shall not permit such student athlete to participate in any full, unrestricted supervised athletic activities without limitations on contact or physical exertion, including, but not limited to, practices, games or competitions and such student athlete (1) no longer exhibits signs, symptoms or behaviors consistent with a concussion at rest or with exertion, and (2) receives written clearance to participate in such full, unrestricted supervised athletic activities from a licensed health care professional trained in the evaluation and management of concussions.

**\*“licensed health care professional” means a physician licensed pursuant to Chapter 370 of the General Statutes, a physician assistant licensed pursuant to Chapter 370 of the General Statutes, an advanced practice registered nurse licensed pursuant to Chapter 378 of the General Statutes or an athletic trainer licensed pursuant to Chapter 375a of the General Statutes.**

~~The Board, as required, for the school year beginning July 1, 2014 and annually thereafter, will collect and report to the State Board of Education all occurrences of concussion. The report shall contain, if known, the nature and extent of the concussion and the circumstances in which it was sustained.~~



## Students

### Student Sports – Concussions (continued)

*Optional language:*

The Board believes that at the forefront of concussion management is the implementation of baseline testing, through the implementation of the ImPACT (Immediate Post-concussion Assessment and Cognitive Testing) Program.\* Subject to the availability of financial resources, District athletes will receive “baseline” testing prior to the start of the sports season and should be done for individual athletes at least every other year.

*\*ImPACT is a 20 minute computerized concussion evaluation system that has been scientifically validated and has become a standard tool used in comprehensive clinical management of concussions for athletes of all ages. Information is available at <http://www.impacttest.com/>. This computerized neurocognitive testing program is available online.*

Legal Reference: Connecticut General Statutes

PA 10-62 An Act Concerning Student Athletes and Concussions

P.A. 14-66 An Act Concerning Youth Athletics and Concussions

“Concussion Education Plan and Guidelines for Connecticut Schools”  
adopted by the State Board of Education, January 7, 2015.

Policy adopted:

## Students

### Student Sports – Concussions

#### Concussion Management in Student Sports

##### A. Return to Play after Concussions

1. A student athlete who has been removed from play may not participate in any supervised team activities involving physical exertion, including, but not limited to practices, games, or competitions, sooner than twenty-four hours\* after such athlete was removed from play until the athlete is evaluated by a licensed health care provider trained in the evaluation and management of concussions and receives a written clearance to return to play from that health care provider. [or: Any athlete removed from play because of a concussion must have written medical clearance from an appropriate health care professional before he/she can resume practice or competition and not until the student athlete and his/her parent/guardian completes the State Board of Education concussion education plan.] (Refer to Appendix E: “The Proper Procedures for Allowing a Student Athlete Who Has Sustained a Concussion to Return to Athletic Activity.”)

*Note: CIAC requirements indicate that no athlete shall return to participation on the same day of concussion.*

*\*P.A. 10-62 does not require a 24 hour waiting period before an athlete may return to participate in team activities. However, the law does require written clearance from a licensed health care professional.*

2. After medical clearance, the return to play by the athlete should follow a step-wise protocol with provisions for delayed return to play based on return of any signs or symptoms.
3. The medical clearance return to play protocol is as follows:
  - a. No exertional activity until asymptomatic.
  - b. When the athlete appears clear, begin low-impact activity such as walking, stationary bike, etc.
  - c. Initiate aerobic activity fundamental to the specific sport such as skating, or running and may also begin progressive strength training activities.
  - d. Begin non-contact skill drills specific to sport such as dribbling, fielding, batting, etc.
  - e. Full contact in practice setting.
  - f. If athlete remains asymptomatic, he/she may return to game/play
4. Once all academic requirements are made up and/or there is a plan in place to complete all academic assignments, the student/athlete may return to his or her athletic team.

Regulation approved:



**HEADS UP: CONCUSSION IN YOUTH SPORTS**  
**A Fact Sheet for COACHES**

To download the coaches fact sheet in Spanish, please visit:  
<http://www.cdc.gov/concussion/HeadsUp/youth.html>

**THE FACTS**

- A concussion is a **brain injury**.
- All concussions are **serious**.
- Concussions can occur **without** loss of consciousness.
- Concussions can occur **in any sport**.
- Recognition and proper management of concussions when they **first occur** can help prevent further injury or even death.

**WHAT IS A CONCUSSION?**

A concussion is an injury that changes how the cells in the brain normally work. A concussion is caused by a blow to the head or body that causes the brain to move rapidly inside the skull. Even a ding, getting your bell rung, or what seems to be a mild bump or blow to the head can be serious. Concussions can also result from a fall or from players colliding with each other or with obstacles, such as a goalpost.

The potential for concussions is greatest in athletic environments where collisions are common.<sup>1</sup> Concussions can occur, however, in **any** organized or unorganized sport or recreational activity. As many as 3.8 million sports- and recreation-related concussions occur in the United States each year.<sup>2</sup>

**RECOGNIZING A POSSIBLE CONCUSSION**

To help recognize a concussion, you should watch for the following two things among your athletes:

1. A forceful blow to the head or body that results in rapid movement of the head.
- and-
2. Any change in the athlete's behavior, thinking, or physical functioning. (See the signs and symptoms of concussion.)

## SIGNS AND SYMPTOMS

<b>SIGNS OBSERVED BY COACHING STAFF</b>
---

- |  |
|--|
| <ul style="list-style-type: none"><li>▪ Appears dazed or stunned</li><li>▪ Is confused about assignment or position</li><li>▪ Forgets sports plays</li><li>▪ Is unsure of game, score, or opponent</li><li>▪ Moves clumsily</li><li>▪ Answers questions slowly</li><li>▪ Loses consciousness (even briefly)</li><li>▪ Shows behavior or personality changes</li><li>▪ Can't recall events prior to hit or fall</li><li>▪ Can't recall events after hit or fall</li></ul> |
|--|

<b>SYMPTOMS REPORTED BY ATHLETE</b>
-------------------------------------

- |   |
|---|
| <ul style="list-style-type: none"><li>▪ Headache or pressure in head</li><li>▪ Nausea or vomiting</li><li>▪ Balance problems or dizziness</li><li>▪ Double or blurry vision</li><li>▪ Sensitivity to light</li><li>▪ Sensitivity to noise</li><li>▪ Feeling sluggish, hazy, foggy, or groggy</li><li>▪ Concentration or memory problems</li><li>▪ Confusion</li><li>▪ Does not feel right</li></ul> |
|---|

*Adapted from Lovell et al. 2004*

Athletes who experience any of these signs or symptoms after a bump or blow to the head should be kept from play until given permission to return to play by a health care professional with experience in evaluating for concussion. Signs and symptoms of concussion can last from several minutes to days, weeks, months, or even longer in some cases.

Remember, you can't see a concussion and some athletes may not experience and/or report symptoms until hours or days after the injury. If you have any suspicion that your athlete has a concussion, you should keep the athlete out of the game or practice.

## PREVENTION AND PREPARATION

As a coach, you can play a key role in preventing concussions and responding to them properly when they occur. Here are some steps you can take to ensure the best outcome for your athletes and the team:

- **Educate athletes and parents about concussion.** Talk with athletes and their parents about the dangers and potential long-term consequences of concussion. For more information on long-term effects of concussion, view the following online video clip: [http://www.cdc.gov/ncipc/tbi/Coaches\\_Tool\\_Kit.htm#Video](http://www.cdc.gov/ncipc/tbi/Coaches_Tool_Kit.htm#Video). Explain your concerns about concussion and your expectations of safe play to athletes, parents, and assistant coaches. Pass out the concussion fact sheets for athletes and for parents at the beginning of the season and again if a concussion occurs.
- **Insist that safety comes first.**
  - Teach athletes safe playing techniques and encourage them to follow the rules of play.
  - Encourage athletes to practice good sportsmanship at all times.
  - Make sure athletes wear the right protective equipment for their activity (such as helmets, padding, shin guards, and eye and mouth guards). Protective equipment should fit properly, be well maintained, and be worn consistently and correctly.
  - Review the athlete fact sheet with your team to help them recognize the signs and symptoms of a concussion.

