unit update

first round: fall 2021

long-view micro school

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long-view micro school

emerald BAND

literacy unit update

Our first reading unit is all about building a powerful, meaningful reading life. We will focus on choosing "just right" books that we love, reading deeply, attending to comprehension, and using strategies to make reading more meaningful. Learners may explore book series in book clubs or partnerships, which will provide a rich opportunity to focus on stamina and volume. Readers will think critically about characters and make higher-level predictions. They will also focus on dealing with difficulty when reading more challenging texts, with lessons on grit and word solving skills or comprehension lessons personalized to each reader's needs.

In writing, our first unit will focus on personal narratives or "small moment stories" (true stories that happened to us), while attending to craft. The spirit of this unit is built upon inquiry and mentorship. As learners write personal narratives, they will turn to mentor authors to help them raise the level of their own narrative writing. The unit began with generating ideas and zooming in on small, meaningful moments, and will culminate with a publishing celebration where learners showcase one piece of writing to their peers.

specific learner outcomes

Learners will…

- Set themselves up for powerful reading lives and develop plans to support their success.
- Choose "just right" books with agency and independence.
- Monitor as they read, devoting attention to volume, accuracy, and comprehension.
- Extend skills of envisioning, predicting, and inferring through our read-aloud, *The Year of the Dog.*
- Learn to live their lives as writers, always on the lookout for story ideas, noting those ideas in an idea file in their Writer's Notebook.
- Work to focus their narrative writing on a true moment, magnifying it with details and dialogue.
- Spend a lot of time writing and rewriting pieces, working hard to think about the intention of a piece and attend to the needs of the reader/audience.
- Study mentor authors by identifying powerful parts and specifying *what* makes the parts powerful, then working to try out these moves in their own writing.

methods of engagement

The Literacy Block is structured according to the reading and writing workshop philosophies. In the workshop approach, the community spends a relatively short period of time carefully considering specific ideas, techniques, or elements of craft in order to advance their work as readers and writers. The majority of the block is devoted to the acts of reading and writing. Learners disperse across the learning space to work independently while teachers meet with individual students or small groups for conferences or focus lessons.

Learners craft writing in notebooks and teachers provide frequent feedback on learners' writing, primarily aiming at high-level craft and structural components. Learners usually create multiple writing pieces over the course of a unit, including one longer piece. A longer-term writing project usually provides for a higher level of challenge and investment for learners, as well as opportunities for practicing the full writing process, from drafting through revision, editing, and celebrating. The pieces that get celebrated are often referred to as "published" pieces.

In reading, learners select their own texts to read within the genre being studied, aiming for a "just right" book, and they are encouraged to read voraciously and for meaning, using tools and strategies developed through structured lessons. Individual courses of study and partner reading provide engagement designed to develop passion and love for reading across genres and for a variety of purposes.

emerald BAND

math unit update

This first unit of the year is built on Equivalence and Substitutive Thinking. For some learners, this begins with a conceptualization of number, i.e. number as a multiplicative expression, which will extend to learners analyzing expressions with a focus on identifying terms and the units numerated in the terms. Leveraging these understandings, learners will also conceptualize operations, particularly addition and division. As learners develop conceptual understandings of number and operations, they will develop their ability to think substitutively in order to simplify increasingly complex expressions and eventually solve equations. For those who have stronger conceptualizations, the focus is on deepening their understanding of division and deepening their facility with substitutive thinking in complex expressions and/or equations.

specific learner outcomes

Learners will...

- Understand counting numbers as multiplicative expressions or expressions of one.
- Express a single term as its equivalent of ones using the properties of substitution and distribution.
- Understand what separates terms, and identify and combine like terms.
- Develop number reasoning skills by leveraging number relationships, such as doubling, halving, ten times, and one-tenth.
- Understand that whole numbers can be expressed as fractional counts or units.
- Construct or deepen conceptual understanding of division, connecting to prior understanding of fractional counts, and explore this concept across number forms.
- Use range and median to identify the nearest decade, century, millennium, etc.
- Develop proportional reasoning skills.
- Understand subtraction as: $a - b = a + {}^{-}b$, i.e., to subtract is the same as combining a value with a negative integer.
- Simplify multi-term expressions that involve subtraction.

methods of engagement

The Math Block comprises three segments: Thought Exercises, Concept Studies, and Studio. These three segments of the Math Block work together to provide learners an experience in which they are pressed to engage with math content in many of the ways that authenticate the discipline of mathematics. The intent of the form and level of engagement facilitated during the Math Block is for learners to attain deep, conceptual understanding of mathematical ideas as well as help learners to view themselves as mathematicians by the use of their understandings to analyze problems and solutions, create novel, sound approaches to problems, and collaborate to construct and advance their understanding of concepts.

