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(US) 1-412-419-1650 PIN: 856 682 996#

Regular BOE Agenda
July 8, 2025

Council Chambers
3 Primrose St.
Newtown, CT 06470
7:00 PM

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.

AGENDA

1. PLEDGE OF ALLEGIANCE
2. ACTION ON APPOINTMENT OF MIDDLE GATE SCHOOL PRINCIPAL
3. CONSENT AGENDA
 - A. Donation to the Newtown Public Schools
 - B. Correspondence Report
4. **PUBLIC PARTICIPATION
5. REPORTS
 - A. Chair Report
 - B. Superintendent's Report
 - C. Committee and Liaison Reports
6. OLD BUSINESS
 - A. Action on Minutes of June 3, 2025
 - B. Action on Minutes of June 10, 2025
 - C. Second Read and Action on Policies
 1. 5137 Connecticut School Climate Policy and Administrative Regulations
 2. 3434 Annual Audits
 - D. Second Read and Action on Non-Mandated Policies to Rescind
 1. 3293.1 Authorization of Signature
 2. 3454 Gate Receipts and Admission
 3. 3455 High School Concession Stand

4. 3510 Operation and Maintenance of Plant
5. 3511 Compliance with 504 Regulations
6. 3513.1 Energy Conservation
7. 3513.2 Recycling Program
8. 3515.2 Community Use of School Facilities - Parking
9. 3516.11 Hazardous Materials
10. 3516.12 Asbestos Control
11. 3516.33 Do Not Resuscitate Order
12. 3517.2 Vandalism
13. 3520 Data-Based Information Management
14. 3520.1 Information Security Breach and Notification
15. 3520.12 Data-Based Information Management - Confidentiality Policy
16. 3520.13 Student Data Protection and Privacy - Cloud-Based Issues
17. 3523.1 Policy Guidelines for Technology Purchases
18. 3523.3 School Facilities - Playground Equipment
- E. Second Read and Action on Grades 5 and 6 Computer Integration Curriculum
- F. Second Read and Action on Differential Equations Curriculum
- G. Second Read and Action on Spanish I Resource "Reporteros"
7. NEW BUSINESS
 - A. NFT Negotiations Process Overview
 - B. Discussion and Possible Action on Tuition for the 2025-2026 School Year
8. PUBLIC PARTICIPATION
9. 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*

July 8, 2025

Newtown Board of Education
3 Primrose Street
Newtown, CT 06470

Re: Notification of Donation

Dear Ladies and Gentlemen,

On behalf of the Sandy Hook School Foundation (the "Foundation"), I am writing to inform you of the Foundation's approved donation in the amount of \$120,000 to Newtown Public Schools, which shall be used for the purpose of investing in enhanced safety and security at Newtown High School (the "Project"). Thoughtful consideration was given by the Foundation on several options for the use of these funds. During the review process, we engaged the Superintendent, the Newtown High School Principal, and the District Safety and Security Committee, who expressed their unanimous support for the Project.

The Foundation's donation is expressly for the Newtown School District's investment in a weapons detection system from CEIA. It is aligned with the Foundation's mission of supporting the physical, emotional and social well-being of the students in the Newtown Public School community.

This donation is contingent upon the Newtown School District's demonstrated commitment of implementation of the Project by October 31, 2025. If this cannot be successfully demonstrated to the Foundation by such date, then the donation will be revoked.

Tracey Jaeger, President, on behalf of the Sandy Hook School Foundation



Newtown Public School District

Newtown Board of Education

Correspondence Report 06/03/2025 – 07/08/2025

Date	Sender Name	Subject
06/03/2025	Deborra Zukowski	Correspondence Report: 06/03/2025
06/03/2025	Wilmarie D. Newton	CABE Webinar Invitation: Get the Latest from DC: A Federal Update on Education Funding and Policy
06/03/2025	Gail Heath	Advocacy Highlights - June 3, 2025
06/03/2025	Shannon Hamilton	Policy highlights 6/3/25
06/04/2025	Nancy Propfe	What's Going On at CABE? 06.04.25
06/04/2025	Anne Uberti	Follow-up Info
06/05/2025	Gail Heath	Advocacy Highlights - Day After Session Update
06/06/2025	BoardBook	Meeting Notification: June 10, 2025 at 6:00 PM - BOE DEAI Committee Meeting
06/06/2025	BoardBook	Meeting Notification: June 10, 2025 at 7:00 PM - Special BOE Agenda
06/06/2025	Anne Uberti	Friday Notes 6.6.25
06/08/2025	Alison Plante	Week in Preview - June 8
06/09/2025	Anne Uberti	Incident at MGS This Morning
06/09/2025	Anne Uberti	NPS Weekly Update 6.9.25
06/09/2025	Anne Uberti	6.9.25 Update
06/10/2025	Deborra Zukowski	Correspondence Report: 06/10/2025
06/10/2025	Shannon Tomai	To BoE
06/10/2025	Anne Uberti	Update
06/10/2025	Kathy June	Agenda Item Revision
06/10/2025	Kathy June	C & I Minutes
06/10/2025	Sarah Connell	Policy Minutes 6_3_25
06/10/2025	Kathy June	Revised C & I Minutes
06/11/2025	Anne Uberti	Final Day of School Remains June 16, 2025
06/11/2025	Anne Uberti	Leadership Update for Middle Gate School
06/11/2025	Suzanne Hurley	Hiring of New Principal for MGS
06/11/2025	Nancy Propfe	What's Going On at CABE? 06.11.25
06/12/2025	Ellington Public Schools	National School Lunch Program Update - Ellington, CT
06/12/2025	Newtown Scholarship Association	NSA Golf Outing on Tuesday, June 24, 2025
06/14/2025	Nicole Sasso	END SCHOOL FRIDAY (please read) - Give the faculty and students the break they deserve!
06/15/2025	Alison Plante	Week in Preview - June 15
06/16/2025	Anne Uberti	NPS Weekly Update 6.16.25
06/18/2025	Nancy Propfe	What's Going On at CABE? 06.18.25
06/19/2025	Nancy Propfe	2025 CABE/CAPSS Convention Early Registration is

		Open!
06/24/2025	Nancy Propfe	2025 CABE/CAPSS Convention Early Registration is Open!
06/25/2025	Nancy Propfe	What's Going On at CABE? 06.25.25
06/26/2025	Gail Heath	REMINDER - Call for Resolutions for the 2025 Delegate Assembly
06/26/2025	Dennis Colclough	Firewall Migration Completed
06/27/2025	Anne Uberti	Friday Notes 6.27.25
06/30/2025	Nancy Propfe	2025 CABE/CAPSS Convention Early Registration is Open!
07/01/2025	Wilmarie D. Newton	Introducing a fresh new look for CABE!
07/02/2025	Nancy Propfe	What's Going On at CABE? 07.02.25
07/03/2025	BoardBook	Meeting Notification: July 8, 2025 at 7:00 PM - Regular BOE Agenda
07/03/2025	Michael Bloom	Danbury Community Event on Hate Crimes
07/04/2025	Anne Uberti	Friday Notes - 4th of July Edition :)
07/05/2025	Anne Uberti	Sad News
07/06/2025	Randi Kiely	Teacher Morale, School Climate, and a Quality Education
07/07/2025	Anne Uberti	Additional Information
07/07/2025	Nancy Propfe	2025 CABE/CAPSS Convention Early Registration is Open!
07/07/2025	Alison Plante	Week in Preview - July 7

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

Minutes of the Board of Education Meeting held on June 3, 2025 at 6:30 p.m. in the Reed Intermediate School Library, 3 Trades Lane, Newtown, CT.

A. Plante, Chair	A. Uberti
J. Vouros, Vice Chair (left 9:45 p.m.)	F. Purcaro
D. Zukowski, Secretary (absent)	T. Gouveia.
S. Tomai (left 9:45 p.m.)	20 Staff
C. Gilson	30 Public
D. Linnetz	1 Press
B. Leonardi	

Mrs. Plante called the meeting to order at 6:30 p.m.

Item 1 – Pledge of Allegiance

MOTION: Mr. Vouros moved that the Board of Education add the agenda item of awarding the bid for out-of-district transportation for special education as the last item under New Business. Mrs. Tomai seconded. Motion passes unanimously.

Item 2 – Action on Appointment of Elementary Principals

MOTION: Mr. Vouros moved that the Board of Education accept the recommendation of the Superintendent and appoint Alison Carmody, Laura Esposito, and Kelly MacLaren elementary assistant principals with special education oversight. Mrs. Linnetz seconded.

Mrs. Uberti spoke about these three tremendous additions to the district and it will be a fantastic journey with them. We had 105 external and 7 internal candidates and interviewed a very strong applicant pool with 5 rising to the top and 3 exceling. She congratulated them and looks forward to working with them.

Motion passes unanimously.

Item 3 – Celebration of Excellence

Retiree Recognition:

Mrs. Uberti spoke about the teachers who are retiring and expressed her gratitude for their dedication to the students they've taught. She wished them all the best in their retirement. She and Mr. Purcaro shared information about each ones teaching career and they were given a gift from Mrs. Plante. The retirees include Laura Battisti, Italian teacher at Newtown High School, Peter Bernson, STEM teacher at Reed Intermediate School, Robyn Cologna, fourth grade teacher at Middle Gate School, Rosemarie Costello, second grade teacher at Head O'Meadow School, Philip Cruz, Social Studies teacher at Newtown Middle School, Diane Dennis, Reading teacher at Middle Gate School, Colleen Ferris-Kimball, Social Studies teacher in the Newtown High School FLEX program, Kathy Gramolini, Kindergarten teacher at Sandy Hook School, Michelle Hiscavich, Director of Visual and Performing Arts at Newtown High School, Mark Mahoney, Music teacher at Newtown Middle School, Cynthia McArthur, Reading/Language Arts Consultant at Sandy Hook School, Ellen Monroe, Special Education teacher at Newtown High School, Julie Shull, sixth grade teacher at Reed Intermediate School and Sharon Vetrano, special education at Reed Intermediate School. These outstanding teachers have had 337 years teaching in Newtown and a total of 387 years in education.

CABE Student Leadership Awards:

Mrs. Uberti spoke about the CABA Student Leadership Awards which were given to Newtown Middle School eighth grade students Devyn Elliot and Eduardo Megalhaes and Newtown High School seniors Rachel Calorossi and Nathan Twitchell.

Top 5% of the 2025 Graduating Class:

Dr. Longobucco introduced the following students who were recognized by the Board. Rachel Calorossi, Shawn Cardmone, Connor Child, Evan Cowley, Danielle Crisci, Charles Dunn, Martin Dunn, Annabelle Foley, Bridget Gioffe, Beatrice Grace, Edward Lui, Charles Massett, Ryan Michlovitz, Ella Renak, Penelope Warren, Sophia Wade, Salutatorian, ,and David Baghdady, Valedictorian.

Item 4 – Consent Agenda

MOTION: Mr. Vouros moved that the Board of Education approve the consent agenda which includes the donation to Reed Intermediate School and the correspondence report.

Mrs. Linnetz seconded. Motion passes unanimously.

Item 5 – Public Participation

Item 6 – Reports

Chair Report: Mrs. Plante spoke about the upcoming Board meetings and having a possible second meeting in July to discuss goals for next year and to help guide our agenda and also the school level goals.

There was no Superintendent's report.

Committee and Liaison Reports:

Dr. Gilson reported on tonight's Curriculum and Instruction meeting which included three presentations. Michael Carvello, teacher at Reed Intermediate School, presented the 5th and 6th grade Computer Integrations Curriculum, Gene Hall, high school math department chair, spoke about the Differential Equations Curriculum, and Michelle Steeves and Liz Ward-Toller, Newtown High School teachers, spoke about the new Spanish Resource "Reporteros." The previous resource was from 2009 and is out of print. The subcommittee voted to forward all three items to the full Board for approval. The presentations will be in the next Board packet.

Mrs. Linnetz spoke about tonight's Policy Committee meeting and our continuing work on the 3000 series. She also spoke about how much she enjoyed the high school chorus concert and the band concert with awards for our seniors. She thanked Michelle Hiscavich and all of the music and art teachers for having an impact on our students. There were 89 recognition categories at the high school awards night. Earlier this week there was an AP physics project where students built cardboard boats and paddled across the pool.

Mrs. Plante thanked the Board student representatives who were unable to attend the meeting. We appreciate their reporting on news from the high school.

Item 7 – Old Business

Minutes of May 20, 2025

MOTION: Mr. Vouros moved that the Board of Education approve the minutes of May 20, 2025.

Mrs. Linnetz seconded. Vote: 5 ayes, 2 abstained (Ms. Zukowski, Mr. Leonardi) Motion passes.

Second Read and Action on Middle School Social Studies Textbook:

MOTION: Mr. Vouros moved that the Board of Education approve the middle school social studies textbook "TCI History Alive." Mrs. Linnetz seconded. Motion passes unanimously. Second read and action on middle school art curriculum:

MOTION: Mr. Vouros moved that the Board of Education approve the middle school art curriculum. Mrs. Linnetz seconded. Motion passes unanimously.

Second read and action on policies:

MOTION: Mr. Vouros move that the Board of Education approve policies 1-4 in Section D under Old Business. Mrs. Linnetz seconded.

Ms. Zukowski referred to the purchasing policy and asked what happens if federal regulations change and if the appendix was part of the regulations or part of the policy.

Mrs. Uberti stated that we are required to have the information in the appendices attached to the policy. If something in the regulation changed we would be notified by Shipman. Usually the change is being tracked by Shipman and lobbyists for CABA and CAPSS so it wouldn't change overnight.

Ms. Zukowski referred to Policy 3280 Purchasing and the third point in the regulations. A couple of years ago a gift was given to the high school for a video screen in the stadium with a non-compete clause which kept people from supporting the program. She is concerned it might happen again given the way the regulation is written.

Mrs. Uberti stated it has come up before but she thinks it was gifted through the Booster Club. A loophole caused the issue that has been rectified.

Ms. Zukowski referred to Policy 3160 Board Budget Procedures and Line Item Transfers and questioned the change from monthly financial report to itemized estimate, which is provided to the fiscal authority.

Ms. Uberti said the itemized estimate is language from the statute and refers to the monthly financial report. There are four quarterly reports and one year-end financial report. Quarterly reports are called narratives.

Mrs. Uberti said the policy was confusing so we substituted the monthly financial report to be referred to as the itemized estimate. The quarterly reports are the narratives which used to be done monthly.

Ms. Zukowski wanted to be sure the fiscal authorities received the monthly reports.

Mrs. Uberti said the term itemized estimates also contain the projected balances.

Ms. Tomai referred to Policy 3280 and proposed adding another bullet in the criteria section because of her concern there would be a restriction on accepting other gifts for any reason.

Mrs. Linnetz said we can vote on the policy and edit the change in the regulation.

Mrs. Uberti agreed with the addition of that item.

Motion passes unanimously.

Action on Policies to Rescind upon Adoption of Items 1 and 2 in Section 7D:

MOTION: Mr. Vouros moved to approve rescinding policies 1 and 2 in Section 7E upon adoption of policies 1 and 2 in Section 7D. Mrs. Linnetz seconded. Motion passes unanimously.

Second read and action on Non-mandated Policies to Rescind:

MOTION: Mr. Vouros moved that the Board of Education approve rescinding non-mandated policies 1-16 in section 7F. Mrs. Linnetz seconded. Motion passes unanimously. Mr. Leonardi read about a federal law called the Take Down Act which is intended to penalize online platforms where there are non-consensual images. He was curious of what the district has regarding a policy around investigation and penalties of sharing those types of images. He suggested this would be something for the policy committee.

Mrs. Uberti said that would fall under acceptable use policy and would be subject to disciplinary action. For employees it would be limited to use of district devices but for student it extends to their personal devices. We encourage parents to screen shot it if something like that happens. Mrs. Plante noted that we would rely on our attorneys to address new laws.

Item 8 – New Business

Chartwells Contract Renewal:

MOTION: Mr. Vouros moved that the Board of Education approve a one-year renewal “Amendment No.1” to Compass Groups USA, Inc., by and through its Chartwells Division initial agreement for food services dated August 23, 2022 with an effective date of July 1, 2025 through June 30, 2026. The terms and conditions in the original agreement as amended will apply. Mrs. Linnetz seconded.

Ms. Gouveia stated that it should read Amendment #3. It’s a one-year renewal and needs to come to the Board each year. Next year is the 4th year.

Ms. Tomai asked for more information which the Board didn’t receive before the meeting. Since the Board didn’t receive the renewal changes Ms. Zukowski moved to table this item until the next meeting.
Motion passes to postpone.

First Read of Educator and Leader Evaluation and Support Plan:

Mrs. Uberti spoke about why we changed this process. We took our existing plan, made the minimum requirement to comply with the statute, and modified our existing plan. She provided the key philosophical changes and the key changes in practice. This plan is less about judging performance with a number or label and more about supporting professional growth and development. It aims to value each professional by creating opportunities for collaboration between educators/leaders and their evaluators, all with the ultimate goal of improving teaching and student outcomes.

Mr. Purcaro spoke about the implementation through Frontline Professional Growth and what we can put in the system.

Mrs. Uberti noted that we will be working with committee members to train the staff over the summer. This will be taught on our professional learning day. There will be people in place to help them.

Mr. Vouros was concerned about the new teachers and how often they will be observed, by who, and who will help them in the classroom.

Mrs. Uberti said that new teachers go into a reflective program called TEAM. They are encouraged to set goals in alignment with what they are working on within TEAM. There are also people determining if they need support and have to work that out.

Mr. Purcaro stated that the new teachers are matched with an experienced teacher for two years while in TEAM.

Mrs. Plante referred to the leader section and asked what an administrator observation was like.

Mr. Purcaro said examples of administrator observations would be observing an activity in a classroom or being part of an MTSS meeting. The observations would be in an environment when they are leading a group.

Out-of-District Special Education Transportation Contract:

MOTION: Mr. Vouros moved that the Board of Education accept the recommendation of the Director of Business to award the bid for out-of-district transportation to Ambassador, Inc. Mrs. Linnetz seconded.

Ms. Gouveia said that EdAdvance was our contractor. April 11 we posted a bid for this service. Bids are due April 25 and has changed from a five-year to a three-year contract with a two-year extension. Ambassador and Connecticut Transportation Solutions bid. We imposed a 20% inflation rate for EdAdvance. Ambassador came in with a \$56,000 reduction and we only had one bidder.

Ms. Zukowski said that CFF gets to review RFPs prior to sending them out.

Ms. Gouveia said it was not brought to the last CFF meeting because we were under a time constraint.

Ms. Zukowsk request that in the future the CFF committee has another set of eyes on an RFP before it goes out.

Motion passes unanimously.

Item 9 – Public Participation

MOTION: Mr. Vouros moved that the Board of Education go into executive session to discuss security strategy and the Superintendent's evaluation and invite Mrs. Uberti and Mr. Pompano for the security strategy session. Mrs. Linnetz seconded. Motion passes unanimously.

Item 10 – Executive Session

The Board went into executive session at 8:40 p.m. and came out of session at 10:14 p.m.

MOTION: Mrs. Linnetz moved to adjourn. Ms. Zukowski seconded. Motion passes 5-0.

Item 11 – Adjournment

The meeting adjourned at 10:15 p.m.

Respectfully submitted:

Deborra J. Zukowski
Secretary

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

Minutes of the Board of Education Meeting held on June 10, 2025 at 7:00 p.m. in the Council Chambers, 3 Primrose Street, Newtown, CT.

A. Plante, Chair	A. Uberti
J. Vouros, Vice Chair	F. Purcaro
D. Zukowski, Secretary	T. Gouveia.
S. Tomai	1 Staff
C. Gilson	1 Public
D. Linnetz	1 Press
B. Leonardi (virtual)	

Mrs. Plante called the meeting to order at 7:05 p.m.

Item 1 – Pledge of Allegiance

Item 2 – Consent Agenda

Mrs. Plante said there would be no action on the donation tonight.

Item 3 – Public Participation

Item 4 – Reports

Chair Report: Mrs. Plante thanked all of the teachers, staff members and administrators for another great year and wished them a restful summer.

Superintendent's Report: Mrs. Uberti noted that staff is finishing the year and tomorrow evening there are two middle school moving-up ceremonies and Thursday is the high school graduation. Due to space constraints, the PAL program is moving to Garden Grove at Sandy Hook School because the preschool is moving to Reed Intermediate School. The first grade will move into the preschool rooms. She went to Sandy Hook School this week to honor our paraeducator of the year, Kathy Coffey who has served for ten years. The district received the resignation of Chris Geissler who has been here since 2010 and acknowledged his work at Middle Gate School.

Committees and Liaisons:

Dr. Gilson spoke about the Diversity, Equity, Accessibility and Inclusion Subcommittee meeting tonight. Kara DiBartolo is working on a hateful language youth protocol, which will be shared with principals and assistant principals. The DEAI website is being updated and will be rolled out next month. The committee also reviewed the incident data report and found issues to address. Activities with Nixon & Co. have wound down and we need to set goals for next year. We will be looking at meetings for next year.

Mrs. Plante felt it might be worthwhile to have an update to the full Board over the next few months.

Ms. Zukowski also suggested having a discussion with equity team leaders.

Item 5 – Old Business

MOTION: Ms. Tomai moved that the Board of Education approve the revised Newtown Public Schools Educator and Leader Evaluation and Support Plan as required by Connecticut State Department of Education, in accordance with Connecticut General Statutes Section 10-151b and the guidelines set forth by the CSDE. Mr. Vouros seconded.

Ms. Zukowski asked who was accountable for changing a student's outcome.

Mr. Purcaro said there are two items teachers have to submit at the end of the year. One is student impact on their goals and impact on their own professional practice. We can't couple student assessment scores directly to the outcomes. There's no mandate to tie students results into teacher goals. To measure student's impact is to have it tied to assessments.

Mrs. Uberti said the definition of accountability has changed. At the end of the day, we are all accountable, but at the same time, no one specifically is accountable. We have to monitor the development of curriculum and put the right one in the teachers' hands. The other piece is implementation of that curriculum. We present the results to the Board of Education and how the progress made with those goals. There is not a direct accountability.

Ms. Zukowski asked if there was a plan to see if the new evaluation plans are working. Mrs. Uberti said we plan to keep the professional development and evaluation committee in place and meet with them regularly on the plan over the course of next year and make changes as we go.

Mr. Vouros asked how the actual observations on the teachers is going to be different than its been and how will you know if its done with fidelity and with non-tenured teachers. Mr. Purcaro said we are employing the Frontline System so we can get an automatic report from there. Mrs. Uberti stated that there will be a lot of training for those who evaluate teachers and those who are observing will provide quality feedback.

Ms. Tomai asked if calibration was the next step and if you envision the person doing the evaluation will have to defend their evaluation in order to calibrate. Mrs. Uberti said there are methods of doing that like taking a random sampling. We need to find that out early in the process.

Mr. Purcaro said its bringing the evaluations to the table. It should include feedback from the teacher, looking at the observations, and continuing to do that overtime.

Mrs. Uberti said we learned a lot from the learning walks. Once you identify the components of good teaching, the same foundational components are there. The challenge will be working with those who will evaluate.

Mr. Vouros asked if the Board members were still invited to attend instructional rounds to which Mrs. Uberti stated they were. Motion passes unanimously.

Item 6 – New Business

Chartwells Renewal:

MOTION: Ms. Tomai moved that the Board of Education approve a one-year renewal "Amendment No. 3" to Compass Groups USA, Inc., by and through its Chartwells Division initial agreement for food services dated August 23, 2022 with an effective date of July 1, 2025 through June 30, 2026. The terms and conditions in the original agreement as amended will apply. Mr. Vouros seconded.

Ms. Tomai asked if the increase in management and administrative fee is required by the original contract.

Ms. Gouveia said it comes from the state and we have to put in an increase for them.

Ms. Tomai asked if the contract requires a 3.8% increase.

Ms. Gouveia said there is a discretionary amount that we can increase it by but it happens to be 3.8% and they are doing a good job.

Ms. Tomai asked what the initial management fee and initial administrative fee numbers were based on.

Ms. Gouveia said we set the fees in the initial contract. Each year they are increased by the CPI.

Ms. Tomai stated they list what the responsibilities are included in the fees. She wants to be sure they didn't delete any from their initial contract and reduce the scope of their services.

Ms. Gouveia said these are in there every year and comes from the state.

Ms. Zukowski asked if we can make the original contract available to the CFF committee to help address concerns.

Ms. Tomai felt it was important to review the contract and be sure the language is not changing.

Ms. Gouveia noted that they are federal regulations which come from the state.

Motion passes unanimously.

Grade 5 and 6 Computer Integration Curriculum:

Dr. Gilson and Mr. Purcaro spoke about this curriculum.

Mrs. Linnetz asked when we will introduce AI.

Mr. Purcaro said there was a lot of work to be done in this area and we are in the planning process now. We will train teachers and provide guidance for the students.