Check with your youth sports league or administrator about concussion policies. Concussion policy statements can be developed to include the leagues commitment to safety, a brief description of concussion, and information on when athletes can safely return to play following a concussion (i.e., an athlete with known or suspected concussion should be kept from play until evaluated and given permission to return by a health care professional). Parents and athletes should sign the concussion policy statement at the beginning of the sports season.

- **Teach athletes and parents that it's not smart to play with a concussion.** Sometimes players and parents wrongly believe that it shows strength and courage to play injured. Discourage others from pressuring injured athletes to play. Don't let athletes persuade you that they're just fine after they have sustained any bump or blow to the head. Ask if players have ever had a concussion.
- **Prevent long-term problems.** A repeat concussion that occurs before the brain recovers from the first usually within a short period of time (hours, days, or weeks) can slow recovery or increase the likelihood of having long-term problems. In rare cases, repeat concussions can result in brain swelling, permanent brain damage, and even death. This more serious condition is called *second impact syndrome*.<sup>4,5</sup> Keep athletes with known or suspected concussion from play until they have been evaluated and given permission to return to play by a health care professional with experience in evaluating for concussion. Remind your athletes: It's better to miss one game than the whole season.

## ACTION PLAN

### WHAT SHOULD A COACH DO WHEN A CONCUSSION IS SUSPECTED?

1. **Remove the athlete from play.** Look for the signs and symptoms of a concussion if your athlete has experienced a bump or blow to the head. Athletes who experience signs or symptoms of concussion should not be allowed to return to play. When in doubt, keep the athlete out of play.
2. **Ensure that the athlete is evaluated right away by an appropriate health care professional.** Do not try to judge the severity of the injury yourself. Health care professionals have a number of methods that they can use to assess the severity of concussions. As a coach, recording the following information can help health care professionals in assessing the athlete after the injury:
  - Cause of the injury and force of the hit or blow to the head
  - Any loss of consciousness (passed out/knocked out) and if so, for how long
  - Any memory loss immediately following the injury
  - Any seizures immediately following the injury
  - Number of previous concussions (if any)
3. **Inform the athlete's parents or guardians about the possible concussion and give them the fact sheet on concussion.** Make sure they know that the athlete should be seen by a health care professional experienced in evaluating for concussion.
4. **Allow the athlete to return to play only with permission from a health care professional with experience in evaluating for concussion.** A repeat concussion that occurs before the brain recovers from the first can slow recovery or increase the likelihood of having long-term problems. Prevent common long-term problems and the rare second impact syndrome by delaying the athletes return to the activity until the player receives appropriate medical evaluation and approval for return to play.

*If you think your athlete has sustained a concussion take him/her out of play, and seek the advice of a health care professional experienced in evaluating for concussion.*

For more information and to order additional materials **free-of-charge**, visit:  
<http://www.cdc.gov/concussion/HeadsUp/youth.html>

For more detailed information on concussion and traumatic brain injury, visit:  
<http://www.cdc.gov/ncipc/tbi/TBI.htm>

**REFERENCES**

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES CENTERS FOR DISEASE CONTROL AND PREVENTION

Content Source: National Center for Injury Prevention and Control, Division of Injury Response

Page Located on the Web at <http://www.cdc.gov/concussion/index.html>



## **Fact Sheet for Student Athletes**

### **What is a concussion?**

A concussion is a brain injury that:

- Is caused by a bump, blow, or jolt to the head.
- Can change the way your brain normally works.
- Can range from mild to severe.
- Can occur during practices or games in any sport.
- Can happen even if you haven't been knocked out.
- Can be serious even if you've just been "dinged" or had your "bell rung."

### **How can I prevent a concussion?**

It's different for every sport. But there are steps you can take to protect yourself from concussion.

- Follow your coach's rules for safety and the rules of the sport.
- Practice good sportsmanship at all times.
- Use the proper sports equipment, including personal protective equipment (such as helmets)
- In order for equipment to protect you, it must be:
  - Appropriate for the game, position, and activity
  - Well maintained
  - Properly fitted
  - Used every time you play

### **How do I know if I've had a concussion?**

You can't see a concussion, but you might notice some of the symptoms right away. Other symptoms can show up days or weeks after the injury. It's best to see a health care professional if you think you might have a concussion. An undiagnosed concussion can affect your ability to do schoolwork and other everyday activities. It also raises your risk for additional serious injury.

### **What are the symptoms of a concussion?**

- Nausea (feeling that you might vomit)
- Balance problems or dizziness
- Double or fuzzy vision
- Sensitivity to light or noise
- Headache
- Feeling sluggish
- Feeling foggy or groggy
- Concentration or memory problems (forgetting game plays)
- Confusion

### **What should I do if I think I have a concussion?**

- **Tell your coaches and your parents.** Never ignore a bump, blow, or jolt to the head. Also tell your coach if one of your teammates might have a concussion.
- **Get a medical checkup.** A health care professional can tell you if you have had a concussion and when you are OK to return to play.
- **Give yourself time to recover.** If you have had a concussion, your brain needs time to heal. While your brain is still healing, you are much more likely to suffer another concussion.

**Connecticut State Department of Education (CSDE)  
and the  
Connecticut Interscholastic Athletic Conference (CIAC)  
Concussion and Head Injury  
Annual Review 2015-16  
Required for all School Coaches in Connecticut**

**5141.7  
Appendix C**

This document was developed to provide coaches with an annual review of current and relevant information regarding concussions and head injuries. In addition to reviewing this form, the annual review must include one of the following prescribed resources: Connecticut Concussion Task Force video, Centers for Disease Control and Prevention (CDC) Heads Up: Concussion in Youth Sports training course, or the National Federation of State High School Associations (NFHS) concussion training course. Links to these resources can be found at: <http://concussioncentral.ciacsports.com/>. A new form is required to be read, signed, dated and kept on file by coaches' associated school districts annually to comply with Connecticut General Statutes (C.G.S.) Chapter 163, Section 149b: *Concussions: Training courses for coaches. Education plan. Informed consent form. Development or approval by State Board of Education. Revocation of coaching permit.*

**What is a Concussion?**

**Centers for Disease Control and Prevention (CDC) - "A concussion is a type of traumatic brain injury, or TBI, caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. This sudden movement can cause the brain to bounce around or twist in the skull, stretching and damaging the brain cells and creating chemical changes in the brain." -CDC, Heads Up: Concussion. [http://www.cdc.gov/headsup/basics/concussion\\_whatIs.html](http://www.cdc.gov/headsup/basics/concussion_whatIs.html)**

***Even a "ding," "getting your bell rung," or what seems to be mild bump or blow to the head can be serious."* -CDC, Heads Up: Concussion Fact Sheet for Coaches [http://www.cdc.gov/headsup/pdfs/custom/headsupconcussion\\_fact\\_sheet\\_coaches.pdf](http://www.cdc.gov/headsup/pdfs/custom/headsupconcussion_fact_sheet_coaches.pdf)**

**Section 1. Concussion Education Plan Summary**

The Concussion Education Plan and Guidelines for Connecticut Schools was approved by the Connecticut State Board of Education in January 2015. Below is an outline of the requirements of the Plan. The complete document is accessible on the CSDE Web site: <http://www.sde.ct.gov/sde/cwp/view.asp?a=2663&q=335572>

State law requires that each local and regional board of education must approve and then implement a concussion education plan by using written materials, online training or videos, or in-person training that addresses, at a minimum, the following:

1. The recognition of signs or symptoms of a concussion.
2. The means of obtaining proper medical treatment for a person suspected of sustaining a concussion.
3. The nature and risks of concussions, including the danger of continuing to engage in athletic activity after sustaining a concussion.
4. The proper procedures for allowing a student-athlete who has sustained a concussion to return to athletic activity.
5. Current best practices in the prevention and treatment of a concussion.