Read more about our Math Block experience here.

emerald BAND

science unit update

For our first investigation cycle of the year, learners will explore our place in the solar system. Using observations of shadows, changing patterns in the sky, and astronomical data, learners will model and explain that the orbits of Earth around the Sun, and the Moon around Earth, together with the rotation of Earth about an axis between its North and South Poles, cause observable patterns. These include day and night, changes in the length and direction of shadows, and the positions of the Sun, Moon, and stars at different times of the day, month, and year.

Parallel to our solar system exploration, learners will consider the science and engineering practices that made possible our current understanding of our place in the universe. Learners will be introduced to basic rocketry, Newton's laws of motion, spectroscopy, and transit.

The unit will conclude with an extended investigation into the question, "How does distance affect the apparent brightness of a star?" Learners will collaboratively plan and conduct an investigation to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. They will collaboratively evaluate their, draw conclusions, and communicate findings to their peers.

specific learner outcomes

Learners will...

- Create models of the Sun-Moon-Earth system to explain the apparent motion of the Sun, and the movement and phases of the moon.
- Use their bodies to create a kinesthetic model of the Earth to understand how the speed of Earth's spin affects the length of a day.
- Construct a "shadow clock" to understand the relationship between time and the Earth-Sun-Moon system.
- Research a planet and create a "travel poster" in order to explain how Earth's position in the solar system creates conditions that support life.
- Investigate a "gravity well" model of gravitation in order to understand that the strength of the gravitational pull depends on how massive an object is.
- Represent data in graphical displays to reveal patterns of daily changes in the length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
- Design investigations to support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
- Communicate technical information or ideas in multiple formats (including orally, graphically, textually, and mathematically).

methods of engagement

Our primary method of engagement in Science Block is investigation cycles. Learners engage with a complex question that requires them to apply content knowledge and utilize a diverse range of discipline-specific and cross-discipline skills.

Components of investigation cycles include Concept Studies, Thought Exercises, and labs. Concept Studies provide a means of introducing new science concepts and assessing for depth of understanding. Concept Studies may involve classroom demonstrations, visits from experts in the field, or readings on scientific topics. During Thought Exercises learners employ critical thinking in order to engage with scientific concepts, theories, and laws in order to make sense of phenomena. Labs address real-world questions and problems. Learners collect and analyze data, use evidence and reasoning to justify claims, and practice scientific communication. They share their findings with peers and collaboratively evaluate outcomes to determine next steps. Learners come to understand that science is an iterative, and social process.

emerald BAND

computer science unit update

For the first unit of the year, Emerald Band is focusing on ensuring all learners know how to interact with foundational concepts and thought processes associated with Computer Science. We split our weekly two hour block into two main threads:

Sequencing, Selection, and Iteration with Scratch Scratch is a high-level block-based programming language developed specifically to teach young learners about programming. Scratch is a useful tool for introducing, visualising, and reinforcing the foundational programming constructs of sequencing, selection, and iteration. Rather than worrying about spelling and punctuation in a text-based programming language, learners are able to focus on analyzing and creating increasingly intricate algorithms. We first introduced Scratch by using Parsons problems, where the learners receive all the pieces of code in the wrong order which they have to place into the correct sequence.

Solving Problems using Computational Thinking To practice our problem-solving skills and explore computer science concepts, we will be reading a book named *Lauren Ipsum: A Story About Computer Science and Other Improbable Things*. The book follows Lauren as she navigates the whimsical Userland trying to find her way home. Each chapter introduces a core concept of Computer Science; we will pay close attention to navigating naming ideas, using conditionals, (de)composition, recursion, logical arguments, and designing algorithms. We will follow along with Lauren as she uses these concepts to solve puzzles and problems as they arise.

specific learner outcomes

Learners will...