Mr. Vouros asked what if we find a child is using this.

Mr. Purcaro said we would treat plagiarism as we normally do. Students are using it but we need to help them find what level of AI would be useful. It takes time to develop this. We have policies that speak to academic dishonesty.

HS Differential Equations Curriculum:

Dr. Gilson spoke about this which speaks to providing resources for gifted and talented.

Eugene Hall is the teacher.

Spanish I Resource:

Dr. Gilson said it is an excellent textbook which is long overdue.

CT Primary Health Grant:

MOTION: Ms. Tomai moved that the Board of Education approve applying for the Connecticut Primary Mental Health Grant for the 2025-26 and 2026-27 school years for Sandy Hook School and further approve that the Chair sign, on behalf of the Board, the letter communicating support for the continued implementation of the Connecticut Primary Mental Health project at Sandy Hook School. Mr. Vouros seconded.

Judit DeStefano spoke about the grant renewal for 2 years. This is a mental health grant for emotional and behavioral learning problems in grades K-3 at Sandy Hook School which has been very successful. It's a play-based intervention in 45 minute sessions. This year we did this in the fall and spring with 38 children served. We are being awarded \$17,000 to \$20,000 from the state which we match with a \$5,000 contribution for items for the program.

Motion passes unanimously.

First Read of Policies:

Mrs. Linnetz spoke about the two policies for first read.

Policy 5137 Connecticut School Climate Policy and Administrative Regulation is required by the State of Connecticut.

Policy 3434 Annual Audit is not required but we wanted to have one.

The others are non-mandated policies to rescind.

Ms. Zukowski noted that we have a policy coming from the state we have no rights to.

Mrs. Uberti said some districts refused to vote on it. She doesn't see it as controversial but we have to implement it. We are going to need legal counsel as to how some of this will work.

Mrs. Plante thinks it's a good policy and doesn't find it controversial.

Possible Action on the Last Day of School:

Mrs. Uberti put this on the agenda because many people inquired whether Friday would be the last day of school and she received a mix of responses. Her biggest concern making the change is hearing from working families given the last hour decision which is a valid concern.

Ms. Tomai suggested making it an optional day for parents who need it and allow them to choose.

Mrs. Uberti said there is no penalty if a parent decides to not to send their students to school on Monday.

Mr. Leonardi said he spoke to a number of parents and educators and all were in favor of ending Friday. There is nothing going on in the classrooms on Monday and he was in favor of ending the year on Friday but would also agree to the option.

Ms. Zukowski was not in favor of taking Monday away as its not a good way to treat working families and agrees there should be no retribution if students are not in school that day.

Mrs. Plante agreed and preferred to keep Monday.

MOTION: Mr. Leonardi moved to approve the modification of the school district to change the final day of the school year from June 16 to June 13. There was no second.

The Board decided to give parents the choice.

Item 7 – Public Participation

MOTION: Ms. Tomai moved that the Board of Education go into executive session to discuss personnel matters, the contract extensions for the Assistant Superintendent and Director of Business, and the Superintendent's evaluation and invite Mrs. Uberti. Mr. Vouros seconded. Motion passes unanimously.

Item 8 – Executive Session

The Board went into executive session at 8:28 p.m. and exited at 9:56 p.m.

Item 9 – Public Session for Possible Vote on Executive Session Items

MOTION: Ms. Zukowski moved that the Board of Education fully authorize the Superintendent to hire for the position of Principal of Middle Gate School through the alternative procedure outlined in Policy 2151. Mr. Vouros seconded. Motion passes unanimously.

MOTION: Ms. Zukowski moved that the Board of Education approve the Superintendent to carry over five vacations days as stated in her contract. Mr. Vouros seconded. Motion passes unanimously.

MOTION: Ms. Zukowski moved that the Board of Education approve the one-year contract extension for Frank Purcaro, Assistant Superintendent. Mr. Vouros seconded. Motion passes unanimously.

MOTION: Ms. Zukowski moved that the Board of Education approve the one-year contract extension for Tanja Gouveia, Director of Business. Mr. Vouros seconded. Motion passes unanimously.

MOTION: Ms. Zukowski moved that the Board of Education extend the employment contract of Mrs. Anne Uberti as Superintendent of Schools, through and including June 30, 2028, and MOVE FURTHER that the Board Chairperson be authorized to finalize and execute the employment contract with Mrs. Uberti for the period July 1, 2025 through June 30, 2028. Mr. Vouros seconded. Motion passes unanimously.

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

Item 10 – Adjournment

The meeting adjourned at 9:58 p.m.

Respectfully Submitted:

Deborra J. Zukowski
Secretary

Note: Pursuant to Connecticut General Statutes Section 10-222cc, for the school year commencing July 1, 2025 and each school year thereafter, each local and regional board of education must adopt and implement the Connecticut School Climate Policy that was developed and approved by the Connecticut Association of Boards of Education and adopted by the Social and Emotional Learning and School Climate Advisory Collaborative.

As such, boards of education are advised to adopt such policy by July 1, 2025. When adopting this policy, boards of education are further advised to repeal their existing Bullying Prevention and Intervention Policy, which will effectively be replaced by the Connecticut School Climate Policy.

On and after the earlier of July 1, 2025 and/or once the Board of Education adopts the Connecticut School Climate Policy, such Board will be subject to the provisions of Connecticut General Statutes Sections 10-222aa through 10-222ii and will no longer be subject to Connecticut General Statutes Sections 10-222d, 10-222g, 10-222h, 10-222i, 10-222k, and 10-222p, which are the provisions of the general statutes related to the state’s former framework regarding bullying prevention and intervention and the implementation of safe school climate plans.

Policy 5131 Bullying Prevention and Intervention and Administrative Regulations Regarding Safe School Climate Plan should be repealed or rescinded at the time this policy is adopted.

**Series 5000
Students**

5137

CONNECTICUT SCHOOL CLIMATE POLICY AND ADMINISTRATIVE REGULATIONS

Policy Statement

All schools must support and promote teaching and learning environments where all students thrive academically and socially, have a strong and meaningful voice, and are prepared for lifelong success.

Implementation of the following set of guiding principles and systemic strategies will promote a positive school climate, which is essential to achieving these goals.

This policy sets forth the framework for an effective and informed school climate improvement process, which includes a continuous cycle of (i) planning and preparation, (ii) evaluation, (iii) action planning, and (iv) implementation, and serves to actualize the Connecticut School Climate Standards, as detailed herein.

The Board recognizes that improving school climate is contextual. Each school needs to consider its history, strengths, needs, and goals. Furthermore, this policy will support and promote the development of restorative action plans that will create and sustain safe and equitable learning environments.

The Newtown Board of Education adopts this policy.

Definitions

1. **“School climate”** means the quality and character of the school life, with a particular focus on the quality of the relationships within the school community, and which is based on patterns of people's experiences of school life and that reflects the norms, goals, values, interpersonal relationships, teaching, learning, leadership practices and organizational structures within the school community.
2. **“Positive Sustained School Climate”** is the foundation for learning and positive youth development and includes:
 - a. Norms, values, and expectations that support people feeling socially, emotionally, culturally, racially, intellectually, and physically safe.
 - b. People who treat one another with dignity and are engaged, respected and solve problems restoratively.
 - c. A school community that works collaboratively together to develop, live, and contribute to a shared school vision.
 - d. Adults who model and nurture attitudes that emphasize the benefits and satisfaction gained from learning; and
 - e. A school community that contributes to the operations of the school and the care of the physical environment.
3. **“Social and emotional learning”** means the process through which children and adults achieve emotional intelligence through the competencies of self-awareness, self-management, social awareness, relationship skills and responsible decision-making.
4. **“Emotional intelligence”** means the ability to (A) perceive, recognize, and understand emotions in oneself or others, (B) use emotions to facilitate cognitive activities, including, but not limited to, reasoning, problem solving and interpersonal communication, (C) understand and identify emotions, and (D) manage emotions in oneself and others.
5. **“Bullying”** means unwanted and aggressive behavior among children in grades kindergarten to twelve, inclusive, that involves a real or perceived power imbalance.
6. **“School environment”** means a school-sponsored or school-related activity, function or program, whether on or off school grounds, including at a school bus stop or on a school bus or other vehicle owned, leased or used by a local or regional board of education, and may include other activities, functions or programs that occur outside of a school-sponsored or school-related activity, function or program if bullying at or during such other activities, functions or programs negatively impacts the school environment.
7. **“Cyberbullying”** means any act of bullying through the use of the Internet, interactive and digital technologies, cellular mobile telephone or other mobile electronic devices or any other electronic communication.
8. **“Teen dating violence”** means any act of physical, emotional or sexual abuse, including stalking, harassing and threatening, that occurs between two students who are currently in or who have recently been in a dating relationship.

9. **“Mobile electronic device”** means any hand-held or other portable electronic equipment capable of providing data communication between two or more individuals, including, but not limited to, a text messaging device, a paging device, a personal digital assistant, a laptop computer, equipment that is capable of playing a video game or a digital video disk or equipment on which digital images are taken or transmitted.
10. **“Electronic communication”** means any transfer of signs, signals, writing, images, sounds, data or intelligence of any nature transmitted in whole or in part by a wire, radio, electromagnetic, photoelectronic or photo-optical system.
11. **“School climate improvement plan”** means a building-specific plan developed by the school climate committee, in collaboration with the school climate specialist, using school climate survey data and any other relevant information, through a process that engages all members of the school community and involves such members in a series of overlapping systemic improvements, school-wide instructional practices and relational practices that prevent, identify and respond to challenging behavior, including, but not limited to alleged bullying and harassment in the school environment.
12. **“Restorative practices”** means evidence and research-based system-level practices that focus on (A) building high-quality, constructive relationships among the school community, (B) holding each student accountable for any challenging behavior, and (C) ensuring each such student has a role in repairing relationships and reintegrating into the school community.
13. **“School climate survey”** means a research-based, validated and developmentally appropriate survey administered to students, school employees and families of students, in the predominant languages of the members of the school community, that measures and identifies school climate needs and tracks progress through a school climate improvement plan.
14. **“Connecticut school climate policy”** means the school climate policy developed, updated and approved by an association in the state that represents boards of education and adopted by the Social and Emotional Learning and School Climate Advisory Collaborative, established pursuant to section 10-222q of the general statutes, as amended by this act, that provides a framework for an effective and democratically informed school climate improvement process that serves to implement Connecticut school climate standards, and includes a continuous cycle of (A) planning and preparation, (B) evaluation, (C) action planning, and (D) implementation.
15. **“School employee”** means (A) a teacher, substitute teacher, administrator, school superintendent, school counselor, school psychologist, social worker, school nurse, physician, paraeducator or coach employed by a local or regional board of education, or (B) any other individual who, in the performance of his or her duties, has regular contact with students and who provides services to or on behalf of students enrolled in a public school, pursuant to a contract with a local or regional board of education.
16. **“School community”** means any individuals, groups, businesses, public institutions and nonprofit organizations that are invested in the welfare and vitality of a public school system and the community in which it is located, including, but not limited to, students and

their families, members of the local or regional board of education, volunteers at a school and school employees.

17. **“Challenging behavior”** means behavior that negatively impacts school climate or interferes, or is at risk of interfering, with the learning or safety of a student or the safety of a school employee.
18. **“Evidence Based Practices”** in education refers to instructional and school-wide improvement practices that systematic empirical research has provided evidence of statistically significant effectiveness.
19. **“Effective School Climate Improvement”** is a restorative process that engages all stakeholders in the following six essential practices:
 - A. Promoting decision-making that is collaborative and actively involves all stakeholders (e.g., school personnel, students, families, community members) with varied and meaningful roles and perspectives where all voices are heard;
 - B. Utilizing psychometrically sound quantitative (e.g., school climate survey, discipline data) and qualitative (e.g., interviews, focus groups) data to drive action planning, preventive and intervention practices and implementation strategies that continuously improve all dimensions of school climate, including regularly collecting data to evaluate progress and inform the improvement process;
 - C. Tailoring improvement goals to the unique needs of the students, educators, and broader school community. These goals shall be integrated into overall school improvement efforts thereby leveraging school strengths to address evidence-based areas of need, while sustaining the improvement process over time;
 - D. Fostering adult learning in teams and/or professional learning communities to build capacity building among school personnel and develop common staff skills to educate the whole child;
 - E. Basing curriculum, instruction, student supports, and interventions on scientific research and grounding in cognitive, social-emotional, and psychological theories of youth development. Interventions include strength-based programs and practices that together represent a comprehensive continuum of approaches to promote healthy student development and positive learning environments as well as address individual student barriers to learning and adult barriers to teaching; and
 - F. Strengthening policies and procedures related to:
 - a. climate and restorative informed teaching and learning environments;
 - b. infrastructure to facilitate data collection, analysis, and effective planning;
 - c. implementation of school climate improvement plans with the goal of becoming restorative;
 - d. evaluation of the school climate improvement process; and
 - e. sustainability of school climate and restorative improvement efforts.

School Climate Coordinator Roles and Responsibilities

For the school year commencing July 1, 2025, and each school year thereafter, the superintendent of schools for each school district, or an administrator appointed by the superintendent, shall serve

as the school climate coordinator for the school district.

The school climate coordinator shall be responsible for:

1. providing district-level leadership and support for the implementation of the school climate improvement plan for each school;
2. collaborating with the school climate specialist, for each school to (A) develop a continuum of strategies to prevent, identify and respond to challenging behavior, including, but not limited to, alleged bullying and harassment in the school environment, and (B) communicate such strategies to the school community, including, but not limited to, through publication in the district student handbook;
3. collecting and maintaining data regarding school climate improvement, including, but not limited to, school discipline records, school climate assessments, attendance rates, social and emotional learning assessments, academic growth data, types and numbers of alleged and verified bullying complaints submitted by members of the school community, types and numbers of challenging behaviors addressed using the restorative practices response policy, and data concerning the implementation and outcome of restorative practices; and
4. meeting with the school climate specialist for each school at least twice during the school year to (A) identify strategies to improve school climate, including, but not limited to, by responding to challenging behavior and implementing evidence and research-based interventions, such as restorative practices, (B) propose recommendations for revisions to the school climate improvement plan, and (C) assist with the completion of the school climate survey.

School Climate Specialist

For the school year commencing July 1, 2025, and each school year thereafter, the principal of each school, or a school employee who holds professional certification pursuant to section 10- 145 of the general statutes, is trained in school climate improvement or restorative practices and is designated as the school climate specialist by the school principal, shall serve as the school climate specialist for the school.

The school climate specialist shall be responsible for:

1. leading in the prevention, identification, and response to challenging behavior, including, but not limited to, reports of alleged bullying and harassment;
2. implementing evidence and research-based interventions, including, but not limited to, restorative practices;
3. scheduling meetings for and leading the school climate committee; and
4. leading the implementation of the school climate improvement plan.

School Climate Committee

For the school year commencing July 1, 2025, and each school year thereafter, each school climate

specialist shall appoint members to the school climate committee who are diverse, including members who are racially, culturally, and linguistically representative of various roles in the school community.

The school climate committee shall consist of:

1. the school climate specialist; a teacher selected by the exclusive bargaining representative for certified employees chosen pursuant to section 10-153b of the general statutes;
2. a demographically representative group of students enrolled at the school, as developmentally appropriate;
3. families of students enrolled at the school; and
4. at least two members of the school community, as determined by the school climate specialist.

Membership of the school climate committee shall be annually reviewed and approved by the school climate specialist, in coordination with the school climate coordinator.

The school climate committee shall be responsible for:

1. assisting in the development, annual scheduling, and administration of the school climate survey, and reviewing of the school climate survey data.
2. using the school climate survey data to identify strengths and challenges to improve school climate, and to create or propose revisions to the school climate improvement plan.
3. assisting in the implementation of the school climate improvement plan and recommending any improvements or revisions to the plan.
4. advising on strategies to improve school climate and implementing evidence and research-based interventions, including, but not limited to, restorative practices, in the school community.
5. annually providing notice of the uniform challenging behavior and/or bullying complaint form, or similar complaint form used by the school, to the school community.

School Climate Survey

For the school year commencing July 1, 2025, and biennially thereafter, the school climate committee, for each school, shall administer a school climate survey to students, school employees and families of students, provided the parent or guardian of each student shall receive prior written notice of the content and administration of such school climate survey and shall have a reasonable opportunity to opt such student out of such school climate survey.

School Climate Improvement Plan

For the school year commencing July 1, 2025, and each school year thereafter, the school climate specialist, for each school, in collaboration with the school climate coordinator, shall develop, and

update as necessary, a school climate improvement plan. Such plan shall be based on the results of the school climate survey, any recommendations from the school climate committee, including the protocols, supports, and any other data the school climate specialist and school climate coordinator deem relevant. Such plan shall be submitted to the school climate coordinator for review and approval on or before December thirty-first of each school year. Upon approval of such plan, a written or electronic copy of such plan shall be made available to members of the school community and such plan shall be used in the prevention of, identification of and response to all challenging behavior.

Additionally, districts may place the school climate improvement plans into their district and school improvement plans.

Training

For the school year commencing July 1, 2024, and each school year thereafter, each local and regional Board of Education shall provide resources and training to school employees regarding:

1. social and emotional learning;
2. school climate and culture and evidence and research-based interventions; and
3. restorative practices.

Such resources and training may be made available at each school under the jurisdiction of such board and include technical assistance in the implementation of a school climate improvement plan. Any school employee may participate in any such training offered by the board under this section. The school climate coordinator, shall select, and approve, the individuals or organizations that will provide such training.

Funding

The school district shall in its discretion allocate sufficient funding to satisfy the requirements of this policy for all schools in the district. Such funding shall be distributed accordingly, with Superintendent approval, for assessments and professional development, as well as for school community outreach, training, and technical assistance.

Accountability

The Board shall adopt and allocate adequate resources to support the Connecticut School Climate Policy and adhere to state regulations set forth in Public Act 23-167.

Connecticut School Climate Standards

1. The school district community² has a shared vision and plan for promoting and sustaining a positive school climate³ that focuses on prevention, identification, and response to all challenging behavior⁴.
2. The school district community adopts policies that promote:
 - a. a sound school environment that develops and sustains academic, social, emotional, ethical, civic, and intellectual skills; and a restorative school environment focused on

overcoming barriers to teaching and learning by building and supporting meaningful school-wide relationships, and intentionally re-engaging any disengaged students, educators, and families of students in the school community.

3. The school community's practices are identified, prioritized, and supported to:
 - a. promote learning and the positive academic, social, emotional, ethical, and civic development of students;
 - b. enhance engagement in teaching, learning, and school-wide activities;
 - c. address barriers to teaching and learning; and
 - d. develop and sustain a restorative infrastructure that builds capacity, accountability, and sustainability.
4. The school community creates a school environment⁵ where *everyone* is safe, welcomed, supported, and included in all school-based activities.
5. The school community creates a restorative system that cultivates a sense of belonging through norms and activities that promote social and civic responsibility, and a dedication to cultural responsiveness, diversity, equity, and inclusion.

² School Community means any individuals, groups or businesses, public institutions and nonprofit organizations invested in the welfare and vitality of a public school system and the community in which it is located, including, but not limited to, students and their families, members of the local or regional board of education, volunteers at a school and school employees.

³ School climate means the quality and character of the school life, with a particular focus on the quality of relationships within the school community, and which is based on patterns of people's experiences of school life, and that reflects the norms, goals, values and interpersonal relationships, teaching, learning, leadership practices and organizational structures within the school community.

⁴ Challenging behavior means behavior that negatively impacts school climate or interferes, or is at risk of interfering, with the learning or safety of a student or the safety of a school employee.

⁵ School environment means a school-sponsored or school-related activity, function or program, whether on or off school grounds, including at a school bus stop or on a school bus or other vehicle owned, leased or used by a local or regional board of education, and may include other activities, functions or programs if bullying at or during such other activities, functions, or programs negatively impacts the school environment.

Approved:
Revised:

NEWTOWN PUBLIC SCHOOLS
Newtown, Connecticut

This form is not required by law or policy but serves as a model challenging behavior reporting form that local and regional boards of education may adapt and adopt.

Instructions

This form is for **students, parents or guardians of students enrolled in the school, and school employees** to report any alleged challenging behavioral incidents. Challenging behavior is behavior that negatively impacts school climate or interferes, or is at risk with interfering, with the learning or safety of a student or the safety of a school employee. This form should also be used to report alleged bullying incidents, meaning: unwanted and aggressive behavior among children in grades kindergarten to twelve, inclusive, that involves a real or perceived power imbalance.

Complete this form electronically, or in writing, or go to your school climate specialist (principal, vice principal, or other certified administrator) who will assist you with completing this form. All completed reports require a response from the school climate specialist, and every student, parent or guardian, and school employee **who completed this form** will receive a copy of the "Response Process(es) Notification Form" describing the action steps taken, within three (3) school business days after an assessment has been completed.

The school climate specialist will assess the facts of a challenging behavior incident and complete the "Response Process(es) Notification Form" (located on page 5 of this document). A confirmation of receipt of the "challenging behavior reporting form" will be provided to the individual who completed this form within **three (3) school business days**, and the behavioral assessment will be finalized within a reasonable amount of time.

If this is an emergency, and you feel that you or someone else is in imminent danger, please call 911, or your municipal police department.

Name: First _____ Last _____ or check here for any **student** who would like to submit anonymously.

I am a: Student, Parent and/or Guardian or School

Employee Email: _____

Phone Number: _____

Contact me by: Phone Email

Was this previously reported to any school employee prior to this report? If yes, identify to whom, when, and what was reported? _____

Where did the incident occur? _____

Check any boxes that apply.

- | | | |
|--|--|--------------------------|
| <input type="checkbox"/> On school property | <input type="checkbox"/> On a school bus | <input type="checkbox"/> |
| <input type="checkbox"/> At a school-sponsored activity or off school property | <input type="checkbox"/> On the way to/from school | <input type="checkbox"/> |
| <input type="checkbox"/> Electronic communication, internet, and social media | <input type="checkbox"/> Outside of school | <input type="checkbox"/> |
| | <input type="checkbox"/> Other | <input type="checkbox"/> |

Approximate date of incident (if known): _____

This form does not modify or eliminate any rights or obligations under state and federal laws, including, any constitutional and civil rights protections, or any applicable policies and procedures or collective bargaining agreements. All students' private and personal information will remain confidential throughout this process, subject to any wavier rights or disclosure responsibilities as permitted or required by law.

Please note: when a student exhibits challenging behavior, our priority is to ensure the safety of the students and the school, and to work with the student(s) to prevent the recurrence of such behavior, including making amends for any challenging behaviors that occurred. Federal law protects the privacy of each student. Therefore, you cannot be provided with any specific information concerning the student alleged to have engaged in the challenging behavior.

Please describe what happened?

Of the following statement(s) check any that may describe or include what happened:

- | | | |
|--|---|--------------------------|
| <input type="checkbox"/> Teasing, name-calling, intimidating, or threatening, in person or through electronic communication | <input type="checkbox"/> Making intimidating, and/or threatening gestures or remarks | <input type="checkbox"/> |
| <input type="checkbox"/> Spreading rumors or gossip | <input type="checkbox"/> Getting another person to do any of the behaviors listed above | <input type="checkbox"/> |
| <input type="checkbox"/> Hitting, kicking, shoving, spitting, hair pulling, or throwing something or other acts of physical aggression | <input type="checkbox"/> Unwanted contact of a sexual nature (verbal, non-verbal, physical) | <input type="checkbox"/> |

Do you believe that the reported instance(s) of challenging behavior was in reference to a student's perceived or actual age, ancestry, color, learning disability, marital status, intellectual disability, national origin, physical disability, mental disability, race, religious creed, sex, gender identity or expression, sexual orientation, and status as a veteran? If so, why?

If known, provide the name(s) of any witness(es) of the alleged incident: _____

Date form submitted: _____

***For school climate specialist use only:**

Date received by school climate specialist: _____

Signature of receipt by school climate specialist: _____

This form does not modify or eliminate any rights or obligations under state and federal laws, including, any constitutional and civil rights protections, or any applicable policies and procedures or collective bargaining agreements. All students' private and personal information will remain confidential throughout this process, subject to any wavier rights or disclosure responsibilities as permitted or required by law.

Please note: when a student exhibits challenging behavior, our priority is to ensure the safety of the students and the school, and to work with the student(s) to prevent the recurrence of such behavior, including making amends for any challenging behaviors that occurred. Federal law protects the privacy of each student. Therefore, you cannot be provided with any specific information concerning the student alleged to have engaged in the challenging behavior.

Investigation Form

The purpose of this form is to provide a streamlined process to assess reported instances of challenging behavior.

This form is to be completed by the school climate specialist within a reasonable amount of time. Pursuant to the Federal Education Confidentiality Law (FERPA), students, parents or guardians, and school employees that completed the challenging behavior reporting form **cannot** receive a copy of this “Investigation Form” but will be provided with a copy of the “Response Process(es) Notification Form” after an assessment is completed.