**Section 2. Signs and Symptoms of a Concussion: Overview**

**A concussion should be suspected if any one or more of the following signs or symptoms are present, or if the coach/evaluator is unsure, following an impact or suspected impact as described in the CDC definition above.**

**Signs of a concussion may include (i.e. what the athlete displays/looks like to an observer):**

- Confusion/disorientation/irritability
- Trouble resting/getting comfortable
- Lack of concentration
- Slow response/drowsiness
- Incoherent/slurred speech
- Slow/clumsy movements
- Loss of consciousness
- Amnesia/memory problems
- Acts silly, combative or aggressive
- Repeatedly asks the same questions
- Dazed appearance
- Restless/irritable
- Constant attempts to return to play
- Constant motion
- Disproportionate/inappropriate reactions
- Balance problems

**Symptoms of a concussion may include (i.e. what the athlete reports):**

- Headache or dizziness
- Nausea or vomiting
- Blurred or double vision
- Oversensitivity to sound/light/touch
- Ringing in ears
- Feeling foggy or groggy

State law requires that a coach MUST immediately remove a student-athlete from participating in any intramural or interscholastic athletic activity who: a) is observed to exhibit signs, symptoms or behaviors consistent with a concussion following a suspected blow to the head or body, or b) is diagnosed with a concussion, regardless of when such concussion or head injury may have occurred. Upon removal of the athlete, a qualified school employee must notify the parent or legal guardian within 24 hours that the student-athlete has exhibited signs and symptoms of a concussion.

**Section 3. Return to Play (RTP) Protocol Overview**

It is impossible to accurately predict how long an individual's concussion will last. There must be full recovery before a student-athlete is allowed to resume participating in athletic activity. Connecticut law now requires that no athlete may resume participation until she/he has received written medical clearance from a licensed health care professional (physician, physician assistant, advanced practice registered nurse (APRN), athletic trainer) trained in the evaluation and management of concussions.

***Concussion Management Requirements:***

1. No athlete shall return to participation in the athletic activity on the same day of concussion.
2. If there is any loss of consciousness, vomiting or seizures, the athlete MUST be transported immediately to the hospital.
3. Close observation of an athlete MUST continue following a concussion. The athlete should be monitored following the injury to ensure that there is no worsening/escalation of symptoms.
4. Any athlete with signs or symptoms related to a concussion MUST be evaluated by a licensed health care professional (physician, physician assistant, advanced practice registered nurse (APRN), athletic trainer) trained in the evaluation and management of concussions.
5. The athlete MUST obtain an initial written clearance from one of the licensed health care professionals identified above directing her/him into a well-defined RTP stepped protocol similar to the one outlined below. If at any time signs or symptoms return during the RTP progression, the athlete should cease activity.
6. After the RTP protocol has been successfully administered (no longer exhibits any signs or symptoms or behaviors consistent with concussions), final written medical clearance is required by one of the licensed health care professionals identified above for the athlete to fully return to unrestricted participation in practices and competitions.

***Medical Clearance RTP protocol (Recommended one full day between steps)\****

Rehabilitation stage	Functional exercise at each stage of rehabilitation	Objective of each stage
1. No activity	Complete physical and cognitive rest until asymptomatic; School activities may need to be modified	Recovery
2. Light aerobic exercise	Walking, swimming or stationary cycling maintaining intensity at less than 70% of maximal exertion; no resistance training	Increase heart rate
3. Sport-specific exercise No contact	Skating drills in ice hockey, running drills in soccer; no head impact activities	Add movement
4. Non-contact sport drills	Progression to more complex training drills, such as passing drills in football and ice hockey; may start progressive resistance training	Exercise, coordination and cognitive load
5. Full contact sport drills	Following final medical clearance, participate in normal training activities	Restore confidence and assess functional skills by coaching staff
6. Full activity	No restrictions	Return to full athletic participation

\* If at any time signs or symptoms should worsen during the RTP progression, the athlete should stop activity that day. If the athlete's symptoms are gone the next day, she/he may resume the RTP progression at the last step completed in which no symptoms were present. If symptoms return and do not resolve, the athlete should be referred back to her/his medical provider.

**Section 4. Local/Regional Board of Education Policies Regarding Concussions**

***** Attach local or regional board of education concussion policies *****
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I have read and understand this document and have viewed the prescribed resource material. I understand that state law requires me to immediately remove any player suspected of having a concussion and to not allow her/him to return to participation until she/he has received written medical clearance by a licensed health care professional trained in the evaluation and management of concussions.

Coach: \_\_\_\_\_ School: \_\_\_\_\_  
(Print Name)

Coach's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**References:**

1. NFHS. Concussions. 2008 NFHS Sports Medicine Handbook (Third Edition). 2008: 77-82. <http://www.nfhs.org>. [http://journals.lww.com/cisportsmed/Fulltext/2009/05900/Consensus\\_Statement\\_on\\_Concussion\\_in\\_Sport\\_3rd.1.aspx](http://journals.lww.com/cisportsmed/Fulltext/2009/05900/Consensus_Statement_on_Concussion_in_Sport_3rd.1.aspx).
2. CDC. *Heads Up: Concussion in High School Sports*. [http://www.cdc.gov/NCIPC/tbi/Coaches\\_Tool\\_Kit.htm](http://www.cdc.gov/NCIPC/tbi/Coaches_Tool_Kit.htm).
3. CIAC Concussion Central - <http://concussioncentral.ciacsports.com/>

**Resources:**

- CDC. *Injury Prevention & Control: Traumatic Brain Injury*. Retrieved on June 1, 2015. <http://www.cdc.gov/TraumaticBrainInjury/Index.html>
- CDC. *Heads Up: Concussion in High School Sports Guide for Coaches*. Retrieved on June 1, 2015. <http://www.cdc.gov/headsup/highschoolsports/coach.html>
- CDC. *Heads Up: Concussion materials, fact sheets and online courses*. Retrieved on June 6, 2015. <http://www.cdc.gov/headsup/>

## Concussion Symptoms

*Common symptoms in concussions are generally divided into physical/somatic, cognitive/thinking/remembering, sleep and emotional/mood disruption categories.*

### 1. **Physical**

- Headache
- Nausea
- Vomiting
- Imbalance
- Slowed reaction time
- Dizziness
- Sensitivity to light
- Sensitivity to sound
- Fuzzy or blurred vision

### 2. **Sleep**

- Sleeping more or less than usual
- Drowsiness
- Trouble falling asleep
- Trouble maintaining sleep

### 3. **Cognitive (Thinking/Remembering)**

- Difficulty thinking or concentrating
- Difficulty remembering
- Confusion
- Feeling mentally foggy
- Feeling slowed down
- Decreased attention
- Decreased retention
- Distractibility
- Amnesia

### 4. **Mood Disruption**

- More emotional
- Irritable
- Sad
- Nervous
- Depressed

Source: Adapted from Pardini et al 2004.