- Design code that interacts with a user.
- Use conditionals to select between different actions.
- Design algorithms that require specific sequencing and repetition.
- Design mini-experiments to deduce the function of unfamiliar code.
- Understand how computational thinking can be used as a problem solving tool.

methods of engagement

The Computer Science Block simultaneously works to grow the ability to think computationally and develop applied skill in one or more languages. Learners are typically engaged in various forms of problem solving, including Parsons problems, debugging challenges, and analyzing algorithms. We ensure we are learning from each other by working through new concepts, explaining our thought processes, and sharing code written during Studio time.

Each Long-View learner has a two-hour block of Computer Science per week; however learners are encouraged to continue avenues of interest on Monday mornings before school in our Waterloo Learning Space.

SAPPHIRE BAND

literacy unit update

Interpreting Characters (Reading)
In this unit, learners are introduced to the structures, routines, and habits of a richly literate reading life. Learners are encouraged to choose books that are "within reach" in order to ensure that they are reading at volume and engaging deeply and intensely with their books – creating mental movies as they read. During the most recent weeks the emphasis has been on growing significant, text-based ideas about characters. Here, the focus was to help learners think in more complex ways about characters by drawing evidence-based conclusions, tweaking their ideas so they are grounded in the text and defensible. Learners are making theories using character traits, including thinking about how some traits emerge across a narrative. The characters in the books learners are now reading are complex and this unit pushes learners toward more rigorous analysis; it also pushes learners to examine parts of characters that are often overlooked, such as less likeable parts. Learners will annotate (or "jot") as they read as well as write responses in a notebook to help grow and capture their best thinking.

Tiger Rising will be our read-aloud book and will provide the opportunity for rich discussions that tie back to the goals of this unit.

Narrative Craft (Writing)
Learners draw on their repertoire of strategies already learned for generating narrative writing. They used this prior knowledge to make decisions about the work they need to do that may not be determined merely by the day's lesson. Writers were pushed to consider, "What is my story really about, and what do I want to say about this event?" Considering these questions spurred many learners to write more than one draft to tell the same story in a different way depending on the theme the writer wants to highlight.

specific learner outcomes

Learners will...
Interpreting Characters (Reading)

- Retell and synthesize to cement comprehension and to develop defensible ideas about characters.
- Develop significant ideas: using the story arc to notice important details about characters.
- Grow grounded, significant ideas by noticing author's craft: finding meaning in repeated details.
- Debate to prompt rich book conversation and grounding evidence back in the text.

Narrative Craft (Writing)

- Develop strategies for generating personal narrative story ideas - Flash-drafting: putting stories on the page.
- Redraft to bring out meaning – What's this story really about?
- Elaborate on important parts: adding scenes from the past and future, stretching out the tension, and catching the action or image that produced the emotion.

methods of engagement

The Literacy Block is structured according to the reading and writing workshop philosophies. In the workshop approach, the community spends a relatively short period of time carefully considering specific ideas, techniques, or elements of craft in order to advance their work as readers and writers. The majority of the block is devoted to the acts of reading and writing. Learners disperse across the learning space to work independently while teachers meet with individual students or small groups for conferences or focus lessons.

Learners craft writing in notebooks and teachers provide frequent feedback on learners' writing, primarily aiming at high-level craft and structural components. Learners usually create multiple writing pieces over the course of a unit, including one longer piece. A longer-term writing project usually provides for a higher level of challenge and investment for learners, as well as opportunities for practicing the full writing process, from drafting through revision, editing, and celebrating. The pieces that get celebrated are often referred to as "published" pieces.

In reading, learners select their own texts to read within the genre being studied, aiming for a "just right" book, and they are encouraged to read voraciously and for meaning, using tools and strategies developed through structured lessons. Individual courses of study and partner reading provide engagement designed to develop passion and love for reading across genres and for a variety of purposes.