Date “Challenging Behavior Reporting Form” received: _____

Today’s Date: _____

Name of school climate specialist who received the report: _____

Were these events already reported to any school employee? If yes, please identify to whom, when, and what was reported _____

Name of school community member who is reporting the incident: (student, parent or guardian, school or district employee, bystander, anonymous): _____

Name of student or students who were allegedly subjected to the challenging behavior: _____

Name of person or persons who allegedly engaged in the challenging behavior: _____

Where did the alleged incident occur? _____

Date and time alleged incident occurred: (if known): _____

Description of the alleged incident: _____

What investigative processes occurred? Answer all of the following questions below. A single incident may require an assessment into multiple areas. Please check all that apply.

Was this investigated as bullying? YES NO

Was this a verified act of bullying? YES NO

Was this investigated as cyberbullying? YES NO

Was this a verified act of cyberbullying? YES NO

Was this investigated as teen dating violence? YES NO

Was this a verified teen dating violence? YES NO

Was this investigated as an assault? YES NO

Was this a verified assault? YES NO

Was this investigated as an act of physical violence? YES
NO

Was this a verified act of physical violence? YES or NO

Was this investigated as a protected class violation/harassment? YES NO

Was this a verified protected class violation/harassment? YES NO

Was this investigated as a Title IX violation? YES NO

Was this a verified Title IX violation? YES or NO

Was this a verified act of challenging behavior not listed above? YES NO

This form does not modify or eliminate any rights or obligations under state and federal laws, including, any constitutional and civil rights protections, or any applicable policies and procedures or collective bargaining agreements. All students' private and personal information will remain confidential throughout this process, subject to any wavier rights or disclosure responsibilities as permitted or required by law.

Please note: when a student exhibits challenging behavior, our priority is to ensure the safety of the students and the school, and to work with the student(s) to prevent the recurrence of such behavior, including making amends for any challenging behaviors that occurred. Federal law protects the privacy of each student. Therefore, you cannot be provided with any specific information concerning the student alleged to have engaged in the challenging behavior.

Form 2
(continued)

What was the response by the school climate specialist? (E.g., utilization of restorative practices, school-based threat assessment, safety plan, student support services) Additionally, provide the date of each response.

If applicable, please provide any additional notes, observations, or actions taken as a result of this incident:

Signature or E-signature of responding school climate specialist: _____

Printed name: _____

Date of response: _____

This form does not modify or eliminate any rights or obligations under state and federal laws, including, any constitutional and civil rights protections, or any applicable policies and procedures or collective bargaining agreements. All students' private and personal information will remain confidential throughout this process, subject to any wavier rights or disclosure responsibilities as permitted or required by law.

Please note: when a student exhibits challenging behavior, our priority is to ensure the safety of the students and the school, and to work with the student(s) to prevent the recurrence of such behavior, including making amends for any challenging behaviors that occurred. Federal law protects the privacy of each student. Therefore, you cannot be provided with any specific information

concerning the student alleged to have engaged in the challenging behavior.

Response Process(es) Notification Form

The purpose of this form is to provide a template for transparency and accountability to a person(s) that submit(s) a report of challenging behavior.

The school climate specialist will complete and submit this form within three (3) school business days **after an assessment has been finalized** and submit it to the student(s), parent(s), or guardian(s), and/or school employee(s) who completed the “Challenging Behavior Reporting Form”.

Describe the steps taken to address and prevent future instance(s) of challenging behavior(s). Responses may include:

- utilization of restorative practices;
- the completion of a school-based threat assessment;
- safety plan for student(s) involved in the instance of alleged challenging behavior;
- student support services;

Signature or E-signature of school climate specialist: _____

Printed name: _____

Date completed: _____

Definitions and Clarifying Terms

Restorative Practices: Evidence and research-based system-level practices that focus on (A) building high-quality, constructive relationships among the school community, (B) holding each student accountable for any challenging behavior, and (C) ensuring each such student has a role in repairing relationships and reintegrating into the school community.

School Based Threat Assessment: An evidence-based systematic evaluation process used to prevent violence, help troubled students, and avoid over-reactions to challenging behavior.

This form does not modify or eliminate any rights or obligations under state and federal laws, including, any constitutional and civil rights protections, or any applicable policies and procedures or collective bargaining agreements. All students' private and personal information will remain confidential throughout this process, subject to any wavier rights or disclosure responsibilities as permitted or required by law.

Please note: when a student exhibits challenging behavior, our priority is to ensure the safety of the students and the school, and to work with the student(s) to prevent the recurrence of such behavior, including making amends for any challenging behaviors that occurred. Federal law protects the privacy of each student. Therefore, you cannot be provided with any specific information concerning the student alleged to have engaged in the challenging behavior.

Note: Pursuant to Connecticut General Statutes Section 10-222cc, for the school year commencing July 1, 2025 and each school year thereafter, each local and regional board of education must adopt and implement the Connecticut School Climate Policy that was developed and approved by the Connecticut Association of Boards of Education (“CABE”) and adopted by the Social and Emotional Learning and School Climate Advisory Collaborative (the “Collaborative”). The Connecticut School Climate Policy addresses some, but not all, elements of the statutes concerning challenging behavior, bullying, and school climate, such as the operational requirements related to implementation of these statutes. To assist the administration in complying with these requirements, Shipman and Goodwin has developed the following model Administrative Regulations Regarding Connecticut School Climate Policy. It is important to note that these regulations are not required by statute. In addition, these regulations refer to the Challenging Behavior Reporting Form, Investigation Form, and Response Process(es) Notification Form that were developed by CABE, approved by the Collaborative, and accompany the Connecticut School Climate Policy. While school districts must have and publicize a complaint form for purposes of reporting alleged challenging behavior and/or alleged bullying incidents, these particular forms are not required and may be adapted and/or customized. However, please note that the firm has not developed alternatives to these forms, and these model Administrative Regulations Regarding Connecticut School Climate Policy assume that school districts are using them.

**Series 5000
Students**

5137 R

ADMINISTRATIVE REGULATIONS REGARDING CONNECTICUT SCHOOL CLIMATE POLICY

The Newtown Board of Education (the “Board”) has adopted the Connecticut School Climate Policy in accordance with Connecticut General Statutes Section 10-222cc. The purpose of these Administrative Regulations Regarding Connecticut School Climate Policy is to outline additional requirements under Connecticut General Statutes Sections 10-222aa *et seq.* regarding the reporting of, assessment of, and responses to challenging behavior and bullying, as well as certain related requirements.

I. Definitions

- A. “School Climate Specialist” means the principal of each school, or a school employee who holds professional certification pursuant to Connecticut General Statutes Section 10-145, who is trained in school climate improvement or restorative practices, and is designated as the School Climate Specialist by the school principal. The School Climate Specialist is responsible for (1) leading in the prevention, identification and response to challenging behavior, including, but not limited to, reports of alleged bullying and harassment, (2) implementing evidence and research-based interventions, including, but not limited to, restorative practices, (3) scheduling meetings for and leading the school climate committee, as described in Connecticut General Statutes Section 10-222ff, and (4) leading the

implementation of the school climate improvement plan, developed pursuant to Connecticut General Statutes Section 10-222hh.

- B. “School employee” means (1) a teacher, substitute teacher, administrator, school superintendent, school counselor, school psychologist, social worker, school nurse, physician, paraeducator or coach employed by the Board, or (2) any other individual who, in the performance of the individual’s duties, has regular contact with students and who provides services to or on behalf of students enrolled in a public school, pursuant to a contract with the Board.
- C. “Challenging behavior” means behavior that negatively impacts school climate or interferes, or is at risk of interfering, with the learning or safety of a student or the safety of a school employee.
- D. “Bullying” means unwanted and aggressive behavior among children in grades kindergarten to twelve, inclusive, that involves a real or perceived power imbalance. “Bullying” includes “cyberbullying”, which means any act of bullying through the use of the Internet, interactive and digital technologies, cellular mobile telephone or other mobile electronic devices or any other electronic communication.
- E. “Challenging Behavior Reporting Form” (referenced as the “uniform bullying complaint form” in Connecticut General Statutes Section 10-222bb) means the form that accompanies the Connecticut School Climate Policy and is intended for students, parents or guardians of students enrolled in the school, and school employees to report alleged challenging behavior and/or alleged bullying incidents. Such form must be included on the Board’s web site and in each of the Board’s student handbooks, and the School Climate Committee must annually provide notice of such form to the school community.
- F. “Investigation Form” means the form that accompanies the Connecticut School Climate Policy and is to be completed by the School Climate Specialist within a reasonable amount of time after receiving a report of an alleged challenging behavior and/or alleged bullying incident.
- G. “Response Process(es) Notification Form” means the form that accompanies the Connecticut School Climate Policy and is to be completed and submitted by the School Climate Specialist to the student(s), parent(s) or guardian(s), and/or school employee(s) who submitted the Challenging Behavior Reporting Form within three (3) school days after an assessment has been finalized and submitted.
- H. “Tiered responses” are responses to challenging behavior, based on level of impact or frequency of occurrence, that are designed to re-engage students who have become disengaged. Particular tiered responses are required when a student engages in behavior that (1) requires temporarily clearing a classroom or removing a majority of students within the classroom to reduce likelihood of injury, (2) indicates credible intention to cause bodily harm to self or others, or (3) results in an injury that requires medical attention beyond basic first aid, or less severe injuries caused by the same student on more than one occasion, verified by the school nurse or other medical professional. Such tiered responses must include, at a minimum, the responses described in Section V of these Administrative Regulations.

- I. “Student discipline”, for purposes of these Administrative Regulations, means removal from the classroom, suspension, or expulsion, as authorized by the Board’s student discipline policy.
- J. “Removal” means an exclusion from a classroom for all or part of a single class period, provided such exclusion shall not extend beyond ninety (90) minutes.

II. Reporting Challenging Behavior or Bullying

- A. School employees shall notify the School Climate Specialist or designee of any alleged challenging behavior or alleged bullying incident that results in student discipline (i.e., removal from the classroom, suspension, or expulsion).
- B. Students, parents or guardians of students enrolled in the school, and school employees (“Reporters”) may file a written report of any alleged challenging behavior or alleged bullying incident using the Challenging Behavior Reporting Form. Such reports may be filed with the building principal, program administrator, and/or the School Climate Specialist, and all reports shall be forwarded to the School Climate Specialist for review and actions consistent with these Administrative Regulations.
- C. Reporters may complete the Challenging Behavior Reporting Form electronically or in hard copy, or they may meet with the School Climate Specialist for assistance in completing the Challenging Behavior Reporting Form.
- D. Written reports of alleged challenging behavior and/or alleged bullying shall be reasonably specific as to the basis for the report, including the date and place of the alleged conduct, a description of what happened, and the names of potential witnesses.
- E. Within three (3) school days, the School Climate Specialist or designee will provide the Reporter with confirmation of receipt of the Challenging Behavior Reporting Form.

III. Assessing Challenging Behavior and Bullying

The School Climate Specialist or other designated administrator shall assess the facts, severity, and intentionality of the alleged challenging behavior or alleged bullying incident in accordance with the following process:

- A. The School Climate Specialist or other designated administrator shall review the information reported in the Challenging Behavior Reporting Form.
- B. The School Climate Specialist or other designated administrator shall assess the factual basis of the report, as well as the severity and intentionality of any actions that may have occurred.
- C. In conducting such assessment, the School Climate Specialist or other designated administrator shall:
 - 1. Consult with individuals reasonably believed to have relevant information, including the Reporter, the individuals identified as having been affected by the behavior, and witnesses to the behavior, as appropriate;

2. Review any relevant materials (e.g., records, statements, documents, videos);
 3. Consider whether the conduct also should be addressed pursuant to any other Board policies or District regulations, such as those related to protected class discrimination or harassment; and
 4. Maintain confidentiality to the extent practicable throughout the assessment process, in accordance with state and federal law.
- D. When conducting the assessment, the School Climate Specialist or other designated administrator shall complete the Investigation Form.
- E. Within a reasonable amount of time, the School Climate Specialist or other designated administrator will determine what responses, if any, should be or have already been taken to address the behavior and/or prevent future instances of such behavior.
- F. Within three (3) school days after an assessment has been completed, the School Climate Specialist or other designated administrator shall (a) complete the Response Process(es) Notification Form, describing the steps taken to address and prevent future instances of challenging behavior or bullying and keeping in mind the District's obligations regarding student confidentiality, and (b) provide the Response Process(es) Notification Form to the Reporter who completed the Challenging Behavior Reporting Form.

IV. Challenging Behavior or Bullying That Results in Student Discipline

- A. **Removal.** If a teacher removes a student from the classroom because the student has deliberately caused a serious disruption of the educational process, the teacher shall: (1) send the student to the office or, if known, the designated area indicated in the student's intervention plan and (2) immediately inform the building principal or designee of the name of the student who was removed and the reason for the removal.
1. While the student has been removed to a designated area, the student may receive supports that include, but are not limited to: intervention from a school employee trained to provide such intervention, therapeutic resources, available mental health supports, instructional materials and technology or other resources to address the temporary needs of such student.
 2. The parents or guardian of any minor student removed from class shall be given notice of such disciplinary action within twenty-four (24) hours of the time of the institution of such removal from class. Additional procedures governing behavior that causes a serious disruption; self-harm; and/or physical harm to teacher, another student, or other school employee shall be implemented in accordance with applicable law. Specifically:
 - a. The notice shall include, but not be limited to, informing such parent or guardian that the teacher of record in the classroom in which such behavior occurred may request a behavior intervention meeting.

- b. If the teacher of record in the classroom ultimately requests a behavior intervention meeting with the Multi-Tiered System of Support (MTSS Team) for the school, the parent or guardian must be notified that such meeting will occur.
 - c. If a behavior intervention meeting occurs, the MTSS Team shall, not later than seven (7) days after the behavior intervention meeting, provide to the parent or guardian of such student, in the dominant language of such parent or guardian, a written summary of such meeting, including, but not limited to, the resources and supports identified.
- A. ***Discipline.*** The District shall address incidents of challenging behavior or bullying that violate the Board’s Student Discipline policy in accordance with such policy and any school rules, student handbook, or code of conduct provisions regarding the same. Disciplinary action may be necessary for violations of other applicable Board policies or District regulations, such as those related to protected class discrimination or harassment and/or Title IX.

V. Challenging Behavior or Bullying That Requires Temporarily Clearing a Classroom or Students, a Credible Intention to Cause Bodily Harm, or Results in Certain Levels of Injury – Tiered Responses

- A. The school shall implement tiered responses, based on level of impact or frequency of occurrence, to incidents of challenging behavior or bullying that:
- 1. Require temporarily clearing a classroom or removing a majority of students within the classroom to reduce likelihood of injury;
 - 2. Indicate credible intention to cause bodily harm to self or others; or
 - 3. Result in an injury that requires medical attention beyond basic first aid, or less severe injuries caused by the same student on more than one occasion, verified by the school nurse or other medical professional.
- B. Such tiered responses shall include, but need not be limited to, the following:
- 1. For a single incident, the school principal shall notify the parents or guardians of each student involved in such incident in a manner that complies with the requirements of the Family Educational Rights and Privacy Act (“FERPA”) and relevant Board policy.
 - 2. For a subsequent incident, the school principal shall invite the parents or guardians of each student involved in such incident to a meeting, either in person at the school or virtually, to discuss the specific supports or interventions that are applicable to such student, including, but not limited to, restorative practices.
 - 3. For multiple subsequent incidents or a single incident that causes severe harm, the school principal shall provide notice to the parents or guardians of each student involved in such incident of other resources for supports and interventions, including, but not limited to, the 2-1-1 Infoline program, services or programs available through the Behavioral Health Partnership, or other resources for professional services, support, or crisis intervention.

- C. For incidents of challenging behavior or bullying that are subject to tiered responses pursuant to this section:
 - 1. Not later than two school days after the date such incident occurred, there shall be a meeting between an administrator and the school employee (if any) who witnessed such incident. The purpose of the meeting shall be to determine the supports and interventions required to address the needs of students and school employees, provided the supports and interventions for any student who receives special education shall be determined by the planning and placement team (“PPT”) for such student, and notice of such incident shall be submitted to the PPT not later than two school days after the date such incident occurred for consideration at a PPT to be scheduled in accordance with the Individuals with Disabilities Education Act. For a student who is eligible under Section 504 of the Rehabilitation Act of 1973 (“Section 504”), notice of the incident shall also be provided to the student’s Section 504 team.
 - 2. Any teacher of record in the classroom may request a behavior intervention meeting with the MTSS Team for the school. Such a request should be submitted to the building principal.
- D. The District prohibits discrimination or retaliation against any person who reports or assists in the investigation of an incident of challenging behavior or bullying that is subject to a tiered response.

VI. Students with Disabilities

- A. The school shall ensure that any supports, services, or interventions provided in accordance with these regulations to any student who receives special education or accommodation for a disability comply such student's individualized education program or Section 504 plan and applicable law.

VII. Reports to Board of Education

- A. The Superintendent of Schools shall submit, at least annually, to the Board a report concerning:
 - 1. the number of incidents of challenging behavior or bullying that require temporarily clearing a classroom of students, a credible intention to cause bodily harm, or result in certain levels of injury, as described in Section V of these regulations, that occurred during the prior year;
 - 2. the grade level of each student involved in such incidents; and
 - 3. the supports, services, or interventions provided in response to such incidents to address the needs of students and school employees.
- B. Such report shall be produced in a manner that does not result in the disclosure of data identifiable to individual students in accordance with FERPA and the Connecticut State Department of Education’s data suppression guidelines.

Legal References:

Conn. Gen. Stat. § 10-222aa

Conn. Gen. Stat. § 10-222bb

Conn. Gen. Stat. § 10-222cc

Conn. Gen. Stat. § 10-222dd

Conn. Gen. Stat. § 10-222ee

Conn. Gen. Stat. § 10-222ff

Conn. Gen. Stat. § 10-222gg

Conn. Gen. Stat. § 10-222hh

Conn. Gen. Stat. § 10-222ii

Conn. Gen. Stat. § 10-233a

Conn. Gen. Stat. § 10-233b

Conn. Gen. Stat. § 10-233c

Conn. Gen. Stat. § 10-233d

Conn. Gen. Stat. § 10-233e

Conn. Gen. Stat. § 10-236c

Administrative Regulations Adopted:

Note: This policy is not required however, it has been revised to reflect the discussion at the last policy meeting.

**Series 3000
Business**

3434

Annual Audit

An **annual** audit of all accounts of the school system shall be conducted by an independent, **certified** public accountant selected by the Legislative Council, **with recommendation from the Board of Finance.**

The audit shall include all funds of the school system, including appropriated budget funds, student activity funds, cafeteria funds and accounts, and all other funds under the control or jurisdiction of the Board of Education. The audit shall identify all expenditures by source of funds and shall contain:

1. A statement that the audit was conducted pursuant to standards and procedures approved by the State of Connecticut; and
2. A summary of audit exceptions and management recommendations.

The independent, certified public accountant is expected to conduct an “exit interview” with the Director of Business, and, if necessary, the Superintendent or designee.

The completed annual audit report shall be formally presented to the Board of Education at a regularly scheduled public meeting for the Board’s review.

If necessary, the Superintendent shall prepare and present a corrective action plan, including periodic updates if warranted, no later than sixty (60) days after receipt of the audit report.

Legal Reference: Conn. Gen. Stat. § 7-392.

Approved:

Revised:

NEWTOWN PUBLIC SCHOOLS, Newtown, CT

Computer Integration Overview

- Class taught to both 5th and 6th Grade at Reed Intermediate
- Classes meet one class per cycle week for a total of approximately 30 classes in a year
- Not mentioned explicitly in the curriculum: students participate in typing practice through the TypeTastic resource



5th Grade Units

Introduction to Computing/Basic Skills/Digital Citizenship

Purpose of Unit:

The purpose of this unit for 5th graders is to introduce students to the essential principles of safe, responsible, and respectful behavior in the digital world. Students will learn about topics such as online privacy, digital footprints, and the importance of respectful communication. This unit is placed at the beginning of the year so the 5th graders can be also assessed on their prior knowledge and skill with computers and computer science as well as introduce them to supplementary materials such as our typing practice program.

Lens: Responsibility

Concepts:

Perspective, Self-Awareness, Balance, Consequences, Interaction, Security, Privacy

Core Activities:

Email Etiquette
Creating a Powerful Password

Assessments:

Safe Internet Scenarios (Formative Activity)
General Skill Review (Formative Activity)



Google Apps (Google Docs & Google Slides)

Purpose of Unit:

The purpose of this unit is for students to become fluent in most aspects of the most commonly used programs in the Google Suite: Google Docs and Google Slides (and by extension other multimedia presentation software). Students will recognize effective and poor techniques of creating multimedia presentations for an audience. Students will explore different methods for finding and manipulating fair use images for presentations.

Lens: Communication

Concepts:

Process, Understanding, Creation, Multimedia Presentations, Audience, Digital Literacy

Core Activities:

Google Docs Formatting Review/Practice
Creation of Google Slides Presentation
Google Slides Stop Motion Animation



Google Docs



Google Slides

Assessments:

Google Slide Presentation Project (Summative Project)

Introduction to Spreadsheets

Purpose of Unit:

The purpose of this unit is to introduce students to spreadsheets in the form of Google Sheets (and by extension other spreadsheets). Students will learn the basic structure of a spreadsheet, uses for a spreadsheet, how to navigate and format the cells of a spreadsheet, how formulas work in a spreadsheet, and how to create a basic graph using a spreadsheet. During an extension activity, students will learn more advanced features involving navigating/formatting in a spreadsheet and conditional formatting.

Lens: Organization

Concepts:

Data Collection, Organization, Analysis, Data

Core Activities:

- Basic Skill/Tool Development Activity in Google Sheets
- Pixel Art in Sheets
- Conditional Formatting



Google Sheets

Assessments:

Review of Comprehension of Sheets Tools

(Informal Formative)

Pixel Art Projects (Formative)

Website Creation

Purpose of Unit:

The purpose of this unit is to introduce students to the concept of building a website to display/deliver information. Students will understand what makes for a cleanly designed website that portrays information effectively. Students will recognize websites as an alternative multimedia presentation resource to Google Slides. Students will utilize secondary software like Google Drawings and Google Forms to appropriately supplement the builds of their website projects.

Lens: Communication/Expression

Concepts:

Design, Multimedia, Resources, Form, Function

Core Activities:

- Creation of a Basic Website
- Introduction to Google Forms
- Introduction to Google Drawings



Google Sites

Assessments:

Website Project (Summative Project)

6th Grade Units

Digital Citizenship and Google Strategies

Purpose of Unit:

The purpose of this digital citizenship unit for 6th graders is to deepen their understanding of safe, ethical, and responsible online behavior, building on the foundation they established in 5th grade. Students will explore topics such as screen time and the ethical use of digital resources. By the end of the unit, they will be exposed to skills needed to protect their digital identities, make informed decisions online, and contribute positively to the digital world.

This unit will also serve as an opportunity to hone some basic computer skills, particularly those needed to efficiently search the internet.

Lens: Responsibility

Concepts:

Perspective, Self-Awareness, Security, Balance, Consequences, Interaction, Privacy

Core Activities:

- Digital Life Activity and Vocabulary
- Google Search Challenge
- Create Digital Citizenship Full Value Badge



Assessments:

- Full Value Badge Assignment** (Summative Project)
- Google Search Challenge** (Formative Activity)

Basic Photo Editing

Purpose of Unit:

The purpose of this unit is to introduce students to the fundamental skills and tools of digital photo editing, providing them with a foundation for creative expression through images while continuing to build on their computer literacy. As this is their first experience with photo editing, the unit will focus on teaching basic techniques such as cropping, resizing, adjusting color, and applying simple filters while also touching on more advanced features such as combining multiple images into one composition. The unit will culminate in an activity that assesses all the skills they have learned through the course of the unit.

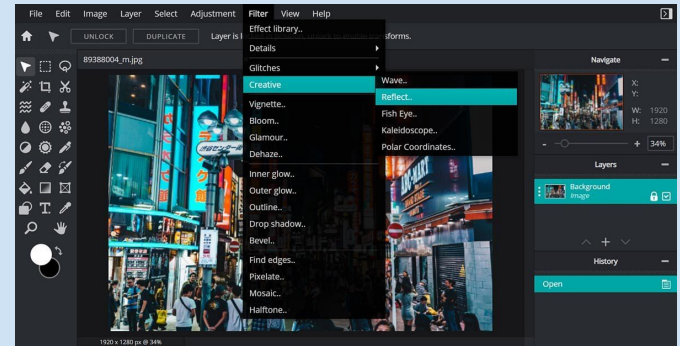
Lens: Creativity, Practicality

Concepts:

Process, Understanding, Creation, Design, Skill, Image Editing, Expression, Interpretation, Message, Ethical Considerations

Core Activities:

- Background, Layering, Photo Composition Introduction Lessons
- ”Create an Advertisement” Assessment



Assessments:

Advertisement Project (Summative Project)

Basics of Coding

Purpose of Unit:

This introductory coding unit is designed to expose students to the backbone of computer science with one of the first steps into coding, developing programs with block-based code - primarily using the Scratch program. This unit will guide students through the fundamentals of programming, such as sequencing, loops, and conditionals. By focusing on creative projects, students will not only learn essential coding concepts, but also develop problem-solving skills and logical thinking.