**Concussion Symptoms** (continued)

Athletes who experience any of the signs and symptoms listed below after a bump, blow, or jolt to the head or body should be kept out of play the day of the injury and until a health care professional, experienced in evaluating concussions, provides written clearance that they are symptom-free and can return to play. It is important to note that some athletes may not experience and/or report symptoms until hours or days after the injury. Most people with a concussion will recover quickly and fully. For some people, however, signs and symptoms of concussion can last for days, weeks, or longer.

**Potential Signs Observed by Coaches, Athletic Trainers, Parents or Others:**

- Appears dazed or stunned
- Is confused about assignment or position
- Forgets an instruction
- Is unsure of game, score, or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even briefly)
- Shows mood, behavior, or personality changes
- Can't recall events prior to hit or fall
- Can't recall events after hit or fall

**Potential Symptoms Reported by Athlete:**

- Headache or "pressure" in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light
- Sensitivity to noise
- Feeling sluggish, hazy, foggy, or groggy
- Concentration or memory problems
- Confusion
- Does not "feel right" or is "feeling down"

Source: CDC, How Can I Recognize a Possible Concussion?

Athletes who experience any of the signs and symptoms listed above after a bump, blow, or jolt to the head or body should be kept out of play the day of the injury and until a health care professional, experienced in evaluating concussions, provides written clearance that they are symptom-free and can return to play. It is important to note that some athletes may not experience and/or report symptoms until hours or days after the injury. Most people with a concussion will recover quickly and fully. For some people, however, signs and symptoms of concussion can last for days, weeks, or longer.

## The Proper Procedures for Allowing a Student Athlete Who Has Sustained a Concussion to Return to Athletic Activity

When managing an athlete with a concussion, the management plan should cover both returning to school and to play, and should:

- include monitoring both physical and cognitive activities;
- consider concussion history; and
- be individualized to the athlete.

An athlete should be referred for follow-up care from a health care professional who can help him or her gradually return to school and to play when fully recovered. An athlete who has been diagnosed with a concussion should not return to practice or play the same day. In addition, *Public Act No. 14-66, An Act Concerning Youth Athletics and Concussions* requires that:

...coaches shall not permit such student athlete to participate in any supervised team activities involving physical exertion, including, but not limited to, practices, games or competitions, until such student athlete receives written clearance to participate in such supervised team activities involving physical exertion from a licensed health care professional trained in the evaluation and management of concussions. Following clearance, the coach shall not permit such student athlete to participate in any full, unrestricted supervised team activities without limitations on contact or physical exertion, including, but not limited to, practices, games or competitions, until such student athlete no longer exhibits signs, symptoms or behaviors consistent with a concussion at rest or with exertion, and receives written clearance to participate in such full, unrestricted supervised team activities from a licensed health care professional trained in the evaluation and management of concussions.

There are five gradual steps to help safely return an athlete to play, adapted from the International Concussion Consensus Guidelines located at:

[http://www.cdc.gov/concussion/headsup/return\\_to\\_play.html](http://www.cdc.gov/concussion/headsup/return_to_play.html)

### **Suggested Return-to-Play Progression**

**Baseline (Step 0):** As the baseline step of the *Return-to-Play Progression*, the athlete needs to have completed physical and cognitive rest and not be experiencing concussion symptoms for a minimum of 24 hours. Keep in mind, the younger the athlete, the more conservative the treatment. There should be a minimum of 24 hours before progressing to the next step.

#### **Step 1: Light Aerobic Exercise**

**Goal:** only to increase an athlete's heart rate

**Time:** 5 to 10 minutes

**Activities:** exercise bike, walking, or light jogging

No weight lifting or resistance training, jumping, or hard running



**Step 2: Moderate Exercise**

**Goal:** limited body and head movement

**Time:** reduced from typical routine

**Activities:** moderate jogging, brief running, moderate-intensity stationary biking, and moderate-intensity weightlifting and resistance training

No head impact activities

**Step 3: Non-contact Exercise**

**Goal:** more intense, but non-contact movement

**Time:** close to typical routine

**Activities:** running, high-intensity stationary biking, the player's regular weightlifting routine, and non-contact sport-specific drills

This stage may add some cognitive component to practice in addition to the aerobic and movement components introduced in Steps 1 and 2.

**Step 4: Practice**

**Goal:** reintegrate in full contact practice with vigilant observation by the coach and/or athletic trainer

**Step 5: Return to Play**

**Goal:** return to competition

It is important to monitor symptoms and cognitive function carefully during each increase of exertion. Athletes should only progress to the next level of exertion if they are not experiencing symptoms at the current level. If symptoms return at any step an athlete should stop these activities as this may be a sign that the athlete is pushing too hard. Only after additional rest, when the athlete is once again not experiencing symptoms for a minimum of 24 hours, should he or she start again at the step during which symptoms were experienced.

The *Return-to-Play Progression* process is best conducted through a team approach and by a health care professional who knows the athlete's physical abilities and endurance, such as the school's athletic trainer in collaboration with the school nurse. By gauging the athlete's performance on each individual step, a health care professional will be able to determine how far to progress the athlete on a given day. In some cases, the athlete may be able to work through one step in a single day, while in other cases it may take several days to work through an individual step. It may take several weeks to months to work through the entire 5-step progression.

While most athletes will recover quickly and fully following a concussion, some will have symptoms for weeks or longer. Athletes should be referred to a concussion specialist if:

1. Symptoms worsen at any time.
2. Symptoms have not gone away after 10-14 days.
3. The athlete has a history of multiple concussions or risk factors for prolonged recovery. This may include a history of migraines, depression, mood disorders, or anxiety, as well as developmental disorders such as learning disabilities and Attention Deficit Hyperactivity Disorder (CDC, *A "Heads Up" on Managing Return to Play*).

### **School Concussion Management Team**

*(Adapted from the Oregon Concussion Awareness and Management Program)*

School concussion management teams may be formed to create and implement a concussion management plan with sound procedures that support a concussed student. Suggestions for team members are as follows:

#### **Student Athlete**

Empowering students to self-assess symptoms and report may be a challenge. Consider inviting an influential student-athlete to the team. Help create an atmosphere of acceptance for reporting suspected and diagnosed concussions, and encourage athletes to report a fellow athlete's symptoms.

#### **Parent(s)/Guardian(s)**

Invite a parent leader to the team who could be influential with parent organizations that support athletics and gaining parental and community support for district policies.

#### **School Administrator**

Administrator support is needed to change the culture surrounding sports concussions, put systems in place to manage concussions effectively, and provide the programs necessary to return students to full activity (athletics and academics) safely.

#### **School Medical Advisor**

It is important that the school medical advisor is appropriately trained in the current knowledge about concussion.

#### **Licensed Health Care Professional**

Student athletes who are suspected of or have a concussion must receive written clearance from a licensed health care professional trained in the evaluation and management of concussions in order to participate in supervised team activities.

#### **School Nurse**

The school nurse is the lead health and medical school staff who works in conjunction with the athletic trainer (when available), athletic director, coaches, school faculty, counselors, and administrators, as well as the student-athlete's health care provider and family, in order to provide the best healing environment possible. In the case of a concussion, school nurses need to be able to recognize signs and symptoms, be aware of risks associated with recurrent injury, and make recommendations to student-athletes, parents, and school officials on proper care and recovery.

#### **Physical Education Director/Athletic Director (AD)**

The physical education or athletic director's leadership is a crucial component of good concussion management. They can support coach/athlete/parent training, promote a culture of awareness, ensure the teaching of safe techniques and sportsmanship, ensure proper and well maintained equipment, monitor appropriate incident protocols, promote good officiating, and encourage effective tracking of injuries.

