

North Hampton School Report Card Supporting Document

7th/8th Grade 2nd Trimester

Science

Matter and Its Interactions

- Students began their study of matter by looking at individual elements on the periodic table. Each student studied at least one element, learned about its properties, the origin of its name, its symbol, where it can be found, how much it costs if for sale, common uses, who discovered it and when. Students then took that information and created element interpretations (8" x 8" cards) that visually represent what they learned.
- Students studied the concepts of atom, element, molecule, and compound and what those terms imply at an atomic level.
- Students examined prefixes and suffixes common in chemistry and used them to decipher ingredients on common household items.
- Students researched properties of individual elements and the properties of compounds composed of those elements to see that when elements combine to form compounds, their properties differ greatly from the properties of the elements from which they are made.
- Students began working with chemical reactions and will continue to do so throughout the remainder of this unit. They will examine evidence of chemical reactions, how to write chemical reactions using the reactants and products, interpret data collected during chemical reactions (i.e., change in temperature, change in pH), and design another inquiry lab based on a chemical reaction activity they do in class.

Heredity: Inheritance and Variation of Traits

- Students began their study by recognizing that hereditary information is contained in genes, which are located in the chromosome of each cell.
- Students then examined the process of how genetic information is passed on from both parents to offspring.
- Students understand that either one or many genes can determine the different types of traits, and that a single gene can influence more than one trait, such as eye color and hair color.
- By understanding genotype and phenotype, students can recognize that an organism can be described in terms of a combination of traits.
- Students began their understanding of epigenetics and can differentiate between inherited traits and those that result from environmental interaction.
- Students have an initial understanding of how all behavior is affected by both inheritance and experience.

Science Practices

Develops and Uses Models

Develop a model to predict and/or describe phenomena. Develop a model to describe unobservable mechanisms.

Analyzes and Interprets Data

Analyze and interpret data to determine similarities and differences in findings.

Plans and Carries Out Investigations

Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.

Obtaining, Evaluating, and Communicating Information

Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are/not supported by evidence.

Learning Habits

Active Engagement in Learning

You work hard to wisely use class time by staying focused on the task at hand, asking meaningful questions, utilizing resources, feedback and direct instruction. You are able to work independently and collaboratively.

Organization

You work hard to maintain an organizational system for your notes, work and handouts so you can easily reference them. You are prepared for every class with the materials and homework that you need.

Conscientiousness

You approach all your work with your best effort and pay close attention to quality.

Commitment/ Perseverance

You seek and initiate meaningful challenges. You stay with the work when it is difficult or when you meet an obstacle and being that academic task to completion.

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8th Grade- ELA- 2nd Trimester

The *Common Core State Standards for English Language Arts* guides the development and implementation of curriculum in the areas of reading, writing, speaking and listening, and language development. Reading is broken into two parts, the reading of literature and the reading of informational texts. Written expression is broken into three common types: narrative, informational and argumentative.

During the second trimester, students participate in curriculum that focuses on several elements of literacy. Students complete a lengthy writing project centered on the *Courage and Conflict Unit/The Holocaust* and create a Personal Portfolio. The portfolio has multiple components to it and requires in-depth knowledge, stamina, and a strong commitment to personal and academic growth.

Reading and Responding to Literature

Students explore how themes or main ideas develop across a text. They identify and describe multiple points of view within a story. Students question the role of the narrator and the impact that has on the reader. All students read *Night*, Elie Wiesel and one more book of their choosing related to World War II/The Holocaust. They respond to these readings in writing and share this within their Personal Portfolio.

Students hear exemplar texts read out loud to model strategies for accessing complex texts. When using exemplars, students are supported to make meaningful connections to other texts,

Reading Range and Complexity

Students practice reading of a range of materials that include multiple genres and complexity. All students read the novel *Night*, by Elie Wiesel. They are required to respond to the novel three times with a minimum of 300-500 words for each response. The focus is on using textual evidence to explore themes and questions that are posed throughout their study of the Holocaust.

They also read and respond to the following types of text and media: an allegory of the Holocaust, documentary films, a speech, a poem, a piece of art, a first person account from the time period, and a biography of an influential individual.