Lens:

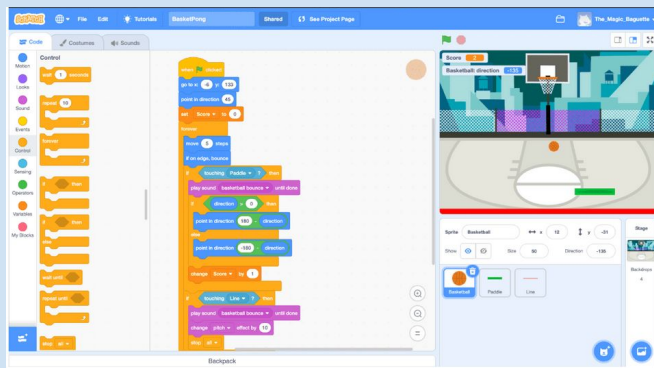
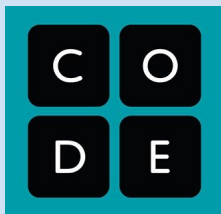
Problem Solving/Logical Thinking

Concepts:

Coding, Efficiency, Logic, Patterns, Process Structures

Core Activities:

- Introduction to Block-Based Coding
- Creation of Block-Based Coding Project



Assessments:

Block Based Coding Project (Summative Project)

Introduction to Computer Aided Design (CAD)

Purpose of Unit:

The purpose of this unit is to introduce students to the concept of computer aided design (CAD). Students will understand the basic tools of CAD and how basic shapes can be manipulated to creating larger and more complex designs. Using Tinkercad as their primary resource, students will be introduced to the beginning stages of the design process and how to model different designs based on different prompts and real world problems that might require specific criteria for their designs. After an introduction to different skills/tools of CAD design, students will build more a complex design as their culminating assessment.

Lens:

Design/Creativity

Concepts:

Visual Communication, Computer Aided Design, Precision, Accuracy, 2D and 3D Design, Computational/Digital Design, Design Process, Brainstorming, Geometrical Design, Spatial Reasoning, Collaboration, Critical Thinking, Efficiency

Core Activities:

-Avatar Design -Dream Room/House Design

Assessments:

Design Work Portfolio (Summative Project)





Unit Plan

Intro Computing/Basic Skills/Digital Citizenship

Reed Intermediate School / Grade 5 / F&AA: Technology

Week 1 - Week 6 | 2 Curriculum Developers | Last Updated: May 14, 2025 by Corvello, Michael

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

The purpose of this unit on digital citizenship for 5th graders is to introduce students to the essential principles of safe, responsible, and respectful behavior in the digital world. As many of these students are just beginning to engage with technology and the internet, this unit aims to equip them with the knowledge and skills they need to navigate online environments confidently. Through age-appropriate discussions and activities, students will learn about topics such as online privacy, digital footprints, and the importance of respectful communication. This foundation will help them make informed decisions and develop positive habits as they begin to explore and interact in the digital world. This unit is placed at the beginning of the year so the 5th graders can be assessed on their prior knowledge with computers and computer science.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Lens: Responsibility

Concepts: Perspective, Self-Awareness, Balance, Consequences, Interaction, Security, Privacy

Computer Microconcepts: Computer Literacy, Digital Footprint, Online Actions, Digital Etiquette

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

1. Following digital etiquette guidelines increases the likelihood of positive online interaction.
2. Awareness and actions by the user protect privacy and strengthen security.
3. Actions online have real world consequences.

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

- 1a. What are some rules of digital etiquette? (F)
- 1b. What are some ways to interact positively with others online? (F)
- 1c. What is a digital footprint? (F)
- 1d. What are real world results of positive or negative etiquette online? (C)
- 1e. How does a digital footprint and online etiquette influence how a user is perceived? (C)
- 1e. Is there a downside or cost for practicing online etiquette? (P)
- 2a. Why are passwords necessary? (F)
- 2b. What are some effects of having poor passwords? (F)
- 2c. What are some characteristics of a strong password? (F)
- 2d. What are some strategies for remembering multiple passwords? (C)
- 2e. What could happen if proper password management is not implemented? (C)
- 3a. How long can an online action follow a user? (F)
- 3b. What are some consequences for not following online etiquette? (C)

Content Knowledge

Critical facts and information that students are expected to **KNOW** at the end of the unit.

Students must be able to:

- Understand the importance of keeping personal information private, such as full names, addresses, and passwords, and knowing how to create strong passwords.
- Recognize that their online actions leave a digital footprint that can be permanent and affect their reputation.
- Identify what cyberbullying is, understanding its impact, and knowing how to respond appropriately if they or someone they know experiences it.
- Understand the importance of communicating respectfully online, including understanding that tone and words can be misinterpreted and hurtful.
- Know the importance of not sharing personal information with strangers online and understanding what to do if they encounter inappropriate content or uncomfortable situations.
- Understand that they should always ask for permission before sharing photos, videos, or other personal content of others online.

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
- 6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

Standards

The content standards that are taught and/or assessed in this unit.

ISTE: ISTE for Students (2024)

ISTE: All Grades

1.1 Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

- 1.1.d. Understand fundamental concepts of how technology works, demonstrate the ability to choose and use current technologies effectively and are adept at thoughtfully exploring emerging technologies.

1.2 Digital Citizen

Students recognize the responsibilities and opportunities for contributing to their digital communities. Students:

- 1.2.a. Manage their digital identity and understand the lasting impact of their online behaviors on themselves and others and make safe, legal and ethical decisions in the digital world.
- 1.2.b. Demonstrate empathetic, inclusive interactions online and use technology to responsibly contribute to their communities.
- 1.2.c. Safeguard their well-being by being intentional about what they do online and how much time they spend online.
- 1.2.d. Take action to protect their digital privacy on devices and manage their personal data and security while online.

1.6 Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:

- 1.6.a. choose the appropriate platforms and digital tools for meeting the desired objectives of their creation or communication.

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Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

Introduction of Typing Practice Curriculum/Standards/Expectations
 - TypeTastic
 5th Grade Digital Citizenship Pretest - Google Form
 Be Internet Awesome Activity 1 - Pear Deck Google Classroom
 Interactive Discussion
 Be Internet Awesome Activity 2 - Pear Deck Google Classroom
 Interactive Discussion
 Quick Basic Computer Skill Review - Class Discussion and Activity
 Email Etiquette Video and Examples - Class Discussion
 Creating a Powerful Password - Class Discussion and Pear Deck
 Interactive Activity
 Safe Internet Scenarios - Discussion and Online Worksheet

Portrait of the Newtown Graduate

Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

Resources

Teacher and student resources used to support the learning.

- Digital Footprint
- Privacy
- Cyberbullying
- Online Safety
- Password
- Personal Information
- Respectful Communication
- Consent for use
- Social Media
- Netiquette
- Phishing

TypeTastic (login through Clever)
CodeMonkey (subscription based)
Online Digital Citizenship Tutorials

- 5th Grade Digital Citizenship Pretest 2024
- Be Internet Awesome: It's Cool to be Kind, Activity 1
- Be Internet Awesome: It's Cool to be Kind, Activity 2
- Safe Internet Scenarios - Follow the Rules
- Interland Digital Citizenship Game
- Email Etiquette
- Quick Review Model
- Creating a Powerful Password

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Safe Internet Scenarios | Formative | Technology Project

Technology Project

[4 Standards Assessed](#)

Safe Internet Scenarios - Follow the Rules

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.



Unit Plan

Google Apps (Google Docs & Google Slides)

Reed Intermediate School / Grade 5 / F&AA: Technology

Week 7 - Week 20 | 2 Curriculum Developers | Last Updated: Apr 25, 2025 by Corvello, Michael

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

The purpose of this unit is for students to become fluent in most aspects of the most commonly used programs in the Google Suite: Google Docs and Google Slides (and by extension other multimedia presentation software). Students will recognize effective and poor techniques of creating multimedia presentations for an audience. Students will explore different methods for finding and manipulating fair use images for presentations.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Lens: Communication

Concepts: Process, Understanding, Creation, Multimedia Presentations, Audience, Digital Literacy

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

1. A well formatted document/presentation requires cultivating an intended message.
2. Specific messaging techniques allow effective message delivery to an audience.
3. Multimedia presentations require diverse forms of media to engage and keep an audience.

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

- 1a. What is a message? (F)
- 1b. What are some ways to format a document/presentation? (F)
- 1c. How is a message evident in a document/presentation? (C)
- 1d. What is the purpose of a multimedia presentation? (C)
- 1e. How does the format of a presentation affect the message? (C)
- 1f. How is a message for a presentation determined? (C)
- 1g. What is the best way to reach an audience? (P)

- 2a. What are some techniques to easily relay information? (F)
- 2b. How is an audience defined? (C)
- 2b. How can a presentation (or presenter) grab the attention of an audience? (C)
- 2c. What makes for an effective or ineffective presentation? (P)

- 3a. What are components of a multimedia presentation? (F)
- 3b. Which components of a multimedia presentation appeal to all audiences? (C)
- 3c. What are the best ways to relay a message to an audience? (C)
- 3d. Is it **always** the presenter's job to entertain an audience when attempting to deliver information? (P)

Content Knowledge

Critical facts and information that students are expected to **KNOW** at the end of the unit.

Students must be able to:

- Create and efficiently use the formatting tool bar in Google Docs and Google Slides
- Insert images, text boxes, video, and links into a Slides presentation
- Master basic computer shortcuts for word processing/presentations
- Manipulate backgrounds and animations in a presentation
- Find and distinguish free use appropriate images to avoid copyright conflicts in their work
- Understand different methods to save media from the internet for use in their presentations
- Understand effective and ineffective presentation techniques
- Plan and design a cohesive presentation in Google Slides on a topic of their choosing

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 2. Work independently and collaboratively to solve problems and accomplish goals.
- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
- 6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

Standards

The content standards that are taught and/or assessed in this unit.

ISTE: ISTE for Students (2024)

ISTE: All Grades

1.1 Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

- 1.1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
- 1.1.d. Understand fundamental concepts of how technology works, demonstrate the ability to choose and use current technologies effectively and are adept at thoughtfully exploring emerging technologies.

1.3 Knowledge Constructor

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:

- 1.3.a. Use effective research strategies to find resources that support their learning needs, personal interests and creative pursuits.

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Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

Students review formatting skills in Google Docs

Portrait of the Newtown Graduate

Students create a short Google Slides presentation on topic of their own choosing

Students create a "Stop Motion Animation" using Google Slides

See attachments for descriptions of activities






















Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Tool bar
- Format
- Text box
- Image
- Copy and paste
- Slide
- Duplicate
- Background
- Animation
- Transition
- Font
- Style

Resources

Teacher and student resources used to support the learning.

-  [Links to Stop Motion Student Examples 2024](#)  
-  [Directions/Examples for Stop Motion with Google Slides Project 2024](#)  
-  [Google Slides Presentation - Assignment Description 2024](#)  
-  [Google Slides Presentation Self Check 2024](#)  
-  [Worst Slideshow Ever 2024](#)    [Google Docs Basics](#)  
-  [Formatting Practice 2024](#)  

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Google Docs Formatting Practice | Formative | Technology Project

[1 Standard Assessed](#)




Google Slides Presentation | Formative | Technology Project

[2 Standards Assessed](#)

Stop Motion Animation with Google Slides | Summative | Technology Project

Students create a brief Stop Motion Animation movie using Google Slides using knowledge learned during the beginning of this unit.

[3 Standards Assessed](#)

-  [Stop Motion Animation Project Rubric \(5th Grade\)](#)  

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

When developing their Google Slides presentation or their Stop Motion Animation, students have the ability to go build in additional slides and go beyond the basic parameters of the assignment. For the stop motion assignment, students are taught an additional optional technique to "autoplay" their file which requires additional learning, planning, and execution.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.



Unit Plan

Intro to Spreadsheets (Google Sheets)

Reed Intermediate School / Grade 5 / F&AA: Technology

Week 21 - Week 26 | 2 Curriculum Developers | Last Updated: Apr 25, 2025 by Corvello, Michael

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

The purpose of this unit is to introduce students to spreadsheets in the form of Google Sheets (and by extension other spreadsheets).

Students will learn the basic structure of a spreadsheet, uses for a spreadsheet, how to navigate and format the cells of a spreadsheet, how formulas work in a spreadsheet, and how to create a basic graph using a spreadsheet. During an extension activity, students will learn more advanced features involving navigating/formatting in a spreadsheet and conditional formatting.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Lens: Organization

Concepts: Data Collection, Organization, Analysis, Data

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

1. Spreadsheets simplify the organization of data.
2. Spreadsheets facilitate a variety of ways to organize and analyze data.
3. Spreadsheets provide multiple tools for data analysis that facilitate organization and understanding.

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

- 1a. What are spreadsheets? (F)
- 1b. How are spreadsheets set up in a way to help organize data/information? (F)
- 1c. How can spreadsheets help organize information efficiently and effectively? (C)
- 2a. How are spreadsheets used? (F)
- 2b. How does the basic functionality of a spreadsheet work (cells, formatting, formulas, graphing)? (F)
- 2c. How can using spreadsheets be helpful in life and work? (C)
- 2d. Does technology always improve organization? (P)
- 3a. What tools do spreadsheets utilize to analyze data? (F)
- 3b. What makes spreadsheets unique in the way they help users understand information? (C)
- 3c. What is the best digital tool for understanding data? (P)

Content Knowledge

*Critical facts and information that students are expected to **KNOW** at the end of the unit.*

Critical Skills

*Critical skills that students are expected to be able to **DO** at the end of the unit.*

Students will know and be able to:

- Understand the unique structure of a spreadsheet
- Navigate and format cells, rows, and columns
- Make a basic list
- Have a basic understanding of how formulas work in a spreadsheet
- Understand how to input information/data into a spreadsheet and turn that data into different types of graphs
- Understand the different uses of spreadsheets and how they might apply and be useful in their lives

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 2. Work independently and collaboratively to solve problems and accomplish goals.
- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
- 5. Effectively apply the analysis, syntheses, and evaluative processes that enable productive problem solving.

Standards

The content standards that are taught and/or assessed in this unit.

CSTA: Computer Science Standards (2017)

CSTA: 3-5

Algorithms & Programming

Algorithms

- 1B-AP-08 Compare and refine multiple algorithms for the same task and determine which is the most appropriate. (P6.3, P3.3)

ISTE: ISTE for Students (2024)

ISTE: All Grades

1.1 Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

- 1.1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
- 1.1.d. Understand fundamental concepts of how technology works, demonstrate the ability to choose and use current technologies effectively and are adept at thoughtfully exploring emerging technologies.

1.5 Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:

- 1.5.a. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
- 1.5.b. collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- 1.5.d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

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Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

- With teacher guidance, students will be introduced to basic workings of a spreadsheet including navigating cells, row, columns, manipulating data in lists, formulas, and graphs and relate how

Portrait of the Newtown Graduate

spreadsheets could be applicable digital tools in their own lives (see resources for the teacher guided Sheet students will complete).
-Students will complete a Pixel Art activity where they will create a piece of digital artwork using a spreadsheet and the tools they have learned. Extended learning during this activity will consist of the concept of conditional formatting (see Google Applied Digital Skills website for reference)

Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Cells
- Rows
- Columns
- Highlighting and Selecting
- Data collection
- Formulas
- Graph/Graphing
- Conditional formatting
- Insert
- Table
- Alignment
- Border

Resources

Teacher and student resources used to support the learning.

- Google Applied Digital Skills - Pixel Art
- Spreadsheet Examples PIXEL ART!!!
- Sheets Template 2024
- How to Automate your Stop Motion Animation - 2025

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Pixel Art | Summative | Technology Project

Students will create at least two examples of pixel art utilizing what they have learned about formatting and navigation within a Google Sheet.

6 Standards Assessed

- PIXEL ART!!!

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

Students will have the opportunity to extend their learning of formatting cells of a spreadsheet through the more advanced features of conditional formatting rather than use the formatting tool bar. This will be completed during the Pixel Art assessment activity.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.



Unit Plan

Website Creation (Google Sites)

Reed Intermediate School / Grade 5 / F&AA: Technology

Week 27 - Week 38 | 2 Curriculum Developers | Last Updated: Apr 28, 2025 by Corvello, Michael

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

The purpose of this unit is to introduce students to the concept of building a website to display/deliver information. Students will understand what makes for a cleanly designed website that portrays information effectively. Students will recognize websites as an alternative multimedia presentation resource to Google Slides. Students will utilize secondary software like Google Drawings and Google Forms to appropriately supplement the builds of their website projects.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Lens: Communication/Expression

Concepts: Design, Multimedia, Resources, Form, Function

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

1. Different mediums allow for unique methods to deliver information
2. Function determines the form/design of a project (website)
3. Websites creation facilitates maximum interactivity with users

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

- 1a. What is a website? (F)
- 1b. What is the purpose of a website? (F)
- 1c. How can websites be an effective alternative to other multimedia presentation software? (C)
- 1d. Does the structure of a website offer a unique method of delivering information? (P)

- 2a. What is form as it relates to web design? (F)
- 2b. What is function as it relates to web design? (F)
- 2c. Why does form follow the function (requirements of a website)? (C)
- 2d. Should form always follow function in web design? (P)

- 3a. How are websites structured? (F)
- 3b. How are websites different from other multimedia software applications? (F)
- 3c. How are websites interactive? (F)
- 3d. What criteria should be used to decide on a multimedia presentation tool? (P)
- 3e. Which is the better multimedia presenting tool - Slides or a website? (P)

Content Knowledge

Critical facts and information that students are expected to **KNOW** at the end of the unit.

Students must be able to:

- Effectively plan and research a topic for a website using a graphic organizer
- Create a Google Site
- Create multiple pages in their site
- Insert text boxes for research and fair use images from the internet to deliver information about a topic
- Utilize themes and templates in Google Sites
- Manipulate an image in Google Drawings and insert into website
- Create a short Google Form to survey the end user about the topic of the website
- Understand how to adjust font, size, background colors, and other visuals inside Google Sites
- Use Google Site tools for finding appropriate videos for website

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
- 4. Demonstrate innovation, flexibility and adaptability in thinking patterns, work habits, and working/learning conditions.

Standards

The content standards that are taught and/or assessed in this unit.

ISTE: ISTE for Students (2024)

ISTE: All Grades

1.1 Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

- 1.1.a. Set learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process to improve learning outcomes.
- 1.1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
- 1.1.d. Understand fundamental concepts of how technology works, demonstrate the ability to choose and use current technologies effectively and are adept at thoughtfully exploring emerging technologies.

1.3 Knowledge Constructor

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:

- 1.3.a. Use effective research strategies to find resources that support their learning needs, personal interests and creative pursuits.
- 1.3.b. Evaluate the accuracy, validity, bias, origin, and relevance of digital content.
- 1.3.c. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

1.4 Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

- 1.4.b. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

1.6 Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:

- 1.6.a. choose the appropriate platforms and digital tools for meeting the desired objectives of their creation or communication.
- 1.6.b. create original works or responsibly repurpose or remix digital resources into new creations.
- 1.6.c. Use digital tools to visually communicate complex ideas to others.
- 1.6.d. Publish or present content that customizes the message and medium for their intended audiences

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Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

- Using graphic organizer, plan and research a website based on a topic of their choosing
- Create and publish a four-page website (Google Sites) based on a topic of their choosing
- Use Google Forms and Google Drawings to supplement the website

See attachments for project description

Portrait of the Newtown Graduate

Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Website
- Pages
- Format
- Theme
- Embed
- Text box
- Image
- Video
- Insert
- Design
- Form
- Function
- Fair use vs copyright images
- Preview vs Editing
- Download
- Save Image As...

Resources

Teacher and student resources used to support the learning.

- Storyboards for Website - 2024
- Creating A Website - Directions and Requirements 2024
- Cupcake Recipe Google Drawing Example
- Pokemon Model
- Pizza Oven Diagram - Google Drawing Example 2024
- Applied Digital Skills - Google Forms reference videos
- Applied Digital Skills - Google Sites reference videos




Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Website | Summative | Technology Project

Students create a website using Google Sites, publish it, view peers' work, provide feedback, and self-assess using a Google Form.

[11 Standards Assessed](#)

 Creating A Website - Directions and Requirements 2024  

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.



Computer Integration Gr. 6

Reed Intermediate School / Grade 6 / F&AA: Technology

2 Curriculum Developers | Last Updated: Tuesday, Apr 29, 2025 by Corvello, Michael

Unit Calendar by Year

Unit	Au		Sep				Oct				Nov				Dec				Jan				Feb				Mar				Apr				May				Ju																																				
	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																																					
<input type="checkbox"/> Draft Digital Citizenship and Google Strategies	█																																																																										
<input type="checkbox"/> Draft Basic Photo Editing								█																																																																			
<input type="checkbox"/> Draft Basics of Coding																									█																																																		
<input type="checkbox"/> Draft Introduction to Computer Aided Design																																							█																																				

◀ 4 Units found ▶



Unit Plan

Digital Citizenship and Google Strategies

Reed Intermediate School / Grade 6 / F&AA: Technology

Week 1 - Week 7 | 2 Curriculum Developers | Last Updated: Apr 28, 2025 by Corvello, Michael

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

The purpose of this digital citizenship unit for 6th graders is to deepen their understanding of safe, ethical, and responsible online behavior, building on the foundation they established in 5th grade. With more advanced concepts and real-world applications, this unit will help students navigate the increasingly complex digital landscape they encounter as they grow older. Students will explore topics such as screen time and the ethical use of digital resources. By the end of the unit, they will be exposed to skills needed to protect their digital identities, make informed decisions online, and contribute positively to the digital world.

This unit will also serve as an opportunity to hone some basic computer skills, particularly those needed to efficiently search the internet.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Lens: Responsibility

Concepts: Perspective, Self-Awareness, Security, Balance, Consequences, Interaction, Privacy

Computer Microconcepts: Computer Literacy, Digital Literacy, Digital Footprint, Online Actions, Digital Etiquette

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

1. Adhering to digital etiquette supports positive and constructive communication with different parties in digital spaces.
2. Using technology involves self-awareness and digital literacy, enabling students to navigate online environments safely and effectively.
3. Problem-solving online requires understanding security risks and the potential consequences of online actions.

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

- 1a. What are the key principles of digital etiquette? (F)
- 1b. How should digital etiquette influence your interactions online? (C)
- 1c. How can you ensure that your communication in digital spaces is respectful and constructive, even when you disagree with others? (C)
- 1d. Why is it important to consider the tone and language in digital communication, and how can this impact relationships with others? (P)
- 2a. What does digital literacy mean? (F)
- 2b. How does being digitally literate help make safe and informed decisions online? (C)
- 2c. What strategies can be used to assess the credibility of online information and protect personal information? (C)
- 3a. What are some common online security risks? (F)
- 3b. How can you protect yourself against common security risks? (C)
- 3c. How can understanding the consequences of online actions help users make better decisions when using technology? (C)

Content Knowledge

Critical facts and information that students are expected to **KNOW** at the end of the unit.

Students will be able to:

- Understand the importance of respectful communication and appropriate behavior in digital spaces.
- Recognize how their online actions contribute to their digital identity and the impact this can have on their reputation.
- Identify common online security threats, such as phishing, hacking, and social engineering, and know strategies to protect against them.
- Safeguard personal information on online platforms
- Understand that their online actions leave a digital footprint that can be permanent and influential.
- Realize that online actions have real-world consequences, both positive and negative, and the importance of responsible behavior.
- Be aware of how their behavior and presence online reflect on them and affect others.
- Understand what cyberbullying is, its impact, and how to respond appropriately if they or others experience it.
- Knowing how to create and maintain strong, secure passwords and the importance of using two-factor authentication.
- Understand the importance of not sharing personal information with strangers online and knowing what to do if they encounter inappropriate content.

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

Standards

The content standards that are taught and/or assessed in this unit.

ISTE: ISTE for Students (2024)

ISTE: All Grades

1.1 Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

- 1.1.a. Set learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process to improve learning outcomes.
- 1.1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

1.2 Digital Citizen

Students recognize the responsibilities and opportunities for contributing to their digital communities. Students:

- 1.2.a. Manage their digital identity and understand the lasting impact of their online behaviors on themselves and others and make safe, legal and ethical decisions in the digital world.
- 1.2.b. Demonstrate empathetic, inclusive interactions online and use technology to responsibly contribute to their communities.
- 1.2.c. Safeguard their well-being by being intentional about what they do online and how much time they spend online.
- 1.2.d. Take action to protect their digital privacy on devices and manage their personal data and security while online.