**Certified Athletic Trainer (ATC)**

Certified athletic trainers (ATCs) are medical experts in preventing, recognizing, managing and rehabilitating injuries that result from physical activity. The ATC in a school environment works under the direction of a licensed physician, in collaboration with the school nurse and in cooperation with other health care professionals, athletic or physical education directors, coaches and parents.

**Coach**

Coaches play a key role in concussion management. They are responsible for pulling an athlete from competition or practice immediately after suspecting a concussion, Securing buy-in from the coaching staff is crucial to the safety of the athlete and to the success of the return to play protocol. Having a coach serve as the liaison between the school concussion management team and the other coaching staff can help ensure effective communication and understanding.

**Teachers**

Teachers are critical to student success post-concussion. Teachers need to have a strong understanding of the potential cognitive, behavioral, emotional, and physical symptoms of a concussion. A school concussion management team representative from the teaching staff can work with the student's teachers to ensure appropriate classroom accommodations.

**School Counselor**

The school counselor is the ideal lead staff person to inform teachers of needed learning accommodations while the student is symptomatic. They can provide information needed for making decisions about return to activity, can work with the student's teachers to ensure appropriate classroom accommodations, and can refer the student to more formalized supports such as 504 plans or Individualized Education Programs (IEP).

**School Psychologist**

School psychologists can help with assessment and test results interpretation.

## **Suggested Roles and Responsibilities of the School Concussion Management Team and School Personnel**

*(Adapted from the University of the State of New York, State Education Department, Office of Student Support Services Guidelines for Concussion Management in the School Setting [Last updated January 2014])*

### **Student Athlete**

Students should be encouraged to communicate any symptoms promptly to district staff and/or parents/guardians, as a concussion is primarily diagnosed by reported and/or observed signs and symptoms. It is the information provided by students about their signs and symptoms that guide the other members of the team in transitioning them back to activities. The amount and type of feedback reported by the student will be dependent on age and other factors. Therefore it is recommended that students:

- Be educated about the prevention of head injuries.
- Be familiar with signs and symptoms that must be reported to the coach, certified athletic trainer, school nurse, parent/guardian, or other staff.
- Be made aware of the risk of concussion and be encouraged to tell their coach, parent/guardian, certified athletic trainer, school nurse or other staff members about injuries and symptoms they are experiencing.
- Be educated about the risk of severe injury, permanent disability, and even death that can occur with re-injury by resuming normal activities before recovering from a concussion.
- Follow instructions from their private medical/health care provider.
- Be encouraged to ask for help and to inform teachers of difficulties they experience in class and when completing assignments.
- Encourage classmates and teammates to report injuries.
- Promote an environment where reporting signs and symptoms of a concussion is considered acceptable and is encouraged.

### **Parent(s)/Guardian(s)**

When students are diagnosed with a concussion, it is important that the parent/guardian communicates with both the health care professional and the school. Therefore, it is recommended that parents/guardians:

- Be familiar with the signs and symptoms of concussions. This may be accomplished by reading pamphlets, Web based resources, and attending meetings and education sessions prior to their child's involvement in athletic activities.
- Be familiar with the requirement that any students suspected of having a concussion must immediately be removed from athletic activities.
- Be familiar with any concussion policies or protocols implemented by the local or regional board of education.
- Be made aware that concussion symptoms that are not addressed can prolong concussion recovery.

- Provide any forms and written orders from the health care professional to the school nurse and the athletic trainer or coach in a timely manner.

- Monitor their child’s physical and mental health as they transition back to full activity after sustaining a concussion.
- Report concerns to their child’s health care professional and the school as necessary.
- Communicate with the school to assist in transitioning their child back to school after sustaining a concussion.
- Communicate with school staff if their child is experiencing significant fatigue or other symptoms during or at the end of the school day.
- Follow the health care professional’s orders at home regarding return to activities.

### **School Administrator**

School administrators and/or their designees, should ensure that the district’s policies on concussion management are communicated and implemented. Administrators may choose to designate a school concussion management team to oversee that district policies are enforced and protocols are implemented. Therefore, administrators should:

- Review the district’s concussion education plan with all staff.
- Arrange for the mandatory professional development regarding concussion management for staff and/or parents.
- Provide guidance to district staff on district wide policies and protocols for emergency care and transport of students suspected of sustaining a concussion.
- Ensure that plans are developed and implemented to meet the needs of individual students diagnosed with a concussion and consult with the school medical advisor, school nurse, and (if any) a certified athletic trainer.
- Enforce district concussion management policies and protocols.
- Encourage parents/guardians to communicate with the school nurse and teachers if their child is experiencing significant fatigue or other symptoms during or at the end of the school day.
- Invite parent/guardian participation in determining their child’s needs at school.
- Encourage parents/guardians to communicate with the health care professional on the status of their child and their progress with return to school activity.
- Ensure that coaches, athletic directors and athletic trainers inform the school nurse or medical advisor of any student who is suspected of or has been diagnosed with a concussion.

### **School Medical Advisor**

The school medical advisor, who is a physician, plays a very important role in setting policies and procedures related to identifying students who may have sustained a concussion, along with post-concussion management in school. Therefore, the medical advisor should:

- Collaborate with district administration and the school nurse supervisor in developing concussion management policies and protocols.
- Assist district staff by acting as a liaison to the student’s medical provider when necessary.

- Attend 504 and concussion management team meetings when necessary or requested. Clear all students returning to athletic activities. This can be done at the discretion of the medical advisor either by reviewing a private medical provider's clearance, or personally assessing the student.
- Work with the concussion management team to monitor the progress of individual students with protracted recovery, multiple concussions, and atypical recovery.
- Encourage school health personnel (such as school nurses and certified athletic trainers) to collaborate and communicate with each other about all students who are involved in athletic activities and are suspected of having or are diagnosed with a concussion.
- Participate in professional development activities as needed to maintain a current knowledge base.

### **Licensed Health Care Professional**

Licensed health care professionals trained in the evaluation and management of concussions provide orders and guidance that determine when students are able to begin transitioning back to school and activities. Therefore, they should:

- Provide written orders regarding restrictions and monitoring for specific symptoms that the health care professional should be made aware of by family and/or district staff members.
- Provide the district with a written graduated return to activity schedule to follow, or approve use of the district's graduated return to activity schedule, if appropriate.
- Readily communicate with the school nurse, certified athletic trainer, or school medical advisor to clarify orders.
- Provide written clearance for return to full activities (coaches shall not permit such student athlete to participate in any supervised team activities involving physical exertion, including, but not limited to, practices, games or competitions, until such student athlete receives written clearance to participate in such supervised team activities involving physical exertion).

### **School Nurse**

The school nurse (registered nurse) is the primary health care professional in the school environment and is responsible for the coordination of care for all students. He or she communicates with the health care professional, medical director, parent/guardian, and district staff, collects written documentation and orders and assesses students' progress in returning to school activities. Therefore, the school nurse should:

- Assess students who have suffered a significant fall or blow to the head or body for signs and symptoms of a concussion and determine if any signs and symptoms of concussion warrant emergency transport to the nearest hospital emergency room per district policy.
- Refer parents/guardians of students believed to have sustained a concussion to their health care professional for evaluation.
- Provide parents/guardians with oral and/or written instructions (best practice is to provide both) on observing the student for concussive complications that warrant immediate emergency care.

