

***In consideration of public health and open meeting requirements, this meeting will include an option for the public to live-stream or phone in to listen to the audio of the meeting. Please note that public comment will be received by phone at the beginning and end of this meeting. Alternatively, the Board encourages the public to email any comments for Board consideration to [NewtownBOE@newtown.k12.ct.us](mailto:NewtownBOE@newtown.k12.ct.us)***

**To view this meeting, the live stream link is: <https://bit.ly/3rWKmaf>**

**For public participation and to listen to the meeting, please call 1-646-558-8656**

**PIN 860 3237 0805#**

Board of Education Virtual Meeting  
February 16, 2021

7:00 p.m.

*As citizens of our community, we will conduct ourselves in accordance with Newtown's Core Character Attributes as displayed in our character tree. We will be responsible for our actions and show respect for each other. We will interact peacefully, productively, and politely. We will be trustworthy and honest and show compassion toward others. Newtown's continued success is contingent upon our ability to persevere, to follow through with our commitments, and to stay focused on the greater good.*

## A G E N D A

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|--------|---|-----------------------------|
| Item 1 | PLEDGE OF ALLEGIANCE  |                             |
| Item 2 | CONSENT AGENDA  |                             |
|        | • Minutes of January 19, 2021   | Minutes of January 21, 2021 |
|        | • Minutes of January 26, 2021   | Minutes of January 28, 2021 |
|        | • Minutes of February 2, 2021   |                             |
|        | • Donation to Sandy Hook School   |                             |
|        | • Correspondence Report   |                             |
| Item 3 | **PUBLIC PARTICIPATION  |                             |
| Item 4 | REPORTS   |                             |
|        | • Chair Report  |                             |
|        | • Superintendent's Report   |                             |
|        | • Committee Reports   |                             |
|        | • Student Representative's Report   |                             |
|        | • Action on Financial Report for Month Ending January 31, 2021                  |                             |
| Item 5 | OLD BUSINESS  |                             |
|        | • COVID-19 Update   |                             |
| Item 6 | NEW BUSINESS  |                             |
|        | • First Read of College Math Topics Curriculum                                  |                             |
|        | • First Read of Pre-calculus Curriculum   |                             |
|        | • Newtown High School – March 19 Schedule and March 24 School-wide SAT Schedule |                             |
| Item 7 | **PUBLIC PARTICIPATION  |                             |
| Item 8 | ADJOURNMENT   |                             |

***\*\*During the first Public Participation, the Board welcomes commentary regarding items on the agenda. After being recognized, please state your name and address for the record. We request that speakers be respectful and limit comments to not more than three minutes. The Board of Education does not discuss personnel items or student matters in public. During the second Public Participation, commentary may address the agenda or may introduce issues for the Board to consider in the future. The Board does not engage in dialogue during either public comment period. If you desire more information or answers to specific questions, please email the BOE: [NewtownBOE@newtown.k12.ct.us](mailto:NewtownBOE@newtown.k12.ct.us)***

12 Dickinson Drive  
Sandy Hook, CT 06482  
(203) 426-7657

**Sandy Hook School**

# Memo

**To:** Newtown Board of Education  
**From:** Erin Ardino  
**cc:**  
**Date:** February 11, 2021  
**Re:** Donation from Schweitzer Engineering Laboratories

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Sandy Hook School received the attached \$100 donation from Schweitzer Engineering Laboratories. This donation is to be used towards math and/or science materials for students.

We are asking the Board to please approve the donation. Once approved, we will deposit the check into the SHS Activity Account to be spent appropriately.

If you have any questions, please contact our office.

Thank you!



**SCHWEITZER ENGINEERING LABORATORIES, INC.**

2350 NE Hopkins Court • Pullman, WA 99163-5603 USA  
Phone: +1.509.332.1890 • Fax: +1.509.332.7990  
www.selinc.com • info@selinc.com

December 21, 2020

Sandy Hook Elementary School  
12 Dickenson Dr.  
Sandy Hook, CT 06482

Dear Sandy Hook Elementary School,

Each year, employees of Schweitzer Engineering Laboratories select an educational institution to receive a corporate gift. We are delighted to inform you that the following employee(s) chose Sandy Hook Elementary School.

- Taylor Turner

SEL employees support schools and universities around the world with scholarships, donations of SEL products for teaching laboratories, mentoring, and gifts such as this one. Please accept this donation for \$100 to help inspire a lifelong love of learning in math and science in your students.

SEL is a high-tech manufacturer, headquartered in Pullman, Washington. We invent, design and build products in the USA that protect power grids around the world. We are committed to developing the next generation of innovators and inventors through the support of science, technology, engineering, and math education.

We welcome the opportunity to learn more about your programs, students and successes. If you would like to share how you used this donation, please contact McKenzie Brumet at (509) 334-5076 or [McKenzie\\_Brumet@selinc.com](mailto:McKenzie_Brumet@selinc.com).

Warm regards,

A handwritten signature in cursive script that reads "Edmund O. Schweitzer, III".

Edmund O. Schweitzer, III  
President and Chief Technical Officer

**Please note: These minutes are pending Board approval.**  
**Board of Education**  
**Newtown, Connecticut**

Minutes of the Board of Education virtual meeting held January 19, 2021 at 7:00 p.m.

M. Ku, Chair	L. Rodrigue
D. Delia, Vice Chair	A. Uberti
D. Cruson, Secretary	T. Vadas
D. Leidlein	18 Staff
J. Vouros	2 Press
R. Harriman-Stites	Public by phone
D. Zukowski	

Mrs. Ku called the meeting to order at 7:01 p.m. and stated it was being recorded and being live streamed.

Item 1 – Pledge of Allegiance

Item 2 – Consent Agenda

MOTION: Mr. Delia moved that the Board of Education approve the consent agenda which includes the donation to Newtown High School. Mr. Delia seconded. Motion passes unanimously.

Item 3 – Public Participation

Item 4 – Reports

Chair Report: Mrs. Ku noted that the Legislative Charter revision Charge Committee is considering our recommendations and will meet tomorrow at 6 p.m. and the full Legislative Council will consider our CIP again. She volunteered to host the CABA Legislative Breakfast which will just be a discussion this year on February 1 at 8 a.m.

Superintendent's Report: Dr. Rodrigue reported that we are now fully back in school for grades 7-12 and has heard positive comments. She thanked our staff, leaders and Whitsons Food Service who prepared our Grab and Go lunches today. We are monitoring the Covid cases which are also on our dashboard. She reminded everyone that tomorrow is an early release for grades 7-12 at 11:32 a.m. and elementary is at 12:37 p.m.

Committee Reports:

Mr. Vouros spoke about the Curriculum and Instruction Committee meeting where the grade one and two reading and writing curriculum were presented. Dr. Frank Purcaro presented K-5 pilot math program which was forwarded to the Board.

CIP/Facilities/Finance Subcommittee:

Mr. Delia said they received a letter to review to send to the Legislative Council regarding the Head O'Meadow lighting. An agreement was worked out with no cost to the district regarding the virtual net metering with a request to remove the \$450,000 from the CIP. We also discussed the food program and want to extend the contract one more year as the State made it possible to do so. Whitsons has been very good to us during this difficult time.

Mr. Cruson reported the Communications Committee met last Monday and discussed our technology newsletter coming to the Board shortly. We also discussed timing for the budget newsletter aiming for the end of March. We also set our schedule for next year.

Mr. Delia attended an EdAdvance Board meeting and didn't realize the amount of services they supply. They have been hit by Covid and are running at a deficit and losing employees. Mr. Vouros mentioned that some members of the Board attended Capstone Projects the seniors have done and he was particularly pleased to see three of them.

#### Student Reports:

Mr. Jerfy reported they were back to school today and it was exciting and other felt the same way. Classes were fun and energetic but students are concerned about the hallways. Sports are starting up again and students appreciate the updates through School Messenger.

Ms. Clure was also happy to be back as it brought back some normalcy. Teachers asked how we were feeling and if we were comfortable. Class time is down to 50 minutes. Lunches were set up in the lobby. A concern for sports was students going home and having to return to school for practice. Unified Sports will have their winter season. Blue and Gold stadium was named the best high school football stadium in Connecticut by Stadium Talk.

#### Financial Report:

MOTION: Mr. Delia moved that the Board of Education approve the financial report for the month ending December 31, 2020. Mr. Cruson seconded.

Mr. Delia said the CIP Committee spent a lot of time working with Mrs. Vadas on this report. Our overall position has changed from a negative \$399,303 to a positive \$136,092 due to the Town's capital non-recurring fund being applied to the Board of Education expenditures in the amount \$400,000 applied directly to technology equipment and the Corona Relief Grant was applied to plant supplies offsetting the negative balance.

Mrs. Vadas presented the financial report which listed three high school emergency repairs this month which included the A/C unit in the band room for \$17,200, repair of the generator water pump and coolant replacement for \$6,794.55, and repair of the roof leak in the auditorium for \$31,845.

Motion passes unanimously.

#### Item 5 – Presentations

##### Superintendent's Overview of the Proposed 2021-2022 Budget:

Dr. Rodrigue noted that this was a complex budget with respect to our challenges since last March supporting our students and staff. She recognized the work of the administrators and central office staff in working on the budget. Covid has impacted our economy and education. Our goals are still focused on teaching and learning and in identifying learning gaps. Three main intentions in developing this budget are to sustain core programming and services to address academic and social/emotional needs of all students, ensure that equitable, quality services are in place for a diverse spectrum of learners through identified academic pathways, scheduling and supports, and highlight the need for deliberate, systemic supports for students with identified gaps in learning following a world-wide pandemic. The key operational plan goals are to implement academic instructional strategies and social-emotional supports, promote a culture of rigorous learning, embrace technology and digital resources, ensure policies, protocols, and practices are implemented, and identify and fund training and professional development for staff.

The budget proposal for next year is \$81,080,697 for a 3.09% increase over last year's budget. The budget increase is \$2,428,921.

#### Elementary School Budgets:

Chris Geissler reported that the PAL Program at Middle Gate School is designed to meet the needs of individual students who have delays in areas and are supported by special education teachers. The pilot was in the 2016-2017 school year and peer mentoring started the following year. We currently have six students in the program. We also have a mentoring program with students in PAL. The budget connection is in being able to maintain students in the district and adding two students from other districts.

Chris Moretti stated that social emotional learning is very important to the district and it covers an array of programming and resources. It started when the Board approved the counselors for the elementary schools. We have behavior interventionist positions which started at Hawley School and services students with emotional and behavioral problems in the class and require more support than the classroom teacher can provide. This person is able to respond and build a relationship with these students. It has been extremely beneficial and successful.

Tim Napolitano is proud of our staff, students and families. This position is new to Head O'Meadow this year and works with the school counselor and special education staff. They are being proactive in working with the students and also helped out at the community center when students were remote. He is very pleased the Board supported this position.

Kathy Gombos expressed her gratitude to our entire teaching staff who have risen to the occasion. The positivity and cooperation with parents has been amazing. There is more social emotional learning than ever this year. She also has a behavior interventionist. This is part of our SEL program along with our instructional pieces. Responsive classroom professional development has been supported over the last few years so everyone has been trained.

Mr. Delia asked how we came up with the enrollment numbers for kindergarten.

Mrs. Ku said these match what the Prowda Enrollment Study said.

Mrs. Vadas said we didn't use the internal projections because they would have skewed the numbers. Using Prowda was a better fit for this year.

Mr. Delia asked if we were using the kindergarten figure this year and putting them in first grade for next year.

Mrs. Vadas said we were and that it was a projection.

Mrs. Ku said enrollment has been very different from what the projections were especially at Hawley and Sandy Hook this year. It's very difficult to predict for next year.

Mr. Delia wants to make sure the schools are properly staffed. If we are making predictions we want to be able to properly serve the children.

Ms. Zukowski said it seems excessive for the Sandy Hook first grade to increase by 28% and asked for a list of where these students dis-enrolled from. She also asked when parents decide to enroll their child in kindergarten.

Mr. Moretti said our kindergarten process starts this time of year for next year. In March each school starts their registration process and the students come into school. Covid hit in the middle of that process last year. He received calls from parents in May until the start of school in September about enrollment.

Dr. Rodrigue said she had the number of students who are disenrolled by school. Hawley had 11, Middle Gate had 13, Sandy Hook had 11, Head O'Meadow had 20, Reed had 6, the middle

school had 4, and the high school had 2, for a total of 67 students. We talked about getting another projection done but this is a different year than any year we've had.

Mr. Vouros heard that at Sandy Hook and Hawley there was a .5 math teacher and a .5 reading teacher at Middle Gate. He has not heard about those positions at Head O'Meadow and he wants to have uniformity. Bret Nichols spoke to them about SEL staffing at the elementary schools and how that translates to more staff and he wants that to be addressed too if we need to add positions.

Mr. Napolitano said that at Head O'Meadow we have extra reading support. He might advocate for that now but he didn't when we started the budget.

Ms. Zukowski noted that Head O'Meadow has 57 in Kindergarten and is projected for 56 in grade one next year. Prowda's report expected five new students in first grade. She asked if Mr. Napolitano had enough teachers for first grade if these students register. Mr. Napolitano said we have 50 in Kindergarten now with a few more projected.

Mr. Cruson said the projection was made prior to any of this because of enrollment this year. Getting too hung up on projections might get us into trouble. We don't know what will happen.

#### Reed Intermediate School Budget:

Matt Correia spoke about the Spanish program and out of our 300 students everyone passed for the first quarter. Reed enrollment has been increasing. He is requesting two new sixth grade teachers as we expect 312 students so classes can be at the 22 or 23 level. We are not going to move fifth grade teachers to sixth grade. Over 40 students joined Reed since July. There are six students returning to sixth grade from being home schooled.

Mr. Delia asked if Reed needed extra math help like the elementary schools.

Dr. Correia said our focus before the pandemic was math. We didn't ask for another person. We have three paras this year who will be helping with math and ELA until we can hire a position for math.

#### Newtown Middle School Budget:

Tom Einhorn spoke about the RISE and SAIL Programs which help outstanding learners who need a specialized approach to learning. He is looking for the Board's support for two additional special education teachers. This will allow us to have case managers assigned to each cluster and will be able to provide additional support to students. A world language will be provided each day. He also would like an additional math interventionist and two unified arts teachers.

Mr. Delia asked why he was cutting a reading teacher.

Mr. Einhorn said we are restructuring our reading department. Many special education students are getting support from reading teachers but that will be switched over to a case manager in each cluster which will be a higher level of support.

Mr. Vouros referred to the unified arts position and wants to focus on project adventure moving out of physical education and also that project challenge is scheduled so students have a class in gifted education but not during lunch or competes with anything else.

Mrs. Ku asked if they will fit into the middle school schedule. Mrs. Uberti is working with Mr. Einhorn and his committee. It's key that it's done so the programs, especially project challenge, can be restored to what it used to be but being held during a class.

Item 6 – Old Business

## COVID-19 Update:

Dr. Rodrigue reported that we are proceeding cautiously monitoring cases. Regarding the vaccinations for teachers we are waiting for confirmation from the State putting them as essential workers but it has not been confirmed yet. The State asked districts to not upload staff information yet. All nurses were entered and they were vaccinated. Some districts received confirmation as some information was inadvertently uploaded. We will not be doing this until we are notified. She spoke to Tom Kuroski about this as it caused some frustration for teachers.

Mr. Delia said they are looking at teacher vaccinations the end of February or early March. He asked if we should compose a letter as a Board to show support for our staff.

Mrs. Ku agreed and it's disheartening that teachers are being put behind other groups as well as paras and bus drivers. She would be happy to sign on another letter which Mr. Delia would prepare. She asked how many students were in cohort D.

Dr. Rodrigue said the last report was 710 before this week with 300 at the high school. Mr. Delia asked if there were any budget increases COVID related and if there will be funds available.

Dr. Rodrigue said the Esser Fund Part 2 will have funding but we can't predict the budget.

Item 7 – New Business

## One Year Only Teaching Positions:

Dr. Rodrigue said we have had a need for more support at the secondary level for classroom coverage. Many subs are not comfortable at the upper level like in the area of science at the high school. It's putting stress on our teachers to cover classes. We plan to hire for the remainder of this year for the middle and high schools. Four teachers will support the absenteeism. This will inspire more individuals to be open to working the rest of the year. They would be flexible between these two schools and work like building subs.

MOTION: Mr. Delia moved to hire four teachers through the end of the year to help fill the need at Newtown Middle School and Newtown High School. Mr. Cruson seconded.