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Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

Digital Citizenship Pretest - Google Form
 Cyberbullying Presentation - Class Discussion
 Cyberbullying: Be Upstanding - Worksheet Questions
 Digital Life Activity - Google Forms and Discussion
 Digital Life Vocabulary - Google Drawing Activity
 Email Etiquette and Spam Review - Class Discussion
 Full Value Digital Badge - Google Drawing Activity Assessment
 Become an Internet Search Master - Class Discussion
 Google Search Challenge - Google Slides Activity/Assessment

*refer to Resource section for directions, models, and digital handouts

Portrait of the Newtown Graduate

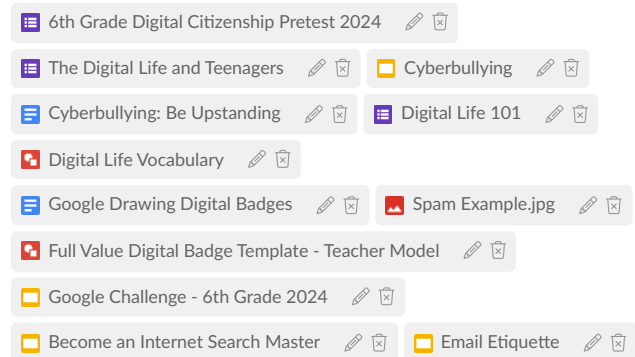
Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Digital Identity
- Two-Factor Authentication
- Digital Etiquette
- Cyberbullying
- Digital Literacy
- Digital Footprint
- Privacy Settings
- Phishing
- Online Reputation
- Intellectual Property
- Plagiarism
- Trolling
- Digital Divide

Resources

Teacher and student resources used to support the learning.



Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Full Value Digital Badge | Summative | Technology Project

Technology Project

Refer to Resource section for handout and template/model

[3 Standards Assessed](#)

Google Search Challenge | Formative | Technology Project

Refer to Resource section for directions, digital handout

No Standards Assessed

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.



Unit Plan

Basic Photo Editing

Reed Intermediate School / Grade 6 / F&AA: Technology

Week 8 - Week 18 | 2 Curriculum Developers | Last Updated: Apr 28, 2025 by Corvello, Michael

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

The purpose of this unit is to introduce students to the fundamental skills and tools of digital photo editing, providing them with a foundation for creative expression through images while continuing to build on their computer literacy. As this is their first experience with photo editing, the unit will focus on teaching basic techniques such as cropping, resizing, adjusting color, and applying simple filters while also touching on more advanced features such as combining multiple images into one composition. Students will also learn how to use layers and text tools to enhance their images. Through hands-on projects, they will gain confidence in navigating photo editing software, understanding the importance of composition, and exploring their creativity. The unit will culminate in an activity that assesses all the skills they have learned through the course of the unit.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Lens: Creativity, Practicality

Concepts: Process, Understanding, Creation, Design, Skill, Image Editing, Expression, Interpretation, Message, Ethical Considerations

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

1. Editing images proficiently cultivates a message.
2. Effective image editing requires specialized process.
3. Learning multiple photo editing tools permits one to be effective at creating a cohesive product/message.
4. Photo editing and manipulation provokes ethical considerations.

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

- 1a. What is photo editing and how does it work? (F)
- 1b. Why is photo editing an effective way to cultivate a message? (C)
- 1c. Can editing an image change the tone in a meaningful way? (P)
- 1d. Can editing an image present ethical dilemmas? (P)
- 2a. What editing tools exist for digital photo editing? (F)
- 2b. What are essential photo editing techniques? (F)
- 2c. What photo editing methods cause the most dramatic change/impact? (P)
- 2d. Which tools are the most effective at changing a photo or video? (C)
- 3a. How can photo editing be used to present a message? (F)
- 3b. How can photo editing be incorporated into other programs or presentations? (F)
- 3c. What are some different digital programs that use photo editing? (F)
- 3d. Which photo editing techniques are best for cultivating a message? (P)
- 3e. Is learning a single editing program sufficient? (P)

- 4a. What are potential problems with using copyrighted imagery? (F)
- 4b. What is propaganda? (F)
- 4c. What is the difference between propaganda and cultivating a message? (C)
- 4d. In what ways can copyrighted imagery be used? (P)

Content Knowledge

*Critical facts and information that students are expected to **KNOW** at the end of the unit.*

Students will know and be able to:

- Understand how to find, save, and import copyright free images into different photo editing software
- Utilize basic photo editing techniques to deliver a specific message, such as:
 - Use the cropping tool on images
 - Overlay text on an image
 - Use multiple techniques, both manually and computer aided, for removing unwanted backgrounds from images
 - Adjust the color of specific parts of an image
 - Merge multiple pictures into one image
- Create an original image using multiple pictures
- Understand the ethical dilemmas of using other people's work/images to cultivate a message

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 2. Work independently and collaboratively to solve problems and accomplish goals.
- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.

Standards

The content standards that are taught and/or assessed in this unit.

ISTE: ISTE for Students (2024)

ISTE: All Grades

1.1 Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

- 1.1.d. Understand fundamental concepts of how technology works, demonstrate the ability to choose and use current technologies effectively and are adept at thoughtfully exploring emerging technologies.

1.2 Digital Citizen

Students recognize the responsibilities and opportunities for contributing to their digital communities. Students:

- 1.2.b. Demonstrate empathetic, inclusive interactions online and use technology to responsibly contribute to their communities.
- 1.2.c. Safeguard their well-being by being intentional about what they do online and how much time they spend online.

1.3 Knowledge Constructor

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:

- 1.3.c. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

1.4 Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

- 1.4.a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- 1.4.b. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

1.6 Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:

- 1.6.a. choose the appropriate platforms and digital tools for meeting the desired objectives of their creation or communication.
- 1.6.b. create original works or responsibly repurpose or remix digital resources into new creations.
- 1.6.c. Use digital tools to visually communicate complex ideas to others.
- 1.6.d. Publish or present content that customizes the message and medium for their intended audiences

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Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

- Basics of Photo Editing Software - Cropping/Text/Filters: Class Activity
- Multiple Methods for Removing Backgrounds on Images - Class Discussion and Practice
- Layering Images - Class Discussion and Practice
- Multiple Methods for Adjusting Color to Parts of An Image - Class Discussion and Practice

Summative Assessment: Creating a Photo Advertisement for a Real Life Product

Portrait of the Newtown Graduate

Vocabulary

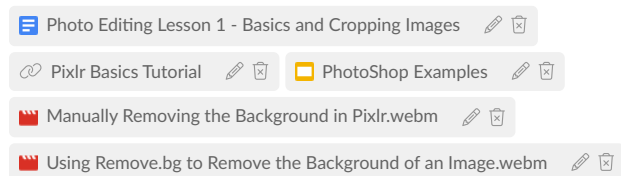
Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Propaganda
- Copy and paste
- Import/Export
- Select (Lasso, Marquee, Wand)
- Polygon Select
- Mask
- Blend
- Layer
- Filter
- Hue/Saturation
- Clone (Clone Stamp)
- Color balance
- Gradient
- Portfolio






















Resources

Teacher and student resources used to support the learning.

- www.pixlr.com/e
- www.photopea.com/
- www.canva.com/
- docs.google.com/drawings/
- www.adobe.com/education/express/
- Adobe PhotoShop and peripheral software (when available)
- www.remove.bg and similar image background removing websites



Unit Plan

-  Finding a Image in Google Images with a Transparent Background.webm  
-  Homer in Monica's Apt.webm  
-  Cutting Out A Shape Using the Polygonal Lasso Select Tool.webm  
-  Photo Editing Lesson 3 - Merging Pictures  
-  Photo Editing Lesson 4 - Colorizing!  
-  Ansel Adams Black and White Images  
-  Lesson #4 - Colorizing Images in Pixlr.webm  










Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Advertising with Photo Editing | Summative | Technology Project

See attachment for detailed description of the final assessment

[10 Standards Assessed](#)

-  Photo Editing Final Lesson - Advertising with Photo Editing Techniques  
-  PhotoShop in Advertising  
-  Photo Editing Final Project Rubric: Advertisement Design  

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

An alternative or extended activity to the summative advertising project, students are given the option to create a poster for the current school play.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.



Unit Plan

Basics of Coding

Reed Intermediate School / Grade 6 / F&AA: Technology

Week 19 - Week 27 | 2 Curriculum Developers | Last Updated: Apr 28, 2025 by Corvello, Michael

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

This introductory coding unit is designed to expose students to the backbone of computer science with one of the first steps into coding, developing programs with block-based code - primarily using the Scratch program. This unit will guide students through the fundamentals of programming, such as sequencing, loops, and conditionals. By focusing on creative projects, students will not only learn essential coding concepts, but also develop problem-solving skills and logical thinking,

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Lens: Problem Solving/Logical Thinking

Concepts: Coding, Efficiency, Logic, Patterns, Process, Structures

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

1. Coding requires an understanding of key concepts, involving planning, problem solving, and the idea that multiple approaches could achieve the same result.
2. Coding requires flexibility from the user to see different solutions and approaches.
3. Coding structures like loops and conditionals help organize and simplify a program, making it efficient and easier to understand.
4. Coding is made efficient by removing unnecessary steps, utilizing distinct code structure, and simplifying when possible.

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

- 1a. What is coding (block-based)? (F)
- 1b. How does coding work? (F)
- 1c. What are the steps to creating a basic code? (F)
- 1d. What are some structures that coders rely on to make coding easier to implement? (C)
- 2a. What are the necessary items to know before starting to code a program? (F)
- 2b. How can different approaches result in the same program? (C)
- 2c. How does a coder decide which path to take when there are multiple solutions? (P)
- 3a. What coding structures (loops, conditionals, etc.) can organize your programming? (F)
- 3b. What role do different coding blocks play in building your project? (C)
- 4a. What coding structures allow for simplicity and efficiency while coding? (F)
- 4b. How can removing unnecessary steps make your code more efficient? (C)
- 4c. What are some ways to simplify your program while maintaining its functionality? (C)

Content Knowledge

Critical facts and information that students are expected to **KNOW** at the end of the unit.

-With teacher guidance, students will be introduced to the basic tools of Scratch and block based coding

Students will be able to:

Know how coding is used to achieve real world results.

Know how to start coding effectively using block-based code.

Know the basics of coding block loops.

Understand the purpose of variables.

Use coding to solve basic abstract problems.

Follow step by step directions to building a program with basic block coding.

Demonstrate effective coding by producing their own code.

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 2. Work independently and collaboratively to solve problems and accomplish goals.
- 5. Effectively apply the analysis, syntheses, and evaluative processes that enable productive problem solving.

Standards

The content standards that are taught and/or assessed in this unit.

ISTE: ISTE for Students (2024)

ISTE: All Grades

1.1 Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:

- 1.1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

1.4 Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

- 1.4.a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

1.5 Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:

- 1.5.a. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
- 1.5.c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
- 1.5.d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

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Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

Formative:

- Introduction to Scratch - Tutorial and Exploration of Resource
- Scratch Exit Ticket
- Coding/Creation of Project Using Scratch Step by Step Directions from Workbooks

Summative:

- Partner Project - Creation of Simple Program, Self Choice

Vocabulary



Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.



1. Algorithm
2. Sequence
3. Loop
4. Conditional
5. Variable
6. Sprite
7. Backdrop
8. Event
9. Broadcast
10. Block
11. Script
12. Debugging
13. Iteration
14. Input
15. Output
16. Cloning





Resources

Teacher and student resources used to support the learning.

- www.codemonkey.com
 - Coding Adventures Part 1 & 2 module
- Scratch (currently using the offline version)
- Scratch DK Workbooks
 - [Coding in Scratch: Games Workbook](#)
 - [Coding in Scratch: Projects Workbook](#)
 - [Coding in Scratch: Challenge Workbook](#)
 - [Star Wars Coding Projects: A Step-by-Step Visual Guide to Coding. Your Own Animations, Games, Simulations](#)

Introduction to Scratch Exit Ticket  

Making your First Program in Scratch  

Rocket Landing Program   Pac Man Program  

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Create A Scratch Project | Formative | Technology Project

Technology Project

See attachment for description/directions







[4 Standards Assessed](#)

Design Your Own Scratch Project | Summative | Technology Project

Technology Project

See attachment for description/directions

[4 Standards Assessed](#)

Introduction to Scratch Exit Ticket   Create A Project in Scratch!   Design Your Own Scratch  

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

Using the CodeMonkey program, students will work at their own pace (outside of the normal coding unit) to build on their coding knowledge.

The CodingAdventure modules in the program introduce students to text-based coding and allow for higher level learning of the different structures and concepts of coding.

Also, the opportunity for differentiation within both the "Create a Project" formative assessment and the "Design Your Own Scratch" summative assessment exists both in their choice of projects and the depth of the coding they choose to implement in their own final project.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.



Unit Plan

Introduction to Computer Aided Design

Reed Intermediate School / Grade 6 / F&AA: Technology

Week 28 - Week 38 | 2 Curriculum Developers | Last Updated: Apr 29, 2025 by Corvello, Michael

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

The purpose of this unit is to introduce students to the concept of computer aided design (CAD). Students will understand the basic tools of CAD and how basic shapes can be manipulated to creating larger and more complex designs. Using Tinkercad as their primary resource, students will be introduced to the beginning stages of the design process and how to model different designs based on different prompts and real world problems that might require specific criteria for their designs. After an introduction to different skills/tools of CAD design, students will build more a complex design as their culminating assessment.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Lens: Design, Creativity

Concepts: Visual Communication, Computer Aided Design, Precision, Accuracy, 2D and 3D Design, Computational/Digital Design, Design Process, Brainstorming, Geometrical Design, Spatial Reasoning, Collaboration, Critical Thinking, Efficiency

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

1. The design process organizes and refines an idea from concept to final product.
2. Computer Aided Design (CAD) facilitates complex design allowing high levels of precision and accuracy in creating models.
3. Learning multiple specific computer aided design tools/skills allows efficiency in creating a cohesive design/product.

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

- 1a. What is the design process (F)
- 1b. Why is the design process important? (C)
- 1b. What are the main stages of the design process? (F)
- 1c. How can the design process help organize and refine our ideas? (C)
- 1d. When does a design needs to be refined or improved? (C)
- 2a. What is CAD? (F)
- 2b. How is CAD useful? (C)
- 2b. How is computer aided design different from other types of design? (C)
- 2c. What does CAD allow a user to do when compared to analog tools? (C)
- 2d. Why is precision important in CAD design? (C)
- 3a. What are the basic features and tools of a typical CAD software? (F)
- 3b. What are the basic operations for modifying 3D models (scaling, rotating, mirroring)? (F)
- 3c. How do you combine different 3D shapes to create a complex model? (F)

3d. What are constraints, and how do they help in creating accurate designs? (F)

Content Knowledge

*Critical facts and information that students are expected to **KNOW** at the end of the unit.*

-With teacher guidance, students will be introduced to the basic tools of CAD through the use of the TinkerCAD program (a basic introductory CAD software program).

Students will be able to:

- Manipulate digital shapes
- Create shapes both by assembling digital shapes and carving away at shapes using the "hole" tool
- Assemble shapes into a cohesive and final product with accurate measurements using multiple CAD software tools (hole tool, grouping, alignment, rotation, duplication)
- Understand and manipulate shapes along the different axis of a three dimensional workspace
- Learn the process to convert basic 2 dimensional shapes from the internet into 3 dimensional shapes in the TinkerCAD program
- Create and edit original digital 3D designs
- Demonstrate proficiency in editing and designing within the introductory CAD software (TinkerCAD)

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 2. Work independently and collaboratively to solve problems and accomplish goals.
- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
- 4. Demonstrate innovation, flexibility and adaptability in thinking patterns, work habits, and working/learning conditions.

Standards

The content standards that are taught and/or assessed in this unit.

ISTE: ISTE for Students (2024)

ISTE: All Grades

1.4 Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

- 1.4.a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- 1.4.b. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- 1.4.c. Develop, test and refine prototypes as part of a cyclical design process.
- 1.4.d. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

1.5 Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:

- 1.5.a. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

1.6 Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:

- 1.6.a. choose the appropriate platforms and digital tools for meeting the desired objectives of their creation or communication.
- 1.6.b. create original works or responsibly repurpose or remix digital resources into new creations.
- 1.6.c. Use digital tools to visually communicate complex ideas to others.
- 1.6.d. Publish or present content that customizes the message and medium for their intended audiences

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Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

Following an introductory class on the basics of the software, students will be asked to assemble a portfolio of designs. The avatar and house design are considered mandatory and students are given choice in other designs to contribute to their portfolio.

Each class following the introduction, students will be shown more advanced tools and skills to add to the designs in their portfolio.

Refer to resource section for materials for different assignments.

Formative:

Introduction of basics through interactive TinkerCAD tutorials - Classroom Demo and Activity

Avatar Creation - Classroom Demo and Activity

House Design and Creation - Formative Assessment

Free Choice Design

Summative:

Portfolio Compilation - Summative Assessment

Portrait of the Newtown Graduate




























Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- CAD (Computer-Aided Design)
- Tinkercad
- 3D Model
- Workspace
- Shape
- Solid
- Hole
- Group
- Ungroup
- Align
- Rotate
- Scale
- Duplicate
- Mirror
- Grid
- Snap
- Object
- Layer

Resources

Teacher and student resources used to support the learning.

-  Tinkercad Portfolio Final Submission  
-  Dream House and Dream Room Examples  
-  Tinkercad Avatar Minilesson.webm  
-  3D CAD Design Examples  
-  Tinkercad Design Portfolio Directions  
-  TinkerCAD Formative Assessment  
-  Redesigning a Living Room Video  
-  Creating Custom Characters Video    TinkerCad  

- Prototype
- Simulation
- Rendering
- Export
- STL File
- Vertex
- Edge
- Face
- Polygon
- Cylinder
- Sphere
- Cube
- Plane
- Transform
- Zoom
- Pan
- Orbit
- Tool
- Toolbar
- Menu
- Palette
- Library
- Axis
- Coordinate
- Grid Snap
- Chamfer
- Dimension
- Perspective
- Orthographic View
- Solid View
- Material
- Texture

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

CAD Formative Assessment | Formative | Technology Project

See TinkerCAD Formative Assessment attachment for description of activity










[8 Standards Assessed](#)

CAD Portfolio | Summative | Student Portfolio

Technology Project

See attachment for portfolio description

[8 Standards Assessed](#)

 Tinkercad Portfolio Final Submission    Tinkercad Design Portfolio Directions    TinkerCAD Formative Assessment  

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

Students are asked to complete a portfolio of designs for this unit. Because of this structure, students are able to differentiate their final product with the number and complexity of their designs. See rubric for the House activity formative assessment for how they will be

assessed on these different concepts.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.



Differential Equations

Newtown High School / High School / Mathematics

5 Curriculum Developers | Last Updated: Tuesday, May 6, 2025 by Bremer, Kathleen

Unit Calendar by Year

Unit	Au		Sep				Oct				Nov				Dec				Jan				Feb				Mar				Apr				May		Ju			
	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		
Introduction to Differential Equations	█																																							
First Order Equations							█																																	
Numerical Methods													█																											
Applications of First Order Equations																			█																					
Linear Second Order Equations																								█																
Laplace Transformations																																					█			

◀ 6 Units found ▶



Unit Plan

Introduction to Differential Equations

Newtown High School / High School / Mathematics

Week 1 - Week 6 | 5 Curriculum Developers | Last Updated: May 6, 2025 by Bremer, Kathleen

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

Equations **simplify** real-world problems into solvable mathematical forms.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Concepts:

- Model
- Differential equation
- Logistic model
- Order
- General solution
- Solution curve
- Direction field

Lens: Abstraction

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

Strand 1: Applications Leading to Differential Equations

Concepts:

- Mathematical model
- Differential equation
- Logistic growth model

1. A **mathematical model** simplifies problem solving with **differential equations** while accurately predicting real world outcomes.
2. **Differential equations** such as the **logistic growth model** can be used to solve problems relating to Population Growth and Decay, laws of physics, and human biology.

Strand 2: Basic Concepts

Concepts:

- Order
- Derivative
- Function
- General solution
- Solution curve

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

Generalization 1:

- What is the definition of the **derivative** of a **function**? (F)
- What is a **differential equation**? (F)
- What is the **logistic growth model**? (F)
- What is meant by the term '**mathematical model**'? (F)
- What are some real-life phenomena that can be modeled using **differential equations**? (F)
- What distinguishes a **mathematical model** that uses a **differential equation** from one that does not? (F)
- How are **differential equations** used to create **mathematical models**? (C)
- What is a **mathematical model** and why is it useful in solving real-world problems? (C)
- How can the solution to a **differential equation** predict long-term behavior of a system? (C)
- What are the limitations of using **differential equations** to model real-world situations? (P)

Generalization 2:

- How is the appropriate type of **differential equation** selected to best serve the model? (C)

3. A **differential equation** is an equation with order that contains one or more derivatives of an unknown function.

4. The **general solution** to a differential equation is a family of **solution curves** that differ only by a constant.

Strand 3: Direction Fields for First Order Equations

Concepts:

- Direction field

5. A **direction field** displays the general solution to a **differential equation**.

Unit Plan

- Why is the **logistic model** used for population growth and Decay? (C)
- How do **differential equations**, like the **logistic growth model**, bridge the gap between theoretical understanding and practical applications? (C)
- Why does the **logistic model** approximate the exponential model under certain circumstances? (C)
- To what extent can mathematical models like the **logistic model** truly predict complex real-world systems, or are they just educated guesses? (P)
- Can relying on mathematical models like the **logistic model** lead to biased or misleading decisions in real-world policy or science? (P)

Generalization 3:

- How is the **order** of a Differential equation determined? (F)
- What is an ordinary **differential equation**? (F)
- How does the order of a **differential equation** impact the complexity and behavior of its solutions? (C)

Generalization 4:

- What is the **general solution** to a Differential equation? (F)
- How is each **solution curve** related to the general solution? (C)
- How do the multiple **solution curves** for each **differential equation** aid in describing dynamic processes in nature and physics? (C)
- Does the number of **solution curves** limit or enhance the usefulness of a **differential equation** in modeling real-world systems? (P)

Generalization 5:

- How is a **direction field** constructed? (F)
- What is the connection between a **direction field** and a **solution curve**? (C)

Provocative: Does the complexity of real-world situations challenge the capacity of mathematical models, like differential equations, to accurately predict outcomes?

Content Knowledge

*Critical facts and information that students are expected to **KNOW** at the end of the unit.*

Students will know:

- how to utilize mathematical models to simplify complex problem-solving tasks while accurately predicting real-world outcomes.
- how to apply differential equations, such as the logistic growth model, to analyze and solve problems in population dynamics, physics laws, and biological systems.
- how to define a differential equation as an equation containing one or more derivatives of an unknown function, classified by its order based on the highest derivative present.
- how to explain that the general solution to a differential equation represents a family of solution curves, distinguished only by a constant parameter.

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
2. Work independently and collaboratively to solve problems and accomplish goals.
3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
4. Demonstrate innovation, flexibility and adaptability in thinking patterns, work habits, and working/learning conditions.
5. Effectively apply the analysis, syntheses, and evaluative processes that enable productive problem solving.
6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

- how to interpret and visualize the general solution of a differential equation by graphing it as a direction field, illustrating the behavior of solutions over a range of values.

Standards

The content standards that are taught and/or assessed in this unit.

Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

In this unit, students will be given the opportunity to work collaboratively and independently.

Utilize mathematical models to simplify complex problem-solving tasks while accurately predicting real-world outcomes.

- Formulate mathematical models that represent real-world phenomena, such as population growth, economic trends, or physical processes.
- Perform parameter estimation techniques to determine unknown parameters in mathematical models using available data.
- Apply numerical methods, such as finite difference, finite element, to solve complex mathematical models.
- Discuss the advantages and limitations of numerical methods in solving real-world problems compared to analytical solutions.

Apply differential equations, such as the logistic growth model, to analyze and solve problems in population dynamics, physics laws, and biological systems.

- Analyze case studies of population growth and decline in different species, discussing how differential equations are used to model these dynamics.
- Explore factors such as birth rates, death rates, and carrying capacity, and their impact on population stability and growth patterns.
- Apply fundamental physics principles, such as Newton's second law of motion, to analyze the motion of objects under varying forces.

Define a differential equation as an equation containing one or more derivatives of an unknown function, classified by its order based on the highest derivative present.

- Define terms such as dependent variable, independent variable, order of a differential equation, and initial/boundary conditions.
- Discuss the distinction between ordinary differential equations (ODEs) and partial differential equations (PDEs) based on the number of independent variables.
- Illustrate examples of first-order, second-order, and higher-order differential equations in various contexts, such as physics, biology, and engineering.
- Apply differential equations to model real-world phenomena, such as exponential growth, harmonic motion, or heat conduction.