Free Choice reading continues as well through the term, with students responding in their reading journals three times with a minimum goal of reading a book a month.

Language

During the 8th grade year, students are developing their vocabulary in two different ways. We gather and learn vocabulary words from the exemplar texts that we read, and we study the unit words from *Wordly Wise*, a vocabulary program used from grades 6-8. While studying new vocabulary words, students reinforce their knowledge of Standard English grammar and conventions (i.e. parts of speech, punctuation, commas, semicolons...)

Writing Practices

During the second trimester, students create a Personal Portfolio in response to their study of WWII/The Holocaust. This requires a multitude of skills across a variety of tasks. The portfolios are primarily comprised of written pieces, but there is an intergrated visual art component as well.

There are 14 writing assignments in total:
Create and explain a symbol that represents a theme that you have developed while studying the unit.

Study and respond to a poem written by someone else
Write and respond to a poem written by you

Study and respond to an influential person from the time period
Choose a person from your life who you admire and interview them then respond

View and respond to one of the videos we watch in school
View and/or read a book or movie outside of school and respond

Read the Book Night, Elie Wiesel and write three in-depth literary responses to the three sections of this historical autobiography.

Listen to, view or read an additional first person account from the time period and respond.

Study a piece of visual art that relates to the time period and write a structured analysis.

Create a piece of visual art that responds to what you have been studying and explain your choices to the reader.

Write a 5 paragraph final essay to answers a series of guiding questions related to the unit and what you learned.

Bibliography

8th Grade Social Studies- Supporting Document

Throughout the year students will be engaged with different periods of US and World History that will center around big ideas and essential questions. Here are those units:

Immigration & Sense of Place

Students learn about the history of immigration in the United States as well as the push and pull factors that cause immigrants to want to come to the US. We explored the impact of immigration on the US and the changes in US policy from 1860 to present day.

Progress & The Industrial Revolution

Students engage in learning about the shift in society that was caused by the invention of machines and methods of mass production including the assembly line. They will explore the impact of progress on society and how it has impacted families, children, the economy, and US history.

Courage & Conflict- (collaborative with ELA)

This unit focuses on the two World Wars as well as the events of the Holocaust. This unit will be integrated with the ELA curriculum to help students to have a well-rounded view and understanding of the Holocaust and the courage that came from those who chose to act.

Rights and Responsibilities

This unit centers on the struggle for Civil Rights in the United States and profiles the people who worked to enact positive change in the country. It also allows students to explore their role as a member of a democratic society and what positive changes they would make in their community.

Power and Action

This unit allows students to look at members of our society who have had a positive impact, to explore issues and concepts that they would like to change, and making plans for how to have a positive impact in their communities. This is heavily focused on their roles as citizens.

Within each unit students will also be working to acquire and demonstrate their skill in the following areas:

Non-fiction reading and interpretation

Presenting information in an organized way

Generating and following through on research topics

Research skills including using a variety of sources

and choosing the best resource

Gathering and evaluating information from charts, graphs, maps, etc.

Evaluating sources of information for bias and validity

Using primary source documents

Forming arguments and supporting them with well-reasoned logic and valid information

An understanding of content-specific vocabulary

In addition to the Common Core State Standards and the NH Grade Span Expectations, we're also beginning implementation of the C3 Curriculum from the National Council for the Social Studies. This includes working on a variety of topics including defining Purpose, Questions for Exploration, Knowledge, Processes, and Products. The focus is on creating competency in the skills necessary to understand and participate in the aspects of social studies and civic life. In addition, SAU 21's Social Studies vertical team has also developed Competencies for Social Studies.

ASSESSMENT:

Students will be assessed on their understanding of the GSE curriculum content as well as the skills outlined in the Common Core Curriculum Standards using the following methods:

Written work- both short responses and longer pieces with revision

Classroom participation in a variety of activities including whole class lecture, group discussions, presentations, etc.

Projects- both group and individual, in-class and as homework

Quizzes and Tests of a variety of formats including multiple choice, short answer, essay, etc.

8TH GRADE SOCIAL STUDIES SUPPORTING DOCUMENT- Curriculum

The following “I can” statements align with the Common Core Standards and are the learning targets for Social Studies throughout the year and throughout different units of study.