Mr. Delia is in support of this in the best interest of students and the community to have certified personnel in the school when needed.

Mr. Cruson asked why these positions would be easy to fill.

Dr. Rodrigue said there are a lot more students who have graduated and haven't found jobs. It's a difference rate a pay and level of education.

Mr. Cruson was in support but not sure how easy it will be to fill these positions.

Ms. Zukowski said this is clearly Covid-related so this would fall into this funding. She asked if the plan was to hire specialized teachers who might be cross certified.

Dr. Rodrigue said that's more difficult but we might want to look at two general science and maybe a math and English. Cross endorsement is more difficult to find.

Motion passes unanimously.

## Minutes of January 5, 2021:

MOTION: Mr. Delia moved that the Board of Education approve the minutes of January 5, 2021. Mr. Cruson seconded. Vote: 6 ayes, 1 abstained (Mrs. Harriman-Stites) Motion passes.



Item 8 – Public Participation

MOTION: Mr. Cruson moved to adjourn. Mr. Delia seconded. Motion passes unanimously.

Item 9 – Adjournment

The meeting adjourned at 10:12 p.m.

Respectfully submitted:

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Daniel J. Cruson, Jr.  
Secretary

**Please note: These minutes are pending Board approval.**  
**Board of Education**  
**Newtown, Connecticut**

Minutes of the Board of Education virtual meeting held January 21, 2021 at 7:00 p.m.

M. Ku, Chair  
D. Delia, Vice Chair  
D. Cruson, Secretary  
D. Leidlein  
J. Vouros  
R. Harriman-Stites  
D. Zukowski

L. Rodrigue  
A. Uberti  
T. Vadas  
12 Staff  
2 Press  
Public by phone

Mrs. Ku called the meeting to order at 7:01 p.m. and stated it was being recorded and being live streamed.

MOTION: Mr. Cruson moved that the Board of Education go into executive session to interview the candidate for the Director of Technology position and invited Dr. Rodrigue and Dennis Colclough. Mr. Vouros seconded. Motion passes unanimously.

Item 1 – EXECUTIVE SESSION

Executive session ended at 7:30 p.m.

Item 2 – Pledge of Allegiance

Item 3 – Action on Candidate for Director of Technology Position

MOTION: Mr. Delia moved that the Board of Education appoint Dennis Colclough as Director of Technology effective on or about February 22, 2021. Mr. Cruson seconded. Motion passes unanimously.

Mr. Delia was in full support of Mr. Colclough and was very impressed with answers to his questions. He is looking forward to his expertise to serve the children of Newtown.

Dr. Rodrigue welcomed Mr. Colclough, was very please he was joining our team, and thanked the members of the committee and Al Miles who was on the second interview.

Motion passes unanimously.

Mrs. Ku was very impressed with him and was looking forward to him joining our district.

Mr. Colclough was excited for the opportunity and the process to fill this position. He appreciated the interview committee which included a variety of members including Al Miles. It gives him an understanding of the core foundation Newtown has.

Item 4 – Special Education Budget

Deb Petersen began her presentation by stating that her staff from teachers to paras, BTs, nurses and supervisors are amazing and they rose to the challenge since March. She also thanked Mrs. Uberti and Dr. Purcaro for reaching out to teachers and taking into account the special education department which was very much appreciated.

Mrs. Petersen spoke about the special education enrollment over the past five years. Currently we have 642 special education students with 20 pulled for home schooling until next year. The number changes almost daily. We have 38 new students to the district with special education needs.

Mr. Delia asked for an explanation on the law regarding how we are not allowed to reduce dollars in this area.

Mrs. Petersen said that under the IDEA Grant we get money for special education but you cannot reduce that amount for the next year and you have to use the funds. You can't spend less than you did the year before.

This year she asked for two special education teachers for the middle school which goes with the new schedule to provide co-teaching which is also new. She also asked for a teacher at Middle Gate because they received more students identified this year. They have 63 students with 11 in the referral process. We anticipate 150 students for ESY so we would like an additional supervisor for the 16 days of summer school.

Mr. Delia asked why there was no increase for training or professional development if adding staff members.

Mrs. Petersen said the staff will come to her when they find training they want to attend. We have had enough funds in our budget to take care of training. No one has reached out so far.

Ms. Zukowski noted that she has two online packages but some of the others are in the curriculum budget and asked if it was because her budget is completely within the special education budget.

Mrs. Petersen said that Everyday Speech is in her budget. We did move some of our staff to digital evaluations and we bought ipads for this. Technology is paid for from her budget.

Ms. Zukowski referred to the special education contingency of \$100,000. The goal said there would be one on a 5-year average which was around \$400,000 and asked if we were going to keep the \$100,000 or increase it to \$400,000.

Mrs. Vadas said we have the previous five-year average. Roughly \$300,000 was put in place three years ago which was supposed to offset the TBDs.

Mrs. Harriman-Stites said she would be open to increasing it. It wasn't specific to anything but to be there to plan for the future. We've had to fight to keep that contingency every year and was not sure if now was the time to have that conversation.

Mrs. Vadas clarified that the average amount was \$226,000 over the last five years.

Mr. Delia asked if we add the middle school special education teachers, would that help the students exit special education when they get to high school.

Mrs. Petersen said she doesn't think they would exit from special education but sees them being more prepared for high school. By adding the special education teachers to the clusters it allows these students the opportunity to take a language or art classes.

Mrs. Leidlein asked how much we have used of the contingency money for this year.

Mrs. Vadas said we haven't use any of it yet.

#### Item 5 – Pupil Personnel Budget

Mrs. Petersen stated she has not asked for additional staffing. Some grants have sunsetted so we are waiting to hear from NOVO and another grant. For Medicaid funds we don't receive a lot of money so it takes a few years for the money to build up to be able to fund a position. \$22,366 of the counselor position salary was provided through the Covid Relief Fund.

Mrs. Harriman-Stites was concerned about social emotional learning and asked if she feels we have the staff resources and Professional Development to adequately support the students.

Mrs. Petersen has the same concerns. We have seen a rise in student anxieties so we are contracting with outside resources to work with students at home. She is confident in the staff professional development to help.

Mrs. Harriman-Stites asked if there was an area needing more support. Mrs. Petersen stated that we have the staff we need right now but we don't know what next year will bring. The decision for an outplacement is not taken lightly. We get very creative to try to keep students in our district. Those numbers go up and down.

#### Item 6 – Health Budget

Anne Dalton thanked the Board for their support in this difficult year which has given the nurses enough time and staffing to step up to the challenges. She is very proud of them. We have had extra staffing in the elementary schools due to the virus to help in our isolation rooms in three of our schools. They have had additional time so they could help with contact tracing. There is a nursing position moving from the middle school to the high school which is due to following a student who needs one-on-one nursing care.

Ms. Zukowski referred to page 142 and asked why the extra time was carried forward.

Mrs. Dalton said it does not reflect the extra time we had for Covid.

Mrs. Vadas said we transferred money into the nursing account for additional coverage. That amount is for the additional time they are working.

Mrs. Dalton said the nurses have worked more than a seven-hour day for a long time as one needs to be in school once buses have cleared to be available if there are any issues on buses.

Ms. Zukowski asked if the intent was to go to an eight-hour day.

Dr. Rodrigue stated that we moved this forward and has talked to the nurses' union about this prior to Covid. We want to carry that forward.

Mr. Delia thanked Mrs. Dalton for all she and her staff have done this year and asked if there was anything she didn't ask for that she thinks she will need.

Mrs. Dalton hoped to return to normalcy by next fall but if not we will continue to need help. We are okay right now.

#### Item 7 – Newtown High School Budget

Dr. Longobucco thanked her staff at Newtown High School who have risen to the occasion and also thanked her nursing staff so much for all they have done. The budget drivers include having needs based on the high school and district strategic plans and objects as well as state mandates, to ensure all programs have adequate resources, to have technology and platforms to ensure online access and equity to all students, to monitor class size and enrollment across the disciplines, and be aware of contractual increases. She also spoke about the Capstone Project for seniors.

Ms. Zukowski inquired about the co-taught classes and Dr. Longobucco assured the Board that we always try to keep this level classes smaller and the students are being well-served as we have good teachers in these classes.

Matt Memoli thanked Dr. Rodrigue, Dr. Longobucco and the Board for their support of the athletics program.

#### Item 8 – Curriculum Budget

Mrs. Uberti thanked the incredible staff, teachers, support staff and paras, as well as administrators, for their dedication to help us move forward. The curriculum budget is broken down into four sections which include staff and curriculum development, staff training provided by outside consultants, contracted services, and textbooks. Some reductions include moving the K-6 FLES teachers into the school budgets, payment for two para professional development days has been absorbed into the para salaries, next year's professional development will require less coverage for teachers during the school day, K-5 math training is included with the purchase of a new resource, there is only attendance at two local conferences, less supplies are need for science now, and duplication of some memberships will be in school budgets.

Ms. Zukowski asked if online courses would be in the curriculum or schools budgets. Mrs. Uberti said historically they have been spread out. The ones in her budget are hinged to go across grades and some include the high school but most are multi-level. Seesaw is for Kindergarten and grade one so that might be moved to the school budgets.

Mrs. Harriman-Stites noted that we have spoken about an equity audit on the curriculum in PEAC and asked if that was looked at to add to the budget and how we can support that process going forward. There is also public support for doing that.

Mrs. Uberti said that has been discussed and we are waiting for the new position to be filled to work on a plan for that. We also have a committee in place to help achieve that.

Dr. Rodrigue thanked the administrator at the meeting this evening.

Mrs. Ku also thanked everyone for being there and all staff members in terms of dealing with this Covid year.

Item 9 – Public Participation

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

Item 10 – Adjournment

The meeting adjourned at 9:21 p.m.

Respectfully submitted:

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Daniel J. Cruson, Jr.  
Secretary

**Please note: These minutes are pending Board approval.**  
**Board of Education**  
**Newtown, Connecticut**

Minutes of the Board of Education virtual meeting held January 26, 2021 at 7:30 p.m.

M. Ku, Chair	L. Rodrigue
D. Delia, Vice Chair	A. Uberti
D. Cruson, Secretary	T. Vadas
D. Leidlein	6 Staff
J. Vouros	2 Press
R. Harriman-Stites	Public by phone
D. Zukowski	

Mrs. Ku called the meeting to order at 7:31 p.m. and stated it was being recorded and live streamed.

Item 1 – Pledge of Allegiance

Item 2 – Technology Budget

Carmella Amodeo recognized the dedicated and collaborative efforts of her department this past year and especially the work involved in supplying Chromebooks for students.

Mr. Cruson referred to the breakdown of expenses for equipment and asked if the cost for staff laptops were Chromebooks or a different device.

Mrs. Amodeo said it was a one-on-one replacement for high staff of Windows 10 laptops.

Mr. Delia asked if we should we put some sort of funds in the budget in case of an emergency. Mrs. Amodeo said we have been able to leverage dollars to meet the needs of the district. The funding was always found. We are in a good position.

Mr. Delia asked that with all the extra devices if we have properly funded the infrastructure in the schools.

Mrs. Amodeo said she worked with a team and looked at our bandwidth needs in the district and were able to increase it going into the next year.

Item 3 – Continuing Education Budget

Jennifer Arnold spoke about the various programs for K-12 students including summer camp. We also offer state mandated courses and adult education classes as well as virtual opportunities.

Ms. Zukowski noted that some programs like adult education have fees and asked if the summer experience and similar programs also had fees.

Ms. Arnold said there is a fee for the support such as the four-week summer program. The money is used for administration of the programs and supplies. The budget money is for salaries.

Mrs. Ku asked if summer school allowed students to make up credits if they failed a course or were not able to take certain courses in high school.

Ms. Arnold said this is for K-8 students. There are none for high school courses but a remedial program will still be offered. We also have the virtual high school option for remedial credit.

Mrs. Uberti said she had spoken to Dr. Longobucco about this and it's a challenge to predict how many students will need credit recovery and hard to know where we will be toward the end of the year. Our biggest priority is to have students pass.

Mr. Delia asked if parents of younger students were aware of what you do and asked if we could promote this through a communication to parents.

Ms. Arnold said we send out our brochure through the mail and Naviance. We also meet with principals so they can advocate for their programs. Information is sent to parents from central office, we have a Facebook page, and also have online registration. Driver's education and SAT classes are also offered.

#### Item 4 – Plant Budget

Bob Gerbert spoke about the custodian and maintenance team who have done a tremendous job for students, staff and families this past year. There has been a lot of cooperation and collaboration with the additional responsibilities they had in keeping up with the day-to-day operation of the schools and he was proud of their work.

The budget request is \$7,917,030 which is an increase of \$275,259 or 3.60% over last year. The budget drivers are salaries, energy, contracted services, professional services, and plant supplies. Last March we started a monthly cleaning system. Paul Devine inspects each school and makes a note of needed improvements. The maintenance department has also taken on more duties with various projects being undertaken.

Ms. Zukowski asked if there was money for periodic monitoring of air quality and subsequent maintenance that might result from it.

Mr. Gerbert said we had money for those costs and also have our own in-house devices and tools so we can do air quality testing.

Ms. Zukowski asked how he prioritized what has to be done each year for building and maintenance work.

Mr. Gerbert said the funds are the driving factors. We have the five year list and work with principals and staff to pull information together to make the list for each school. He will decide what should stay and what would be deferred. The list will change year to year.

Ms. Zukowski asked if he was finding to be constantly getting further and further behind and things will be harder to achieve.

Mr. Gerbert said there will always be something that needs attention. He has a lot of confidence in the maintenance team we have now. They stay on top of things and are dedicated to their job. They work as a team and work well together.

Mr. Vouros asked about landscaping services especially in the front of Sandy Hook School. Mr. Gerbert said he was working with our landscaping vendor. The town went out to bid last year and brought in a landscaper. They also maintain courts at Reed and Middle Gate and have done a great job.

Mrs. Ku thanked Mr. Gerbert for spending time with the other boards which benefits us as a district and board. They enjoy having his expertise there.

#### Item 5 – Benefits Budget

Mrs. Vadas thanked the business office team for the transitions they've been through this year and the Board of Education and Dr. Rodrigue for her role as Director of Business. She introduced Bjorn Burke, the new Assistant Director of Business. Mr. Burke stated he was happy to join the Newtown School District and looked forward to meeting the Board in person. Mrs. Vadas spoke about the employee benefits budget which includes the various insurance plans for employees.

Item 6 – General Services Budget

Mrs. Vadas spoke about the general services budget which includes the central office departments.

Item 7 – Transportation Budget

Mrs. Vadas spoke about the transportation budget which included 54 buses.

Item 8 – Discussion and Possible Action on Modification to School Calendar

MOTION: Mr. Delia moved that the Board of Education approve the modification to the school calendar for March 10 as presented. Mr. Cruson seconded.

Dr. Rodrigue said that at the time we developed the calendar we were still deciding our school schedules and scheduled a typical professional development requiring a two-hour delay for students. With the creation of the early release Wednesdays, it was decided to remove the staff development on that day given the other professional development time in the calendar. She also spoke to the union president and it makes sense to make this change.

Motion passes unanimously.

Item 9 – Public Participation

MOTION: Mr. Vouros moved to adjourn. Mr. Cruson seconded. Motion passes unanimously.

Item 10 – Adjournment

The meeting adjourned at 9:23 p.m.

Respectfully submitted:

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Daniel J. Cruson, Jr.  
Secretary



**Please notes: These minutes are pending Board approval.  
Board of Education  
Newtown, Connecticut**

Minutes of the Board of Education virtual meeting held January 28, 2021 at 7:00 p.m.

M. Ku, Chair	L. Rodrigue
D. Delia, Vice Chair	A. Uberti
D. Cruson, Secretary	T. Vadas
D. Leidlein	12 Staff
J. Vouros	2 Press
R. Harriman-Stites	Public by phone
D. Zukowski	

Mrs. Ku called the meeting to order at 7:01 p.m. and stated it was being recorded and live streamed.

Item 1 – Pledge of Allegiance

Item 2 – Public Hearing on the 2021-2022 Budget

There were no public comments.

Item 3 – Discussion and Possible Action to suspend the Board’s Policies and regulations Pursuant to Policy 9314

Mrs. Ku explained the two motions.

MOTION: Mr. Delia moved that the Board of Education suspend the Board’s policies and regulations pursuant to policy 9314. The policy to be suspended is 3323. The suspension shall be for the specified purpose of opting into the state’s waiver that allows for the extension of the Board’s food service contract for one additional year. Such suspension shall only be for the meeting held on January 28, 2021. Mr. Cruson seconded.

