

# North Hampton School Report Card

## Supporting Document

## 8<sup>th</sup> Grade- ELA- 3rd 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 third trimester, students participate in a curriculum that focuses on several elements of literacy. Each student creates a 3-6 minute *WE Talk speech* which requires them to research a topic of their choosing, create a message for an intended audience, write, revise and edit multiple drafts, gather multiple points of view for feedback, polish a final draft and perform this in front of an audience of peers. Each student is given an option to add enhancements/media to the final presentation as a way to support the spoken word. They also have a choice to share their speech with a live audience on the night of our *WE Talk Live* event. In addition, they read a collection of texts and then write a literary essay responding to the ELA unit entitled, *I Have a Dream...* They end the year by participating in the national *Favorite Poem Project*.

### Reading and Responding to Literature

Students work to accurately identify main idea and theme in a variety of developmentally challenging texts, including texts of different lengths and complexity. Within this goal, students hear exemplar texts read out loud to model strategies for accessing complex texts: close reading and annotation.

When using exemplar texts like Martin Luther King's *I Have a Dream* speech and his *Letter from a Birmingham Jail*, students are taught the concepts of allusion and figurative language as techniques used to develop message and create impact.

Students are required to respond to both of these texts with multiple short essay questions. Students are then supported to make meaningful connections to other texts and their study of The Civil Rights Movement.

### Reading Range and Complexity

Students practice the reading of a range of materials that included multiple genres and complexity. All students read the novel *Nightjohn*, by Gary Paulsen. They are required to respond to this novel using text-based guiding questions for each response. The focus is on using the text to build background knowledge related to slavery and to study internal and external conflict within character development.

In addition, all students read an extensive list of primary source American documents related to African-American history: famous speeches, letters, slave narratives, and poets across more than a hundred years. They then used at least 3 of these texts to write the "*I Have a Dream...*" literary essay.

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.

### Writing Practices

Students will write frequently over extended time frames and shorter time frames to meet the expectations of a variety of genres, purposes and audiences. Students will use writing as a tool to share their thoughts and observations and to gain a deeper understanding of the content, themselves, and others. Students are active members of a community of writers including that share and celebrate written work.

Students will participate in a writing process model to: brainstorm and generate ideas, gather information and access resources, draft written pieces of varying length, edit and revise with peer and adult feedback, evaluate impact on intended audience, and publish completed assignments. Students will reflect on growth and self-assess product and their process. Assessments are created based on the Common Core State Standards. Students are expected to participate in regular writing workshop time where they are expected to sustain their writing, revise their work, and use peer conferencing.

- Students gather evidence and research to support their thesis using information from a variety of points of view and sources.
- Students seek quality feedback from teachers and/or peers as needed and for self-selected purposes dependent upon the nature of the assignment, amount of time given, etc.
- Students use workshop time wisely in order to achieve their intended message or purpose for the writing.
- Students edit and revise their work for not only grammar and conventions, but also sentence variety, clarity of their message, word choice, and voice.
- Students are motivated by their own message and purpose for their writing rather than teacher generated rubrics
- Students seek quality feedback from teachers and/or peers as needed and for self-selected purposes dependent upon the nature of the assignment, amount of time given, etc.
- Students celebrate each other's genuine and authentic accomplishments
- Emphasis of writing process is on craft and "writing like a reader" by using exemplar texts to model mastery.

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## 7<sup>th</sup>/8<sup>th</sup> Grade 3<sup>rd</sup> Trimester

### Science

#### Waves and Their Applications

- Students learned about waves and their properties (amplitude, wave height, wavelength, frequency, period, crest, trough, line of origin). They drew visual representations of cross sections of waves. They wrote an algebraic equation relating wave height to amplitude. They wrote an algebraic equation that relates the period of the wave to the frequency.
- Students examine the relationship between pitch, frequency, and wavelength.
- Students worked with an online wave simulator to examine the relationship between wave amplitude and energy, wave frequency and energy, and wavelength and energy and generated graphs representative of their findings.
- Students generate evidence through various experiences to explain that different types of waves (sound, light, and water waves= matter vs light) interact with various types of matter differently.
- Students examined the relationship between wave height and energy and the amount of sediment that can be carried in ocean waves by analyzing data collected by scientists from ocean waters off the coast of the Shandong Peninsula in the Yellow Sea, China, during a storm in the spring of 2010. They generated graphs of the data, used Excel to draw a line of best fit, and then generated an equation for that line. Students then analyzed the results of those graphs to generate conclusions.

#### 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.

#### Biological Evolution

- Students learned how to analyze and interpret data for patterns of change in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth by researching the species of their own choice through the Epochs.
- Students develop an understanding that organisms features reflect its evolutionary history and that all organisms share fundamental similarities such as anatomical features, DNA, and cell function.
- Through activities and lab activities students develop an understanding that evolution results from natural selection acting upon variation within a population.

#### 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 bring that academic task to completion.

## **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