- Use the health care professional's orders when developing an individualized health care plan or an emergency care plan for staff to follow.
- Ensure proper communication (as guided by FERPA and school district policies) to teachers, coaches, athletic trainers, athletic directors and other school staff that a student is suspected of or has sustained a concussion.
- Monitor and assess the student's return to school activities, assessing the student's progress with each step and communicating with the health care professional, school medical advisor, certified athletic trainer, parent/guardian, and appropriate district staff when necessary.
- Collaborate with the concussion management team in creating accommodations if it is determined that a 504 plan is necessary.
- Assist in educating students and staff in concussion management and prevention.

#### **Director of Physical Education and/or Athletic Director (AD)**

The Director of Physical Education provides leadership and supervision for Physical Education (PE) class instruction, intramural activities, and interscholastic athletic competition within a school district's total physical education program. In many districts there may be an athletic director solely in charge of the interscholastic athletic program. The Director of Physical Education and/or the athletic director must be fully informed about district policies regarding concussion management. They should educate physical education teachers, coaches, parents/guardians, and students about such policies. The Director of Physical Education and/or the athletic director often act as the liaison between district staff and coaches. Therefore, the Director of Physical Education and/or athletic director should:

- Ensure that informed consent forms are distributed to and collected from the parents and legal guardians of student athletes involved in intramural or interscholastic athletic activities. Such informed consent form shall include, at a minimum, a summary of the concussion education plan and a summary of the local or regional board of education's policies regarding concussions.
- Inform the school nurse, certified athletic trainer, or medical advisor of any student who is suspected of or has been diagnosed with a concussion.
- Ensure that any student identified as potentially having a concussion is not permitted to participate in any athletic activities until written clearance is received from a licensed health care professional trained in the evaluation and management of concussions.
- Ensure that game officials, coaches, physical education teachers, or parents/guardians are not permitted to determine whether a student with a suspected head injury can continue to play.
- Educate coaches on the school district's policies on concussions and care of injured students during interscholastic athletics, including when to arrange for emergency medical transport.
- Assist in educating students, parents/guardians and staff in concussion management and prevention.
- Enforce district policies on concussions including training requirements for coaches and certified athletic trainers.
- Advocate for a certified athletic trainer to be present during athletic activities.



### **Certified Athletic Trainer (ATC)**

A certified athletic trainer, under the supervision of a qualified physician, can assist the medical advisor and athletic director (or Director of Physical Education) by identifying a student with a potential concussion. The certified athletic trainer can also evaluate the concussed student's progress in return to athletic activities and post-concussion care based on the licensed health care professional's provider orders and/or district protocol. Therefore, in collaboration with the school nurse, certified athletic trainers should:

- Evaluate student athletes who may have suffered a significant fall or blow to the head or body for signs and symptoms of a concussion when present at athletic events.
- Observe for late onset of signs and symptoms of a concussion and refer as appropriate.
- Evaluate the student to determine if any signs and symptoms of concussion warrant emergency transport to the nearest hospital emergency room per district policy.
- Refer parents/guardians of student athletes believed to have sustained a concussion to their health care professional for evaluation.
- Provide parents/guardians with oral and/or written instructions (best practice is to provide both) on observing the student for concussive complications that warrant immediate emergency care.
- Monitor the student's return to school activities, evaluating the student's progress with each step.
- Review the written statement to clear a student for return to activities.
- Assist in educating students, parents/guardians and staff in concussion management and prevention.
- Inform the school nurse or medical advisor of any student who is suspected of or has been diagnosed with a concussion.

### **Coach**

Coaches are typically the only district staff present at all interscholastic athletic practices and competitions. Therefore, it is essential that coaches be well informed regarding possible causes of concussions and to understand the signs and symptoms. Coaches should always put the safety of the student first. Therefore, coaches should:

- Remove any student who has taken a significant blow to head or body, or presents signs and symptoms of a head injury immediately from play. Public Act No. 14-66: An Act Concerning Youth Athletics and Concussions require immediate removal of any student suspected to have sustained a concussion.
- Contact the school nurse or certified athletic trainer for assistance with any student injury.
- Send any student exhibiting signs and symptoms of a more significant concussion to the nearest hospital emergency room via emergency medical services (EMS).
- Inform the parent/guardian of the need for evaluation by their medical/health care provider.
- Provide the parent/guardian with written educational materials on concussions along with the district's concussion management policies.

- Inform the school nurse, certified athletic trainer, athletic director (or physical education director) of the student's potential concussion. This is necessary to ensure that the student does not engage in activities at school that may complicate the student's condition prior to having written clearance by a licensed health care professional.
- Ensure that students diagnosed with a concussion do not participate in any athletic activities until written authorization has been received from the licensed health care professional trained in the evaluation and management of concussions.
- Inform the school nurse or medical advisor of any student who is suspected of or has been diagnosed with a concussion.

### **Teacher/School Counselor/School Psychologist**

Teachers, school counselors, and school psychologists can assist students in their recovery from a concussion by making and coordinating the implementation of accommodations that minimize aggravating symptoms so that the student has sufficient cognitive rest. They should refer to district protocols and licensed health care provider orders in determining academic accommodations. Section 504 plans may need to be considered for some students with severe symptoms requiring an extended timeframe for accommodations. The school professionals should be aware of the processing issues a student with a concussion may experience. A student who has a concussion will sometimes have short-term problems with attention and concentration, speech and language, learning and memory, reasoning, planning, and problem solving. Students transitioning into school after a concussion might need academic accommodations to allow for sufficient cognitive rest. These include, but are not limited to:

- shorter school day;
- rest periods;
- extended time for tests and assignments;
- provision of copies of notes;
- alternative assignments;
- minimizing distractions;
- permitting student to audiotape classes;
- peer note takers;
- providing assignments in writing; and
- refocusing student with verbal and nonverbal cues.

## Current Best Practices in the Prevention and Treatment of a Concussion

### Prevention

There are many ways to reduce the chances of sustaining a concussion during participation in athletic activities. Schools should ensure that during athletic contests and practices, athletes:

- use the correct protective equipment (should be fitted and maintained properly in order to provide the expected protection);
- follow all safety rules and the rules of the sport;
- practice good sportsmanship; and
- do not return to play with a known or suspected concussion until they have been evaluated and given **written permission** by an appropriate health care professional.

### Treatment

Education and recognition are the best tools for improving the care of the athlete with a concussion. Students who have been diagnosed with a concussion require both physical and cognitive rest. Delay in instituting health care provider orders for such rest may prolong recovery from a concussion. The health care provider's orders for avoidance of cognitive and physical activity and graduated return to activity should be followed and monitored both at home and at school. Districts should consult their school medical director if further discussion and/or clarification is needed regarding a private medical provider's orders, or in the absence of a private medical provider's orders. Additionally, children and adolescents are at increased risk of protracted recovery and severe, potentially permanent disability (e.g. early dementia, also known as chronic traumatic encephalopathy), or even death if they sustain another concussion before fully recovering from the first concussion. Therefore, it is imperative that a student is fully recovered before resuming activities that may result in another concussion. Best practice warrants that, whenever there is a question of safety, a health care professional errs on the side of caution and holds the athlete out for a game, the remainder of the season, or even a full year.

### Cognitive Rest

Cognitive rest requires that the student avoid participation in, or exposure to, activities that require concentration or mental stimulation including, but not limited to:

- computers and video games;
- television viewing;
- texting;
- cell phone use;
- reading or writing;
- studying or homework;
- taking a test or completing significant projects;
- loud music; or
- bright lights.