SAPPHIRE BAND

math unit update

Ratios, Rates, and Proportionality

In this unit, learners will define the term *ratio* and understand its distinction from the term *rate*. Extending their knowledge of ratios, learners will understand the reason that a ratio can be expressed as a fraction and notate the value of a ratio in a variety of forms: common fraction, decimal fraction, and exponential notation. Learners will also discuss commonly referenced ratios, inclusive of percent, probability, and slope. Considering their knowledge of constant rate, learners will extrapolate and solve proportion equations when exploring various situations.

specific learner outcomes

Learners will...

- Define ratio and notate a ratio in its various forms.
- Define proportionality.
- Identify and generate equivalent fractions.
- Simplify fractions.
- Solve equations using properties of equality.
- Solve problems by identifying ratios and rates and creating proportion equations.
- Divide fractions by fusing a number of mathematical understandings.
- Express standard decimal expressions as common fractions and visa versa.
- Express a ratio as its percent equivalent in standard decimal and common fraction forms.
- Understand Pi as a ratio.
- Understand the relationship between points on a coordinate grid through an exploration of distance and slope.
- Explore the Fibonacci Sequence and the Golden Ratio.
- Distinguish between simple probability and odds.
- Convert within and between Metric and American Customary systems.

methods of engagement

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Read more about the Long-View Math Block experience here.

SAPPHIRE BAND

science unit update

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methods of engagement

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SAPPHIRE BAND

computer science unit update

For the first unit of the year, we are focusing on ensuring all learners know how to interact with foundational concepts and thought processes associated with Computer Science. We split our weekly two hour block into two main threads:

Solving Problems using Computational Thinking To practice our problem-solving skills and explore computer science concepts, we will be reading a book named *Lauren Ipsum: A Story About Computer Science and Other Improbable Things*. The book follows Lauren as she navigates the whimsical Userland trying to find her way home. Each chapter introduces a core concept of Computer Science; we will pay close attention to navigating naming ideas, using conditionals, (de)composition, recursion, logical arguments, and designing algorithms. We will follow along with Lauren as she uses these concepts to solve puzzles and problems as they arise.

Sequencing and Iteration with Turtle Sapphire band will be using a built-in Python library known as Turtle. This highly-visual library allows the learners to create intricate images using a relatively small number of commands. The visualization helps reinforce the importance of sequencing as the learners are able to see how the images are created in real time. The constraints around the number of possible commands for the programmer to creatively use various control sequences, such as loops and procedures (functions). Turtle has the added benefit of explicitly using object oriented programming, which will help to push the learner's understanding of a fundamental feature of Python.

specific learner outcomes

Learners will…

- Use conditionals to select between different actions.
- Design algorithms that required specific sequencing and repetition.
- Design mini-experiments to deduce the function of unfamiliar code.
- Understand how computational thinking can be used as a problem solving tool.
- Further their understanding of Object Oriented Programming.
- Create intricate visualizations using Turtle.

methods of engagement

The Computer Science Block simultaneously works to grow the ability to think computationally and develop applied skill in one or more languages. Learners are typically engaged in various forms of problem solving, including Parsons problems, debugging challenges, and analyzing algorithms. We ensure we are learning from each other by working through new concepts, explaining our thought processes, and sharing code written during Studio.

Each Long-View learner has a two-hour block of Computer Science per week; however learners are encouraged to continue avenues of interest on Monday mornings before school in our Waterloo Learning Space.

RUBY BAND

literacy unit update

Thematic Interpretation

In our first reading unit, Ruby Band learners are engaging deeply with the way they interpret and write about what they read. We are working to name the qualities of strong writing about texts and to learn techniques from our peers and other writers to raise the level of our insights. Soon, learners will begin meeting in Interpretation Book Clubs to explore how talk and collaboration can further enrich their insights, and to investigate the development of themes across literary texts.

Crafting Narratives of Identity

In writing, we are building on our experiences with writing personal narratives to craft essays centered on the development of aspects of identity that learners have named as important to them. In narrating small, true moments, learners are looking closely at the interplay between experience and identity -- how what we do frames how we see ourselves. In this way, we're studying how effective writers move fluidly between observation and reflection. We're also thinking about the iterative and recursive nature of writing cycles and how writers can travel the continuum from collecting ideas to publishing finished pieces multiple times within a genre study. Publishing our best identity narratives for each other will provide an affirming conclusion to the unit.

specific learner outcomes

Learners will...