Reading Informational Text

I can give examples of key pieces in a text that support my thoughts and inferences.

I can give an unbiased summary of a piece of informational text.

I can figure out the meanings of words and phrases in a piece of informational text.

I can determine an author's point of view in a piece of informational text.

I can distinguish among fact, opinion, and reasoned judgment in a text.

I can outline and explain specific claims and supportive evidence within a piece of text.

I can locate and judge arguments or claims in a text.

I can read and understand literary nonfiction at my grade level independently.

Research

I can use various sources to complete short research projects in order to answer an assigned question or a question I have created myself.

I can cite specific textual evidence to support analysis of primary and secondary sources.

I can research a topic and develop more related questions about that topic for further exploration.

I can determine if a source is credible and accurate when I gather new information from books or technology.

I can quote or paraphrase from print and digital sources without plagiarizing.

I can correctly cite sources within or at the end of my writing.

I can gather evidence from fiction or informational text to support my investigation, thinking and research.

Speaking and Listening- Class Discussion/Student Seminars

I can effectively participate in student seminars and class discussions.

I can build on others' ideas and express my own ideas clearly in discussions with others.

I can come to discussions prepared to share my ideas because I have read or studied the required material.

I can participate in discussions more effectively by using examples and evidence from the text to help me reflect on the ideas in the discussion.

I can follow rules, set goals, meet deadlines and carry out my assigned role in shared discussions and decision making with peers.

I can ask questions to connect group members' ideas and answer questions with relevant information.

I can consider others' viewpoints, but continue to support my view with evidence.

I can change my way of speaking for a variety of situations and tasks.

NEW HAMPSHIRE STATE STANDARDS (GRADES 7-8)

The following standards are specific to units of study in 8th grade throughout the year.

Civics & Government (CV)

SS:CV:8:3.2: Analyze environmental, economic, and technological developments and their impact on society.

SS:CV:8:4.1: Describe and analyze ways Americans can effectively participate in civic and political life at the local, state, and federal levels, e.g., problem solving, public engagement, or voting.

Economics (EC)

SS:EC:8:4.2: Identify the different ways in which income can be redistributed, e.g., taxes, welfare, or government loans.

SS:EC:8:5.1: Distinguish among the different methods of allocating resources, e.g., traditional, free market, or command economies.

SS:EC:8:5.2: Identify and explain the impact on trade of government policies, e.g., tariffs, quotas, or embargoes.

SS:EC:8:5.3: Recognize the role of economics in international diplomacy and war, e.g., the United States Civil War, foreign aid, or conflict over natural resources.

SS:EC:8:5.4: Examine the effects of changing economies on international trade, e.g., modernization, specialization, or interdependence.

Geography (GE)

SS:GE:8:1.1: Compare relative advantages and disadvantages of using maps, globes, aerial and other photographs, satellite-produced images, and models to solve geographic problems, e.g., the Mercator projections versus Robinson projections.

SS:GE:8:2.1: Identify the types of regions, e.g., formal, functional, or vernacular regions of which the local community is a part.

SS:GE:8:2.2: Illustrate the connections among regions, e.g., world trade or regional alliances.

SS:GE:8:2.3: Describe how culture, technology, and experience affect perception of places and regions, e.g., images created by mass media or travel.

SS:GE:8:3.1: Recognize how physical processes influence the formation and distribution of resources, e.g., the potential for hydroelectric power or coal deposits.

SS:GE:8:4.1: Describe ways in which physical and human regional systems are interconnected, e.g., canal systems or "hub-and-spoke" airline operations.

SS:GE:8:4.2: Explain how cooperation and conflict among people contribute to political divisions of Earth's surface, e.g., trade agreements, military pacts, or boundary disputes.

US History (HI)

SS:HI:8:1.4: Analyze the tension between states' rights and national authority, e.g., the nullification crisis of 1832 or school integration of the 1960's.

SS:HI:8:2.1: Explain major attempts to force European powers to recognize and respect the sovereignty of the United States as a new nation, e.g., the Jay Treaty or the War of 1812.