Portrait of the Newtown Graduate

Explain that the general solution to a differential equation represents a family of solution curves, distinguished only by a constant parameter.

- Provide examples of differential equations where the general solution includes constant parameters, such as in first-order linear equations or separable equations.
- Plot solution curves for differential equations with varying constant parameters using software or graphing tools.
- Discuss how different values of the constant parameter result in distinct solution curves within the same family.
- Analyze the geometric interpretation of solution curves and their relationship to the differential equation's general solution.
- Solve differential equations using initial conditions to find particular solutions.

Interpret and visualize the general solution of a differential equation by graphing it as a direction field, illustrating the behavior of solutions over a range of values.

- Explain the concept of a direction field as a graphical representation of the slopes of solution curves at various points.
- Demonstrate how direction fields are constructed for first-order differential equations using a grid of points and arrows indicating the direction of the derivative.
- Overlay solution curves onto direction fields to illustrate how they intersect and follow the direction indicated by arrows.
- Analyze the relationship between the slope field and the solution curves, emphasizing how the field predicts the behavior of solutions over different intervals.

Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Model
- Differential Equation
- Logistic Model
- Order
- General Solution
- Solution Curve
- Initial Condition
- Direction Field

Resources

Teacher and student resources used to support the learning.

[https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_\(Trench\)/03%3A_Numerical_Methods](https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_(Trench)/03%3A_Numerical_Methods)

- Basic Integration Rules.pdf
- Integration by Parts Homework.pdf
- Integration by Parts Notes.pdf
- Parts Quiz Review Solutions.pdf
- Parts Quiz Review.pdf
- Rational Integration Notes.pdf
- Rational Integration Quiz.docx
- Basic Functions Answers V_1.pdf
- Basic Functions notes.pdf
- Basic Functions Version 1.pdf
- Basic Functions Version 2.pdf
- basic functions.docx
- Interlude_3__Slope_Fields.pdf
- Slope Fields Flamingo.pdf
- Slope Fields Quiz.pdf
- Slope Fields.docx
- Slope-Fields_Slides.pdf

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

- Create tiered problem sets where each tier varies in complexity and depth of conceptual understanding required.
 - Provide students with options to choose problems aligned with their current understanding, allowing for differentiated learning experiences.
 - Provide structured supports such as guiding questions, hints, or partial solutions to scaffold students' problem-solving skills while deepening their understanding of concepts.
 - Design choice boards offering a variety of activities related to differential equations concepts.
 - Implement think-pair-share activities where students individually reflect on a differential equations concept or problem, discuss their thoughts with a partner, and then share their insights with the class.
 - Encourage students to explain their reasoning and engage in peer-to-peer learning, promoting collaborative understanding.
 - Flip classroom instruction by providing pre-recorded lectures or readings on differential equations concepts for students to review outside of class.
 - Organize peer teaching sessions where students research and prepare mini-lessons on specific differential equations topics.
 - Facilitate problem-based learning workshops where students work collaboratively to solve authentic differential equations problems.
 - Encourage students to make connections between theoretical concepts and real-world applications, fostering metacognitive awareness and deeper conceptual understanding.
-

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.

Does not apply.



Unit Plan

First Order Equations

Newtown High School / High School / Mathematics

Week 7 - Week 12 | 5 Curriculum Developers | Last Updated: May 5, 2025 by Bremer, Kathleen

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

Study first-order differential equations for which there are general methods of solution.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Concepts:

- Linear
- Homogeneous
- Nonhomogeneous
- Trivial solutions
- Nontrivial
- First-order differential equation
- Separable differential equation
- Arbitrary constant
- Family of solutions
- Boundary values
- Open rectangle
- Existence
- Uniqueness
- Bernoulli equation
- Transformations

Lens: Linearization

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

Strand 1: Linear First Order Equations

Concepts:

- Linear
- Homogeneous
- Nonhomogeneous
- Trivial solutions
- Nontrivial

1. **Linear** first-order differential equations are **homogeneous** and **nonhomogeneous** with **trivial solutions** for the homogeneous case, with any other solution being **nontrivial**.

Strand 2: Separable Equations

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

Generalization 1:

- What is a **trivial solution**? (F)
- What is a **nontrivial** solution? (F)
- What distinguishes a **linear** differential equation from a nonlinear one, and how does this classification impact the methods used for finding solutions? (C)
- How does the linearity of a first-order differential equation influence the classification of its solutions as **homogeneous** or **nonhomogeneous**? (C)
- Why is the concept of **trivial solutions** important when discussing **homogeneous** linear differential equations? (C)
- Are **nontrivial solutions** of **nonhomogeneous** linear differential equations essential for truly understanding the

Concepts:

- First-order differential equation
- Separable differential equation
- Arbitrary constant
- Family of solutions
- Boundary values

2. A **first-order differential equation** is a **separable differential equation**, allowing for the method of separation of variables where x and y are isolated on opposite sides.

3. Integrating a **separable differential equation** introduces an **arbitrary constant**, which represents the **family of solutions** and accommodates specific initial conditions or **boundary values**.

Strand 3: Existence and Uniqueness of Solutions of Nonlinear Equations

Concepts:

- Open rectangle
- Existence
- Uniqueness

4. An **open rectangle**, excluding its boundary, serves as a domain for **existence** and **uniqueness**.

Strand 4: Transformation of Nonlinear Equations into Separable Equations

Concepts:

- Bernoulli Equation
- Transformations

5. The **transformation** of **Bernoulli equations** into separable differential equations requires the variation of parameters.

dynamics of physical systems, or do **trivial** solutions provide sufficient insight? (P)

Generalization 2:

- How does the method of **separation of variables** apply to first-order differential equations?
- What advantages does **separation of values** offer in terms of solving first-order differential equations? (C)
- How does the concept of **separability** in differential equations contribute to understanding the interplay between independent and dependent variables in the context of modeling dynamic systems? (C)

Generalization 3:

- What is an **arbitrary constant**? (F)
- What are **boundary values**? (F)
- What is **existence**? (F)
- What is **uniqueness**? (F)
- What role does the **arbitrary constant** play in the solution of separable differential equations? (C)
- How does the **arbitrary constant** facilitate the determination of specific solutions given initial conditions or **boundary values**? (C)

Generalization 4:

- What is an **open rectangle**? (F)
- What role does an **open rectangle** play in the context of establishing the **existence** and **uniqueness** of solutions to initial value problems for nonlinear differential equations? (C)
- Do the theoretical conditions for the **existence** and **uniqueness** of solutions in nonlinear differential equations align with the practical challenges of applying these concepts to real-world phenomena? (P)

Generalization 5:

- What is the **Bernoulli equation**? (F)
- How does the variation of parameters method **transform** a **Bernoulli equation** into a separable differential equation? (C)
- How does the process of **transforming** a nonlinear **Bernoulli equation** into a separable form through variation of parameters enhance the understanding of the relationship between different solution methods in differential equations? (C)
- Is the **transformation** of a nonlinear **Bernoulli equation** into a separable form through variation of parameters merely a mathematical convenience, or does it fundamentally alter our interpretation of the underlying dynamics described by the equation? (P)

Content Knowledge

*Critical facts and information that students are expected to **KNOW** at the end of the unit.*

Students will know:

- how to apply linear first order differential equations.
- how to integrate separable differential equations.
- how to identify and apply the existence and uniqueness of solutions of nonlinear equations.

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 2. Work independently and collaboratively to solve problems and accomplish goals.
- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.

- how to transform nonlinear equations into separable equations.
- 4. Demonstrate innovation, flexibility and adaptability in thinking patterns, work habits, and working/learning conditions.
- 5. Effectively apply the analysis, syntheses, and evaluative processes that enable productive problem solving.
- 6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

Standards

The content standards that are taught and/or assessed in this unit.

Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

In this unit, students will be given the opportunity to work collaboratively and independently.

Apply linear first order differential equations.

- Analyze and understand the components of a linear differential equation.
- Solving linear first-order differential equations using integrating factors, separation of variables, and exact equations.
- Interpret and analyze the solutions in the context of domain and initial conditions.
- Explore the conditions for the existence and uniqueness of solutions to initial value problems posed by linear differential equations.

Integrate separable differential equations.

- Identify differential equations that can be separated into functions of x and y .
- Formulate separable differential equations from given physical or mathematical scenarios.
- Apply integration techniques such as integration by parts, substitution, or partial fractions to solve the separated differential equations.
- Interpret the solutions in terms of the initial conditions provided and the behavior of the system over time.

Identify and apply the existence and uniqueness of solutions of nonlinear equations.

- Study the theoretical conditions under which solutions to nonlinear equations exist and are unique.
- Analyze specific nonlinear differential equations and determine whether they satisfy the conditions for existence and uniqueness of solutions.
- Explore how boundary conditions and initial values affect the existence and uniqueness of solutions in nonlinear equations.
- Set up and solve initial value problems for nonlinear differential equations.
- Compare and contrast the concepts of existence and uniqueness for linear versus nonlinear equations.

Transform nonlinear equations into separable equations.

- Identify nonlinear equations, such as Bernoulli equations, that can be transformed into separable form.

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- Understand the characteristics of nonlinear equations and the challenges they present for direct solution methods.
- Apply the variation of parameters technique to transform specific types of nonlinear equations into separable form.
- Explore substitution methods for transforming nonlinear equations into forms amenable to separation of variables.
- Apply the transformation techniques to model and solve practical problems from physics, biology, economics, etc., where nonlinear equations arise.

Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Linear
- Homogeneous
- Nonhomogeneous
- One-parameter family
- Trivial solutions
- Complementary equation
- Nontrivial
- Principle of superposition
- First-order differential equation
- Separable differential equation
- Implicit function theorem
- Arbitrary constant
- Family of solutions
- Boundary values
- Open rectangle
- Existence
- Uniqueness
- Bernoulli Equation
- Transformations

Resources

Teacher and student resources used to support the learning.

[https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_\(Trench\)/03%3ANumerical_Methods](https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_(Trench)/03%3ANumerical_Methods)

- [Checking for Solutions to Differential Equations.pdf](#)
- [Separable Notes.pdf](#)
- [Separable Practice.pdf](#)
- [Separable Quiz.pdf](#)
- [Bernouli homework.docx](#)
- [Bernouli notes.docx](#)
- [Bernoulli Quiz.pdf](#)
- [Bernoulli supplemental.docx](#)
- [Homogeneous Homework.pdf](#)
- [Homogeneous notes.pdf](#)
- [Homogeneous online resource for homework.pdf](#)
- [uniqueness.docx](#)

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

- Create tiered problem sets where each tier varies in complexity and depth of conceptual understanding required.
- Provide students with options to choose problems aligned with their current understanding, allowing for differentiated learning experiences.
- Provide structured supports such as guiding questions, hints, or partial solutions to scaffold students' problem-solving skills while deepening their understanding of concepts.
- Design choice boards offering a variety of activities related to differential equations concepts.
- Implement think-pair-share activities where students individually reflect on a differential equations concept or problem, discuss their thoughts with a partner, and then share their insights with the class.
- Encourage students to explain their reasoning and engage in peer-to-peer learning, promoting collaborative understanding.
- Flip classroom instruction by providing pre-recorded lectures or readings on differential equations concepts for students to review outside of class.

- Organize peer teaching sessions where students research and prepare mini-lessons on specific differential equations topics.
- Facilitate problem-based learning workshops where students work collaboratively to solve authentic differential equations problems.
- Encourage students to make connections between theoretical concepts and real-world applications, fostering metacognitive awareness and deeper conceptual understanding.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.

Does not apply.



Unit Plan

Numerical Methods

Newtown High School / High School / Mathematics

Week 13 - Week 18 | 5 Curriculum Developers | Last Updated: May 6, 2025 by Bremer, Kathleen

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

Students will study three methods for solving first order differential equations.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Concept:

- Euler's method
- Differential equations
- Tangent line
- Integral curve
- The Improved Euler method
- The Runge-Kutta method

Lens: Approximation

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

Strand 1: Euler's method

Concepts:

- Euler's method
- Tangent line
- Integral curve
- Differential equations

1. **Euler's method** solves a **differential equation** by approximating the tangent line to the integral curve on a set interval.

Strand 2: The Improved Euler method and related methods

Concepts:

- Improved Euler method

2. The **Improved Euler method** solves differential equations using two evaluations.

Strand 3: The Runge-Kutta method

Concepts:

- Runge-Kutta method

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

Generalization 1:

- What is **Euler's method**? (F)
- Why is **Euler's method** used? (C)
- What is a **tangent line**? (F)
- What is an **integral curve**? (F)
- How does **Euler's method** approximate the **tangent line**? (C)

Generalization 2:

- What is the process for the **Improved Euler's method**? (F)
- How is the **Improved Euler method** different than Euler's Method? (C)

Generalization 3:

- What is the **Runge-Kutta method**? (F)
- How does the **Runge-Kutta method** differ from the Euler Method and the Improved Euler Method? (C)

Provocative: Under what circumstances might one method, the **Improved Euler** or **Runge-Kutta**, provide a more accurate approximation than the other.

3. The **Runge-Kutta method** computes approximate values of a solution to a differential equation.

Content Knowledge

*Critical facts and information that students are expected to **KNOW** at the end of the unit.*

Students will know:

- how to apply the Euler's method
- how to apply the Improved Euler method
- how to apply the Runge-Kutta method

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 2. Work independently and collaboratively to solve problems and accomplish goals.
- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
- 4. Demonstrate innovation, flexibility and adaptability in thinking patterns, work habits, and working/learning conditions.
- 5. Effectively apply the analysis, syntheses, and evaluative processes that enable productive problem solving.
- 6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

Standards

The content standards that are taught and/or assessed in this unit.

Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

Students will work independently and collaboratively

Apply the Euler's method

- Discuss the accuracy and limitations of Euler's method as the step size varies.
- Present a differential equation with a known exact solution.
- Calculate the numerical errors (difference between the approximate and exact solutions) for each step size.
- Plot the errors against the step size to analyze the convergence behavior of Euler's method.
- Formulate the corresponding differential equation and initial conditions.
- Discuss how the method can be generalized to higher-order differential equations by extending this approach.

Apply the Improved Euler method

- Calculate the approximations of the solution iteratively and compare them with the exact solution (if available).
- Discuss the advantages of the Improved Euler method over the basic Euler's method, emphasizing its improved accuracy.
- Compare the accuracy of the numerical solutions obtained from both Euler's method and the Improved Euler method.
- Improved Euler Method to numerically approximate the solution over a specified time interval.

Apply the Runge-Kutta method

Portrait of the Newtown Graduate

- Compute the approximations of the solution iteratively and compare them with the exact solution (if available).
- Discuss how to optimize the step size for Runge-Kutta to achieve accurate results while balancing computational efficiency.
- Interpret the results in the context of the problem and discuss any insights gained from using Runge-Kutta
- Visualize how the solution evolves over time and compare it with the exact solution or other numerical methods..

Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Euler's Method
- Taylor's Theorem
- Semi-linear method
- Improve Euler Method
- Runge-Kutta Method

Resources

Teacher and student resources used to support the learning.

[https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_\(Trench\)/03%3ANumerical_Methods](https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_(Trench)/03%3ANumerical_Methods)

- AP Calculus BC - Live Review Session 2 - Differential Equations on the AP Calculus BC Exam Final.pdf
- AP Classroom BC Unit 7.1-7.5 video Guided Notes .docx
- AP Classroom BC Unit 7.1-7.5 video Guided Notes.pdf
- Day 16 - Eulers Method - FRQ Review.pdf
- Euler's Method Notes and Homework.docx
- Euler's Method Notes.pdf
- Euler's Method Quiz.docx
- Euler's Quiz.pdf
- Improved Euler's Method.docx
- Programming Assignment.docx
- Programming Assignment.pdf

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

- Create tiered problem sets where each tier varies in complexity and depth of conceptual understanding required.
- Provide students with options to choose problems aligned with their current understanding, allowing for differentiated learning experiences.
- Provide structured supports such as guiding questions, hints, or partial solutions to scaffold students' problem-solving skills while deepening their understanding of concepts.
- Design choice boards offering a variety of activities related to differential equations concepts.
- Implement think-pair-share activities where students individually reflect on a differential equations concept or problem, discuss their thoughts with a partner, and then share their insights with the class.
- Encourage students to explain their reasoning and engage in peer-to-peer learning, promoting collaborative understanding.
- Flip classroom instruction by providing pre-recorded lectures or readings on differential equations concepts for students to review outside of class.
- Organize peer teaching sessions where students research and prepare mini-lessons on specific differential equations topics.
- Facilitate problem-based learning workshops where students work collaboratively to solve authentic differential equations problems.

- Encourage students to make connections between theoretical concepts and real-world applications, fostering metacognitive awareness and deeper conceptual understanding.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.

Does not apply.



Unit Plan

Applications of First Order Equations

Newtown High School / High School / Mathematics

Week 19 - Week 24 | 5 Curriculum Developers | Last Updated: May 6, 2025 by Bremer, Kathleen

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

To consider applications of first order differential equations.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Concepts:

- Rate of change model
- Growth and Decay
- Exponential Model
- Newton's Law of Cooling
- Mixing problem
- Newton's Second Law of Motion
- Terminal velocity
- Escape velocity

Lens: Dynamic Change

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

Strand 1: Growth and Decay

Concepts:

- Rate of change model
- Growth and decay
- Exponential Model

1. **Rate-of-change models** are applicable to a wide range of scenarios, including radioactive **decay**, carbon dating, and compound interest.
2. The most common model for **growth and decay** is the **exponential model** which assumes that the rate of change of a quantity is proportional to the quantity itself.

Strand 2: Cooling and Mixing

Concepts:

- Newton's Law of Cooling
- mixing problem

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

Generalization 1:

- What is the **rate-of-change model**? (F)
- What are some specific examples where **rate-of-change models**, such as exponential **growth and decay**, are widely applicable in real-world scenarios? (F)
- How does the **exponential model** represent **growth and decay** processes, and what does it assume about the relationship between the rate of change and the quantity itself? (F)
- How do **rate-of-change models**, particularly the **exponential model**, provide insights into the behavior of quantities over time in various contexts like population growth, radioactive decay, and financial investments? (C)

Generalization 2:

- What is the **Exponential Model**? (F)
- How does the **exponential growth model** describe the relationship between the rate of change of a quantity and the quantity itself, and what are its key characteristics? (F)

3. **Newton's Law of Cooling** is used to model the temperature **growth or decay** of a surrounding medium when an heated object is introduced.
4. Differential equations can be used to measure the **rate of change** of a quantity in a **mixing problem** when two solutions are combined.

Strand 3: Elementary Mechanics

Concepts:

- Newton's Second Law of Motion
- Terminal velocity
- Escape velocity

5. **Newton's Second Law of Motion** governs the acceleration of an object under gravitational force, defining both **terminal velocity** and **escape velocity**.

Unit Plan

- In what contexts is the **exponential decay model** commonly applied? (F)
- How does the **exponential decay model** differ from the **exponential growth model** in terms of its mathematical formulation and implications? (C)
- How does the assumption of proportionality between the rate of change and the quantity itself in the **exponential growth and decay model** provide insight into natural processes involving growth, decay, and dynamic equilibrium? (C)

Generalization 3:

- What is **Newton's Law of Cooling**? (F)
- What factors influence the rate of temperature change predicted by **Newton's Law of Cooling** when an object of different initial temperature is introduced into a medium at a different temperature? (F)
- How does **Newton's Law of Cooling** mathematically describe the rate at which the temperature of a heated object changes as it interacts with a surrounding medium? (C)
- How does **Newton's Law of Cooling** illustrate the principles of heat transfer between an object and its surroundings? (C)

Generalization 4:

- What are **mixing problems**? (F)
- How does the initial concentration of each solution and their respective volumes influence the formulation of the differential equation used in a **mixing problem**? (F)
- How does the application of differential equations in **mixing problems** reflect the underlying principles of conservation of mass and the dynamics of concentration changes over time? (C)

Generalization 5:

- What is **Newton's Second Law of Motion**? (F)
- What is **terminal velocity**? (F)
- What is **escape velocity**? (F)
- How does **Newton's Second Law of Motion** mathematically relate the acceleration of an object to the forces acting upon it, including gravitational force? (F)
- What factors determine the **terminal velocity** of an object falling through Earth's atmosphere? (F)
- How does **terminal velocity** relate to the forces of gravity and air resistance as described by **Newton's laws**? (C)
- How does understanding the relationship between **Newton's Second Law of Motion**, **terminal velocity**, and **escape velocity** contribute to our ability to analyze and predict the behavior of objects in gravitational fields? (C)
- If an object were launched from Earth at precisely **escape velocity**, would it be forever free from the influence of Earth's gravitational pull, or are there other factors that could affect its trajectory over time? (P)
- To what extent does **Newton's Second Law** remain valid under extreme gravitational conditions, and when might its limitations become significant? (P)
- To what extent do additional forces—such as atmospheric drag or relativistic effects—expand our understanding of **terminal** and **escape velocity** beyond what **Newton's Second Law** provides? (P)

Content Knowledge

Critical facts and information that students are expected to **KNOW** at the end of the unit.

Students will know:

- how rate-of-change models are applied in real-world scenarios.
- how to explain the exponential model and its representation of growth and decay.
- how to describe Newton's Law of Cooling.
- how to apply differential equations to model concentration changes in mixing problems.
- how to analyze Newton's Second Law of Motion and related concepts like terminal velocity and escape velocity.

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 2. Work independently and collaboratively to solve problems and accomplish goals.
- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
- 4. Demonstrate innovation, flexibility and adaptability in thinking patterns, work habits, and working/learning conditions.
- 5. Effectively apply the analysis, syntheses, and evaluative processes that enable productive problem solving.
- 6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

Standards

The content standards that are taught and/or assessed in this unit.

Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

In this unit, students will be given the opportunity to work collaboratively and independently.

Understand how rate-of-change models are applied in real-world scenarios.

- Analyze case studies and examples where rate-of-change models, such as first-order differential equations, are used to describe real-world phenomena like population growth, radioactive decay, chemical reactions, or economic trends.
- Practice formulating first-order differential equations that represent rate-of-change models based on given scenarios.
- Solve first-order differential equations using analytical and numerical methods to understand how solutions evolve over time.
- Verify the validity of rate-of-change models by comparing model predictions with empirical data or experimental results.

Explain the exponential model and its representation of growth and decay.

- Discuss the concept of exponential growth and decay in natural and social systems, emphasizing how the rate of change of a quantity is proportional to the quantity itself.
- Analyze how real-world applications of exponential growth and decay accurately describe the dynamics of these processes and discuss their practical implications.
- Compare the exponential model with other growth and decay models, such as linear growth or logistic growth.
- Investigate the sensitivity of the exponential model to changes in parameters such as growth rates or initial conditions.

Describe Newton's Law of Cooling.

Portrait of the Newtown Graduate

- Investigate real-world applications of Newton's Law of Cooling in various contexts, such as food preservation, climate control systems, or medical applications.

Apply differential equations to model concentration changes in mixing problems.

- Formulate differential equations that describe the rate of change of concentration in a mixing problem.
- Discuss how to incorporate factors such as flow rates, initial concentrations, and mixing efficiencies into the differential equation.
- Explore how different parameters and initial conditions affect the concentration profile and mixing efficiency.
- Apply differential equations to solve engineering problems involving mixing, such as designing chemical reactors, optimizing pollutant dispersion in environmental engineering, or calculating drug concentrations in pharmacokinetics.

Analyze Newton's Second Law of Motion and related concepts like terminal velocity and escape velocity.

- Formulate differential equations to describe the concentration changes of reactants and products in chemical reactions occurring within reactors.
- Solve differential equations to predict reaction rates, optimize reactor design, and determine the necessary conditions for desired product yields.
- Develop differential equations to model the dispersion of pollutants in air, water, or soil environments.
- Apply pharmacokinetic models to optimize drug dosage regimens, understand drug interactions, and design drug delivery systems for enhanced therapeutic efficacy.

Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Rate of change model
- Growth and Decay
- Exponential Model
- Newton's Law of Cooling
- mixing problem
- Newton's Second Law of Motion
- Terminal velocity
- Escape velocity

Resources

Teacher and student resources used to support the learning.

[https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_\(Trench\)/03%3A_Numerical_Methods](https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_(Trench)/03%3A_Numerical_Methods)

[1_Growth and Decay Quiz.docx](#)

[1_Growth and Decay.docx](#)

[2_Cooling and Mixing.docx](#)

[3_Mechanics.docx](#)

[Cooling and Mixing Quiz.docx](#)

[Growth and Decay Quiz.pdf](#)

[Growth and Decay.pdf](#)

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

- Create tiered problem sets where each tier varies in complexity and depth of conceptual understanding required.