Mrs. Ku said this motion is about our Policy 9314 and if the Board is willing to suspend this policy specifically for extending the food service contract.

Motion passes unanimously.

Item 4 – Discussion and Possible Action on Food Services Contract

Mrs. Vadas said the USDA Food and Nutrition service granted all states a one-year bid waiver on our food service contract. This is our fifth year and we would be obligated to do an RFP. With so many unknowns in next year’s budget she would like to extend their contract as they are familiar with the district and community. Changing companies would not be advantageous.

MOTION: Mr. Delia moved that

**WHEREAS**, the Board’s current contract for food services has been amended to provide the maximum allowed, four one-year extensions (7 CFR § 210.16 - Food Service Management Companies) and will expire on June 30, 2021;

**WHEREAS**, due to COVID, the USDA Food and Nutrition Service has provided a waiver to allow for the use the emergency noncompetitive proposal procurement method to negotiate a new one-year Food Service Management Company contract for FY 2021-2022 (FNS Document COVID-19: Child Nutrition Response # 71);

**WHEREAS**, the State of Connecticut has elected to use the waiver provided by USDA Food and Nutrition Service;

**WHEREAS**, due to COVID, food vendor walk-throughs for the RFP process would be challenging under the current conditions;

**WHEREAS**, Newtown Public Schools Business Director has recommended extending the contract with the Board's current Food Service Management Company;

**BE IT RESOLVED**, that the Board authorize the Superintendent or her designee to notify the state of the intent to use the waiver allowing for a one year extension on the current food service contract with Whitsons New England, Inc.;

**FURTHER RESOLVED**, that the Superintendent or her designee be authorized to negotiate a potential one-year extension of the Food Service Management Company contract for Board review and approval.

Mr. Cruson seconded.

Mrs. Ku said we are not approving the extension at this point, just directing the Superintendent to negotiate this extension.

Mr. Delia was in support of this motion and wanted to be sure we aren't approving the contract but the negotiation of the contract which will come to us for approval.

Mrs. Vadas said we are a few weeks behind and considering it's a four to five month process we would have to get started on the RFP right away. This would also give Whitsons time to put a budget together for next year.

Motion passes unanimously.

#### Item 5 – Budget Discussion

Dr. Rodrigue thanked her leadership team and central office staff in putting this budget together which reflects a balance between typical requests and annual obligations. We have a new middle school schedule with some new courses. We moved our funding for social workers and school psychologists, the addition of behavior interventionists, reading and math supports, additional special education teachers and the Diversity and Equity Compliance Officer. We continue to include curriculum projects and new textbooks and staff development related to next generation science, a new K-5 math program, and diversity. These are the hallmarks of next year's budget. There are still a few unknowns but we will have further support from the NOVO and BOCA grants. Yesterday we received news the ESSER funds will be higher than double than received before. She thanked the Board for their support.

Mrs. Harriman-Stites asked about the equity audit on the curriculum and the new person coming in to work with the district in that area and if we can extend their contract. There is a lot of desire to do this audit.

Dr. Rodrigue has reached out to other districts about the potential cost for the audit. Re Center would be interested in staying on another year and could help with the curriculum to work with Mrs. Uberti and Dr. Purcaro. We are currently paying \$35,000 and she assumes some of the work would be on curriculum if we extend it another year.

Mrs. Uberti said there is some work already going on but you have to create a plan. The teachers are also asking for training in handling difficult situations especially regarding what is happening in the country. The equity audit should be in our long range plan. She agrees with continuing the relationship with Re Center. We are in the process of developing a student advisory council for students in grades 8 through 12. This will be a facilitated conversation by those involved in delivering the curriculum.

Mr. Vouros asked for an update to the conversation we had regarding the new middle school schedule in the areas of project challenge, project adventure, and the intended courses that are being designed for the students so we know what that schedule is going to look like and what direction it's going in and if it requires any more money.

Mrs. Uberti said there is no additional funding needed in the budget. The time students will be engaged in project challenge is being addressed. Those students will attend on a fixed day schedule and will miss some schedules on a rotating basis like at Reed. Regarding the new courses, she doesn't anticipate any additional expenditure. We don't know what the courses will be yet and will do a student survey to get a student voice. We want to fill a need and offer what the students want to take.

Mr. Vouros wants to make sure project adventure at the middle school will be the same model as at Reed where it will stand alone in the schedule.

Ms. Zukowski asked that regarding summer school and the need for students to participate if more funds will be needed for it to run.

Mrs. Uberti spoke to Mr. Einhorn and Dr. Longobucco about this. It's hard to know what will be needed for those students. Last year it didn't impact the continuing education budget when we knew what we needed for students who needed to be supported over the summer. Most students who are failing are not doing the work. We connected them with an adult who checked in with them to help organize their work. We will do the same this year.

Mrs. Ku asked if there was a cost for students who need credit recovery.

Mrs. Uberti said there was a cost for students.

Ms. Zukowski asked if it was possible to get an estimate of how much she paid for certified or non-certified staff for Tuesday night. She noted also that the total amount we pay on special education is in the budget plus the out-of-district tuition we receive.

Mrs. Vadas stated that was an expenditure offset and included in the transition program.

Dr. Rodrigue said it was there to support the program.

Ms. Zukowski said it would be interesting to know what that offset was in special education. On page 128 the contingency line still shows the \$100,000. We talked about the five-year average and asked if that should be hiked up to the five-year average or take off the part of that bullet. She wants the report to be stricken from page 7 with everything we are dealing with.

Mr. Cruson noted we voted on the bullet on page 7 before the budget was made. We don't need to amend it to strike a part of one of those bullets. There is a valid discussion on amending the budget to meet that goal.

Mrs. Ku said we should be fully funding that special education line. The motion when we added that to our goals was a good one.

Ms. Zukowski state we could plan on putting in some surplus at the end of the year into the non-lapsing account over and above the \$100,000.

Mr. Delia was very alarmed with students not being engaged virtually. What will be our need next year to help students catch up?

Dr. Longobucco said we are adequately staffed in this area. We are not doing home visits so it's hard to connect with many of the students. It's not a staffing issue. Now with more students back it's starting to fix itself.

Mr. Delia asked if we were anticipating more of a need at the student level. A lot are not engaged and we will need more counselors or social works when they return to school.

Dr. Longobucco stated we won't need more than we have now.

Mr. Delia referred to enrollment being a concern because we are using the study before Covid happened which shows significant increase in certain populations and what would happen if we hire teachers and the enrollment doesn't go up.

Dr. Rodrigue has looked at Prowda's predictions for this year which were pretty much right on target. This kind of things happens even without Covid. If it's a wash in a certain grade level or plus or minus in another grade we will utilize a staff member in another area. We see that happening here. We added a plus one at Hawley, Sandy Hook, and Head O'Meadow. Middle Gate was plus one and minus so it was a wash. We looked at problem areas by grade and go through this every year. We look at the predictions but it was much harder this year because we had students pulled out of school for a year. With the challenges this year we also have the retirement package and attrition. We don't do scheduling until after the budget is in place. She feels these figures are accurate in a year of uncertainty. The biggest concern she has is the mobility which will be a factor but feels confident we did our due diligence with the predictions.

Mr. Delia asked the timing of hiring if the Board approves these new hires.

Dr. Rodrigue said we wait until the budget is approved to fill new positions.

Ms. Zukowski agreed with Mr. Delia but felt more comfortable after receiving information from a real estate agent. If you look from last December to this past December we are running 150 single family houses higher in pending sales. She is more confident we will have more students than we anticipate.

Mrs. Ku feels the Prowda projections are more accurate.

Dr. Rodrigue said that in discussions with area superintendents Prowda has been extremely accurate.

Mr. Moretti noted that he is supposed to add a fourth kindergarten section at Hawley. By the time the budget passes and if we are significantly lower than the projections he will notify Dr. Rodrigue and then monitor it. That position may be needed at another school if not in his.

Mr. Delia said his concerns are not just at the elementary level. They also predicted high school would go down. He wants to make sure we are best prepared to serve every student in all grades.

Mrs. Leidlein said it was important to make data-driven decisions. There have been teachers hired and moved within their grade level. If there is a need in an area it is normally offset by a need in another area. She trusted the data regarding staffing and the dollar amounts. We need to take a lot of things into consideration like reassignments and moving. She was comfortable with the process.

Ms. Zukowski asked if we don't have as many in the elementary schools and find we are short a teacher in the high school if we would be able to use that money to hire for the high school.

Mrs. Vadas said we could hire for any school with those funds.

Mr. Delia said when he joined the Board they chose not to use the paid for company predictions and use our own internal numbers so he is skeptical of this report.

Mrs. Vadas said at that time we used Milone and MacBroom which was an outdated study. We had the Prowda study the following year.

Dr. Longobucco appreciates Mr. Delia's and Ms. Zukowski's concerns but a six student change is different in the high school from an elementary school. It's much easier at the high school. The numbers are not that concerning for her at the high school.

Mr. Delia asked Mr. Gerbert the cost of painting a classroom and how he would prioritize doing that job.

Mr. Gerbert said the principals give us requests but a lot of it comes down to custodians recognizing needs through inspections and taking feedback.

Mr. Delia asked for the cost by the next meeting.

Item 6 – Public Participation

MOTION: Mrs. Leidlein moved to adjourn. Mr. Cruson seconded. Motion passes unanimously.

Item 7 – Adjournment

The meeting adjourned at 8:23 p.m.

Respectfully submitted:

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Daniel J. Cruson, Jr.  
Secretary

**Please note: These minutes are pending Board approval.  
Board of Education  
Newtown, Connecticut**

Minutes of the Board of Education virtual meeting held February 2, 2021 at 7:00 p.m.

M. Ku, Chair	L. Rodrigue
D. Delia, Vice Chair	A. Uberti
D. Cruson, Secretary	T. Vadas
D. Leidlein	12 Staff
J. Vouros	2 Press
R. Harriman-Stites	Public by phone
D. Zukowski	

Mrs. Ku called the meeting to order at 7:01 p.m. and stated it was being recorded and live streamed.

Item 1 – Pledge of Allegiance

Item 2 – Public Participation

Melissa Beylouni, 15 Equestrian Ridge, was there speaking for herself and not as the middle school PTA president. She was saddened to hear Mrs. Volpacchio was retiring and was concerned about the elimination of the Family and Consumer Science course and felt it was a mistake to do this. The students enjoy the class which is very valuable because it facilitates teamwork. The exposure to cooking could lead to interest in culinary at the high school. Her older son enjoyed the class and she suggested polling the students.

Katie Burke, 48 Taunton Hill Road, echoed what Mrs. Beylouni said and was also very disappointed that this class was going away. Her children love to cook and these are important life skills and feeds into the high school programs. It should be added back if possible.

Item 3 – Discussion and Possible Action on Communications Sub-Committee Newsletter

MOTION: Mr. Delia moved that the Board of Education approve the Communications Sub-committee Newsletter. Mr. Cruson seconded.

Mr. Cruson said this was the culmination of a few months of work focused on the importance of technology and how it is normally used in the district.

Mrs. Ku appreciated all the work that went into this and it comes at a great time as technology is so valued in our budget.

Motion passes unanimously.

Item 4 – Discussion and Possible Adoption of 2021-2022 Budget

MOTION: Mr. Delia moved that the Board of Education adopt the Superintendent's recommended budget for \$81,080,697. Mr. Cruson seconded

Mr. Delia had two technical motions.

MOTION: Mr. Delia moved that Board of Education amend the motion and accept the technical adjustments as presented for a total reduction of \$42,951. Mr. Cruson seconded.

Dr. Rodrigue spoke about the adjustments which included the special education grant reallocation, workers compensation, liability insurance, property insurance, non-certified salaries, Head O'Meadow duct cleaning, and the graphics lab from the Perkins Grant. Motion passes unanimously.

MOTION: Mr. Delia moved that the Board of Education amend the motion to accept the adjustments based on anticipated ESSR II funds as presented for a reduction of \$390,276. Mr. Cruson seconded.

Dr. Rodrigue said the amount is close to \$625,000 and we decided to look at areas that were important going into next year's budget. These funds go through 2023. The adjustments include the special education teacher at Middle Gate and two at the middle school, the reading and math interventionists in the elementary schools, curriculum for the differentiation/co-teaching model for staff development, the MERV filters for the air quality system, and the middle school math interventionist. We feel these are all appropriate uses of the funds.

Mr. Delia asked if there were other uses for this fund beyond \$390,000.

Dr. Rodrigue said there were but we wanted to reserve some funding and things may come up in March or April such as a more robust summer program for students and technology costs.

Ms. Zukowski stated that will have an expanded summer school. If we use all of this money this year we will start next year \$600,000-plus in the hole and asked if we can take some of that to use for Covid-related funding.

Dr. Rodrigue said we want to look at the summer program which wasn't budgeted for. They also mentioned there is additional funding coming which is pretty certain. We still feel we will have enough funding the following year. She agrees about the summer program.

Motion passes unanimously.

MOTION: Mrs. Harriman-Stites moved to amend the motion that \$35,000 be added to the general services budget contracted services line for consultants to assist in the continued work of the diversity and equity subcommittee including a plan for an equity audit on the curriculum and teaching practices. Mrs. Leidlein seconded.

Mrs. Harriman-Stites noted that we discussed this at the previous meeting and came up with the amount based on what other districts are doing. This will put us in a place to begin the curriculum and equity audit, which is a large project.

Mrs. Leidlein agreed and had also wanted to add money for this. As long as we have the momentum and motivation we need to keep this moving forward and was in full support of this motion.

Motion passes unanimously.

Mr. Delia asked the cost for painting a classroom.

Mr. Gerbert stated that it would be \$2,600 using an outside vendor based on classrooms of 800 square feet.

Mr. Delia asked the number of rooms in the old part of Hawley School to which he said there were approximately a dozen.

MOTION: Mr. Delia moved to add \$30,000 to the building and site maintenance budget to paint rooms in the front of Hawley School. Mr. Vouros seconded.

Mr. Gerbert noted that with the proposed HVAC project we could capture painting in that work or it might be better to wait until the work is completed.

Mr. Delia feels these rooms need to be painted in the best interest of teachers and students. If we paint the walls and trim he doesn't think it will get damaged when the work is being done.

Ms. Zukowski asked to hear what Mr. Moretti feels about it for this year or after the HVAC work.

Mr. Moretti said he and Mr. Gerbert speak about this during every budget cycle. We did paint a couple of rooms during remote learning when they were empty. We can identify the ones in the most need. Knowing the project is being sectioned over a couple of years he would welcome a conversation with Mr. Gerbert regarding painting.

Ms. Zukowski asked how many rooms needed painting in the 29 Building.

Mr. Moretti said possibly seven rooms with three on the top floor and four other classrooms in the school.

MOTION: Mr. Delia moved to amend the motion to add \$18,200 for seven rooms.

Mrs. Harriman-Stites seconded.

Mr. Vouros asked if it was possible for the custodians to paint these rooms over the summer rather than contract out.

Mr. Gerbert said the custodians can do the painting and we could explore that alternative.

Ms. Zukowski asked the price if the painting could be done in-house.

Mr. Gerbert responded we could do it this summer and the cost would possibly go down to \$500 per room.

Mrs. Ku asked if Hawley had more of a need for painting rooms compared to other schools.

Mr. Gerbert said there is always room to repaint a room every couple of years so they are clean and fresh feel for staff and students.

Ms. Zukowski clarified we could paint the seven rooms for approximately \$3,500 to which Mr. Gerbert agreed.

Vote on the amendment to add \$18,200 for painting: 2 ayes, 5 nays (Mrs. Ku, Mr. Cruson, Mrs. Leidlein, Mr. Vouros, Ms. Zukowsk) Motion fails.

MOTION: Ms. Zukowski moved to amend the amendment to add \$3,500 to the budget for painting seven needed classrooms.

Mr. Cruson seconded.

Ms. Zukowski clarified her motion to give Mr. Gerbert some flexibility if there are classrooms that needed painting in other schools with the default of seven classrooms in Hawley.

Mr. Vouros said the money is for painting classrooms at Hawley. If others in the district need painting we need to know that now or we can find other money to give to Mr. Gerbert so he can paint those rooms. Mr. Delia's concern was for Hawley, not elsewhere.

Vote: 1 aye, 6 nays (Mrs. Ku, Mr. Delia, Mr. Cruson, Mrs. Leidlein, Mr. Vouros, Mrs. Harriman-Stites)) Motion fails.

MOTION: Ms. Zukowski moved to amend the amendment to add \$3,500 to paint seven rooms in Hawley School. Mr. Vouros seconded.