SS:HI:8:2.2: Explain major United States efforts to remove European influence from the Western Hemisphere, e.g., the Monroe Doctrine or the Cuban Missile Crisis.

SS:HI:8:2.3: Compare and contrast the rationales for entering into war with other nations, e.g., the American Revolution or the Korean Conflict.

SS:HI:8:2.4: Analyze the extent to which democratic ideals, economic motives and empire building have influenced United States foreign policy in events and policies, e.g., the Louisiana Purchase or the Marshall Plan.

SS:HI:8:2.5: Investigate the impact of foreign policy on domestic affairs as illustrated in historical events, e.g., the XYZ Affair or the Vietnam War.

SS:HI:8:3.1: Explain how art, music and literature often reflect and/or influence major ideas, values and conflicts of particular time periods, e.g., manifest destiny, protest movements, or freedom of expression.

SS:HI:6:4.3: Demonstrate an understanding of how westward movement led to personal opportunities and a more diverse economy as seen in events, e.g., the Louisiana Purchase or the Homestead Act (1862).

SS:HI:8:4.2: Examine the causes of conflict between management and labor, e.g., the Pullman Strike or the Air Traffic Controllers Strike of 1981.

SS:HI:8:5.1: Analyze how societal changes have influenced the family, e.g., child labor or elderly care.

World History (WH)

SS:WH:8:1.1: Explore how leaders have attempted to achieve political legitimacy using methods and rationales, e.g., the Divine Right of Kings, military power, or popular elections.

SS:WH:8:1.2: Analyze the influence of religious groups on political systems, e.g., Confucianism in China, Catholicism in Europe, or Wahabism in the Middle East.

SS:WH:8:1.3: Explore the use and abuse of power that results in mass murder and genocide, e.g., Carthage by Rome, the conquest of Aztecs, or the Holocaust.

SS:WH:8:2.1: Analyze the demographic impact of diseases and their treatment, e.g., the bubonic plague, smallpox in the Western Hemisphere, or AIDS.

SS:WH:8:3.1: Demonstrate an understanding of how art, music and literature often influence or reflect major ideas, values and conflicts of a particular time.

SS:WH:8:3.2: Analyze how architecture has symbolized the values of various societies, e.g., Greco-Roman, Tudor English, or Scandinavian.

8th Grade Math Course Syllabus

Learning math this year will require thought, questioning, wondering, connecting, and most importantly hard work. In math class students share their ideas and thinking with each other through discussion, group work, reflection, and review. Since students are expected to apply concepts that they learn to new situations, see that problems can be solved in many ways, and make connections. It is important they understand how a math concept works as well as demonstrate the procedure/strategy for solving it.

Course Expectations:

In middle school mathematics, students are more responsible for their own learning. There will be opportunities provided for every type of learner and enrichment is available for students willing to seek it out and work for it. Students are expected to show up for class every day ready to engage and make the most out of their learning opportunities. Students are expected to interact with one another in ways that build confidence in themselves and others and in ways that help them to understand the content that we are studying. Students are expected to show respect for themselves and the learning community by being where the learning is. Lastly, students are expected to be open to new ideas and to one another.

Homework can be expected weekly and quizzes will occur approximately once every two weeks with lots of small check-ins in between. Tests will be administered at the end of each unit. All tests can be retaken by appointment once students review their work.

The Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

In other words, Students will:

- Communicate their understanding of mathematics
- Create and use representations to communicate mathematical ideas to solve problems
- Recognize, explore, and develop mathematical connections
- Use problem-solving strategies to investigate and understand increasingly complex mathematical content
- Use mathematical reasoning and/or proof throughout the study of geometry and algebra

- Apply mathematical concepts and skills to solve problems across the content areas of number operations, algebra, geometry, and probability and statistics
- Demonstrate the skills to work independently
- Demonstrate the skills to work collaboratively
- Organize and evaluate information for its relevance to a question or problem

Course Competencies:

- Students will use mathematical operations to simplify expressions.
- Students will use mathematical operations to solve single variable equations and Inequalities.
- Students will use linear functions to model situations where change occurs at a constant rate.
- Students will solve problems involving systems of linear equations and inequalities.
- Students will use a variety of techniques to solve and analyze problems involving probability.
- Students will use a variety of data collection and organization tools to organize and interpret data.
- Students will demonstrate a conceptual understanding of linear and non-linear functions and relations including function notation, families of functions, and transformations.
- Students will use operations with polynomials, including factoring, to model geometric concepts of perimeter and area.
- Students will use mathematical operations to solve quadratic equations.