Parents/guardians, teachers, and other school staff should watch for signs of concussion symptoms such as fatigue, irritability, headaches, blurred vision, or dizziness reappearing with any type of mental activity or stimulation. If any of these signs and symptoms occur, the student should cease the activity. Return of symptoms should guide whether the student should participate in an activity. Initially a student with a concussion may only be able to attend school for a few hours per day and/or need rest periods during the day. Students may exhibit increased difficulties with focusing, memory, learning new information, and/or an increase in irritability or impulsivity. (Districts should have policies and procedures in place related to transitioning students back to school and for making accommodations for missed tests and assignments.) An Individual Health Care Plan with academic accommodations is an example of a guideline that may be used. If the student's symptoms last longer than 7 to 14 days, a medical provider should consider referring the student for an evaluation by a neuropsychologist, neurologist, psychiatrist, or other medical specialist in traumatic brain injury.

**Note:** increased cognitive activity, as well as too little cognitive activity, is associated with longer recovery from concussion. Thus, it is desirable to pace a student's academic load below symptom threshold. (Pediatrics 2014; 133:1-6)

Schools are permitted to authorize certain testing accommodations for students who incur an injury within a certain timeframe prior to the test administration. In some situations, a 504 plan may be appropriate for students whose concussion symptoms are significant or whose symptoms last 6 months or longer. Section 504 is part of the Rehabilitation Act of 1973 and is designed to protect the rights of individuals with disabilities in programs and activities that receive federal financial assistance from the U.S. Department of Education. Section 504 requires a school district to provide a "free appropriate public education" (FAPE) to each qualified student with a disability who is in the school district's jurisdiction, regardless of the nature or severity of the disability. Under Section 504, FAPE consists of the provision of regular or special education and related aids and services designed to meet the student's individual educational needs as adequately as the needs of nondisabled students are met.

(More information is available on Section 504 law at:  
<http://www2.ed.gov/about/offices/list/ocr/index.html>

Questions and Answers on Section 504 including information on addressing temporary impairments such as concussions is available at:

<http://www2.ed.gov/about/offices/list/ocr/504faq.html>

### **Physical Rest**

Physical rest includes getting adequate sleep, taking frequent rest periods or naps, and avoiding physical activity that requires exertion. Some activities that should be avoided include, but are not limited to:

- activities that result in contact and collision and are high risk for re-injury;
- high speed and/or intense exercise and/or sports;

- any activity that results in an increased heart rate or increased head pressure (such as straining or strength training).

**5141.7**  
**Appendix H**  
(continued)

Students may experience frustration or stress about having to limit activities or having difficulties keeping up in school. They should be supported and reassured that they will be able to resume activities as soon as it is safe, and that it is important to avoid activities which will delay their recovery. Students should be informed that the concussion will resolve more quickly when they follow their medical provider's orders. Students will need encouragement and support at home and school until symptoms fully resolve (CDC, *Heads Up: Preventing Concussion Heads Up*).

School Name \_\_\_\_\_

**Student and Parent Concussion Informed Consent Form  
2015-16**

This consent form was developed to provide students, parents and legal guardians with current and relevant information regarding concussions and to comply with Connecticut General Statutes (C.G.S.) Chapter 163, Section 149b: *Concussions: Training courses for coaches. Education plan. Informed consent form. Development or approval by State Board of Education. Revocation of coaching permit;* and Section 10-149c: *Student athletes and concussions. Removal from athletic activities. Notification of parent or legal guardian. Revocation of coaching permit.*

**What is a Concussion?**

**National Athletic Trainers Association (NATA)** - *A concussion is a "trauma induced alteration in mental status that may or may not involve loss of consciousness."*

**Centers for Disease Control and Prevention (CDC)** - *"A concussion is a type of traumatic brain injury, or TBI, caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. This sudden movement can cause the brain to bounce around or twist in the skull, stretching and damaging the brain cells and creating chemical changes in the brain."* -CDC, Heads Up: Concussion. [http://www.cdc.gov/headsup/basics/concussion\\_what.html](http://www.cdc.gov/headsup/basics/concussion_what.html)

*Even a "ding," "getting your bell rung," or what seems to be mild bump or blow to the head can be serious."* -CDC, Heads Up: Concussion Fact Sheet for Coaches [http://www.cdc.gov/headsup/pdfs/custom/headsupconcussion\\_fact\\_sheet\\_coaches.pdf](http://www.cdc.gov/headsup/pdfs/custom/headsupconcussion_fact_sheet_coaches.pdf)

**Section 1. Concussion Education Plan Summary**

The Concussion Education Plan and Guidelines for Connecticut Schools was approved by the Connecticut State Board of Education in January 2015. Below is an outline of the requirements of the Plan. The complete document is accessible on the CDE Web site: <http://www.sde.ct.gov/sde/cwp/view.asp?a=2663&q=335572>

State law requires that each local and regional board of education must approve and then implement a concussion education plan by using written materials, online training or videos, or in-person training that addresses, at a minimum, the following:

1. The recognition of signs or symptoms of a concussion.
2. The means of obtaining proper medical treatment for a person suspected of sustaining a concussion.
3. The nature and risks of concussions, including the danger of continuing to engage in athletic activity after sustaining a concussion.
4. The proper procedures for allowing a student-athlete who has sustained a concussion to return to athletic activity.
5. Current best practices in the prevention and treatment of a concussion.

**Section 2. Signs and Symptoms of a Concussion: Overview**

**A concussion should be suspected if any one or more of the following signs or symptoms are present, or if the coach/evaluator is unsure, following an impact or suspected impact as described in the CDC definition above.**

**Signs of a concussion may include (i.e. what the athlete displays/looks like to an observer):**

- Confusion/disorientation/irritability
- Trouble resting/getting comfortable
- Lack of concentration
- Slow response/drowsiness
- Incoherent/slurred speech
- Slow/clumsy movements
- Loss of consciousness
- Amnesia/memory problems
- Acts silly, combative or aggressive
- Repeatedly asks the same questions
- Dazed appearance
- Restless/irritable
- Constant attempts to return to play
- Constant motion
- Disproportionate/inappropriate reactions
- Balance problems

**Symptoms of a concussion may include (i.e. what the athlete reports):**

- Headache or dizziness
- Nausea or vomiting
- Blurred or double vision
- Oversensitivity to sound/light/touch
- Ringing in ears
- Feeling foggy or groggy

State law requires that a coach **MUST** immediately remove a student-athlete from participating in any intramural or interscholastic athletic activity who: a) is observed to exhibit signs, symptoms or behaviors consistent with a concussion following a suspected blow to the head or body, or b) is diagnosed with a concussion, regardless of when such concussion or head injury may have occurred. **Upon removal of the athlete, a qualified school employee must notify the parent or legal guardian within 24 hours that the student athlete has exhibited signs and symptoms of a concussion.**

**Section 3. Return to Play (RTP) Protocol Overview**

Currently, it is impossible to accurately predict how long an individual’s concussion will last. There must be full recovery before a student-athlete is allowed to resume participating in athletic activity. Connecticut law now requires that no athlete may resume participation until she/he has received written medical clearance from a licensed health care professional (physician, physician assistant, advanced practice registered nurse (APRN), athletic trainer) trained in the evaluation and management of concussions.

**Concussion Management Requirements:**

1. No athlete shall return to participation in the athletic activity on the same day of a concussion.
2. If there is any loss of consciousness, vomiting or seizures, the athlete MUST be transported immediately to the hospital.
3. Close observation of an athlete MUST continue following a concussion. The athlete should be monitored following the injury to ensure that there is no worsening/escalation of symptoms.
4. Any athlete with signs or symptoms related to a concussion MUST be evaluated by a licensed health care professional (physician, physician assistant, advanced practice registered nurse (APRN), athletic trainer) trained in the evaluation and management of concussions.
5. The athlete MUST obtain an initial written clearance from one of the licensed health care professionals identified above directing her/him into a well-defined RTP stepped protocol similar to the one outlined below. If at any time signs or symptoms return during the RTP progression, the athlete should cease activity.
6. After the RTP protocol has been successfully administered (no longer exhibits any signs or symptoms or behaviors consistent with concussions), final written medical clearance is required by one of the licensed health care professionals identified above for the athlete to fully return to unrestricted participation in practices and competitions.