Vote: 2 ayes, 5 nays (Mrs. Ku, Mr. Cruson, Mrs. Leidlein, Mrs. Harriman-Stites, Ms. Zukowski) Motion fails.



Vote on adding \$30,000: 1 aye, 6 nays (Mrs. Ku, Mr. Cruson, Mrs. Leidlein, Mr. Vouros, Mrs. Harriman-Stites, Ms. Zukowski) Motion fails.

Ms. Zukowski asked about the ESSER II adjustments for summer school and if it will impact the budget.

Dr. Rodrigue said the summer school we are discussing is not budgeted now so there are no appropriations for it.

Mrs. Ku said the budget amount is \$80,682,470 which is a 2.58% increase.

Vote on Superintendent's budget as amended: Motion passes unanimously.

Mrs. Ku referred to the parent comments about the middle school course being eliminated and there wasn't a budget adjustment for that.

Dr. Rodrigue noted the Family and Consumer Science was in the reduction and two courses are yet to be determined.

MOTION: Mr. Delia moved to direct the business office to prepare the final budget and authorize the Director of Business to make any technical and arithmetical changes.

Mr. Cruson seconded. Motion passes unanimously.

Mrs. Leidlein thanked Mrs. Vadas and appreciated her hard work, diligence and thorough answers through the budget process.

#### Item 5 – Public Participation

MOTION: Mr. Delia moved to adjourn. Mr. Cruson seconded. Motion passes unanimously.

#### Item 6 – Adjournment

The meeting adjourned at 8:10 p.m.

Respectfully submitted:

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Daniel J. Cruson, Jr  
Secretary

**NEWTOWN BOARD OF EDUCATION  
MONTHLY FINANCIAL REPORT  
JANUARY 31, 2021**

**SUMMARY**

The seventh report of the 2020-21 school year continues to provide year to date expenses, active encumbrances, anticipated obligations and year-to-date transfers. A majority of accounts such as instructional supplies, postage and printing are estimated as full budget spend and captured in the anticipated obligation column. Full year forecasting and account analysis continue for unencumbered accounts, such as transportation and utilities. These amounts can also be found in the anticipated obligations column.

The overall projected year end position has changed from \$136,982 to -\$54,059; the primary driver coming from the salary accounts.

During the month of December, The Board of Education spent approximately \$7.5M; \$4.0M on salaries; \$2.2M on benefits (the third quarter installment was made to our self-insurance fund for \$2.0M), and approximately \$1.3M on all other objects.

The excess cost grant has been adjusted by the State and accounts for an additional \$65,732 above our current estimate, yielding a reimbursement rate of 83.54% (the reimbursement rate typically runs between 72% – 75%). The grant will be re-calculated at the end of February (due to the State by March 1<sup>st</sup>) and adjustments will be made within the May deposit. Seventy-five percent of the deposit is made in February with the remaining twenty-five percent deposited in May.

**Salary**

The overall salary account is showing a negative balance of -\$143,147. The balance has decreased by \$156,929 over the prior month and the driver of this change is due to the following:

- We have included an additional four teaching positions with one-year assignments (Board approved January 19, 2021). These teachers will fill in the gaps where teacher coverage is required. The estimated amount for these positions is \$96,000.
- There were other various small changes within the certified salaries with the largest change coming from a teaching position that was replaced in January.
- We have included an estimate in the paraprofessional account along with re-balancing the salary encumbrance which has resulted in a reduction to the balance by \$43,659.
- We are still showing a large deficient in the certified turnover account which will most likely remain unchanged through the balance of the year.

**Employee Benefits**

The balance in this account has improved by \$8,239 due to less unemployment claims.

## **Professional Services**

The balance in this account has changed by -\$1,780 due to an estimated increase in professional educational services.

## **Purchased Property Services**

These accounts contain costs such as building & grounds contracted services, building site & emergency repairs, equipment repairs and building equipment. Overall the change in these account resulted in a decrease of \$4,834.

## **Other Purchased Services**

The overall balance in these accounts was reduced by \$5,022.

- Out estimated balance in contracted services, primarily for the lunch program, has increased by \$38,193.
- Out of district tuition has decreased by -\$38,451
- Small changes in student & staff travel as well as communications resulted in -\$4,764.

## **Supplies**

The overall change in this account was a decrease of \$24,747; primarily coming from the purchase of additional plant supplies.

- We will continue to monitor these supplies and track all COVID related expenses.
- There was a small increase in the electricity balance as we continue to re-evaluate our virtual net metering credits on a monthly basis.

## **Property**

Slight changes in property & equipment as we continue to assess our needs in technology.

## **Emergency Repairs**

There were no emergency repairs for the month of January

**NEWTOWN BOARD OF EDUCATION  
2020-21 BUDGET SUMMARY REPORT  
FOR THE MONTH ENDING JANUARY 31, 2021**

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2019 - 2020	2020 - 2021 APPROVED BUDGET	YTD TRANSFERS 2020 - 2021	CURRENT BUDGET	YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE	% EXP
<b><u>GENERAL FUND BUDGET</u></b>											
100	SALARIES	\$ 49,586,526	\$ 51,044,554	\$ -	\$ 51,044,554	\$ 25,045,101	\$ 25,230,779	\$ 768,674	\$ 911,821	\$ (143,147)	100.28%
200	EMPLOYEE BENEFITS	\$ 11,126,524	\$ 11,435,283	\$ -	\$ 11,435,283	\$ 8,333,019	\$ 2,143,116	\$ 959,147	\$ 987,608	\$ (28,460)	100.25%
300	PROFESSIONAL SERVICES	\$ 659,940	\$ 751,382	\$ -	\$ 751,382	\$ 252,110	\$ 51,479	\$ 447,792	\$ 372,315	\$ 75,477	89.95%
400	PURCHASED PROPERTY SERV.	\$ 2,304,638	\$ 1,884,463	\$ -	\$ 1,884,463	\$ 1,057,367	\$ 421,267	\$ 405,829	\$ 428,373	\$ (22,544)	101.20%
500	OTHER PURCHASED SERVICES	\$ 8,823,709	\$ 9,314,942	\$ -	\$ 9,314,942	\$ 5,182,913	\$ 4,397,014	\$ (264,985)	\$ (455,804)	\$ 190,819	97.95%
600	SUPPLIES	\$ 3,347,825	\$ 3,498,335	\$ -	\$ 3,498,335	\$ 1,879,304	\$ 197,456	\$ 1,421,575	\$ 1,297,208	\$ 124,367	96.44%
700	PROPERTY	\$ 831,904	\$ 549,402	\$ -	\$ 549,402	\$ 498,251	\$ 295,501	\$ (244,350)	\$ 7,525	\$ (251,875)	145.85%
800	MISCELLANEOUS	\$ 66,090	\$ 73,415	\$ -	\$ 73,415	\$ 56,191	\$ 2,853	\$ 14,371	\$ 13,067	\$ 1,303	98.22%
910	SPECIAL ED CONTINGENCY	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ -	\$ 100,000	\$ 100,000	\$ -	100.00%
<b>TOTAL GENERAL FUND BUDGET</b>		\$ 76,747,157	\$ 78,651,776	\$ -	\$ 78,651,776	\$ 42,304,257	\$ 32,739,466	\$ 3,608,053	\$ 3,662,112	\$ (54,059)	100.07%
900	TRANSFER NON-LAPSING										
<b>GRAND TOTAL</b>		\$ 76,747,157	\$ 78,651,776	\$ -	\$ 78,651,776	\$ 42,304,257	\$ 32,739,466	\$ 3,608,053	\$ 3,662,112	\$ (54,059)	100.07%

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2019 - 2020	2020 - 2021 APPROVED BUDGET	YTD TRANSFERS 2020 - 2021	CURRENT BUDGET	YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE	% EXP
<b>100</b>	<b>SALARIES</b>										
	Administrative Salaries	\$ 4,163,820	\$ 4,160,309	\$ 11,430	\$ 4,171,739	\$ 2,461,653	\$ 1,706,026	\$ 4,060	\$ 4,059	\$ 1	100.00%
	Teachers & Specialists Salaries	\$ 31,619,798	\$ 32,219,745	\$ (11,430)	\$ 32,208,315	\$ 15,114,687	\$ 17,449,766	\$ (356,138)	\$ 12,620	\$ (368,758)	101.14%
	Early Retirement	\$ 32,000	\$ 16,000	\$ -	\$ 16,000	\$ 16,000	\$ -	\$ -	\$ -	\$ -	100.00%
	Continuing Ed./Summer School	\$ 92,408	\$ 93,096	\$ -	\$ 93,096	\$ 50,495	\$ 19,411	\$ 23,190	\$ 3,750	\$ 19,440	79.12%
	Homebound & Tutors Salaries	\$ 88,213	\$ 185,336	\$ -	\$ 185,336	\$ 32,246	\$ 11,785	\$ 141,306	\$ 138,702	\$ 2,603	98.60%
	Certified Substitutes	\$ 548,648	\$ 698,193	\$ -	\$ 698,193	\$ 355,414	\$ 318,110	\$ 24,669	\$ 166,220	\$ (141,551)	120.27%
	Coaching/Activities	\$ 643,256	\$ 656,571	\$ -	\$ 656,571	\$ 335,746	\$ -	\$ 320,825	\$ 287,423	\$ 33,401	94.91%
	Staff & Program Development	\$ 173,319	\$ 143,517	\$ -	\$ 143,517	\$ 91,635	\$ 28,729	\$ 23,154	\$ 70,200	\$ (47,046)	132.78%
	<b>CERTIFIED SALARIES</b>	<b>\$ 37,361,462</b>	<b>\$ 38,172,767</b>	<b>\$ -</b>	<b>\$ 38,172,767</b>	<b>\$ 18,457,877</b>	<b>\$ 19,533,826</b>	<b>\$ 181,065</b>	<b>\$ 682,975</b>	<b>\$ (501,910)</b>	<b>101.31%</b>
	Supervisors & Technology Salaries	\$ 917,739	\$ 945,154	\$ 50,245	\$ 995,399	\$ 605,821	\$ 386,819	\$ 2,758	\$ 9,252	\$ (6,494)	100.65%
	Clerical & Secretarial Salaries	\$ 2,310,741	\$ 2,362,981	\$ (69,514)	\$ 2,293,467	\$ 1,246,943	\$ 968,320	\$ 78,204	\$ 16,885	\$ 61,319	97.33%
	Educational Assistants	\$ 2,743,151	\$ 2,875,564	\$ -	\$ 2,875,564	\$ 1,300,906	\$ 1,384,527	\$ 190,131	\$ 17,947	\$ 172,184	94.01%
	Nurses & Medical Advisors	\$ 764,244	\$ 801,532	\$ 58,592	\$ 860,124	\$ 389,646	\$ 464,047	\$ 6,430	\$ 12,500	\$ (6,070)	100.71%
	Custodial & Maint. Salaries	\$ 3,144,919	\$ 3,263,032	\$ -	\$ 3,263,032	\$ 1,801,155	\$ 1,364,190	\$ 97,686	\$ 20,694	\$ 76,992	97.64%
	Non-Certied Adj & Bus Drivers Salaries	\$ 22,043	\$ 81,607	\$ (56,022)	\$ 25,585	\$ 8,003	\$ 19,549	\$ (1,967)	\$ 17,500	\$ (19,467)	176.09%
	Career/Job Salaries	\$ 117,954	\$ 183,209	\$ (32,281)	\$ 150,928	\$ (9,944)	\$ 88,659	\$ 72,213	\$ 11,000	\$ 61,213	59.44%
	Special Education Svcs Salaries	\$ 1,224,685	\$ 1,355,856	\$ 48,980	\$ 1,404,836	\$ 666,896	\$ 713,214	\$ 24,726	\$ (49,201)	\$ 73,927	94.74%
	Security Salaries & Attendance	\$ 594,071	\$ 621,957	\$ -	\$ 621,957	\$ 305,560	\$ 305,652	\$ 10,744	\$ -	\$ 10,744	98.27%
	Extra Work - Non-Cert.	\$ 141,823	\$ 115,447	\$ -	\$ 115,447	\$ 103,542	\$ 1,975	\$ 9,929	\$ 21,448	\$ (11,519)	109.98%
	Custodial & Maint. Overtime	\$ 214,479	\$ 233,448	\$ -	\$ 233,448	\$ 167,829	\$ -	\$ 65,619	\$ 122,000	\$ (56,381)	124.15%
	Civic Activities/Park & Rec.	\$ 29,216	\$ 32,000	\$ -	\$ 32,000	\$ 866	\$ -	\$ 31,134	\$ 28,821	\$ 2,313	92.77%
	<b>NON-CERTIFIED SALARIES</b>	<b>\$ 12,225,064</b>	<b>\$ 12,871,787</b>	<b>\$ -</b>	<b>\$ 12,871,787</b>	<b>\$ 6,587,225</b>	<b>\$ 5,696,953</b>	<b>\$ 587,609</b>	<b>\$ 228,846</b>	<b>\$ 358,763</b>	<b>97.21%</b>
	<b>SUBTOTAL SALARIES</b>	<b>\$ 49,586,526</b>	<b>\$ 51,044,554</b>	<b>\$ -</b>	<b>\$ 51,044,554</b>	<b>\$ 25,045,101</b>	<b>\$ 25,230,779</b>	<b>\$ 768,674</b>	<b>\$ 911,821</b>	<b>\$ (143,147)</b>	<b>100.28%</b>

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2019 - 2020	2020 - 2021 APPROVED BUDGET	YTD TRANSFERS 2020 - 2021	CURRENT BUDGET	YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE	% EXP
<b>200</b>	<b>EMPLOYEE BENEFITS</b>										
	Medical & Dental Expenses	\$ 8,051,502	\$ 8,289,180	\$ -	\$ 8,289,180	\$ 6,231,372	\$ 2,036,568	\$ 21,240	\$ 21,240	\$ -	100.00%
	Life Insurance	\$ 86,352	\$ 86,760	\$ -	\$ 86,760	\$ 50,625	\$ -	\$ 36,135	\$ 36,135	\$ -	100.00%
	FICA & Medicare	\$ 1,523,488	\$ 1,602,597	\$ -	\$ 1,602,597	\$ 813,490	\$ -	\$ 789,107	\$ 789,107	\$ -	100.00%
	Pensions	\$ 863,104	\$ 913,394	\$ -	\$ 913,394	\$ 827,916	\$ 500	\$ 84,978	\$ 84,978	\$ -	100.00%
	Unemployment & Employee Assist.	\$ 122,970	\$ 82,000	\$ -	\$ 82,000	\$ 69,460	\$ -	\$ 12,540	\$ 41,000	\$ (28,460)	134.71%
	Workers Compensation	\$ 479,108	\$ 461,352	\$ -	\$ 461,352	\$ 340,155	\$ 106,049	\$ 15,148	\$ 15,148	\$ -	100.00%
	<b>SUBTOTAL EMPLOYEE BENEFITS</b>	<b>\$ 11,126,524</b>	<b>\$ 11,435,283</b>	<b>\$ -</b>	<b>\$ 11,435,283</b>	<b>\$ 8,333,019</b>	<b>\$ 2,143,116</b>	<b>\$ 959,147</b>	<b>\$ 987,608</b>	<b>\$ (28,460)</b>	100.25%
<b>300</b>	<b>PROFESSIONAL SERVICES</b>										
	Professional Services	\$ 500,341	\$ 559,102	\$ -	\$ 559,102	\$ 195,440	\$ 47,595	\$ 316,067	\$ 302,861	\$ 13,206	97.64%
	Professional Educational Serv.	\$ 159,599	\$ 192,280	\$ -	\$ 192,280	\$ 56,670	\$ 3,884	\$ 131,726	\$ 69,454	\$ 62,272	67.61%
	<b>SUBTOTAL PROFESSIONAL SERV.</b>	<b>\$ 659,940</b>	<b>\$ 751,382</b>	<b>\$ -</b>	<b>\$ 751,382</b>	<b>\$ 252,110</b>	<b>\$ 51,479</b>	<b>\$ 447,792</b>	<b>\$ 372,315</b>	<b>\$ 75,477</b>	89.95%
<b>400</b>	<b>PURCHASED PROPERTY SERV.</b>										
	Buildings & Grounds Contracted Svc.	\$ 716,095	\$ 664,859	\$ -	\$ 664,859	\$ 424,255	\$ 167,018	\$ 73,586	\$ 83,463	\$ (9,877)	101.49%
	Utility Services - Water & Sewer	\$ 134,403	\$ 146,945	\$ -	\$ 146,945	\$ 66,190	\$ -	\$ 80,755	\$ 82,755	\$ (2,000)	101.36%
	Building, Site & Emergency Repairs	\$ 503,227	\$ 460,850	\$ -	\$ 460,850	\$ 279,494	\$ 88,134	\$ 93,223	\$ 118,712	\$ (25,489)	105.53%
	Equipment Repairs	\$ 283,175	\$ 351,506	\$ -	\$ 351,506	\$ 150,670	\$ 72,042	\$ 128,794	\$ 112,008	\$ 16,787	95.22%
	Rentals - Building & Equipment	\$ 268,547	\$ 260,303	\$ -	\$ 260,303	\$ 136,759	\$ 94,073	\$ 29,471	\$ 31,435	\$ (1,964)	100.75%
	Building & Site Improvements	\$ 399,191	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	<b>SUBTOTAL PUR. PROPERTY SERV.</b>	<b>\$ 2,304,638</b>	<b>\$ 1,884,463</b>	<b>\$ -</b>	<b>\$ 1,884,463</b>	<b>\$ 1,057,367</b>	<b>\$ 421,267</b>	<b>\$ 405,829</b>	<b>\$ 428,373</b>	<b>\$ (22,544)</b>	101.20%