Learning Expectations Assessed:

- Demonstrate the skills to work independently
- Demonstrate the skills to work collaboratively
- Organize and evaluate information for its relevance to a question or problem

Unit 1 Introduction to Algebra and Algebra Mindset

What are different ways to represent patterns? How do you describe patterns? What are characteristics of linear patterns? What are characteristics of quadratic patterns? What relationships exist between different representations?

Learn first about pattern growth and see that algebra can be useful for describing growth

Learn that algebra is a problem-solving tool

Examine different functions that they explore visually, numerically, graphically, physically constructed, and algebraically.

Generalizing, representing, modeling, describing, and interpreting the relationships between two quantities.

Distinguishing between linear, quadratic, cubic, and exponential growth within multiple representations.

Develop stronger number sense

Determine independent and dependent variables

Understand the different between discrete and continuous.

Unit 2: Solving Linear Equations

Why is solving equations simply reversing the order of operations and using inverse operations? What kind of change can be modeled with a proportion and how are they solved?

What real world applications use ratios and proportions to describe them?

Use variables to write equations and expressions

Solve one step equations

Solve multi-step equations

Solve equations with the variable on both sides

Solving equations and formulas for a given variable Ratios, Rates, and Unit Rates

Proportions

Percents(common applications including percent change)

Students will say "I can..."

___ Translate written word into algebraic expressions

___ Translate algebraic expression into written word

___ Use the distributive property and factoring to rewrite expressions

___ Factor to rewrite expressions

___ Simplify an expression by combining like terms

___ Identify an equation

___ Solve one-step equations (one variable)

___ Solve one-step proportions

___ Solve multi-step equations (one variable)

___ Solve multi-step proportions

___ Solve equations in one variable that contain variable terms on both sides

___ Solve single variable linear equations including no solution and infinite solutions

___ Solve literal equations (solve a formula for a given variable)

___ Recognize the differences between ratios, rates, and proportions

___ Write and use ratios, rates, and unit rates

___ Write and solve a proportion

- ___ Find the percentage of a number
- ___ Solve problems involving percents
- ___ Use common applications of percents
- ___ Find a percent increase/decrease of a number

Unit 3: Inequalities- Relate compound inequalities to compound sentences and the use of and/or in the English language

How can we expand our knowledge of linear relationships from equations to inequalities? How will our algebra skills allow for the solving of absolute value equations and inequalities?

Solve linear inequalities and graph their solutions on the number line Solve absolute value equations and inequalities

(relate to absolute value functions introduced in the previous unit)

- ___ Recognize inequality signs and convert them to English and vice versa
- ___ Compare two numbers using $<$, $>$, or $=$
- ___ Graph a number on the number line
- ___ Identify inequalities
- ___ Classify and identify solutions to linear inequalities using proper notation
- ___ Solve one-step and multi-step inequalities in one variable
- ___ Graph the solution for inequalities in one variable
- ___ Write the equation/inequality given the graphical representation of a solution in one variable
- ___ Solve single variable linear inequalities including no solution and infinite solutions
- ___ Create a table of solutions to sketch a graph of a linear equation/inequality
- ___ Solve and graph solutions sets of compound inequalities in one variable

Unit 4: Graphing Relations and Functions

How do we represent, algebraically, graphically and with equations, two related quantities? What special designation is given to pairs of values for which each input has exactly one output?