- Approach reading choice with a new sophistication, adapting their choice of texts with an eye not only to reading level but to each learner's differing needs (enjoyment, curiosity, challenge, etc.) at different times.
- Grow significant ideas about texts through reading with a writer's eye, re-reading, analyzing quoted evidence, revisiting their previous writing about a text, and trying a variety of strategies for writing-to-think about reading.
- Explore how talk and collaboration generate and refine interpretative ideas about reading through Interpretation Book Clubs.
- Understand and practice how to identify and analyze thematic content within literary texts.
- Enact interpretative strategies and writerly observation of a narrative mentor text through discussions about our read-aloud, Jason Reynolds' *Ghost*.
- Write personal narratives through the lens of specific identities, crafting pieces through a deep engagement with all phases of the writing cycle.
- Attend to the rich detail of characterization, sensory information, narration of thought, grouping of ideas, sequence, and conflict/resolution patterns that distinguish effective personal narratives.

methods of engagement

The Literacy Block is structured according to the reading and writing workshop philosophies. In the workshop approach, the community spends a relatively short period of time carefully considering specific ideas, techniques, or elements of craft in order to advance their work as readers and writers. The majority of the block is devoted to the acts of reading and writing. Learners disperse across the learning space to work independently while teachers meet with individual students or small groups for conferences or focus lessons.

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In reading, learners select their own texts to read within the genre being studied, aiming for a "just right" book, and they are encouraged to read voraciously and for meaning, using tools and strategies developed through structured lessons. Individual courses of study and partner reading provide engagement designed to develop passion and love for reading across genres and for a variety of purposes.

RUBY BAND

math unit update

Whether Algebraic or Numeric, Division is Division

The first unit of this school year will be an exploration of polynomials. Learners will very purposefully build on their understanding of division, namely its mathematical definition, along with several other mathematical understandings - substitution, multiplicative association and inverse, and distribution - in order to simplify algebraic expressions that involve division. Learners will divide with polynomial expressions, inclusive of quadratics, and explore the laws of exponents. Additionally, learners will express number values conveyed by way of standard decimal notation in scientific notation as well as calculate values expressed in scientific notation.

specific learner outcomes

Learners will...

- Leverage the understanding of the definition of division to divide across various number forms: whole, standard decimal, common fraction, scientific notation.
- Factor integers, i.e., express integers multiplicatively -- as unfractured counts of specific units or denominations.
- Leverage the understandings of factors and the distributive property in order to factor polynomials, i.e., express monomials and polynomials (inclusive of quadratic polynomials) as a multiplicative expression -- a count of a specific unit or denomination.
- Simplify algebraic fractions
    - Divide or simplify algebraic fractions with monomial divisors
    - Divide or simplify algebraic fractions with polynomial, namely binomial, divisors for which the quotient or equivalent may or may not be a mixed expression.
- Simplify complex algebraic fractions and solve algebraic equations that involve polynomials and require multiple understandings, inclusive of factoring.

methods of engagement

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Read more about our Math Block experience here.

RUBY BAND

science unit update

For our first investigation cycle of the year, learners will be exploring physics through Newton's laws. Learners will work collaboratively to construct sail cars and then will use a Pocketlab sensor to perform a series of labs exploring ideas that arose through Concept Studies and Thought Exercises. The Pocketlab will allow learners to explore challenging concepts by converting their measurements into graphs which they can then analyze.

For our first investigation we will collect data to determine how the mass affects the velocity of their vehicles. Using the Pocketlabs we will explore how velocity vs. time graphs relate to different accelerations. We will begin constructing an understanding of Newton's first law of inertia and its relationship to mass of the sail cars.

From there we will begin to explore Newton's second and third laws by investigating what happens during vehicle collisions. We will draw mathematical connections between Newton's second law and momentum.

During our final engineering project learners will construct Half Atwood Machines. Working collaboratively learners will decide to investigate either acceleration vs mass or acceleration vs force. They will use argument boards to present a claim, provide graphical evidence, and present justification for the relationships they see in their experiments.

Later in the semester we will explore thermal energy during a chemistry unit of study.

specific learner outcomes

Learners will...