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2019 - 2020	2020 - 2021 APPROVED BUDGET	YTD TRANSFERS 2020 - 2021	CURRENT BUDGET	YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE	% EXP
<b>500</b>	<b>OTHER PURCHASED SERVICES</b>										
	Contracted Services	\$ 750,419	\$ 669,215	\$ -	\$ 669,215	\$ 601,165	\$ 55,172	\$ 12,878	\$ 249,367	\$ (236,489)	135.34%
	Transportation Services	\$ 3,827,061	\$ 4,457,135	\$ -	\$ 4,457,135	\$ 1,996,726	\$ 1,694,746	\$ 765,663	\$ 445,894	\$ 319,769	92.83%
	Insurance - Property & Liability	\$ 378,323	\$ 378,032	\$ -	\$ 378,032	\$ 301,786	\$ 80,007	\$ (3,760)	\$ 284	\$ (4,044)	101.07%
	Communications	\$ 142,944	\$ 146,872	\$ -	\$ 146,872	\$ 80,917	\$ 91,902	\$ (25,946)	\$ (24,851)	\$ (1,095)	100.75%
	Printing Services	\$ 24,637	\$ 31,040	\$ -	\$ 31,040	\$ 4,731	\$ 5,493	\$ 20,816	\$ 20,816	\$ -	100.00%
	Tuition - Out of District	\$ 3,527,920	\$ 3,399,851	\$ -	\$ 3,399,851	\$ 2,165,079	\$ 2,367,827	\$ (1,133,055)	\$ (1,195,965)	\$ 62,910	98.15%
	Student Travel & Staff Mileage	\$ 172,406	\$ 232,797	\$ -	\$ 232,797	\$ 32,510	\$ 101,868	\$ 98,419	\$ 48,651	\$ 49,768	78.62%
	<b>SUBTOTAL OTHER PURCHASED SERV.</b>	\$ 8,823,709	\$ 9,314,942	\$ -	\$ 9,314,942	\$ 5,182,913	\$ 4,397,014	\$ (264,985)	\$ (455,804)	\$ 190,819	97.95%
<b>600</b>	<b>SUPPLIES</b>										
	Instructional & Library Supplies	\$ 805,612	\$ 801,275	\$ -	\$ 801,275	\$ 462,831	\$ 104,199	\$ 234,245	\$ 240,957	\$ (6,713)	100.84%
	Software, Medical & Office Supplies	\$ 212,777	\$ 221,701	\$ -	\$ 221,701	\$ 98,581	\$ 36,127	\$ 86,994	\$ 90,278	\$ (3,284)	101.48%
	Plant Supplies	\$ 423,659	\$ 356,400	\$ -	\$ 356,400	\$ 379,295	\$ 52,907	\$ (75,802)	\$ 94,839	\$ (170,641)	147.88%
	Electric	\$ 1,164,615	\$ 1,228,072	\$ -	\$ 1,228,072	\$ 581,324	\$ -	\$ 646,748	\$ 346,748	\$ 300,000	75.57%
	Propane & Natural Gas	\$ 347,253	\$ 431,350	\$ -	\$ 431,350	\$ 150,514	\$ -	\$ 280,836	\$ 262,336	\$ 18,500	95.71%
	Fuel Oil	\$ 76,257	\$ 63,000	\$ -	\$ 63,000	\$ 24,619	\$ -	\$ 38,381	\$ 38,381	\$ -	100.00%
	Fuel for Vehicles & Equip.	\$ 122,159	\$ 205,031	\$ -	\$ 205,031	\$ 65,709	\$ -	\$ 139,322	\$ 89,478	\$ 49,844	75.69%
	Textbooks	\$ 195,495	\$ 191,506	\$ -	\$ 191,506	\$ 116,431	\$ 4,223	\$ 70,853	\$ 134,191	\$ (63,338)	133.07%
	<b>SUBTOTAL SUPPLIES</b>	\$ 3,347,825	\$ 3,498,335	\$ -	\$ 3,498,335	\$ 1,879,304	\$ 197,456	\$ 1,421,575	\$ 1,297,208	\$ 124,367	96.44%

OBJECT CODE	EXPENSE CATEGORY	EXPENDED 2019 - 2020	2020 - 2021 APPROVED BUDGET	YTD TRANSFERS 2020 - 2021	CURRENT BUDGET	YTD EXPENDITURE	ENCUMBER	BALANCE	ANTICIPATED OBLIGATIONS	PROJECTED BALANCE	% EXP
<b>700</b>	<b>PROPERTY</b>										
	Technology Equipment	\$ 559,515	\$ 410,000	\$ -	\$ 410,000	\$ 464,100	\$ 193,067	\$ (247,167)	\$ -	\$ (247,167)	160.28%
	Other Equipment	\$ 272,389	\$ 139,402	\$ -	\$ 139,402	\$ 34,151	\$ 102,434	\$ 2,817	\$ 7,525	\$ (4,708)	103.38%
	<b>SUBTOTAL PROPERTY</b>	\$ 831,904	\$ 549,402	\$ -	\$ 549,402	\$ 498,251	\$ 295,501	\$ (244,350)	\$ 7,525	\$ (251,875)	145.85%
<b>800</b>	<b>MISCELLANEOUS</b>										
	<b>Memberships</b>	\$ 66,090	\$ 73,415	\$ -	\$ 73,415	\$ 56,191	\$ 2,853	\$ 14,371	\$ 13,067	\$ 1,303	98.22%
	<b>SUBTOTAL MISCELLANEOUS</b>	\$ 66,090	\$ 73,415	\$ -	\$ 73,415	\$ 56,191	\$ 2,853	\$ 14,371	\$ 13,067	\$ 1,303	98.22%
<b>910</b>	<b>SPECIAL ED CONTINGENCY</b>	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ -	\$ 100,000	\$ 100,000	\$ -	100.00%
	<b>TOTAL LOCAL BUDGET</b>	\$ 76,747,157	\$ 78,651,776	\$ -	\$ 78,651,776	\$ 42,304,257	\$ 32,739,466	\$ 3,608,053	\$ 3,662,112	\$ (54,059)	100.07%

<b>REVENUES</b>					
<u>EXCESS COST GRANT REVENUE</u>	<u>EXPENDED 2019 - 2020</u>	<u>APPROVED BUDGET</u>	<u>ANTICIPATED OFFSET</u>		
Special Education Svcs Salaries ECG	\$ (33,039)	\$ (26,247)	\$ (39,115)	149.03%	
Transportation Services - ECG	\$ (354,206)	\$ (402,480)	\$ (244,709)	60.80%	
Tuition - Out of District ECG	\$ (1,372,981)	\$ (1,381,462)	\$ (1,195,965)	86.57%	
<b>Total</b>	\$ (1,760,226)	\$ (1,810,189)	\$ (1,479,789)	81.75%	
<b>OTHER REVENUES</b>					
<u>BOARD OF EDUCATION FEES &amp; CHARGES - SERVICES</u>		<u>APPROVED BUDGET</u>	<u>RECEIVED</u>	<u>BALANCE</u>	<u>% RECEIVED</u>
LOCAL TUITION		\$32,340	\$15,150	\$17,190	46.85%
HIGH SCHOOL FEES FOR PARKING PERMITS		\$30,000	\$0	\$30,000	0.00%
MISCELLANEOUS FEES		\$6,000	\$1,603	\$4,397	26.71%
<b>TOTAL SCHOOL GENERATED FEES</b>		\$68,340	\$16,753	\$51,587	24.51%
<u>OTHER GRANT / SPECIAL REVENUE OFFSETS</u>					
Corona Releif Grant - State Entitlement Grant		\$380,841	\$380,841		100.00%
Town Municipal Portion of CRF Grant		\$165,000	\$165,000		100.00%
Town Capital Non-recurring Revenue Fund		\$400,000	\$400,000		100.00%



**Board of Education COVID related expenses, offsets and 2020-21 budget balance**

***As of January 31, 2021***

<u>Category</u>	<u>Expense</u>	<u>Offset</u>	<u>Balance</u>
Additional Nurse Hours (incl .8 FTE)	\$110,844		
Increased Para Hours	\$24,435		
Custodial Overtime for Additional Cleaning	\$93,168		
Teacher Coverage	\$313,457		
Other Student Related Costs	\$158,715		
Desk Shields & Protective Gear	\$204,123		
Furniture, Fixtures & Storage	\$139,754		
Air Purification	\$89,299		
Disinfectant & Sanitizers	\$128,268		
Technology Devices	\$734,666		
Other Technology (cameras' microphones, etc)	\$166,545		
School Lunch Program	\$247,558		
Misc School Supplies	\$73,502		
<b>COVID related expenses to Date</b>			<b>-\$2,484,332</b>
<b><u>Grant &amp; Town Revenue Offsets</u></b>			
Corona Relief Grant		\$380,842	
Town Capital Nonrecurring Fund		\$400,000	
Municipal Portion CRF Grant		\$165,000	
	<b>Total Revenue Offsets</b>		<b>\$945,842</b>
<b><u>COVID Savings Within Budget</u></b>			
Transportation & Fuel		\$360,000	
Student & Staff Travel		\$50,000	
Non-certified Salary		\$190,000	
Summer School & Activity Salaries		\$50,000	
Professional Development		\$40,000	
	<b>Total COVID Related Savings</b>		<b>\$690,000</b>
<b>Subtotal Expense, Offsets &amp; BOE Budget Balance</b>	<b>\$2,484,332</b>	<b>\$1,635,842</b>	<b>-\$848,490</b>
	<b>Potential Additional Offsets</b>		<b>\$380,000</b>
	(additional energy, fuel, PD)		
	<b>Various Other Balances*</b>		<b>\$414,431</b>
<i>*balances in these accounts are currently "carrying" the additional expenses; however, these accounts should not be considered potential offsets at this time</i>			
<b>Total Expense, Offset &amp; BOE Budget Balance</b>	<b>\$2,484,332</b>	<b>\$1,635,842</b>	<b>-\$54,059</b>



5 Curriculum Developers

Unit:	Lessons	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
		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
Graphs and Functions	✓ 0	█									
Solving	✓ 0	█	█								
Systems	✓ 0		█	█							
Quadratics	✓ 0			█	█	█					
Polynomial Equations	✓ 0					█	█	█	█		
Rational Equations	✓ 0										
Radical Equations	✓ 0										█



# Unit Planner: Graphs and Functions

## College Math Topics

Friday, February 5, 2021, 11:50AM

Newtown High School > 2020-2021 > High School > Mathematics > College Math Topics > Week 1 - Week 4

Last Updated: Today by Charlotte Cavatario

### Graphs and Functions

Cavatario, Charlotte; Dominick, Lauren; Hall, Eugene; Manos, Charlotte; Murphy, Kelly

- [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*

Lens: Relationship

#### Concepts

- ordered pair
- relation
- function
- continuous
- discrete
- domain
- range
- notation
- slope
- intercepts
- linear equations

#### Generalizations / Enduring Understandings

##### Strand 1

- ordered pair
- relation
- function
- continuous
- discrete

##### Generalization:

Ordered pairs create a variety of continuous or discrete relations or functions.

##### Strand 2

- domain
- range

#### 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 relationship between domain and range? (S2)
- What is the domain/range of a relation? (S2)
- What is continuous/discrete? (S1)
- What relationship exists between a function/relation and its domain? (S1/S2)
- What relationship exists between the domain of a continuous/discrete function? (S1/S2)
- What is set notation?(S2)
- What is interval notation? (S2)
- What is slope? (S3)
- What are intercepts? (S3)

- notation

Generalization:

Function notation models the relationship between domain and range.

Strand 3

- slope
- intercepts
- linear equations

Generalization:

Characteristics of linear equations including slope and intercepts determine the graph of a linear equation.

- What are the different forms of linear equations? (S3)
- How are compositions evaluated using function notation? (S2)
- How do real world situations present either discrete/continuous? (S1)
- What is the difference between a relation and a function? (S1)
- How are the input/outputs related to domain/range? (S2)

Conceptual:

- How are functions used to make predictions and are they reliable? (S1/S2/S3)

Provocative:

- What form of a linear equation is best to use for any given situation?(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.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.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.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.

## **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.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.

### **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.

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Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will

- Compare functions and relations
- Identify domain/range
- Represent relations using different methods

**Critical Content & Skills**

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

Students must be able to:

Determine whether a relation is a function using

- mapping diagrams
- ordered pairs
- graphs
- tables of values
- vertical line test

Interpret and analyze a graph

- state domain/range
  - using interval notation
  - set notation
- determine continuous/discrete
- determine slope
- identify key characteristics of a graph
  - intercepts
  - vertical/horizontal
  - parallel/perpendicular

Model relations using different methods

- graphically
- using a table
- in a mapping diagram
- write equations of lines
  - slope intercept
  - point slope
  - standard

**Core Learning Activities**

[Notes and Additional Exercise Problems.pdf](#)

**Assessments**

[Summative Test \(6 versions\).pdf](#)

[Formative Exercise Problems \(all subsections\).pdf](#)

**Resources**

*Professional & Student*

**Professional**

*Intermediate Algebra: A Graphing Approach* by Martin-Gay & Greene  
(Chapter 3)

**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.
- Analyze the affects of a sale vs discounted pricing to generalize and write own business sale plan.

**Science**

- Position, velocity and time graphs all model linear functions.





# Unit Planner: Solving College Math Topics

Friday, February 5, 2021, 11:51AM

Newtown High School > 2020-2021 > High School > Mathematics > College Math  
Topics > Week 5 - Week 8

Last Updated: Today by Charlotte  
Cavataro

## Solving

Cavataro, Charlotte; Dominick, Lauren; Hall, Eugene; Manos, Charlotte; Murphy, Kelly

- [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

Lens: balance

#### Concepts

- expression
- equality
- inequality
- inverse operations
- solutions

#### Generalizations / Enduring Understandings

##### Strand 1

- expression

##### Generalization:

Combining like terms simplifies expressions.

##### Strand 2:

- equality
- inverse operations
- solutions

##### Generalization:

Inverse operations yield solutions to an equation.

##### Strand 3:

- inequality

##### Generalization:

Inverse operations yields a set of solutions to an 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/S3)
- What is the difference between an expression and an equation?(S1/S2)
- What is an equation? (S2)
- What does equality mean? (S2)
- What is an inequality? (S2)
- What does it mean to balance an equation/inequality?(S2/S3)
- What is the solution to a linear equation? (S2)
- What is the solution(s) to a linear inequality (S3)
- When does the inequality sign change direction? (S3)
- What are possible types of solutions? (S1/S2)
- What is the difference between a solution(s) for a linear equation and a linear inequality? (S2/S3)
- How are the properties of equality applied to solve linear equations and linear inequalities? (S2/S3)
- How is a linear inequality represented on a number line? (S3)
- How are the number of solutions identified in an



equation or inequality? (S2/S3)

Conceptual:

- Is there ever a situation where there is one solution to an inequality? (S3)

Provocative:

- When is it best to use a linear equation versus a linear inequality to model a real world situation?(S2/S3)

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.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.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.

**CCSS: HS: Stats/Prob**

**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.

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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
- model 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.

- Isolate specified variables given literal equations.
- Set up and solve absolute value equations/inequalities.
- 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.
- Graph and interpret the solution to absolute value equations/inequalities on the a number line.
- Represent the solution to an inequality using interval notation.
  - make use of intersections, and unions of sets specifically for inequality solution sets

Model a real-world problem with an expression/equation/inequality and interpret the solution/outcome

- Construct and solve an equation or inequality given a real-world problem.