**Medical Clearance RTP protocol (at least one full day between steps recommended)**

Rehabilitation stage	Functional exercise at each stage of rehabilitation	Objective of each stage
1. No activity	Complete physical and cognitive rest until asymptomatic; School activities may need to be modified	Recovery
2. Light aerobic exercise	Walking, swimming or stationary cycling maintaining intensity at less than 70% of maximal exertion; no resistance training	Increase heart rate
3. Sport-specific exercise No contact	Skating drills in ice hockey, running drills in soccer; no head impact activities	Add movement
4. Non-contact sport drills	Progression to more complex training drills, such as passing drills in football and ice hockey; may start progressive resistance training	Exercise, coordination and cognitive load
5. Full contact sport drills	Following final medical clearance, participate in normal training activities	Restore confidence and assess functional skills by coaching staff
6. Full activity	No restrictions	Return to full athletic participation

\* If at any time signs or symptoms should worsen during the RTP progression the athlete should stop activity that day. If the athlete’s symptoms are gone the next day, she/he may resume the RTP progression at the last step completed in which no symptoms were present. If symptoms return and do not resolve, the athlete should be referred back to her/his medical provider.

**Section 4. Local/Regional Board of Education Policies Regarding Concussions**

\*\*\*\*\* Attach local or regional board of education concussion policies \*\*\*\*\*

I have read and understand the Student and Parent Concussion Informed Consent Form and the attached board of education policies regarding concussions and understand the severities associated with concussions and the need for immediate treatment of such injuries.

Student name: \_\_\_\_\_ Date: \_\_\_\_\_ Signature: \_\_\_\_\_  
(Print Name)

I authorize my child to participate in \_\_\_\_\_ for school year \_\_\_\_\_  
(Sport/Activity)

Parent/Guardian name: \_\_\_\_\_ Date: \_\_\_\_\_ Signature: \_\_\_\_\_  
(Print Name)

**References:**

1. NFHS. Concussions. 2008 NFHS Sports Medicine Handbook (Third Edition). 2008: 77-82. <http://www.nfhs.org>. [http://journals.lww.com/cisportsmed/Fulltext/2009/05000/Consensus\\_Statement\\_on\\_Concussion\\_in\\_Sport\\_3rd.1.aspx](http://journals.lww.com/cisportsmed/Fulltext/2009/05000/Consensus_Statement_on_Concussion_in_Sport_3rd.1.aspx).
2. CDC. *Heads Up: Concussion In High School Sports*. [http://www.cdc.gov/NCIPC/tbi/Coaches\\_Tool\\_Kit.htm](http://www.cdc.gov/NCIPC/tbi/Coaches_Tool_Kit.htm).
3. CIAC Concussion Central - <http://concussioncentral.ciacsports.com/>

**Resources:**

- CDC. *Injury Prevention & Control: Traumatic Brain Injury*. Retrieved on June 1, 2015. <http://www.cdc.gov/TraumaticBrainInjury/index.html>
- CDC. *Heads Up: Concussion In High School Sports Guide for Coaches*. Retrieved on June 1, 2015. <http://www.cdc.gov/headsup/highschoolsports/coach.html>
- CDC. *Heads Up: Concussion* materials, fact sheets and online courses. Retrieved on June 6, 2015. <http://www.cdc.gov/headsup/>



## **HEADS UP: CONCUSSION IN YOUTH SPORTS**

**A Fact Sheet for Parents and Athletes**  
**(Requirement to Read and Signed by Parents and Athletes)**  
**Return This Form to Team Coach.**

### **WHAT IS A CONCUSSION?**

A concussion is a type of traumatic brain injury (TBI) that is caused by a bump, blow or jolt to the head. It can change the way your brain normally works. Concussions can also occur from a fall or blow to the body that causes the head and brain to move quickly back and forth. It can occur during practices or games in any sport. Even a “ding,” “getting your bell rung,” or what seems to be a mild bump or blow to the head can be serious. A concussion can happen even if you haven’t been knocked out. You can’t see a concussion. Signs and symptoms of a concussion can show up right after the injury or may not appear or be noticed until days or weeks after the injury. If your child reports any symptoms of concussion, or if you notice the symptoms yourself, seek medical attention right away.

### **Parents and Guardians**

#### **What are the signs and symptoms of a concussion observed by Parents/Guardians?**

If your child has experienced a bump or blow to the head during a game or practice, look for any of the following signs and symptoms of a concussion:

- Appears dazed or stunned
- Is confused about assignment or position
- Forgets an instruction
- Is unsure of game, score, or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even briefly)
- Shows behavior or personality changes
- Can’t recall events prior to being hit or falling
- Can’t recall events after being hit or falling

#### **How can a Parent/Guardian help their child prevent a concussion?**

Every sport is different, but there are steps your children can take to protect themselves from concussion.

- Ensure that they follow their coach’s rules for safety and the rules of the sport.
- Encourage them to practice good sportsmanship at all times.
- Make sure they wear the right protective equipment for their activity (such as helmets, padding, shin guards, and eye and mouth guards). Protective equipment should fit properly, be well maintained, and be worn consistently and correctly.
- Learn the signs and symptoms of a concussion.

**What should a parent/guardian do if they think their child has a concussion?**

1. Seek medical attention right away. A health care professional will be able to decide how serious the concussion is and when it is safe for your child to return to sports. Notify your child's coach if you think your child has a concussion.
2. Keep your child out of play. Concussions take time to heal. Don't let your child return to play until a health care professional says it's OK. Children who return to play too soon while the brain is still healing risk a greater chance of having a second concussion. Second or later concussions can be very serious. They can cause permanent brain damage, affecting your child for a lifetime.
3. Tell your child's coach about any recent concussion in ANY sport or activity. Your child's coach may not know about a concussion your child received in another sport or activity unless you tell the coach.

**Athletes**

**What are the symptoms of a concussion?**

- Headache or "pressure" in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Bothered by light
- Bothered by noise
- Feeling sluggish, hazy, foggy, or groggy
- Difficulty paying attention
- Memory problems
- Confusion
- Does not "feel right"

**What should an athlete do if they think they have a concussion?**

- **Tell your coaches and your parents.** Never ignore a bump or blow to the head even if you feel fine. Also, tell your coach if one of your teammates might have a concussion.
- **Get a medical checkup.** A doctor or health care professional can tell you if you have a concussion and when you are OK to return to play.
- **Give yourself time to get better.** If you have had a concussion, your brain needs time to heal. While your brain is still healing, you are much more likely to have a second concussion. Second or later concussions can cause damage to your brain. It is important to rest until you get approval from a doctor or health care professional to return to play.
- **It is better to miss one game than the whole season.**

**How can athletes prevent a concussion?**

Every sport is different, but there are steps you can take to protect yourself.

- Follow your coach's rules for safety and the rules of the sport.
- Practice good sportsmanship at all times.
- Use the proper sports equipment, including personal protective equipment (such as helmets, padding, shin guards, and eye and mouth guards). In order for equipment to protect you, it must be:
  - The right equipment for the game, position, or activity
  - Worn correctly and fit well
  - Used every time you play
  - Repaired and maintained

Student Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_ Date: \_\_\_\_\_