- Construct a deeper understanding of Newton's three laws of motion experimentally.
- Explore how inertia is related to mass and effects motion of a vehicle and how this is connected to Newton's first law.
- Analyze data (including graphs of velocity as a function of time) to explore the relationship among the net force on a macroscopic object, its mass, and its acceleration.
- Plan an investigation using collisions to provide evidence that the change in an object's motion depends on both the mass of the object and the strength of the force acting on it.
- Explore mathematical representations which support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.
- Explore the effects of balanced and unbalanced forces on the motion of an object using a Half-Atwood machine.
- Design investigations using a Half-Atwood machine to make a claim on the relationship between either acceleration vs mass or acceleration vs force.
- Communicate technical information or ideas in multiple formats (including orally, graphically, textually, and mathematically).

methods of engagement

Our primary method of engagement in Science Block is investigation cycles. Learners engage with a complex question that requires them to apply content knowledge and utilize a diverse range of discipline-specific and cross-discipline skills.

Components of investigation cycles include Concept Studies, Thought Exercises, and labs. Concept Studies provide a means of introducing new science concepts and assessing for depth of understanding. Concept Studies may involve classroom demonstrations, visits from experts in the field, or readings on scientific topics. During Thought Exercises learners employ critical thinking in order to engage with scientific concepts, theories, and laws in order to make sense of phenomena. Labs address real-world questions and problems. Learners collect and analyze data, use evidence and reasoning to justify claims, and practice scientific communication. They share their findings with peers and collaboratively evaluate outcomes to determine next steps. Learners come to understand that science is an iterative, and social process.

RUBY BAND

computer science unit update

In this unit, Sapphire Band will be using a built-in Python library known as Turtle. This highly-visual library allows the learners to create intricate images using a relatively small number of commands. The visualization helps reinforce the importance of sequencing as the learners are able to see how the images are created in real time. The constraints around the number of possible commands push the programmer to creatively use various control sequences, such as loops and functions. Turtle has the added benefit of explicitly using object oriented programming, which will help to push the learners' understanding of a fundamental feature of Python.

Ruby Banders are introduced to new concepts in Turtle through an exploratory process similar to the scientific method. In these sessions, learners are given examples of completed code that push them beyond their comfort level. Learners then design mini-experiments where they edit one part of the code, predict the outcome, and compare the predicted outcome with the actual outcome.

specific learner outcomes

Learners will...

- Further their understanding of Object Oriented Programming.
- Translate between pseudocode and code.
- Create intricate visualizations using Turtle.
- Design mini-experiments to deduce the function of unfamiliar code.
- Investigate source code of a complicated library.

methods of engagement

The Computer Science Block simultaneously works to grow the ability to think computationally and develop applied skill in one or more languages. Learners are typically engaged in various forms of problem solving, including Parsons problems, debugging challenges, and analyzing algorithms. We ensure we are learning from each other by working through new concepts, explaining our thought processes, and sharing code written during Studio.

Each Long-View learner has a two-hour block of Computer Science per week; however learners are encouraged to continue avenues of interest on Monday mornings before school in our Waterloo Learning Space.

AMBER BAND

literacy unit update

"Re" Weeks: Returning to Independent Reading and Rewriting

Amber Band learners begin their Fall semester of literacy by reflecting on their "textual lineage," which Alfred Tatum defines as "a reading and writing autobiography that reveals who we are--in part shaped through the stories and information we've read and experienced." Learners will have the opportunity to return to some of their most beloved books and consider the ways in which their present encounter with these stories is similar/different from their original or previous readings. In doing so, this exercise invites learners to "locate" themselves as readers, explore the evolution of their reading selections, reading identity, and the manner in which these inform their ever-maturing world view. Upon completing the rereading of their chosen text, learners will exchange their books with bandmates who may never have read the book before. The books from the band will be supplemented by books from Long-View teachers, who will also offer their formative texts to the band. The goal is to reinforce a culture of discourse about and facilitated by literature, cement mutual understanding through such conversations, and ultimately bond the band through the establishment of a *community* textual lineage.

In tandem to this reading cycle, Amber Band will encounter and reflect on their development as writers by spending the first weeks of the semester rewriting a story, memoir, poetry collection, or essay completed in a previous school year. This project will allow learners to update or revise their work deploying their increasingly nuanced understanding of their chosen genre and writing mechanics.