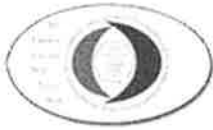
### Core Learning Activities

[Notes and Additional Exercise Problems Equations and Inequalities.pdf](#)

[Notes and Additional Exercise Problems Expressions.pdf](#)

<ul style="list-style-type: none"> <li>• Interpret the validity of absolute value solution sets.</li> <li>• Describe the solution(s) in a sentence.</li> </ul>	
<p>Assessments</p> <p><u>Formative Exercise Problems (all subsections) Equations and Inequalities.pdf</u></p> <p><u>Formative Exercise Problems (all subsections) Expressions.pdf</u></p> <p><u>Summative Test (6 versions) Equations and Inequalities.pdf</u></p> <p><u>Summative Test (6 versions) Expressions.pdf</u></p>	<p>Resources</p> <p><i>Professional &amp; Student</i></p> <p><b>Professional</b></p> <p><i>Intermediate Algebra: A Graphing Approach</i> by Martin-Gay &amp; Greene (Chapters 1 &amp; 2)</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><b>Science</b></p> <ul style="list-style-type: none"> <li>• using varied equations from physics, chemistry, environmental sciences, isolate variables, to solve for missing values</li> </ul> <p><b>Business</b></p> <ul style="list-style-type: none"> <li>• compound interest, simple interest formulas lend themselves to manipulation, and interpretation of answers</li> </ul>





# Unit Planner: Systems College Math Topics

Friday, February 5, 2021, 11:02AM

Newtown High School > 2020-2021 > High School > Mathematics > College Math Topics > Week 9 - Week 12

Last Updated: Today by Charlotte Cavataro

## Systems

Cavataro, Charlotte; Dominick, Lauren; Hall, Eugene; Manos, Charlotte; Murphy, Kelly

- [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*

Lens: Interaction

#### Concepts

- Consistent solution
- Inconsistent solution
- Unique solution
- Solution region
- Graph
- System of linear equation
- System of linear inequalities

#### Generalizations / Enduring Understandings

##### Strand 1: Graphical Representation

Concepts:

- Consistent solution
- Inconsistent solution
- Unique solution
- Systems of linear equations

##### Generalization:

Graphing a system of linear equations determines a consistent solution, inconsistent solution, or a unique solution.

##### Strand 2: Algebraic Representation

Concepts:

- Consistent solution
- Inconsistent solution
- Unique solution

##### Generalization:

Algebraic means of a system of linear equations

#### 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)

determines a consistent solution, inconsistent solution, or a unique solution.

Strand 3: Inequalities

Concepts:

- Solution region
- Graph
- System of linear inequalities

Generalization:

Graphing a system of linear inequalities determines a solution region.

- How can inconsistent solutions be determined by 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)

Conceptual:

- What is the difference between all real numbers and infinitely many solutions? (S1/S2/S3)
- When is it more appropriate to use a system of equations versus inequalities? (S1/S2/S3)

Provocative:

- Which type of system, equations or inequalities, is more applicable to everyday life? (S1/S2/S3)
- What kind of real-life situations result in systems? (S1/S2/S3)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Algebra**

**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.C.7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line  $y = -3x$  and the circle  $x^2 + y^2 = 3$ .

HSA-REI.C.8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.

**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.

- Graph systems by hand and identify solutions.

Solve systems using appropriate methods.

- Solve the system of equation by
  - Graphing
  - Substitution
  - Elimination
  - Matrix
- 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

Core Learning Activities

Notes and Additional Exercise Problems Systems of Equations.pdf

Assessments

Formative Exercise Problems (all subsections) Systems of Equations.pdf

Summative Test (6 versions) Systems of Equations.pdf

Resources

*Professional & Student*

**Professional**

*Intermediate Algebra: A Graphing Approach* by Martin-Gay & Greene  
(Chapter 4)

Student Learning Expectation & 21st Century Skills

Information Literacy

Critical Thinking

Spoken Communication

Interdisciplinary Connections

**Business**

- compare two companies, look at the break even point

Written Performance

- compare the growth rates of stocks, bonds, CD's



Atlas Version 9.6.1

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# Unit Planner: Quadratics College Math Topics

Friday, February 6, 2021, 11:53AM

Newtown High School > 2020-2021 > High School > Mathematics > College Math Topics > Week 13 - Week 18

Last Updated: Today by Charlotte Cavaturo

## Quadratics

Cavaturo, Charlotte; Dominick, Lauren; Hall, Eugene; Manos, Charlotte; Murphy, Kelly

- [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*

Lens: Relationships

Concepts:

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

#### Generalizations / Enduring Understandings

##### Strand 1: Graphing

Concepts:

- intercepts
- vertex
- axis of symmetry
- quadratic

##### Generalization:

Intercepts, vertices, and the axis of symmetry construct quadratic relationships.

##### Strand 2: Factoring

Concepts:

- factoring 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 are the forms of quadratic equations? (S4)
- What are the critical points and features to a parabola? (S1)
- Why are conjugates necessary? (S3)
- What is the relationship between roots and factors? (S2 /S4)

##### Conceptual:



- real zeros/roots

Generalization:

Factor patterns identify roots.

Strand 3: Square roots

Concepts:

- simple radical form
- square roots
- complex numbers
- conjugates
- imaginary number
- quadratic equations

Generalization:

Square root procedures solve quadratic equations.  
Complex conjugates eliminate the imaginary number.

Strand 4: Completing the square

Concepts:

- perfect square trinomial
- quadratic equations
- quadratic formula
- discriminant

Generalization:

Completing the square derives the quadratic formula.  
The discriminant determines the number and type of solutions.

How are quadratic functions used to model actual data?  
(S1)

How do the number of real roots help determine the graph of a quadratic?(S1/S2/S3/S4)

How can the discriminant determine the best method to solve a quadratic?

How are factoring patterns used as strategies to solve quadratics?(S2)

Provocative:

Is there a best method to graph a quadratic equation?  
(S1-S4)

Is there a best method for solving quadratic equations?(S1/S2/S3/S4)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: Grade 7**

**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: 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.

HSA-SSE.B.3b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

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

#### **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.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  $b$ .

#### **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).

## **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.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.

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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:

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

- 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

### Core Learning Activities

[Notes and Additional Exercise Problems Factoring.pdf](#)  
[Notes and Additional Exercise Problems Solving Quadratics.pdf](#)

### Assessments

Formative Exercise Problems (all subsections)

### Resources

*Professional & Student*

<p><a href="#">Factoring.pdf</a>  <a href="#">Formative Exercise Problems (all subsections) Solving Quadratics.pdf</a>  <a href="#">Summative Test (6 versions) Solving Quadratics.pdf</a></p>	<p><b>Professional</b>  <i>Intermediate Algebra: A Graphing Approach</i> by Martin-Gay &amp; Greene  (Chapter 5.3-5.8 &amp; Chapter 8)</p>
<p>Student Learning Expectation &amp; 21st Century Skills  <a href="#">Information Literacy</a>  <a href="#">Critical Thinking</a>  <a href="#">Spoken Communication</a>  <a href="#">Written Performance</a></p>	<p><b>Interdisciplinary Connections</b></p> <p><b>Science</b></p> <ul style="list-style-type: none"> <li>projectile motion, movement of atoms, sports, falling from a building, flight paths, bounces, optical design, and determining value of resistors ...</li> </ul> <p><b>Business</b></p> <ul style="list-style-type: none"> <li>profit vs loss models (break even points)</li> </ul> <p><b>Architecture</b></p> <ul style="list-style-type: none"> <li>modeling arches in buildings and bridges (determining strength)</li> </ul>





# Unit Planner: Polynomial Equations

## College Math Topics

Friday, February 6, 2021, 11:54AM

Newtown High School > 2020-2021 > High School > Mathematics > College Math Topics > Week 19 - Week 24

Last Updated: Today by Charlotte Cavataro

### Polynomial Equations

Cavataro, Charlotte; Dominick, Lauren; Hall, Eugene; Manos, Charlotte; Murphy, Kelly

- [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

Lens: Interactions

Concepts:

- properties of exponents
- Scientific Notation
- operations
- zeros
- solving
- long division
- synthetic division
- factoring
- polynomials

#### Generalizations / Enduring Understandings

##### Strand 1: Exponents

- properties of exponents
- Scientific Notation

##### Generalization:

Properties of exponents aid in representing numbers in Scientific Notation.

##### Strand 2: Operations

- operations
- long division
- synthetic division
- polynomials

##### Generalization:

Synthetic and long division factor polynomials.  
Operations on polynomials generate standard form.

#### Guiding Questions

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

##### Factual

- What are the properties of exponents? (S1)
- What is Scientific Notation?(S1)
- What are like terms? (S2)
- What role do like terms play in a GCF interaction? (S2)
- What is the GCF? (S2/S3)
- What is a factor? (S3)
- What is a zero? (S3)
- What is a solution?(S3)
- What are the factoring techniques?(S3)
- What is the relationship between the degree of the original polynomial and its quotient after synthetic division? (S2)
- How is synthetic division used to factor a polynomial? (S2)
- What is the difference between synthetic and

Strand 3: Factor

- factoring
- zeros
- solving

Generalization:

Zeros of a polynomial are solved for by factoring.

long division? (S2)

Conceptual

- In what situations is Scientific Notation valuable?(S1)
- How can the skills of factoring quadratics be used to factor polynomials?(S3)
- When is a polynomial not factorable?(S3)

Provocative

- What in your life requires exponential thinking? (S1/S2/S3)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**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.

HSA-SSE.B.3c. Use the properties of exponents to transform expressions for exponential functions.

**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.

**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:

- Convert between Scientific and Standard Notation
- Simplify exponential expressions
- Classify polynomials
- Factor polynomials
- Recognize and Solve polynomials
- Simplify Polynomials

### Critical Content & Skills

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

Students will be able to

Convert between Scientific and Standard Notation

- large number conversion
- small number conversions
- operations on scientific notation

Simplify exponential expressions

- properties of exponents
  - product
  - power
  - quotient
  - like terms

Identify degree and number of terms to classify polynomials

- perform operations on polynomials
  - combine like terms
  - multiply
  - divide
    - long division

### Core Learning Activities

[Notes and Additional Exercise Problems Polynomial Long Division.pdf](#)

[Notes and Additional Exercise Problems Polynomial Operations.pdf](#)

<ul style="list-style-type: none"> <li>▪ synthetic division</li> </ul> <p>Factor polynomials</p> <ul style="list-style-type: none"> <li>• Greatest common factor</li> <li>• Grouping</li> <li>• Factor quadratics by <ul style="list-style-type: none"> <li>○ Greatest common factor</li> <li>○ the difference of perfect squares</li> <li>○ perfect square trinomial</li> <li>○ sum/difference of cubes</li> <li>○ split the middle term/guess and check</li> </ul> </li> </ul> <p>Recognize and solve polynomial functions by</p> <ul style="list-style-type: none"> <li>• factor</li> <li>• use synthetic division to <ul style="list-style-type: none"> <li>○ check to see if a root is a solution</li> <li>○ if it has a specified factor</li> </ul> </li> <li>• solve using zero product property</li> </ul>	
<p><b>Assessments</b></p> <p><a href="#">Formative Exercise Problems (all subsections) Long Division.pdf</a></p> <p><a href="#">Formative Exercise Problems (all subsections) Polynomial Operations.pdf</a></p> <p><a href="#">Summative Test Questions Polynomial Operations.pdf</a></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i></p> <p><b>Professional</b></p> <p><i>Intermediate Algebra: A Graphing Approach</i> by Martin-Gay &amp; Greene (Chapter 5.1-5.4 &amp; Chapter 6.4)</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>Business</b></p> <ul style="list-style-type: none"> <li>• Maximize volume with specified dimensions.</li> </ul> <p><b>Science</b></p> <ul style="list-style-type: none"> <li>• approximate speed/size of atoms using scientific notation</li> <li>• volume of planets/distance/ molar mass using scientific notation and operations on those larger/small numbers.</li> </ul>







# Unit Planner: Rational Equations College Math Topics

Friday, February 5, 2021, 11:57AM

Newtown High School > 2020-2021 > High School > Mathematics > College Math  
Topics > Week 25 - Week 30

Last Updated: Today by Charlotte  
Cavataro

## Rational Equations

Cavataro, Charlotte; Dominick, Lauren; Hall, Eugene; Manos, Charlotte; Murphy, Kelly

- [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

Lens: Interpretation

Concepts:

- lowest term
- operations
- solution
- extraneous solutions
- rational equations

#### Generalizations / Enduring Understandings

##### Strand 1: Simplify

Concepts:

- lowest terms
- operations
- rationals

##### Generalization:

Operations reduce rationals to lowest terms.

##### Strand 2: Solving

- solving
  - extraneous solutions
- rational equations

##### Generalization:

Extraneous solutions may occur when solving rational equations.

#### Guiding Questions

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

##### Factual:

- What is a rational function? (S1-2)
- When is a common denominator necessary? (S1)
- What is a complex fraction? (S1)
- What is an extraneous solution? (S2)
- How are mathematical operations used to simplify a complex fraction? (S1)
- How are proportions used to solve rational functions? (S2)

##### Conceptual:

- How are the rules for simplifying rational numbers connected to simplifying rational expressions? (S1)
- Why do rational equations generate extraneous solutions? (S1)

##### Provocative:

- How is an extraneous solution modeled in real life? (S2)
- Is there an importance to extraneous solutions?(S2)

## 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.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  $b$ .

#### **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  $y = f(x)$ .

#### **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

- Define rational function.
- Interpret domain restrictions
- Compute products, quotients, sums and differences of rational expressions
- Find removable discontinuities
- Compare expressions versus equations, connect manipulation versus alteration
- Solve rational equations
- Investigate extraneous roots

### Critical Content & Skills

*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).

- 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.

### Core Learning Activities

[Notes and Additional Exercise Problems Rational Functions.pdf](#)

### Assessments

[Formative Exercise Problems \(all subsections\) Rational Functions.pdf](#)

[Summative Test \(6 versions\) Rational Functions.pdf](#)

### Resources

*Professional & Student*

**Professional**

*Intermediate Algebra: A Graphing Approach* by Martin-Gay & Greene  
(Chapter 6)

## Student Learning Expectation & 21st Century Skills

Information Literacy

Critical Thinking

Spoken Communication

Written Performance

## Interdisciplinary Connections

### Science

- Distance, speed, and time (upstream, downstream)
- work rate problems
- medicine in bloodstream (rate of time)



Atlas Version 9.6.1

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# Unit Planner: Radical Equations

## College Math Topics

Friday, February 5, 2021, 11:58AM

Newtown High School > 2020-2021 > High School > Mathematics > College Math Topics > Week 31 - Week 37

Last Updated: Today by Charlotte Cavaturo

### Radical Equations

Cavaturo, Charlotte; Dominick, Lauren; Hall, Eugene; Manos, Charlotte; Murphy, Kelly

- [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*

Lens: Interpretation

Concept:

- index
- simple radical form
- operations
- rational exponent
- solution
- extraneous solutions
- radical equations

#### Generalizations / Enduring Understandings

##### Strand 1: Simplify

Concepts:

- simple radical form
- operations
- rational exponent

##### Generalization:

Operations with rational exponents change expressions into simplified radical form.

##### Strand 2: Solving

Concepts:

- solve
- extraneous solutions
- radical equations

##### Generalization:

Extraneous solutions can be produced by solving radical equations.

#### Guiding Questions

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

Factual:

- 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 is a conjugate? (S1)
- What is the difference between an imaginary and an irrational conjugate pair? (S1)
- What are the key questions that students should ask to determine if a radical expression is in simplest form? (S1)
- How are radical expressions and rational exponents related? (S1)

Conceptual:

- Why are conjugates necessary to simplify? (S1/S2)
- How can simplifying radical expressions be applied to use solve radical equations?(S1/S2)
- Why is an inverse operation needed to solve radical equations? (S2)

Provocative:

- Considering radical, rational or polynomials equations, which is more useful/important?(S1/S2)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

---

**The Real Number System**

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

HSN-RN.A.1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.

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

**The Complex Number System**

**HSN-CN.A. Perform arithmetic operations with complex numbers.**

HSN-CN.A.1. Know there is a complex number  $i$  such that  $i^2 = -1$ , and every complex number has the form  $a + bi$  with  $a$  and  $b$  real.