Graph multiple representations of relations

Define functions, look at multiple representations, introduce notation for functions, demonstrate function machines Domain and range

Name, graph, and known domain and range for the five parent functions (linear, absolute value, quadratic, reciprocal, and square root)

Graph translations, dilations, and reflections to the parent functions

I can:

- ___ Understand the idea of ordered pairs as input and output
- ___ Use a coding grid to encode or decode a message

- ___ Use the vocabulary domain and range
- ___ Explain what makes a set of ordered pairs a function
- ___ Understand a function when it is presented as an equation, a graph, a table or a Umap
- ___ Decide if an equation, graph, table or map represents a function
- ___ Explain the difference between continuous and discrete sets of values
- ___ Find domain and range for both discrete and continuous functions
- ___ Use function notation and understand that $f(x)$ is the same as y
- ___ Evaluate a function for given values
- ___ Match a graph to a real life situation
- ___ Describe sections of a graph as increasing, decreasing or constant
- ___ Construct a graph for a real life situation
- ___ Decide if a function is linear or non-linear
- ___ Explain constant rate of change and variable rate of change
- ___ Identify maximums and minimums from a graph
- ___ Use function notation and understand that $f(x)$ is the same as y
- ___ Evaluate a function for given values
- ___ Recognize 5 special functions by their names and/or graphs:
 Linear, Squaring, Square Root, Absolute Value, Reciprocal
- ___ Make a graph for each of the special functions with 3-5 “perfect” points
 Linear, Squaring, Square Root, Absolute Value, Reciprocal
- ___ Describe the domain, range and intercepts for these special functions
- ___ Explain changes to the graphs called translations, dilations and reflections
- ___ Look at an equation and describe how its graph will change
- ___ Operate a graphing calculator to make graphs of equations

note: graphing calculator/program technology is used throughout the teaching of these topics but competency must be achieved both with and without technology

Unit 5: Linear Equations- Understanding and finding rate of change

What does it mean for a quantity to be changing at a constant rate? How can we use algebra to model this change? Where do we see this kind of change in the real world?

Write linear equations in point-slope, standard and slope-intercept forms and convert between forms

Continued graphing of linear equations parallel and perpendicular equations of lines

Students will say “I can...”

- ___ Identify linear functions and linear equations and state the domain and range
- ___ Find the x and y intercepts of a linear function and recognize their significance in real-life situations
- ___ Distinguish constant from variable rates of change given a graph, table, or equation
- ___ Classify rates of change as positive, negative, or zero and describe how they relate to the graph

- ___ Match a real-life situation to a graph based on the relationships of changes between the quantities
- ___ Recognize and calculate rate of change (slope) of a line algebraically and graphically
- ___ Recognize four types of rate of change (slope) (positive, negative, zero, and undefined)
- ___ Identify, write, and graph direct variation

- ___ Recognize slope-intercept, standard, and point-slope forms of lines
- ___ Represent linear functions as equations in a variety of forms (slope-intercept, standard, point-slope)
- ___ Convert between slope-intercept, standard, and point-slope forms
- ___ Determine the slope and y-intercept from Slope-Intercept Form ($y=mx+b$)
- ___ Determine the point and slope from point-slope form $(y-y_1)=m(x-x_1)$
- ___ Write an equation given two points, slope and a point, or a table of values
- ___ Graph a linear equation that is written in slope-intercept, standard and point-slope form
- ___ Graph a linear inequality that is written in slope-intercept, standard and point-slope form
- ___ Describe the relationship of slopes of lines that are parallel or lines that are perpendicular
- ___ Write an equation for a line parallel or perpendicular to a given line through a given point

Unit 6: Solving Systems of Equations and Inequalities

How can we model related situations with systems of equations or inequalities? What algebraic and graphical techniques are available to solve them?

Use graphing skills to solve systems of linear equations and inequalities

Use algebraic techniques of substitution and elimination to solve systems of linear equations

Students will say “I can...”

- ___ Recognize a solution to a system of equations
- ___ Solve systems of equations by graphing methods
- ___ Solve systems of equations by substitution methods
- ___ Solve systems of equations by elimination methods
- ___ Compare and choose an appropriate method for solving systems of linear equations
- ___ Classify and identify solutions to linear systems (consistent, inconsistent, dependent, and independent)
- ___ Solve a system of inequalities by graphing
- ___ Create an equation/inequality from a real life application
- ___ Create a system of equations from a real life application

Unit 7: Geometry

How can we apply the special properties of right triangles? What patterns and relationships exist in right triangles?