Personal Narrative: Exploring the Boundaries of Autobiographical Writing

The reflective work that learners are undertaking in the first weeks of the semester is intended to lay the groundwork for their proceeding unit: personal narrative. Over the course of the unit, learners will have the opportunity to review and solidify their understanding and handling of this genre, both in their reading and writing; they will also be encouraged to explore the possibilities of personal narrative and consider autobiographical writing through a multitude of modalities and forms including epistolary exchanges, "textual lineage" writing, reportage, and even admissions essays.

specific learner outcomes

Learners will...

- "Locate" themselves as readers and writers by re-engaging with meaningful texts and reworking previously completed writing projects.
- Establish a reading and writing community through textual exchange.
- Leverage their rereading and rewriting experiences as lenses through which they can focus their autobiographical writing.
- Solidify their understanding of traditional memoir structures and investigate alternative modalities of autobiographical writing through mentor texts such as Alan Lightman's collection of essays *Searching for Stars on an Island in Maine*.
- Analyze mentor texts to gain techniques for shaping a compelling "I" and setting.
- Explore tone and register in drafting and iterating on their personal narratives.
- Adjust and refine their narratives with an eye toward their target audience /readers.
- Develop lines of critical inquiry which serve as a framework to deepen and complexify their textual engagement and analysis.

methods of engagement

The Literacy Block is structured according to the reading and writing workshop philosophies. In the workshop approach, the community spends a relatively short period of time carefully considering specific ideas, techniques, or elements of craft in order to advance their work as readers and writers. The majority of the block is devoted to the acts of reading and writing. Learners disperse across the learning space to work independently while teachers meet with individual students or small groups for conferences or focus lessons.

Learners craft writing in notebooks and teachers provide frequent feedback on learners' writing, primarily aiming at high-level craft and structural components. Learners usually create multiple writing pieces over the course of a unit, including one longer piece. A longer-term writing project usually provides for a higher level of challenge and investment for learners, as well as opportunities for practicing the full writing process, from drafting through revision, editing, and celebrating. The pieces that get celebrated are often referred to as "published" pieces.

In reading, learners select their own texts to read within the genre being studied, aiming for a "just right" book, and they are encouraged to read voraciously and for meaning, using tools and strategies developed through structured lessons. Individual courses of study and partner reading provide engagement designed to develop passion and love for reading across genres and for a variety of purposes.

AMBER BAND

math unit update

Amber Band learners are studying unitization, thinking deeply about enumerating quantities with a focus on strategically creating and combining like terms. They are simplifying a wide variety of mathematical expressions that include rational and irrational numbers, numbers expressed in non-base-10 bases, and polynomial and rational functions. In this study of unitization, the learners also are deepening their understanding of division as a multiplicative idea in their work with polynomial and rational expressions.

Learners will expand their understanding of function transformations—translations, dilations, and reflections—in a study of radical, polynomial, rational, and linear functions. They will establish connections between transformations and operations such as addition and composition. They will examine function transformations numerically, algebraically, and graphically. As they engage in this study, learners will evaluate functions and solve equations with an eye on determining x- and y-intercepts, thus deepening their understanding of the connections between algebraic and graphic representations of functions.

specific learner outcomes

Learners will...

- Simplify a wide variety of mathematical expressions by creating and combining like terms, applying their understanding of distribution, association, commutation, and exponentiation.
- Simplify rational expressions, using a multiplicative understanding of division and/or area models for determining factors of polynomial expressions.
- Analyze functions numerically, algebraically, and graphically.
- Examine graphs, sequences, and algebraic expressions for apparent transformations.
- Express functions algebraically given graphs or numeric sequences.
- Solve equations to determine x-intercepts of the graphs of functions.

methods of engagement

The Math Block comprises three segments: Thought Exercises, Concept Studies, and Studio. These three segments of the Math Block work together to provide learners an experience in which they are pressed to engage with math content in many of the ways that authenticate the discipline of mathematics. The intent of the form and level of engagement facilitated during the Math Block is for learners to attain deep, conceptual understanding of mathematical ideas as well as help learners to view themselves as mathematicians by the use of their understandings to analyze problems and solutions, create novel, sound approaches to problems, and collaborate to construct and advance their understanding of concepts.