HSN-CN.A.2. Use the relation  $i^2 = -1$  and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

HSN-CN.A.3. (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.

**CCSS: HS: Functions**

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**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.C. Analyze functions using different representations.**

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

## 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

- compute and simplify with radicals/complex expressions, employing rationalization techniques
- calculate then check answers for extraneous solutions when solving
- 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 nth root radical expressions.

- use square roots and nth roots considering only the real number system and use absolute value for even roots

Perform operations on nth root radical expressions.

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

## Core Learning Activities

[Notes and Additional Exercise Problems Radical Functions.pdf](#)

<p>Perform operations on complex number expression.</p> <ul style="list-style-type: none"> <li>• add/subtract/multiply/divide and rationalize <ul style="list-style-type: none"> <li>◦ binomial rationalization</li> </ul> </li> </ul> <p>Use rational exponents.</p> <ul style="list-style-type: none"> <li>• convert between rational exponents and radical expressions</li> <li>• apply properties of exponents to simplify and perform operations with rational exponents</li> </ul> <p>Solve radical equations, including equations involving rational exponents.</p> <ul style="list-style-type: none"> <li>• use inverse operations/reciprocal powers to solve</li> <li>• check for extraneous solutions</li> </ul>	
<p><b>Assessments</b></p> <p><a href="#"><u>Formative Exercise Problems (all subsections) Radical Functions.pdf</u></a></p> <p><a href="#"><u>Summative Test (6 versions) Radical Functions.pdf</u></a></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i></p> <p><b>Professional</b></p> <p><i>Intermediate Algebra: A Graphing Approach</i> by Martin-Gay &amp; Greene (Chapter 7)</p>
<p><b>Student Learning Expectation &amp; 21st Century Skills</b></p> <p><a href="#"><u>Information Literacy</u></a></p> <p><a href="#"><u>Critical Thinking</u></a></p> <p><a href="#"><u>Spoken Communication</u></a></p> <p><a href="#"><u>Written Performance</u></a></p>	<p><b>Interdisciplinary Connections</b></p> <p><b>Engineering</b></p> <ul style="list-style-type: none"> <li>• measure voltage</li> </ul> <p><b>Physical Education</b></p> <ul style="list-style-type: none"> <li>• Measure body surface (BSA)</li> </ul>







5 Curriculum Developers

Unit:	Lessons	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
		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	39 40 41 42 43 44 45 46 47 48 49 50	51 52 53 54 55 56 57 58 59 60 61 62	63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200	201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300	301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400
Trigonometric Functions	0										
Analytical Trigonometry	0										
Sequences and Series	0										
Polynomial and Rational Functions	0										
Exponential and Logarithmic Functions	0										
Conics	0										
Polar Coordinates and Graphs	0										
Limits	0										



# Unit Planner: Trigonometric Functions Pre-Calculus

Friday, February 5, 2021, 12:01PM

Newtown High School > 2020-2021 > Grade 11 > Mathematics > Pre-Calculus > Week 1 - Week 6

Last Updated: Thursday, January 21, 2021 by Charlotte Cavatara

## Trigonometric Functions

Cavatara, Charlotte; Hall, Eugene; Pearson, Christopher; Raccio, Keristen; Tierney, Shawn

- [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

Lens: Relationships

#### Concepts

- Degrees
- Radians
- Trigonometric Functions
- Trigonometric Ratios
- Right Triangles
- Angles
- Periodic Functions
- Transformations

#### Generalizations / Enduring Understandings

Strand 1: Unit Circle

Concepts:

- Degrees
- Radians
- Trigonometric Functions
- Trigonometric Ratios
- Right Triangles
- Angles

Generalization:

Trigonometric ratios evaluate angles in degrees and radians.

Trigonometric functions relate angles in a right triangle to the ratio of its side lengths.

Strand 2: Graphing

Concepts:

- Periodic Functions
- Transformations

#### Guiding Questions

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

Factual:

- What are the six trigonometric ratios? (S1)
- What are co-terminal angles? (S1)
- What are reference angles? (S1)
- What is the difference between a positive and negative angle? (S1)
- What variables affect transformations? (S2)
- What makes a periodic function undefined? (S2)
- How do angle measures relate to the sides in a right triangle? (S1)
- How are trigonometric graphs related to the reciprocal graph? (S2)
- How are the period and amplitude found from the trigonometric function and its graph? (S2)
- How are trigonometric functions written from graphs? (S2)
- How are degree measures converted to radian measures? (S1)

**Generalization:**

Graphs of periodic functions represent patterns of cycles transformed over regular intervals.

Conceptual:

- How are radian measures related to degree measures? (S1)
- What are the similarities and differences of the trigonometric ratios between the quadrants? (S1)
- What transformations can be used to create the same trigonometric graph? (S2)

Provocative:

- Where could the relationships formed by trigonometric functions be applied in science? (S1)

**Standard(s)**

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

**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**

**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.

HSF-TF.A.2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to

all real numbers, interpreted as radian measures of angles traversed counterclockwise around 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.

HSF-TF.A.4. (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.

### CCSS: HS: Geometry

#### Similarity, Right Triangles, & Trigonometry

##### 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.

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### Objective(s)

#### Bloom/ Anderson Taxonomy / DOK Language

Students will:

- Evaluate trigonometric ratios
- Graph trigonometric functions

### Critical Content & Skills

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

Evaluate and apply trigonometric ratios

- Convert radians to degrees.
- Convert degrees to radians.
- Evaluate the six trigonometric ratios using reference angles.
- Evaluate the six trigonometric ratios using special right triangles.
- Evaluate the six trigonometric ratios given a ratio or coordinate point.
- Find coterminal and reference angles.

Graph and transform trigonometric functions

- Find key features and critical points.
- Write the trigonometric equation given a graph.
- Write the trigonometric equation given critical information.
- Graph trigonometric functions on the coordinate plane.
- Model a trigonometric function using real world applications.

### Core Learning Activities

Unit 1 notes for AB

Trigonometric Functions Notes CPA.pdf

### Assessments

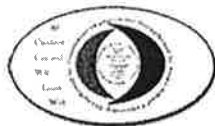
**Trig Unit 1 Quiz**  
**Summative: Written Test**

### Resources

*Professional & Student*  
Department developed materials on google drive

<p><u>Trig Quiz 1.doc</u>  <b>Graphing Trig Quiz AB</b>  <b>Summative: Written Test</b>  <u>Graphing Trig functions quiz.pdf</u>  <u>Trigonometric Functions Formative Assessment</u>  <u>CPA.pdf</u>  <u>Trigonometric Functions Summative Assessment 1</u>  <u>CPA.pdf</u>  <u>Trigonometric Functions Summative Assessment 2</u>  <u>CPA.pdf</u>  <u>Problem Set 3 Formative AB.pdf</u></p>	<p>Pre-Calc Textbook</p>
<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>	<p><b>Interdisciplinary Connections</b>  Physics and Engineering-Finding location of a wheel at a certain point.  Finding the amplitude of different pitches on a sound wave.</p>





# Unit Planner: Analytical Trigonometry

## Pre-Calculus

Friday, February 5, 2021, 12:03PM

Newtown High School > 2020-2021 > Grade 11 > Mathematics > Pre-Calculus > Week 7 - Week 11

Last Updated: Today by Eugene Hall

### Analytical Trigonometry

Cavataro, Charlotte; Hall, Eugene; Pearson, Christopher; Raccio, Keristen; Tierney, Shawn

- [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*

Lens: Balance

#### Concepts

- Domain
- Input
- Output
- Inverse of trigonometric functions
- Pythagorean Identities
- Sum and Difference Identities
- Double angle and half angle Identities
- Quotient and Reciprocal Identities
- Properties of Equality
- Solution(s)

#### Generalizations / Enduring Understandings

Strand 1: Inverse Trigonometry

Concepts:

- Domain
- Input
- Output
- Inverse of trigonometric functions

Generalizations:

The inverse of a trigonometric function maps outputs to inputs while restricting its domain.

Strand 2: Trigonometric Identities

Concepts:

- Pythagorean Identities
- Sum and Difference Identities
- Double Angle and Half Angle Identities
- Quotient and Reciprocal Identities

#### Guiding Questions

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

Factual:

- What are the range restrictions on the six trigonometric inverse functions? (S1)
- What are the Pythagorean identities? (S2)
- What are the sum and difference identities? (S2)
- What are the double and half-angle identities? (S2)
- What are the quotient and reciprocal identities? (S2)
- How are all possible solutions to a trigonometric equation expressed? (S3)
- How can trigonometric identities be used to prove equivalence? (S2)
- How is the composition of inverse functions evaluated? (S1)
- Why are certain identities memorized? (S2)
- Why are there multiple solutions to a

**Generalization:**

Sum and difference, double and half angle, quotient and reciprocal, and Pythagorean identities reveal relationships between trigonometric expressions.

**Strand 3: Trigonometric Equations**

**Concepts:**

- Properties of Equality
- Solution(s)

**Generalization:**

Properties of equality maintain balance to determine the solution(s) to trigonometric equations.

trigonometric equation? (S3)

Conceptual:

- How can trigonometric identities be used to solve a trigonometric equation? (S3)
- When proving a trigonometric identity, why can only one side of the equation be manipulated? (S2)

Provocative:

- What makes one way to prove a trigonometric identity better than another method? (S2)

**Standard(s)**

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

**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.

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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:

- Evaluate Inverse trigonometric functions
- Apply trigonometric identities

- Solve trigonometric equations

### Critical Content & Skills

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

Students must be able to:

Define, evaluate, and graph inverse trigonometric functions

- Define inverse trigonometric functions.
- Evaluate inverse trigonometric functions.
- Graph inverse trigonometric functions.

Use trigonometric identities to prove equivalence

- Manipulate trigonometric expressions using trigonometric identities.
- Derive trigonometric identities including sum and difference, double and half angle, and Pythagorean identities.
- Use sum and difference, double and half angle identities to evaluate trigonometric ratios.

Solve trigonometric equations

- Use inverse trigonometric functions to solve trigonometric equations.
- Use properties of equality to solve trigonometric equations.

### Core Learning Activities

[Trig Unit 2 Notes AB.pdf](#)

[Analytic Trig Notes CPA.pdf](#)

### Assessments

**Trig Unit Test Review**

**Summative: Written Test**

[Unit 1 Test Review.pdf](#)

**Trig Identities Quiz AB**

**Summative: Written Test**

[Trig ID quiz.pdf](#)

**Inverses and Solving quiz**

**Summative: Written Test**

[inverse and solving trig quiz.pdf](#)

[Analytic Trig Formative Assessment CPA.pdf](#)

[Analytic Trig Summative Assessment 1 CPA.pdf](#)

[Analytic Trig Summative Assessment 2 CPA.pdf](#)

[Problem Set 6 Formative AB.pdf](#)

### Resources

*Professional & Student*

Department developed materials on google drive

Pre-Calc Textbook

### Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

### Interdisciplinary Connections

Physics-Angles of elevation and depression.

Vectors-speed and direction

Engineering- How long should a cable be?







# Sequences and Series

5 Curriculum Developers

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

### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Concepts: Patterns

Concepts

- Arithmetic
- Geometric
- Explicit Formula
- Recursive Formula
- Sums
- Infinite value
- Finite value
- Sigma Notation
- Convergence
- Divergence

#### Generalizations / Enduring Understandings

Strand 1: Sequences

Concepts:

- Arithmetic
- Geometric
- Explicit Formula
- Recursive Formula

Generalization:

Arithmetic and geometric sequences create a list of numbers expressed recursively and/or explicitly.

Strand 2: Series

Concepts:

- Sums
- Infinite
- Finite
- Sigma Notation
- Converging
- Diverging

Generalization:

A series is a sum of a finite or infinite sequence expressed using sigma notation and is either converging or diverging.

#### Guiding Questions

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

Factual:

- What is sigma notation? (S2)
- What is converging? (S2)
- What is diverging? (S2)
- What is the general form for an explicit and recursive formula? (S1)
- What is an arithmetic sequence? (S1)
- What is a geometric sequence? (S1)
- How is the convergence or divergence of an infinite series determined? (S2)
- How is an explicit formula for a sequence that is neither arithmetic or geometric written? (S1)

Conceptual:

- Can a series that has an infinite number of terms have a sum? (S2)
- Can every recursive sequence be written as a geometric or an arithmetic sequence? (S1/S2)

Provocative:

- Is there a type of sequence more applicable to the real world?(S1/S2)

CSS: Mathematics

CCSS: HS: Num/Quantity

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: Algebra

Seeing Structure in Expressions

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

- HSA-SSE.B.4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.

CCSS: HS: Functions

Building Functions

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

- HSF-BF.A.2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.

## Objective(s)

loom/ Anderson Taxonomy / DOK Language

Students will:

- Express sequences using formulas
- Find sums of series

## Critical Content & Skills

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

Students must be able to:

Express and apply explicit and recursive formulas for sequences


- Given an arithmetic sequence write the explicit and recursive formula.
- Given a geometric sequence write the explicit and recursive formula.
- Given a formula, find the *n*th term of an arithmetic or geometric sequence.

Find sums of finite and infinite series

- Given the formula, find the sum of the first *n* terms of an arithmetic or geometric series, including infinite series.
- Finding the sum of a finite or infinite series.
- Expand a series written in summation notation.
- Expressing a series in summation notation.
- Using summation formulas, find the sum of the first *n* terms of a series written in summation notation.

## Core Learning Activities

 Sequences and Series Unit 3 Notes AB.pdf

 Sequences and Series Notes CPA.pdf

## Assessments

## Resources

Professional & Student

Sequences and Series Test

Summative: Written Test

sequences series test AB.pdf

Sequences and Series Formative Assessment CPA.pdf

Sequences and Series Summative Assessment CPA.pdf

Sequences and Series Formative Assessment AB

## Student Learning Expectation & 21st Century Skills

Information Literacy

Critical Thinking

Oral Communication

Written Performance

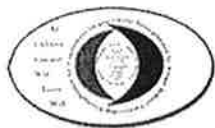
## Interdisciplinary Connections

Physics- Pendulum problems.

Ball bouncing problems.

Counting-Find total numbers.





# Unit Planner: Polynomial and Rational Functions Pre-Calculus

Friday, February 5, 2021, 12:05PM

Newtown High School > 2020-2021 > Grade 11 > Mathematics > Pre-Calculus >  
Week 16 - Week 18

Last Updated: Today by  
Eugene Hall

## Polynomial and Rational Functions

Cavataro, Charlotte; Hall, Eugene; Pearson, Christopher; Raccio, Keristen; Tierney, Shawn

- [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

Lens: Function

#### Concepts

- Polynomial Functions
- Rational Functions
- Zeros
- Maximums/Minimums
- End Behavior
- Discontinuity
- Increasing/Decreasing
- Number line
- Testing points
- Zeros
- Discontinuity
- Multiplicity

#### Generalizations / Enduring Understandings

Strand 1: Key Features

Concepts:

- Polynomials functions
- Zeros
- Maximums/Minimums
- End Behavior
- Rational functions
- Discontinuity
- Increasing/Decreasing
- Asymptote

Generalization:

Zeros, maximums and minimums, end behavior, discontinuity, intervals of increasing or decreasing, and asymptotes describe the key features of polynomial and rational functions.