- Provide students with options to choose problems aligned with their current understanding, allowing for differentiated learning experiences.
- Provide structured supports such as guiding questions, hints, or partial solutions to scaffold students' problem-solving skills while deepening their understanding of concepts.
- Design choice boards offering a variety of activities related to differential equations concepts.
- Implement think-pair-share activities where students individually reflect on a differential equations concept or problem, discuss their thoughts with a partner, and then share their insights with the class.
- Encourage students to explain their reasoning and engage in peer-to-peer learning, promoting collaborative understanding.
- Flip classroom instruction by providing pre-recorded lectures or readings on differential equations concepts for students to review outside of class.
- Organize peer teaching sessions where students research and prepare mini-lessons on specific differential equations topics.
- Facilitate problem-based learning workshops where students work collaboratively to solve authentic differential equations problems.
- Encourage students to make connections between theoretical concepts and real-world applications, fostering metacognitive awareness and deeper conceptual understanding.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.

Does not apply.



Unit Plan

Linear Second Order Equations

Newtown High School / High School / Mathematics

Week 25 - Week 31 | 5 Curriculum Developers | Last Updated: May 6, 2025 by Bremer, Kathleen

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

Students will be able to solve homogenous and non-homogenous differential equations using the constant of coefficient, the principle of superposition, reduction of order, and variation of parameters.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Concepts:

- Homogenous
- Non-homogenous
- Second order differential equations
- Linear
- Constant coefficient
- Principle of superposition
- Particular solution
- Reduction of order
- General solution
- Variation of parameters

Lens: Variation

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

Strand 1: Homogenous Linear Equations

Concepts:

- Homogenous
- Non-homogenous
- Second order differential equations
- Linear

1. A **homogenous** or **non-homogenous second order differential equation** can be **linear**.

Strand 2: Constant Coefficient Homogenous Equations

Concepts:

- Constant coefficient

2. A **constant coefficient** determines a **homogenous** equation.

Strand 3: Non-Homogenous Linear Equations

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

Generalization 1:

- What is a **homogenous equation**? (F)
- What is a **non-homogenous equation**? (F)
- How can a **second order differential equation** be linear? (C)
- What is the different between a **homogenous** and **non-homogenous equation**? (F)

Generalization 2:

- What is a **constant coefficient**? (F)
- What defines a **homogeneous equation**? (F)
- Why does the presence of **constant coefficients** influence the structure of a **homogeneous equation**? (C)
- How does the behavior of solutions change when **coefficients** are **constant** versus variable? (C)
- Does the reliance on **constant coefficients** limit our understanding of more realistic, time-dependent phenomena in nature and engineering? (P)

Concepts:

- Principle of Superposition
- Particular solution

3. The **Principle of Superposition** breaks down a **non-homogenous** equation into smaller parts.

4. The smaller parts of a **non-homogenous** equation yields a **particular solution** for each part.

Strand 4: Reductions of Order

Concepts:

- Reduction of order
- General solution

5. **Reduction of order** finds the **general solution** to a **homogenous second order linear equation**.

Strand 5: Variation of Parameters

Concepts:

- Variation of parameters

6. **Variation of parameters** solves **non-homogenous linear** equations.

Generalization 3:

- What is the **principle of superposition**? (F)
- In what ways does the principle of **superposition** deepen our understanding of solutions to **homogeneous equations**? (C)
- How does the **principle of superposition** apply to the solutions of **homogeneous equations**, and what makes this principle inapplicable to **nonhomogeneous** cases? (C)
- Why is the distinction between **homogeneous** and **nonhomogeneous equations** essential when modeling physical systems, especially when interpreting the combined effects of external forces and natural system behavior?

Generalization 4:

- What is a **particular solution** to a differential equation? (F)
- How is a **particular solution** found using the principle of superposition? (C)

Generalization 5:

- What is the method for using the **reduction of order**? (F)

Generalization 6:

- What is the **variation of parameters**? (F)
- How is the **variation of parameters** used? (C)

Provocative: Is there a best method for solving **non-homogenous** second order differential equations?

Content Knowledge

*Critical facts and information that students are expected to **KNOW** at the end of the unit.*

Students will know how to:

- Identify the difference between a homogenous and non-homogenous linear equation.
- Determine a constant coefficient in a homogenous equation.
- Apply the principle of superposition.
- Identify the particular solution to a non-homogenous differential equation.
- Apply the reduction of order to find the general solution to a homogenous second order linear equation.
- Apply the variation of parameters to solve non-homogenous linear equations.

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

- 1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
- 2. Work independently and collaboratively to solve problems and accomplish goals.
- 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
- 4. Demonstrate innovation, flexibility and adaptability in thinking patterns, work habits, and working/learning conditions.
- 5. Effectively apply the analysis, syntheses, and evaluative processes that enable productive problem solving.
- 6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

Standards

The content standards that are taught and/or assessed in this unit.

Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

Portrait of the Newtown Graduate

In this unit, students will be given the opportunity to work collaboratively and independently.

Identify the difference between a homogenous and non-homogenous linear equation.

- Differentiate between homogeneous linear equation and a non-homogeneous linear equations based on the presence or absence of the non-zero forcing term (right-hand side) in the non-homogeneous equation.
- Explore the key characteristics of solutions to homogeneous and non-homogeneous linear equations.
- Discuss how the solutions to homogeneous equations form a vector space (the solution space) and include the trivial solution.
- Explore techniques like variation of parameters or the method of annihilators for solving non-homogeneous linear equations.
- Apply different methods for solving homogeneous linear equations, such as finding eigenvalues and eigenvectors for systems or using the method of undetermined coefficients for scalar equations.

Determine a constant coefficient in a homogenous equation.

- Define what constitutes a constant coefficient in the context of a differential equation or a system of linear equations.
- Investigate how constant coefficients affect the nature of solutions and the methods used to find them.
- Differentiate between homogeneous and non-homogeneous equations and their implications for constant coefficients.
- Explore applications in physics, engineering, and other fields where constant coefficient equations arise (e.g., vibrational systems, circuit analysis, population dynamics).
- Identify and analyzing specific examples of homogeneous equations with constant coefficients, and solving them using appropriate methods.

Apply the principle of superposition.

- Differentiate between superposition as applied to linear differential equations, integral equations, and systems of linear equations.
- Solve practical problems in physics, engineering, and other fields by decomposing them into individual components and applying the principle to find the total solution.
- Explore the limitations and conditions under which the principle of superposition holds.

Identify the particular solution to a non-homogenous differential equation.

- Identify and calculate the particular solution using either the Method of Undetermined Coefficients or Variation of Parameters.
- Interpret the particular solution in the context of the problem and discuss its significance.
- Solve the differential equation using both the particular solution method and numerical methods.
- Discuss on the advantages and disadvantages of using analytical methods (such as finding particular solutions) versus numerical methods in solving differential equations with non-homogeneous terms.

Apply the reduction of order to find the general solution to a homogenous second order linear equation.

- Compare and contrast reduction of order with variation of parameters in terms of ease of application and conceptual understanding.
- Explore real-world applications where second-order homogeneous linear differential equations arise, such as mechanical vibrations, electrical circuits, or heat conduction.
- Apply reduction of order to find the general solution and interpret the solutions in the context of the physical or engineering problem.
- Discuss how the general solution encapsulates the behavior and characteristics of the system under study.

Apply the variation of parameters to solve non-homogenous linear equations.

- Contrast the variation of parameters method with the method of undetermined coefficients for solving non-homogeneous linear differential equations.
- Discuss when it is advantageous to use variation of parameters over the method of undetermined coefficients based on the structure of the non-homogeneous term.
- Explore practical applications where non-homogeneous linear differential equations arise, such as in physics (e.g., forced oscillations, electrical circuits) or engineering (e.g., control systems, fluid dynamics).
- Formulate differential equations based on these applications and provide initial conditions.

Vocabulary




Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.




- Homogenous
- Non-homogenous
- Second order Differential Equations
- Linear
- Constant Coefficient
- Principle of Superposition
- Particular solution
- Reduction of order
- General Solution
- Variation of parameters
- Complementary equation
- Characteristic Equation
- Distinct Real Roots
- Repeated Real Root
- Complex Conjugate Root
- Forcing Function
- Cramer's Rule

Resources

Teacher and student resources used to support the learning.

[https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_\(Trench\)/05%3A_Linear_Second_Order_Equations](https://math.libretexts.org/Bookshelves/Differential_Equations/Elementary_Differential_Equations_with_Boundary_Value_Problems_(Trench)/05%3A_Linear_Second_Order_Equations)

 2nd order linear homogeneous.pdf  

 Homogeneous Constant Coefficient.docx  

 non-Homogeneous Constant Coefficient.docx  

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

- Create tiered problem sets where each tier varies in complexity and depth of conceptual understanding required.
 - Provide students with options to choose problems aligned with their current understanding, allowing for differentiated learning experiences.
 - Provide structured supports such as guiding questions, hints, or partial solutions to scaffold students' problem-solving skills while deepening their understanding of concepts.
 - Design choice boards offering a variety of activities related to differential equations concepts.
 - Implement think-pair-share activities where students individually reflect on a differential equations concept or problem, discuss their thoughts with a partner, and then share their insights with the class.
 - Encourage students to explain their reasoning and engage in peer-to-peer learning, promoting collaborative understanding.
 - Flip classroom instruction by providing pre-recorded lectures or readings on differential equations concepts for students to review outside of class.
 - Organize peer teaching sessions where students research and prepare mini-lessons on specific differential equations topics.
 - Facilitate problem-based learning workshops where students work collaboratively to solve authentic differential equations problems.
 - Encourage students to make connections between theoretical concepts and real-world applications, fostering metacognitive awareness and deeper conceptual understanding.
-

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.

Does not apply.



Unit Plan

Laplace Transformations

Newtown High School / High School / Mathematics

Week 32 - Week 38 | 5 Curriculum Developers | Last Updated: May 6, 2025 by Bremer, Kathleen

Concept-Based Curriculum Unit Template

Purpose of the Unit

The overarching goal(s) of the unit.

Students will solve differential equations using the Laplace transform.

Conceptual Lens/Concepts

Concepts are the "big ideas" of the unit. The conceptual lens is a particular concept that focuses the thinking of the unit.

Concepts:

- Laplace transforms
- Linearity
- Time shifting
- Frequency shifting
- Inverse Laplace transform tables
- Heaviside's method
- Partial fraction decomposition
- time domain
- Solution of Initial Value Problems
- The unit step functions
- Constant coefficient equations with piecewise continuous forcing functions
- Convolution
- Constant coefficient equations with impulses

Lens: Simplification of a Complex System

Generalizations

*Critical conceptual relationships that students are expected to **UNDERSTAND** at the end of the unit.*

Strand 1: Intro to Laplace Transforms

Concepts:

- Laplace transform
- Linearity
- Time shifting
- Frequency shifting

1. The **Laplace transform** uses **linearity**, **time shifting**, and **frequency shifting** properties to simplify the solution to complex engineering, physics, and control theory problems.

Strand 2: Inverse Laplace Transforms

Concepts:

- Inverse Laplace transform tables

Guiding Questions

A combination of Factual (F), Conceptual (C) and Provocative/Debatable (P) questions that lead to the generalizations. Label each question (F), (C) or (P).

Generalization 1:

- What is a **Laplace Transform**? (F)
- What is the **linearity** property? (F)
- What is **time shifting**? (F)
- What is **frequency shifting**? (F)
- How are integrals and exponentials used to find **Laplace transforms**? (C)
- How can the table of Laplace transforms be used to find the **Laplace transform**? (C)
- How can the **Linearity** property be applied to complex linear differential equations. (C)
- How are the **Laplace transforms** of piecewise functions found? (C)

- Heaviside's method
- Partial fraction decomposition
- time domain

2. The **inverse** transform converts solutions back to the **time domain** using **Heaviside's method**, **Laplace transforms tables**, **partial fraction decomposition** tables to providing meaningful physical interpretations.

Strand 3: Applications of Laplace Transforms

- Solution of Initial Value Problems
- The unit step functions
- Constant coefficient equations with piecewise continuous forcing functions
- Convolution
- Constant coefficient equations with impulses

3. **Initial value problems**, **unit step functions**, **constant coefficient equations with piecewise continuous forcing functions**, **convolution**, **constant coefficient equations with impulses** illustrate the broad applicability of differential equations and the Laplace transform in modeling real-world problems.



Laplace transforms are used to solve initial value problems for constant coefficient second order equations.

Unit Plan

Generalization 2:

- What is **Heaviside's method**? (F)
- Why must Laplace transforms be converted back to the **time domain**? (F)
- How can the table of Laplace transforms be used to find the **inverse Laplace transform**? (C)
- How can the **inverse transform** of a rational function be found? (C)
- How is **Heaviside's method** used to find the **inverse Laplace transform**? (C)
- How can **partial fraction decomposition** be used to simplify complex rational expressions into forms that are easily inverted using transform tables? (C)
- What challenges or considerations arise when transforming and interpreting the solution in the **time domain**? (C)

Generalization 3:

- What is **Convolution**? (F)
- What are **Constant coefficient equations with impulses**? (F)
- What are some real world **applications of Laplace transforms**? (F)
- How does the Laplace transform aid in solving **initial value problems** in differential equations? (F)
- In what way does the Laplace transform facilitate the solution of **constant coefficient equations with piecewise continuous forcing functions**? (F)
- How do **unit step functions** enhance the modeling of systems in differential equations? (F)
- How does the Laplace transform methodically handle **initial value problems** in differential equations, and what advantages does it offer over traditional methods like separation of variables? (C)
- How does the role of **unit step functions** facilitate the modeling of systems, and what are the implications of their use in representing system behavior with sudden changes?
- In what way do Laplace transforms effectively solve **initial value problems** with discontinuous functions, such as unit step functions and piecewise continuous forcing functions? (P)

Content Knowledge

*Critical facts and information that students are expected to **KNOW** at the end of the unit.*

Students will know how to:

- Find Laplace transforms.
- Find inverse Laplace transforms.
- Apply Laplace transforms to differential equations.

Critical Skills

Critical skills that students are expected to be able to **DO** at the end of the unit.

1. Use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks.
2. Work independently and collaboratively to solve problems and accomplish goals.
3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
4. Demonstrate innovation, flexibility and adaptability in thinking patterns, work habits, and working/learning conditions.
5. Effectively apply the analysis, syntheses, and evaluative processes that enable productive problem solving.
6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

Standards

The content standards that are taught and/or assessed in this unit.

Core Learning Activities

The learning activities that support the acquisition of content knowledge, attainment of critical skills and lead to the generalizations of the unit. Activities should be clearly articulated, include teacher instructions and identify optional vs. assured experiences.

In this unit, students will be given the opportunity to work collaboratively and independently.

Find Laplace transforms.

- Understand the definition of the Laplace transform and its basic properties.
- Apply the step-by-step process of transforming a differential equation into an algebraic equation using the Laplace transform
- Apply linearity, time-shifting, scaling properties to find Laplace transforms of polynomial, exponential, and trigonometric functions.
- Transform different types of differential equations (ordinary and partial) with constant coefficients into algebraic equations using the Laplace transform.
- Use Laplace transform tables.

Find inverse Laplace transforms.

- Solve initial value problems using the transformed equations and then inverse Laplace transform to find the solution in the time domain.
- Apply inverse Laplace transforms to model and analyze practical scenarios, verifying solutions through both Laplace and time domain perspectives.
- Apply the inverse Laplace transform to solutions obtained in the Laplace domain to derive explicit solutions in the time domain.
- Use partial fraction decomposition to decompose the Laplace transform into simpler fractions to facilitate the inverse transform.

Apply Laplace transforms to differential equations.

- Solve initial value problems by combining the transformed differential equation with the transformed initial conditions, and then applying inverse Laplace transform to find the solution in the time domain.
- Apply advanced techniques such as partial fraction decomposition and convolution theorem in the context of Laplace transforms.
- Explore applications of Laplace transforms in engineering disciplines (electrical, mechanical, chemical) to solidify understanding and relevance.
- Investigate Laplace transforms to handle special functions like unit step functions, piecewise continuous functions, and impulses and understand their significance in practical applications (circuit analysis, control systems, etc.).
- Apply the convolution theorem to solve non-homogeneous differential equations with various types of forcing functions (polynomial, exponential, sinusoidal).

Portrait of the Newtown Graduate

- Explore applications in control theory, circuit analysis, and mechanical systems

Vocabulary

Academic and content-specific vocabulary needed to support knowledge, understanding and/or skills.

- Laplace transforms
- Linearity
- Time shifting
- Frequency shifting
- Inverse Laplace transform tables
- Heaviside's method
- Partial fraction decomposition
- time domain
- Solution of Initial Value Problems
- The unit step functions
- Constant coefficient equations with piecewise continuous forcing functions
- Convolution
- Constant coefficient equations with impulses

Resources

Teacher and student resources used to support the learning.

Department developed materials on google drive.

[William F. Trench, Elementary Differential Equations with Boundary Value Problems](#)

Assessments

The means by which students will demonstrate what they know (content knowledge), what they can do (critical skills), and what they understand (generalizations) as a result of their learning from the unit.

Differentiation

Core learning activities, resources and assessments that meet the needs of all learners.

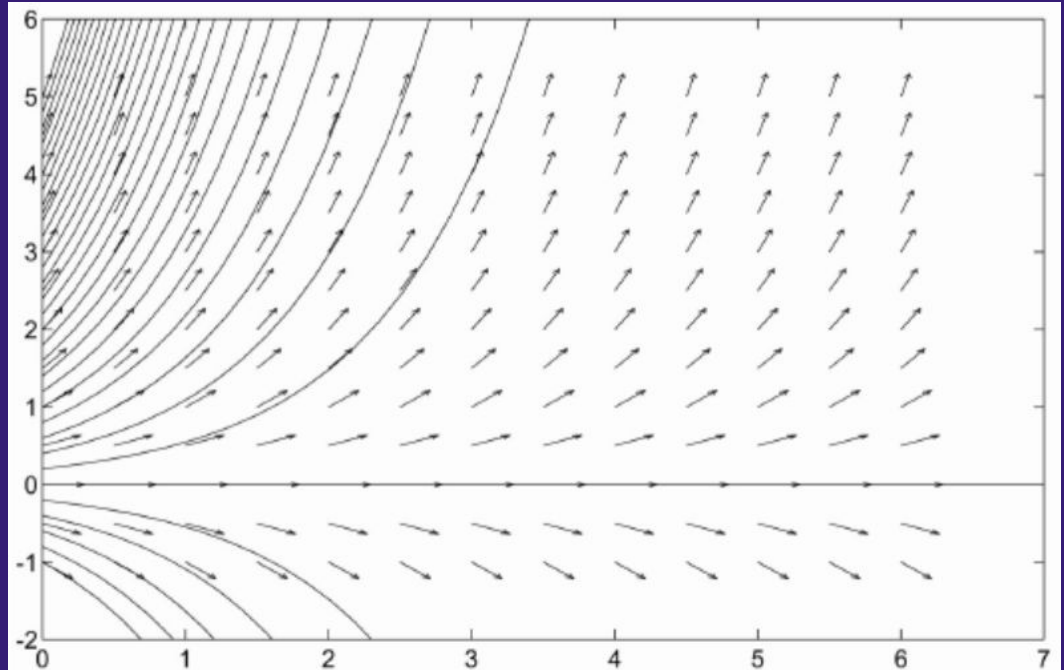
- Create tiered problem sets where each tier varies in complexity and depth of conceptual understanding required.
- Provide students with options to choose problems aligned with their current understanding, allowing for differentiated learning experiences.
- Provide structured supports such as guiding questions, hints, or partial solutions to scaffold students' problem-solving skills while deepening their understanding of concepts.
- Design choice boards offering a variety of activities related to differential equations concepts.
- Implement think-pair-share activities where students individually reflect on a differential equations concept or problem, discuss their thoughts with a partner, and then share their insights with the class.
- Encourage students to explain their reasoning and engage in peer-to-peer learning, promoting collaborative understanding.
- Flip classroom instruction by providing pre-recorded lectures or readings on differential equations concepts for students to review outside of class.
- Organize peer teaching sessions where students research and prepare mini-lessons on specific differential equations topics.
- Facilitate problem-based learning workshops where students work collaboratively to solve authentic differential equations problems.
- Encourage students to make connections between theoretical concepts and real-world applications, fostering metacognitive awareness and deeper conceptual understanding.

Test Prep Connections

As appropriate, include activities that build skills for standardized testing, such as IABs.

Does not apply.

Differential Equations



Eugene Hall
Newtown High School
Mathematics Department

Differential Equations

Agenda

1. Pathways to DE(Middle School to 12th Grade)
 2. Pure Math versus Applied Math Pathway
 3. Do we need to offer a class beyond Multivariable Calculus?
 4. Prerequisites for DE from area colleges
 5. Area HS that offer a class beyond Multivariable Calculus
 6. ECE Math Courses
 7. DE Curriculum highlights
-

Multivariable Calculus Pathway ONLY

7th Grade	Algebra 1
8th Grade	Algebra 2
9th Grade	Honors Geometry
10th Grade	Honors Precalculus BC
11th Grade	AP Calculus BC
12th Grade	Multivariable Calculus

Differential Equations Pathway ONLY

7th Grade	Algebra 1
8th Grade	Algebra 2
9th Grade	Honors Geometry
10th Grade	Honors Precalculus BC
11th Grade	AP Calculus BC
12th Grade	Multivariable Calculus

7th Grade	Algebra 1
8th Grade	Algebra 2
9th Grade	Honors Geometry
10th Grade	Honors Precalculus BC
11th Grade	AP Calculus BC
12th Grade	Differential Equations

Differential Equations and Multivariable Calculus

Pathway 1

Test Out	Algebra 1
7th Grade	Algebra 2
8th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
11th Grade	Differential Equations
12th Grade	Multivariable Calculus

Differential Equations and Multivariable Calculus

Pathway 2

Test Out	Algebra 1
7th Grade	Algebra 2
8th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
11th Grade	Differential Equations
12th Grade	Multivariable Calculus

Test Out	Algebra 1
7th Grade	Algebra 2
8th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
12th Grade	Multivariable Calculus
11th Grade	Differential Equations

Differential Equations and Multivariable Calculus

Pathway 3

Test Out	Algebra 1
7th Grade	Algebra 2
8th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
11th Grade	Differential Equations
12th Grade	Multivariable Calculus

7th Grade	Algebra 1
8th Grade	Algebra 2
Summer before 9th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
11th Grade	Differential Equations
12th Grade	Multivariable Calculus

Test Out	Algebra 1
7th Grade	Algebra 2
8th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
12th Grade	Multivariable Calculus
11th Grade	Differential Equations

Differential Equations and Multivariable Calculus

Pathway 2

Test Out	Algebra 1
7th Grade	Algebra 2
8th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
11th Grade	Differential Equations
12th Grade	Multivariable Calculus

7th Grade	Algebra 1
8th Grade	Algebra 2
Summer before 9th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
11th Grade	Differential Equations
12th Grade	Multivariable Calculus

Test Out	Algebra 1
7th Grade	Algebra 2
8th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
12th Grade	Multivariable Calculus
11th Grade	Differential Equations

7th Grade	Algebra 1
8th Grade	Algebra 2
Summer before 9th Grade	Geometry
9th Grade	Honors Precalculus BC
10th Grade	AP Calculus BC
12th Grade	Multivariable Calculus
11th Grade	Differential Equations

Multivariable Calculus or Differential Equations

School year	Number of students	12th Graders	11th Graders	Course Taught
2025-2026	8	4	4	DE
2024-2025	12	11	1	MV
2023-2024	8	8	0	DE
2022-2023	11	9	2	MV
2021-2022	9	9	0	MV
2020-2021	16	16	0	MV
2019-2020	18	18	0	MV
2018-2019	9	9	0	MV
2017-2018	5	3	2	MV
2016-2017	2	1	1	MV
2015-2016	10	10	0	MV
2014-2015	5	2	3	MV
2013-2014	7	7	0	MV
2012-2013	7	7	0	MV

Multivariable Calculus or Differential Equations

Pure Mathematics

Algebra 1

Algebra 2

Geometry

Honors Precalculus BC

AP Calculus BC

Multivariable Calculus

Differential Equations

Multivariable Calculus or Differential Equations

Pure Mathematics

Algebra 1

Algebra 2

Geometry

Honors Precalculus BC

AP Calculus BC

Multivariable Calculus

Differential Equations

Applied Mathematics:

AP Statistics

Computer Science

AP Computer Science A

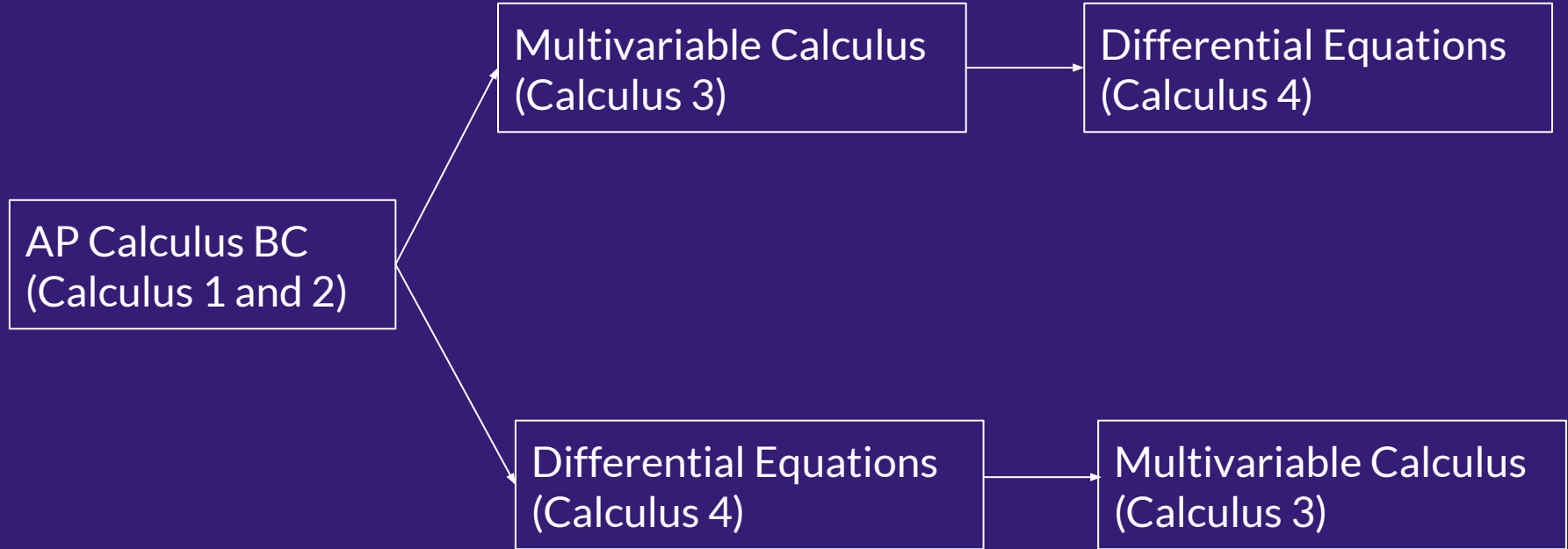
AP Computer Science

Principles

Game Design I and II

Honors Python I and II

Multivariable Calculus or Differential Equations



UConn Multivariable Calculus Prerequisites

Cell Biology

MATH 2110Q. Multivariable Calculus. (4 Credits)

Two- and three-dimensional vector algebra, calculus of functions of several variables, vector differential calculus, line and surface integrals.