Read more about the Long-View Math Block experience here.

AMBER BAND

science unit update

For our first investigation cycle of the year, learners will be studying electricity and magnetism. Through a series of Concept Studies we will explore what causes different types of magnetism (diamagnetic, ferromagnetic, and paramagnetic) and construct an understanding that forces at a distance are explained by fields permeating space. During Thought Exercises we will explore which substances have electric charge due to the nature of matter. We will have a guest visit from Ben Davis-Purcell who works on the ATLAS experiment at the Large Hadron Collider. He will explain how the particle accelerator utilizes electromagnetism. Learners will investigate the properties of an electric current and electromagnets through a series of mini-investigations.

Learners will also design experiments to test how different variables affect the strength of an electromagnetic and communicate their findings using argument boards. We will discuss the differences between alternating and direct current and learners will work collaboratively to construct a DC motor. For our culminating engineering project we will explore options for minimizing burning fossil fuel for transportation and learn how magnetic and electric fields can be used to engineer a vehicle. Learners will then construct small-scale "maglev" trains – the task will be to construct a coil that will transport a battery as quickly as possible through the coil. We will explore how the following length of the coil, number of batteries, and placements of magnets affects the speed of their train car. Later in the semester we will explore thermal energy during a chemistry unit of study.

specific learner outcomes

Learners will...

- Understand forces at a distance are explained by fields (gravitational, electric, and magnetic) permeating space that can transfer energy through space.
- Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that changing a magnetic field can produce an electric current.
- Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
- Understand how magnets or electric currents can cause magnetic fields
- Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects due to the interaction.
- Differentiate between alternating and direct currents and design DC motors.
- Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
- Communicate technical information or ideas in multiple formats (including orally, graphically, textually, and mathematically).

methods of engagement

Our primary method of engagement in Science Block is investigation cycles. Learners engage with a complex question that requires them to apply content knowledge and utilize a diverse range of discipline-specific and cross-discipline skills.

Components of investigation cycles include Concept Studies, Thought Exercises, and labs. Concept Studies provide a means of introducing new science concepts and assessing for depth of understanding. Concept Studies may involve classroom demonstrations, visits from experts in the field, or readings on scientific topics. During Thought Exercises learners employ critical thinking in order to engage with scientific concepts, theories, and laws in order to make sense of phenomena. Labs address real-world questions and problems. Learners collect and analyze data, use evidence and reasoning to justify claims, and practice scientific communication. They share their findings with peers and collaboratively evaluate outcomes to determine next steps. Learners come to understand that science is an iterative, and social process.

AMBER BAND

computer science unit update

This semester, Amber Band will combine their literacy, math, and science skills to implement a probabilistic language model in Python. Through a series of Concept Studies, Amber Band will be introduced to the linguistic and mathematical framework necessary to create modern language models. The core of the unit will be a multi-week individual project in which each learner plans, codes, and trains their own probabilistic language model using a text of their choosing. During this unit, we will also discuss intentional and unintentional biases resulting from the choice of data, as well as the general ethics behind using large amounts of data.

specific learner outcomes

Learners will...

- Gain a deeper understanding of advanced data structures such as Dictionaries.
- Design mini-experiments to deduce the function of unfamiliar code.
- Analyze textual data using computational methods.
- Discuss Copyright and the ethics of "big data."
- Understand how Bayes' theorem of probability is used in language modeling.
- Implement an unsupervised machine learning algorithm in Python.
- Understanding of how bias is often unintentionally introduced in machine learning.
- Understand the importance of version control in long-term projects.
- Design mini-experiments to deduce the function of unfamiliar code.

methods of engagement

The Computer Science Block simultaneously works to grow the ability to think computationally and develop applied skill in one or more languages. Learners are typically engaged in various forms of problem solving, including Parsons problems, debugging challenges, and analyzing algorithms. We ensure we are learning from each other by working through new concepts, explaining our thought processes, and sharing code written during Studio.

Each Long-View learner has a two-hour block of Computer Science per week; however learners are encouraged to continue avenues of interest on Monday mornings before school in our Waterloo Learning Space.