#### Guiding Questions

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

Factual:

- What are the different types of discontinuities? (S1)
- What is end behavior? (S1)
- What is number line analysis? (S2)
- What is multiplicity? (S2)
- How does multiplicity affect graphed behavior? (S1)
- Why is only one test point used on an interval when solving inequalities? (S2)
- How can technology be used to find the maximums and minimums of a function? (S1)
- How are complex zeros of a polynomial function found? (S1)
- Where are horizontal or vertical asymptotes

Strand 2: Inequalities  
Concepts:

- Polynomial inequalities
- Rational inequalities
- Number line
- Testing points
- Zeros
- Discontinuity
- Multiplicity

Generalization:

Number line analysis tests points between the zeros and discontinuities of varying multiplicities which solve polynomial and rational inequalities.

located for a rational function? (S1)

Conceptual:

- How can all the critical information of a polynomial or rational function be used to create a sketch of the curve? (S1/S2)
- How can the concept of linear inequalities be used to determine the solution set of a polynomial or rational inequality? (S2)
- How can all the critical information of a polynomial or rational be used to determine the solution set of a polynomial inequality? (S1/S2)
- How do functions behave differently around horizontal or vertical asymptotes? (S1)
- Why can a function cross a horizontal asymptote and not a vertical asymptote? (S1)

Provocative:

- In what real-world situations is a polynomial function the best model? (S1)
- What real-world situations can be modeled by an asymptote? (S1)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

**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: Algebra

### Arithmetic with Polynomials & Rational Functions

#### 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.

#### 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.

### 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.

### 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.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.

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### Objective(s)

#### Bloom/ Anderson Taxonomy / DOK Language

Students will:

- Identify key features of polynomial and rational functions
- Analyze polynomial and rational inequalities

<p><b>Critical Content &amp; Skills</b>  <i>What students must <b>KNOW and be able to DO</b></i>  Students must be able to:  Identify key features of polynomial and rational functions</p> <ul style="list-style-type: none"> <li>• Graph polynomial and rational functions.</li> <li>• Find key features and critical points of polynomial and rational functions given an equation.</li> <li>• Find key features and critical points of polynomial and rational functions given a graph.</li> <li>• Write a polynomial or rational equation given a graph.</li> </ul> <p>Analyze polynomial and rational inequalities using number line analyses</p> <ul style="list-style-type: none"> <li>• Find all zeros and discontinuities with their multiplicities.</li> <li>• Test on the appropriate intervals.</li> </ul>	<p><b>Core Learning Activities</b></p> <p><a href="#">Polynomials Notes AB.pdf</a>  <a href="#">Polynomial Notes Part 2 AB.pdf</a>  <a href="#">Polynomials Notes CPA.pdf</a>  <a href="#">Rational Functions Notes.pdf</a></p>
<p><b>Assessments</b></p> <p><b>Rational Functions Test Review</b>  <b>Formative: Written Test</b>  <a href="#">Review Rational Functions Test.pdf</a></p> <p><b>Polynomials Unit Test AB</b>  <b>Summative: Written Test</b>  <a href="#">Polynomials Test AB.pdf</a></p> <p><b>Rationals Quiz AB</b>  <b>Summative: Written Test</b>  <a href="#">Rationals Quiz AB.pdf</a>  <a href="#">Polynomials Formative Assessments CPA.pdf</a>  <a href="#">Rational Functions Formative Assessments CPA.pdf</a></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i>  Department developed materials on google drive.  Pre-Calc Textbook</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>	<p><b>Interdisciplinary Connections</b></p> <p>Science-Modeling data using an equation.</p>





# Unit Planner: Exponential and Logarithmic Functions

## Pre-Calculus

Friday, February 5, 2021, 12:05PM

Newtown High School > 2020-2021 > Grade 11 > Mathematics > Pre-Calculus > Week 19 - Week 22

Last Updated: Today by Eugene Hall

### Exponential and Logarithmic Functions

Cavataro, Charlotte; Hall, Eugene; Pearson, Christopher; Raccio, Keristen; Tierney, Shawn

- [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*

Lens: Functions

#### Concepts

- Exponential Functions
- Logarithmic Functions
- Growth
- Decay
- Transformations
- Properties of equality
- Properties of Logarithms
- Properties of Exponents
- Domain
- Input
- Output
- Inverse

#### Generalizations / Enduring Understandings

Strand 1: Graphing

Concepts:

- Exponential functions
- Logarithmic functions
- Growth
- Decay
- Transformations

Generalization:

Transformations of exponential and logarithmic functions model exponential growth and decay.

Strand 2: Solving

Concepts:

- Properties of equality
- Properties of Logarithms

#### Guiding Questions

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

Factual:

- What are the properties of exponents? (S2)
- What are the properties of logarithms? (S2)
- What are the limits of the domain on a logarithm? (S3)
- How is a logarithmic function converted to an exponential function? (S2/S3)
- How is an exponential function converted to a logarithmic function? (S2/S3)
- What are the parent exponential and logarithmic functions? (S1)
- What are the parameters of an exponential function? (S1)
- What are the parameters of a logarithmic function? (S1)
- How do the parameters of an exponential function transform the parent function? (S1)



- Properties of Exponents

Generalization:

Properties of equality, logarithms, and exponents assist in solving logarithmic and exponential equations.

Strand 3: Inverses

Concepts:

- Domain
- Input
- Output
- Inverse

Generalization:

The domain of inputs for an exponential function becomes the range of outputs for its inverse logarithmic function.

- How do the parameters of a logarithmic function transform the parent function? (S1)
- How can exponents be used to solve logarithmic equations? (S2)

Conceptual:

- How are the graphs of exponential function and logarithmic functions related to each other? (S1/S3)
- How can the properties of exponents be used to prove the properties of logarithms? (S2)

Provocative:

- Which are more versatile for studying mathematics-exponential or logarithmic functions? (S1/S2/S3)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

**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.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.

### Building Functions

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

HSF-BF.B.5. (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.

### 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:

- Model exponential and logarithmic functions by graphing
- Solve exponential and logarithmic equations
- Apply inverse properties to exponential and logarithmic functions
- Understand the definitions and properties of exponential and logarithms

### Critical Content & Skills

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

Students must be able to:

Graph exponential and logarithmic functions and identify their characteristics

- Write exponential equations to describe real-world applications.
- Transform an exponential parent function based on the parameters.
- Transform a logarithmic parent function based on the parameters.
- Identify domain, asymptotes, and intercepts of exponential and logarithmic functions.
- Given a graph or a table of values, write the exponential or logarithmic function.

Use properties of exponents and logarithms to solve exponential and logarithmic equations

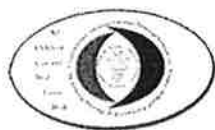
- Evaluate exponential functions.
- Evaluate logarithmic functions.
- Apply change of base formula to solve logarithmic functions.
- Apply properties of exponents to solve exponential equations.
- Apply properties of logarithms to solve logarithmic equations.
- Define and use common log, natural log, and the number "e".
- Solve real-world problems using exponential

### Core Learning Activities

[Exponential and Logarithmic Functions Notes.pdf](#)

<p>growth and decay.</p> <p>Identify the inverse relationship between exponential and logarithmic functions</p> <ul style="list-style-type: none"> <li>• Convert between logarithmic and exponential form.</li> <li>• Convert between exponential and logarithmic form.</li> <li>• Describe relationships between key features of exponential functions compared to its inverse function.</li> <li>• Describe relationships between key features of logarithmic functions compared to its inverse function.</li> </ul>	
<p><b>Assessments</b></p> <p><b>Exponentials and Logs Review</b>  <b>Formative: Written Test</b>  <a href="#">Exponents and Logs worksheet.pdf</a>  <b>Logs Quiz AB</b>  <b>Summative: Written Test</b>  <a href="#">Logs Quiz AB.pdf</a>  <b>Graphing Logs Quiz AB</b>  <b>Summative: Written Test</b>  <a href="#">honors precalc exponents and logs quiz.pdf</a></p>	<p><b>Resources</b></p> <p><i>Professional &amp; Student</i>  Department developed materials on google drive.  Pre-Calc Textbook</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>	<p><b>Interdisciplinary Connections</b></p> <p>Finance-Money/Interest  Chemistry-Half Life and radioactivity  Science-Population models</p>





# Unit Planner: Conics Pre-Calculus

Friday, February 5, 2021, 12:06PM

Newtown High School > 2020-2021 > Grade 11 > Mathematics > Pre-Calculus >  
Week 23 - Week 26

Last Updated: Today by Eugene Hall

## Conics

Cavataro, Charlotte; Hall, Eugene; Pearson, Christopher; Raccio, Keristen; Tierney, Shawn

- [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

Lens: Classification

#### Concepts

- Conic Sections
- Key Features

#### Generalizations / Enduring Understandings

Strand 1: Graphing

Concepts:

- Conic Sections
- Key Features

Generalization:

Key features that appear in graphs classify conic sections.

Strand 2: Writing

Concepts:

- Conic Sections
- Key features

Generalization:

Key features of conic sections equations illicit the type.

#### Guiding Questions

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

Factual:

- What are the conic sections? (S1/S2)
- What are the key features for each type of conic section? (S1/S2)
- What is the standard form of each conic section? (S1/S2)
- How is standard form converted to graphing form? (S2)
- How is graphing form converted to standard form? (S2)
- How is the type of conic section classified based on the equation in standard form? (S1/S2)
- How is the type of conic section classified based on the equation in graphing form? (S1/S2)
- How is the orientation of the conic section determined? (S1/S2)

Conceptual:

- How can the parameters of a conic be manipulated to change the version of the conic? (S2)

Provocative:

- How can conics be effectively used in real-world

- applications? (S1/S2)
- Are non-function conics more versatile than polynomials? (S1/S2)

## Standard(s)

*Connecticut Core Standards / Content Standards*

### **CCSS: Mathematics**

#### **CCSS: HS: Num/Quantity**

#### **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: 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.

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## Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will:

- Graph conic sections
- Write conic equations

## Critical Content & Skills

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

Students must be able to:

Graph and identify key features of conic sections

- Graph a circle given specific characteristics.
- Identify the center and radius of a circle.
- Graph a parabola given specific characteristics.
- Identify the vertex, focus, directrix, and orientation of a parabola.
- Graph a hyperbola given specific characteristics.
- Identify the vertices, asymptotes, foci, transverse and conjugate axes, and orientation of a hyperbola.
- Graph an ellipse given specific characteristics.
- Identify the vertices, co-vertices, foci, major and minor axes, and orientation of an ellipse.

Write and identify key features of conic sections

- Convert a conic section equation from graphing form to standard form.
- Convert a conic section equation from standard form to graphing form.
- Write the equation of a conic section given a graph.
- Identify key features of each conic section given the equation.
- Model practical problems involving conic sections.

## Core Learning Activities

[Conics Notes.pdf](#)

## Assessments

### Conics Review

#### Formative: Written Test

[3. Conic Sections Review.pdf](#)

#### Conics Test AB

#### Summative: Written Test

[Conics Quiz AB.pdf](#)

## Resources

### Professional & Student

Department developed materials on google drive.

Pre-Calculus Textbook

## Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

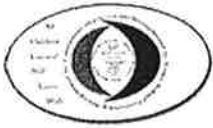
## Interdisciplinary Connections

Science-Planetary orbits

-Projectile motion

-GPS





# Unit Planner: Polar Coordinates and Graphs

## Pre-Calculus

Friday, February 5, 2021, 12:07PM

Newtown High School > 2020-2021 > Grade 11 > Mathematics > Pre-Calculus >  
Week 27 - Week 30

Last Updated: Today by Eugene Hall

### Polar Coordinates and Graphs

Cavataro, Charlotte; Hall, Eugene; Pearson, Christopher; Raccio, Keristen; Tierney, Shawn

- [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

Lens: Position

#### Concepts

- Radius
- Directed Angle
- Polar axis
- Rectangular coordinate
- Pole
- Circles
- Cardioids
- Lemniscates
- Limacons
- Rose Petals

#### Generalizations / Enduring Understandings

Strand 1: Polar Coordinates

Concepts:

- Radius
- Directed Angle
- Polar axis
- Rectangular coordinate
- Pole

Generalization: A polar coordinate system graphs rectangular coordinate points on a plane with the pole at the center of a circular grid using a radius and a directed angle.

Strand 2: Polar curves

Concepts:

- Circles
- Cardioids
- Lemniscates

#### Guiding Questions

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

Factual:

- What are the properties of the polar coordinate plane (S1)
- What is a radius? (S1)
- What is a directed angle? (S1)
- What is the general form for a polar curve in the cardioid family? (S2)
- What is the general form for a Lemniscate? (S2)
- What is the general form for a Rose Petal Curve? (S2)
- How is a coordinate from rectangular form converted to polar form? (S1)
- How are polar coordinates converted to rectangular form? (S1)
- How is a polar equation converted to rectangular form? (S2)
- How is a rectangular equation converted to polar form? (S2)

- Limacons
- Rose Petals

Generalization: Circles, Cardioids, Lemniscates, Limacons, and Rose Petal Curves satisfy a polar equation.

- How is a polar equation graphed using a table of values? (S2)
- How do the parameters of a polar equation affect the dimensions of a polar curve? (S2)
- How is a polar curve classified based on its equation? (S2)

Conceptual:

- How can a parameter of one polar equation be manipulated to create a new polar equation? (S2)
- What are the advantages and disadvantages to using the polar coordinate plane for graphing? (S1/S2)

Provocative:

- Which polar curve is most applicable to real-world scenarios? (S1/S2)

**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.4. (+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.

**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 polar coordinates
- Graph polar curves

### Critical Content & Skills

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

Students must be able to:

Identify key features of polar coordinates and graphs

- Given a polar coordinate, write other polar coordinates that would land in the same location.
- Graph polar coordinates with a negative radius or a negative directed angle.
- Graph a polar curve using a table of values.
- Graph a polar curve by identifying key points from its polar curve equation.
- Write a polar equation based on a graph.
- Identify the type of polar curve based on a graph or equation.

Identify relationships between polar coordinates and their rectangular counterparts

- Convert a rectangular coordinate to a polar coordinate.
- Convert a polar coordinate to a rectangular coordinate.
- Convert a polar equation to a rectangular equation.
- Convert a rectangular equation to a polar equation.

### Core Learning Activities

[Polar Coordinates and Graphs Notes.pdf](#)

### Assessments

**Polar Quiz Review**

**Formative: Written Test**

[polar review.docx](#)

**Polar Unit Test AB**

**Summative: Written Test**

[Polar Unit Test.pdf](#)

### Resources

*Professional & Student*

Department developed materials on google drive.

Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

### Interdisciplinary Connections

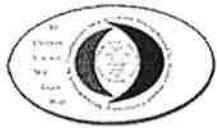
Physics - Equations of motion and vectors. Velocity using direction and speed.

Critical Thinking Spoken Communication Written Performance	
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# Unit Planner: Limits Pre-Calculus

Friday, February 5, 2021, 12:08PM

Newtown High School > 2020-2021 > Grade 11 > Mathematics > Pre-Calculus >  
Week 31 - Week 34

Last Updated: Today by Eugene Hall

## Limits

Cavataro, Charlotte; Hall, Eugene; Pearson, Christopher; Raccio, Keristen; Tierney, Shawn

- [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

Lens: Estimation

#### Concepts

- Properties
- Limit Existence Theorem
- One-Sided Limits
- Infinity
- Limit existence

#### Generalizations / Enduring Understandings

Strand 1: Evaluate

Concepts:

- Properties
- Limit Existence Theorem
- One-Sided Limits
- Infinity

Generalization:

Limits of a function evaluated graphically or algebraically use the properties and the limit existence theorem.

One-sided limits, limits at infinity, and limits as  $x$  approaches a constant derives the definition of a limit.

Strand 2: Continuity

Concepts:

- Defined
- Limit existence

Generalization:

For continuity to exist at a point, the functions defined value equals the limit at that point.

#### Guiding Questions

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

Factual:

- What are the properties of limits? (S1)
- What is the limit existence theorem? (S1)
- What is a one-sided limit? (S1)
- What is the proper notation for a limit? (S1)
- What is the definition of continuity? (S2)
- What does it mean for a function to be continuous? (S2)
- How can limits at a discontinuity be evaluated? (S1)
- When do limits fail to exist? (S1)

Conceptual:

- How can properties of limits be used to evaluate complex limits? (S1)
- How can limits be used to develop the definition of derivatives? (S1)
- How can a function be undefined but still have a limit? (S1/S2)

Provocative:

- How can limits be effectively used in real-world applications? (S1/S2)
- Why are one-sided limits equal to infinity, but the limit existence theorem does not allow the limit to exist? (S1/S2)

Standard(s)

*Connecticut Core Standards / Content Standards*

**CCSS: Mathematics**

**CCSS: HS: Num/Quantity**

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Objective(s)

Bloom/ Anderson Taxonomy / DOK Language

Students will:

- Evaluate limits
- Define continuity

Critical Content & Skills

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

Students must be able to:

Evaluate limits from a graph or from an expression

Core Learning Activities

[Limits Notes.pdf](#)

- Given a limit, evaluate algebraically.
- Evaluate a limit given a graph.
- Define where limits do not exist based on a graph.
- Evaluate one-sided limits from a graph or algebraically.
- Use properties of limits to evaluate.

Define continuity from a graph or an expression

- Determine if continuity exists at key points of a piecewise function.
- Find the value of a variable that will make a function continuous at a given point.
- Determine if continuity exists algebraically.

#### Assessments

**Limits Unit Review**

**Formative: Written Test**

10. Review Unit Test on Limits.pdf

**Limits Quiz AB**

**Summative: Written Test**

Limits Quiz AB.pdf

#### Resources

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Pre-Calculus Textbook

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Information Literacy

Critical Thinking

Spoken Communication

Written Performance

Interdisciplinary Connections

Physics-Rate of change



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