Students will say “I can...”

- ___ Show a visual of the theorem
- ___ Solve for the hypotenuse
- ___ Solve for a missing leg (given length of hypotenuse and leg)
- ___ Understand the relationships in
 - i. 30-60-90
 - ii. 45-45-90
- ___ Simplify Radicals
- ___ Simplified radical form

- ___ Write and use the distance formula
 - Find the distance between two points
 - Find the missing coordinate

Unit 8: Polynomials and Exponents

How can arithmetic be made more efficient with the use of exponents?

Why are polynomials a good model for our number system and how are operations modeled?

Why is the relationship between multiplying and factoring an important one to understand?

Use rules of exponents to simplify expressions

Simplify zero and negative exponents

Use Scientific Notation and perform operations Add, subtract and multiply polynomials

Special products $(a + b)(a + b)$ and $(a - b)(a - b)$

and $(a + b)(a - b)$

Students will say "I can..."

- ___ Identify the base and exponent of an exponential term
- ___ Use the definition of an exponent to re-write a term as repeated factors of the base
- ___ Simplify an expression using rules of exponents for multiplying, dividing and raising to a power
 - ___ Evaluate expressions containing zero or integer exponents
- ___ Convert between scientific notation and customary notation
- ___ Classify polynomials by the number of terms and by degree
- ___ Use algebra tiles make a physical model of a polynomial
- ___ Simplify polynomial expressions
- ___ Add, subtract, and multiply polynomial expressions
- ___ Recognize and find special products of polynomials

Unit 9: Using Factoring and Quadratics

Where are quadratic functions useful in the real world?

What properties do parabolas have that make them such helpful models?

How can learning to represent quadratic functions algebraically and graphically advance our understanding of functions in general?

Find prime factorizations of integers and greatest common factors of monomials Factor a GCF and grouping

Factor trinomials, differences of square, perfect square trinomials

Solve polynomial equations using factoring and the zero product property

Solve quadratic equations by the quadratic formula

Recognize quadratic equations and graphs

Graph Quadratics in h,k form

Identify the axis of symmetry and vertex of a parabola given its equation in standard form Find domain, range, maximums, minimums, x-intercepts and y-intercepts

Graph Quadratics in standard form

Solve quadratic equations by graphing, factoring, taking Square Roots and by use of the quadratic formula if time also solve by completing the square

I can:

- _____ factor a polynomial by removing the greatest common monomial factor
- _____ factor a polynomial with four terms by grouping and removing a common binomial factor

- _____ factor any quadratic polynomial of the form $ax^2 + bx + c$
- _____ recognize and factor a difference of perfect squares
- _____ recognize and factor a perfect square trinomial
- _____ solve quadratic equations using factoring and the Zero Product Property
- _____ solve quadratic equations using the Quadratic Formula
- _____ Identify quadratic functions from a graph or an equation
- _____ Recognize h-k form ($y = (x-h)^2 + k$) and standard form ($y = ax^2 + bx + c$)
- _____ Determine if a given quadratic function will have a maximum or minimum based on its graph or the sign of “a” in its equation
- _____ Determine the domain and range of a quadratic function
- _____ Describe the characteristics of a parabola from a graph or from an equation
 - Including: the axis of symmetry
 - the vertex
 - the zeros (a.k.a. x-intercepts)
 - the y-intercept

- _____ Explain the relationship between the axis of symmetry and the x-intercepts
- _____ Graph quadratic functions efficiently from both h-k and standard form
- _____ Solve quadratic equations using factoring and the Zero Product Property
- _____ Understand how an equation that does not factor may still have real solutions
- _____ Simplify square roots
- _____ Solve quadratic equations of the form $()^2 = \#$ remembering \pm to find two solutions
- _____ Use the Quadratic Formula to solve equations both with and without a calculator
- _____ Understand that some quadratic equations do not have real solutions
- _____ Relate the Quadratic Formula to the axis of symmetry of a parabola
- _____ Explain what the discriminant is and how it helps determine how many solutions a quadratic equation will have
- _____ Solve word problems involving quadratic functions i.e. free falling objects or projectile motion
- _____ Solve quadratic equations by completing the square