Enrollment Requirements: [MATH 1132Q](#) or MATH 1152Q or a score of 4 or 5 on the AP Calculus BC exam.

Recommended preparation: a grade of C- or better in [MATH 1132Q](#). May not be taken for credit after passing MATH

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MATH 1132Q. Calculus II. (4 Credits)

Transcendental functions, formal integration, polar coordinates, infinite sequences and series, vector algebra and geometry, with applications to the physical sciences and engineering.

Substitutes for MATH 1122Q as a requirement.

Enrollment Requirements: A qualifying score on the math placement assessment (placement.uconn.edu/mathematics-



ut of sequence after passing [MATH 2720](#), [3146](#), [3160](#), [3330](#), [3370](#), [3410](#),
oly; see advising.uconn.edu/repeat-policy.

y

UConn Differential Equations Prerequisites

MATH 2410Q. Elementary Differential Equations. (3 Credits)

Introduction to ordinary differential equations and their applications, linear differential equations, systems of first order linear equations, numerical methods.

Enrollment Requirements: [MATH 1132Q](#), 1152Q, or 2142Q. Recommended preparation: A grade of C- or better in [MATH 1132Q](#); [MATH 2110Q](#) or [2120Q](#). Cannot be taken after [MATH 2144Q](#), 2420Q, [2720](#), [3146](#), [3150](#), [3410](#), 3412,



advising.uconn.edu/repeat-policy.

MATH 1132Q. Calculus II. (4 Credits)

Transcendental functions, formal integration, polar coordinates, infinite sequences and series, vector algebra and geometry, with applications to the physical sciences and engineering.
Substitutes for MATH 1122Q as a requirement.

Beyond AP Calculus BC

**Area schools that offer Multivariable
Calculus(Calculus 3)**

New Canaan HS

Darien HS

Greenwich HS

Staples HS(Westport)

Wilton HS

Beyond Multivariable Calculus

**Area schools that offer a course beyond
Multivariable Calculus(Calculus 3)**

Greenwich HS(Linear Algebra)

Staples HS(Differential Equations)

ECE(Early College Experience)

WCSU:

WCSU Calculus(pre-existing for years)

WCSU Precalculus(started 24_25)

WCSU Statistics(returned 24_15)

ECE(Early College Experience)

UConn(apply during 25_26):

AP Calculus AB

AP Calculus BC

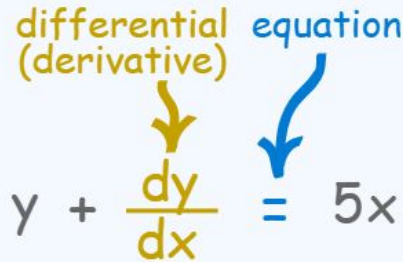
Multivariable Calculus

Multivariable Calculus

- 1. Curricula was written during the summer of 2022 by K. Raccio, P. Hyman, C. Cavataro & K. Bremer**
 - 2. Feedback and Adjustment**
 - a. District Math Committee**
 - b. Curriculum Council**
 - c. Frank Purcaro, Asst. Superintendent**
 - d. Math Department Team**
-

Differential Equations

A differential equation is an equation relating some function f to one or more of its derivatives.



The diagram shows the equation $y + \frac{dy}{dx} = 5x$. Above the term $\frac{dy}{dx}$, the text "differential (derivative)" is written in yellow, with a yellow arrow pointing down to the fraction. Above the equals sign, the text "equation" is written in blue, with a blue arrow pointing down to the equals sign.

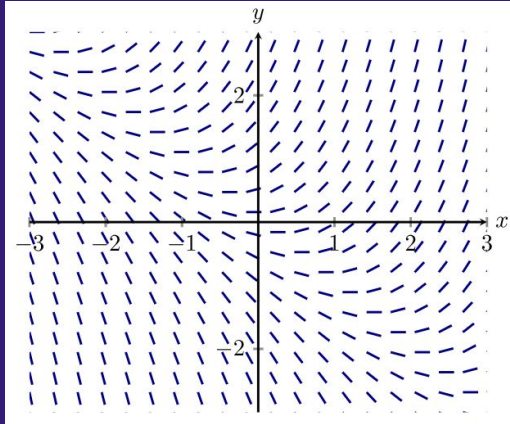
$$y + \frac{dy}{dx} = 5x$$

Example: an equation with the function y and its derivative $\frac{dy}{dx}$

Differential Equations

Unit 1: Introduction to Differential Equations

1. Separable DE
2. Slope Field



$$\frac{dy}{dx} = f(x)g(y)$$

$$\frac{dy}{g(y)} = f(x) dx$$

$$\int \frac{1}{g(y)} dy = \int f(x) dx$$

Differential Equations

Unit 2: First Order Differential Equations

1. Homogeneous
2. Bernoulli
3. Exact

Order of Differential Equation

First Order Differential Equation

$$\frac{dy}{dx} + Py = Q$$

Second Order Differential Equation

$$\frac{d^2y}{dx^2} + ny \frac{dy}{dx} + my^2 = P$$

Differential Equations

Unit 4: Second Order Differential Equations

1. Homogeneous
2. Constant Coefficients
3. Reduction of Order

Order of Differential Equation

First Order Differential Equation

$$\frac{dy}{dx} + Py = Q$$

Second Order Differential Equation

$$\frac{d^2y}{dx^2} + ny \frac{dy}{dx} + my^2 = P$$

Differential Equations

Unit 3: Applications of First Order Differential Equations

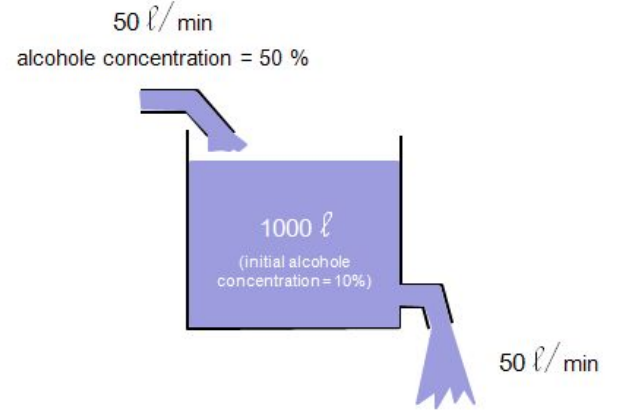
1. Newton's Law of Cooling
2. Mixing Problems
3. Motion

Newton's Law of Cooling

The rate of cooling of an object is proportional to the temperature difference between it and its surroundings

$$\frac{dT}{dt} = -k(T - T_0)$$

T: Object's temperature T_0 : Environment's temperature t: Time k: Cooling constant

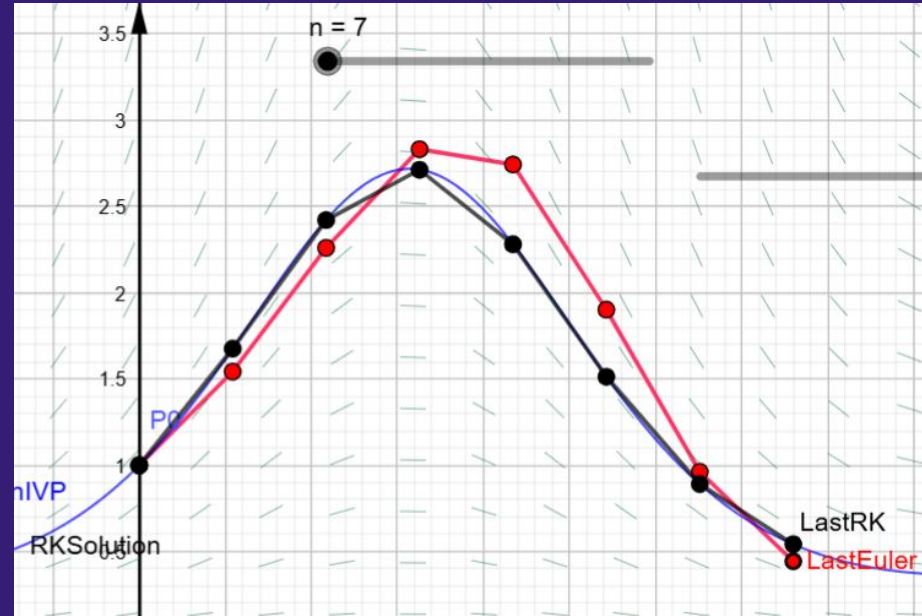


What is the amount of the alcohol in the tank after 10 mins ?

Differential Equations

Unit 3: Numerical Methods

1. Euler's Method
2. Runge-Kutta



Differential Equations

Unit 5: Laplace Transformation

1. Formula
2. Partial Fractions
3. Linearity

LAPLACE TRANSFORM FORMULA

$$F(s) = \int_0^{+\infty} f(t) \cdot e^{-s \cdot t} \cdot dt$$

Partial Fraction Decomposition

$$\frac{px + q}{(x-a)(x-b)} = \frac{A}{x-a} + \frac{B}{x-b}$$

$$\mathcal{L}\{\lambda f(t) + \lambda g(t)\} = \lambda \mathcal{L}\{f(t)\} + \lambda \mathcal{L}\{g(t)\}$$

NHS Mathematics Department

12 Approved Curriculums

Algebra Foundations Parts 1, 2 & 3

Algebra 1 & 2

Geometry

Precalculus

Calculus AB & BC

Statistics

College Math Topics

AP Computer Science A

Multivariable Calculus

Spanish 1 (BOE)

Michelle Steeves, NMS / Elizabeth Ward-Toller, NHS



Previous series update: Avancemos



- Has been the resource for NMS since 2009
- Outdated vocabulary (i.e. DVD player)
- Outdated cultural references (i.e. famous people, factual information)
- Random cultural notes (i.e. turtles)
- Outdated methods of assessing
 - Result: many teacher created materials that have strayed from a cohesive course; nearly impossible to find authentic, appropriate materials to support curriculum

What was our process?

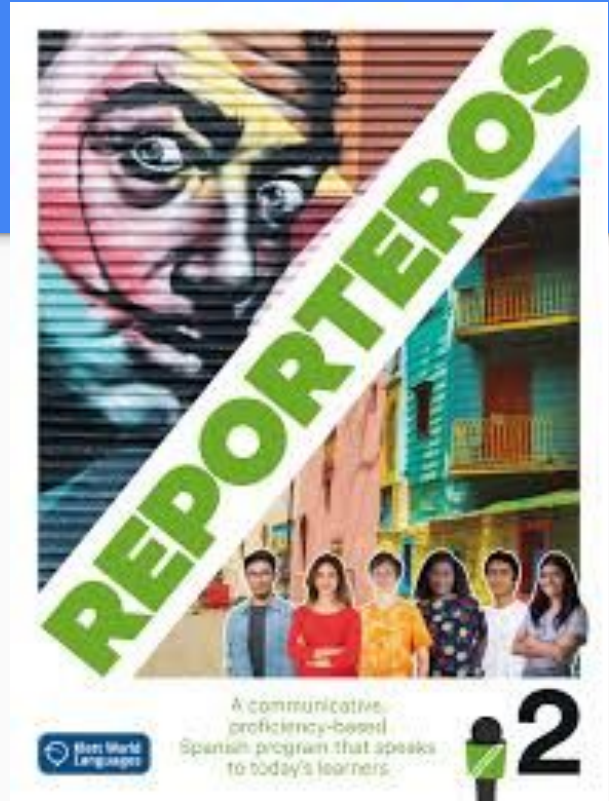
- Reviewed a number of series with all of the Spanish teachers giving input to ensure alignment / long term goals
- Considered and reviewed: Así Se Dice, Senderos, Encuentros, Descubre, Somos, Auténticos, Mapas, Entreculturas
- All teachers voted for their preferred series and Reporteros had the majority of votes from both NMS and NHS teachers

Overview of program. Why Reporteros?

- Goal of the series (and our departments) is production of language
- Project / proficiency based series and assessments
- Vocabulary that is directly useful/interesting to students
 - Spanish 1 examples: greetings, music, activities, pets, home, school, sports, clothes
- Culture intertwined with lessons and themes
- Workbooks and books are very student-focused and friendly: very visual for today's learners (including fake texts)
- Resources available online to teachers (book, videos, audios)

Why new textbooks?

- Reporteros is for today's learners with our goals of more natural, authentic language use. Old book is more of a traditional language approach.
- Old textbook and workbooks from Avancemos series are no longer in print.
- We no longer have access to teacher and student online materials as Avancemos website is no longer active.



Sample workbook with Spiderman

NAME _____ CLASS _____ DATE _____

MI animal favorito LECCIÓN 1

MI GRAMÁTICA

21 NOUN-ADJECTIVE AGREEMENT

★ Put a mark (✓) in the columns that apply.

	SINGULAR	PLURAL	MASCULINE	FEMINE
a. el gato	✓		✓	
b. la tortuga				
c. los perros				
d. el pez				
e. las cobayas				
f. el manatí				

22 NOUN-ADJECTIVE AGREEMENT

★★ Fill in the blanks with the correct endings for the adjectives.

- Me gustan mucho los perros porque son inteligentes y divertidos .
- La mascota de Marta es muy cariños . ¡Tiene un gato súper bonito !
- El manatí es un animal representativ de Puerto Rico.
- No me gustan los lagartos. Para mí, son fe y aburrid .
- El coquí es una rana pequeñ que solo existe en Puerto Rico.
- Las cobayas son muy nervios y muy divertid .



23 QUANTIFIERS (1 Y 2): MUY, MUCHO, UN POCO

★★ Underline the correct quantifier.

- Mi perro es muy / un poco inteligente. Se llama Rex y es un Labrador.
- Me gustan muy / mucho las tortugas. ¡En mi familia tenemos dos!
Son tranquilas y muy / un poco bonitas. También son mucho / un poco lentas.
- Me gusta muy / mucho hacer deporte. ¡Mi deporte favorito es el béisbol!
- Los elefantes son unos animales muy / mucho grandes.
- Me gusta muy / mucho la música latina: la salsa, el reguetón, etc.
- Mi lagarto es muy / mucho tranquilo, pero es mucho / un poco distante.

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UNIDAD 2

NAME _____ CLASS _____ DATE _____

¿Cómo es La Borinqueña? LECCIÓN 1

MI VOCABULARIO

24 LA PERSONALIDAD (1 Y 2)

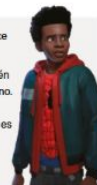
★ Miles Morales is the new Spider-Man. Read the text about him. Describe Miles Morales and Ganke Lee's personalities.



Miles Morales es un muchacho de Brooklyn (Nueva York). Tiene trece años y es el nuevo Hombre Araña (Spider-Man).

Miles es un muchacho inteligente y trabajador. Habla inglés y también español porque su mamá es de Puerto Rico. Su papá es afroamericano. Es abierto y es muy creativo. Le gusta hacer graffitis y salir con sus amigos. Cuando Miles es Spider-Man, es muy ágil y rápido. También es muy valiente.

El mejor amigo de Miles es Ganke Lee. Es amable, simpático y leal.



- Miles Morales es _____.
- Ganke Lee es _____.

25 LA PERSONALIDAD (2)

★ Choose the correct adjective for each sentence.

creativa abierta tímida trabajadora perezosa valiente

- No te gusta trabajar. Eres una persona perezosa.
- Tienes mucha imaginación. Eres una persona _____.
- No eres tímido / tímida. Eres una persona _____.
- No eres sociable. Eres una persona _____.
- Te gusta mucho trabajar. Eres una persona _____.
- No eres cobarde (coward). Eres una persona _____.

26 LA PERSONALIDAD (1 Y 2)

★★ What is a good friend like? Complete the sentence.

Para mí, un buen amigo o una buena amiga es una persona _____.

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UNIDAD 2

Long term vision / plan

- Aligns with the ACTFL national standards
- AP aligned concepts (website document), in all levels, but specifically:
 - Spanish 1: Personal and public identities, contemporary life
 - Spanish 2: Families and communities, contemporary life
 - Spanish 3: Science and technology, global issues
 - Spanish 4: Beauty and aesthetics, all previous topics in depth

Current use of new series and feedback

- Reporteros is currently being used for the Spanish I course at NHS (2 sections)
- Teacher feedback. Highlights:
 - “embraces a communicative, task and production based model
 - “integrated cultural content...engage in relevant, real-world conversations”
 - “foundational grammar and vocabulary through authentic, and relatable content. Its naturalist design”
 - Student project sample



Samples of student assignments

Intro unit: weather report

Unit 1: communicative speaking

Unit 2: speaking 1 and 2

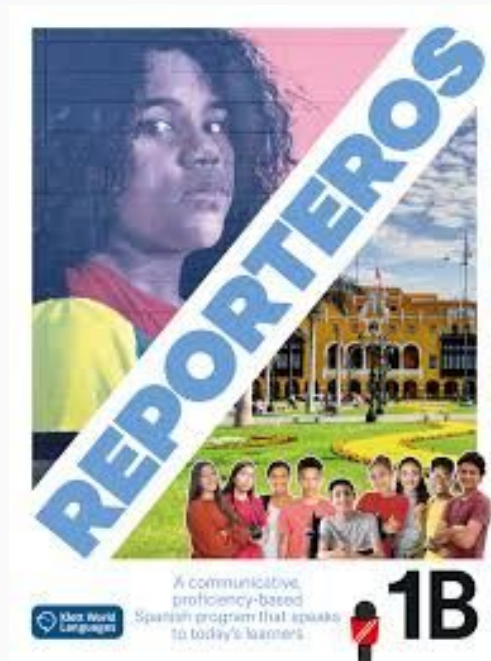
Unit 3: communicative speaking

Unit 4: speaking and writing

Unit 5: speaking

Unit 6: speaking

More projects and activities are readily available throughout the books.



Benefits of Reporteros



- User friendly interface for teachers with many updated resources
- Student friendly book and workbooks
- Interpersonal communication focused
- Aligned with standards
- Uses authentic materials

Questions?



A poster for the 'REPORTEROS 3' program. The word 'REPORTEROS' is written in large, bold, purple letters diagonally across the top. Below it, a young girl with colorful face paint looks upwards. The background features a collage of images including a cityscape and a group of students. At the bottom, a group of six diverse students is shown. The number '3' is prominently displayed in a large, bold font at the bottom right, next to a microphone icon. The 'Start World Languages' logo is in the bottom left corner.

Start World Languages

A communicative, proficiency-based Spanish program that speaks to today's learners.

3



A poster for the 'REPORTEROS 4' program. The word 'REPORTEROS' is written in large, bold, yellow letters diagonally across the top. Below it, a man with a colorful, abstract face is shown. The background features a collage of images including a cityscape and a group of students. At the bottom, a group of six diverse students is shown. The number '4' is prominently displayed in a large, bold font at the bottom right, next to a microphone icon. The 'Start World Languages' logo is in the bottom left corner.

Start World Languages

A communicative, proficiency-based Spanish program that speaks to today's learners.

4

Overview: Upcoming NFT Contract Negotiation



Newtown Public
School District

Background

- The BOE's current contract with the Newtown Federation of Teachers (NFT) expires on June 30, 2026.
- Unlike other collective bargaining negotiations, **state statute outlines a highly prescriptive process** that BOEs must follow for teacher (and administrator) contract negotiations¹.
- The key requirements are **(1) a specific timeline** we must follow and **(2) involvement from the Town's fiscal authority** (in our case, the Legislative Council - in partnership with the BOF).

Timeline

- July 16: Pre-negotiation session with BOE, BOE Counsel, LC, BOF representatives (non-meeting²)
- July 22: Negotiations begin
- Sept 7: Mediation date (if needed)
- Oct 2: Arbitration date (if needed)

Upon completion, the negotiated agreement must be filed with the Town Clerk. Within 30 days of filing, the LC can vote to accept or reject the agreement (or take no action, in which case the agreement stands).

Reps

BOE: Doria (with Anne, Suzanne, Tanja)
LC: [TBD]
BOF: [TBD]

Next Steps

- ✓ Optional attendance at July 16th session
- ✓ Doria / Anne to keep the Board updated

1. See [CGS 10-153\(d\)](#). 2. "Non-meeting" because sessions related to collective bargaining strategy are not subject to CT FOIA. [See FOIA.](#)

Newtown Public Schools

Non-Resident Tuition Rate

2025-2026

Existing BOE Policy No. 5118 (c)

...tuition is to be determined annually by the BOE...

	Calculated 2016-17	Calculated 2017-18	Calculated 2018-19	Calculated 2019-20	Calculated 2020-21	Calculated 2021-22	Calculated 2022-23	Calculated 2023-24	Calculated 2024-25	RECOMMENDED 2025-26
Board of Education Approved Operating Budget	\$73,665,065	\$72,995,957	\$76,054,231	\$78,104,410	\$78,651,776	\$78,651,776	\$82,134,639	\$85,069,651	\$87,409,066	\$91,744,644
Board of Education Approved Debt Service*	\$3,990,255	\$4,416,701	\$4,516,073	\$4,109,495	\$4,009,580	\$4,009,580	\$3,638,703	\$4,287,217	\$3,249,537	\$3,413,212
Total Approved Operations & Debt Service	\$77,755,320	\$77,412,658	\$80,570,304	\$82,213,905	\$82,661,356	\$82,661,356	\$85,773,342	\$89,356,868	\$90,658,603	\$95,157,856
Projected Enrollment for School Year (Pk-12)	4,404	4,270	4,263	4,185	4,086	4,011	4,025	3,912	3,894	3,833
Calculated Tuition = Budget & Debt divided by Enrollment	\$17,656	\$18,129	\$18,900	\$19,645	\$20,230	\$20,609	\$21,310	\$22,842	\$23,282	\$24,826
BoE Approved Tuition Rate (Rounded)	\$17,600	\$18,100	\$18,900	\$19,600	\$20,200	\$20,200	\$20,900	\$21,500	\$22,575	\$24,826
<i>Increases Year over Year</i>	4.14%	2.84%	4.42%	3.70%	3.06%	0.00%	3.47%	2.87%	5.00%	9.97%
<i>Increases Year over Year</i>	-\$56	-\$29	\$0	-\$45	-\$30	-\$409	-\$410	-\$1,342	-\$707	\$24,826

Employee Rate @ 25%	\$4,400	\$4,525	\$4,725	\$4,900	\$5,050	\$5,050	\$5,225	\$5,375	\$5,644	\$6,206
Additional Child Rate @ 15%	\$2,640	\$2,715	\$2,835	\$2,940	\$3,030	\$3,030	\$3,135	\$3,225	\$3,386	\$3,724