

College Prep Math Core 7 Year at a Glance

	1 st Trimester	1 st Trimester	2 nd Trimester	2 nd Trimester	3 rd Trimester	3 rd Trimester
Standards	HONORS: Number Systems 7.NS.1 7.NS.2 7.NS.3 7.EE.3 7.EE.2 7.EE.3 7.EE.4 HONORS: Number Bases Practice Standards	7.RP.1 7.RP.2 7.RP.3 7.EE.2 7.EE.3 HONORS: Patterns Practice Standards	7.G.1 7.G.2 7.G.5 Practice Standards	7.G.3 7.G.4 7.G.6 Practice Standards	7.SP.1 7.SP.2 7.SP.3 7.SP.4 Practice Standards	7.SP.5 7.SP.6 7.SP.7 7.SP.8 HONORS: Codes Practice Standards
Chapters (2012)	1,2	3,4	5	6/7	8	9
Chapters (2014)	1, 2, 3, 4	3, 5, 6, 7	7	8, 9	10	10
Big Idea	Character	Perseverance	Challenges and Choices	Adaptation & Survival	Innovation	Making Sense of Our World
Math Concepts	Operations with Integers Rational Numbers	Expressions Equations Inequalities	Ratios & Proportional Relationship	Percent Similarity	Geometry Surface Area & Volume of Solids	Data Analysis Probability
Writing Focus	Narrative	Informative/ Explanatory	Argument	Informative/ Explanatory	Argument	Narrative
Prioritized Vocabulary	Analyze Collaborate Characteristics	Infer Evidence Structure	Claim Refutation Credibility	Roots (Chron-, Geo-, Homo-, Hetero-)	Infer Variability Innovate Roots (-ness, -cide)	Classify Probability Suffix (-ship, -able/-ible)
Science Connections	Properties of Matter & Earth's Structure	Properties of Matter & Earth's Structure	Cells & Organ Systems	Inherited vs. Acquired Traits Forensic Science	Natural Selection Genetically Modified Organisms	Classification
Social Studies Connections	Geography and the environment of Utah	Early settlers and explorers	Statehood & Government Rights and responsibilities of citizenship	Economics	Utah in the Modern Age	Utah's cultural diversity
ELA Connections	Characteristics of a story	Choosing credible sources Citing sources Recognizing text features/structure	Identifying & creating claims and evidence Identifying and refuting counterclaims	Writing with text structures: (Cause/Effect Problem Solution Sequence Compare/Contrast Descriptive)	Writing with text structures (Inference Textual evidence Claims, Counterclaims, Refutation,	Using figurative language Writing using elements of a story

					Figurative language	
PE & Health Concepts	Mental Health Physical Fitness Sportsmanship	Stress Management Body Image Goal Setting Decision Making	Peer Pressure & Refusal Skills Addiction	Nutrition First Aid Abstinence Infectious Disease	Teamwork Abstinence Human Development	Communication Puberty

Scope and Sequence Broken Down By Sections (2012)

Ch. 1: Operations on Integers	Ch. 2: Rational Numbers & Equations	Ch. 3: Proportions and Variation	Ch. 4: Percents	Ch. 5: Similarity	Ch. 6/7: Surface Area & Volume of Solids	Ch. 8: Data Analysis and Samples	Ch. 9: Probability
Honors: Number Systems Unit 1.1 ** 1.2 1.3 1.4 1.5 1.6 ** Honors: Bases	2.1 ** 2.2 2.3 2.3B 2.4 2.5 2.5B 2.6 2.6B (Refer to Ch. 8 in Big Ideas blue book)	3.1 3.2 ** 3.3 ** 3.4 ** 3.5 ** 3.6 ** 3.7 3.7B 3.8 ** Honors: Patterns Unit	4.1 4.2 4.3 4.4	5.1 ** 5.2 ** 5.3 ** 5.4 5.4B 5.5 ** 5.6 ** 5.7 ** Angles: pg. 422 Triangles: pg. 424	6.2 6.2B 6.3 ** 6.4 6.6 7.1 7.3 7.5 7.6 **	8.1 ** 8.2 ** 8.3 ** 8.4 8.4B	9.1 9.2 9.3 9.4 Honors: Codes Unit
** These sections are not covered explicitly in the 7 th grade core. Teachers should use discretion as to whether or not these sections should be taught for background knowledge, review, or extension based upon the needs of their students. This book was used to create the scope and sequence.							

Scope and Sequence Broken Down By Sections (2014)

Ch. 1: Integers	Ch. 2: Rational Numbers	Ch. 3: Expressions & Equations	Ch. 4: Inequalities	Ch. 5: Ratios & Proportion	Ch. 6: Percents	Ch. 7: Construction & Scale Drawing	Ch. 8: Circles & Area	Ch. 9: Surface Area & Volume	Ch. 10: Probability & Statistics
1.1** 1.2 1.3 1.4 1.5	2.1 ** 2.2 2.3 2.4	3.1 3.2 3.3 3.4 3.5	4.1 4.2 4.3 4.4	5.1 5.2 5.2 Ext 5.3 5.5 5.6	6.1 6.2 6.3 6.4 6.5 6.6 6.7	7.1 7.2 7.3 7.4 7.5	8.1 8.2 8.3 8.4	9.1 9.2 9.4 9.5 9.5 Ext	10.1 10.2 10.3 10.4 10.5 10.5 Ext 10.6 10.7
** These sections are not covered explicitly in the 7 th grade core. Teachers should use discretion as to whether or not these sections should be taught for background knowledge, review, or extension based upon the needs of their students.									
The following scope and sequence does not go in order of the 2014 book. Please refer to the scope and sequence for the ordering of sections.									

Standard	Current Big Ideas	Big Ideas 2014	Performance Task
7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent additional and subtraction on a horizontal or vertical number line diagram.	Section 1.1 Integers & Absolute Value Section 1.2 Adding Integers Section 1.3 Subtracting Integers Section 2.2 Adding & Subtracting Rational Numbers	Section 1.1 Integers & Absolute Value Section 1.2 Adding Integers Section 1.3 Subtracting Integers Section 2.2 Adding Rational Numbers Section 2.3 Subtracting Integers	Big Ideas: Bottling (includes a question about percentage) NC pg. 15 #3
7.NS.2: Apply and extend previous understandings of multiplication and division and of fractions to multiple and divide rational numbers.	Section 1.4 Multiplying Integers Section 1.5 Dividing Integers Section 2.3 Multiplying & Dividing Rational Numbers	Section 1.1 Integers & Absolute Value Section 1.4 Multiplying Integers Section 1.5 Dividing Integers Section 2.1 Rational Numbers Section 2.4 Multiplying & Dividing Rational Numbers	Big Ideas: Gasoline Prices NC pg. 15 #1 NC pg. 16 #2
7.NS.3: Solve real-world and mathematical problems involving the four operations with rational numbers.	Section 1.1 Integers & Absolute Value Section 1.2 Adding Integers Section 1.3 Subtracting Integers Section 1.4 Multiplying Integers Section 1.5 Dividing Integers Section 2.2 Adding & Subtracting Rational Numbers Section 2.3 Multiplying & Dividing Rational Numbers	Section 1.1 Integers & Absolute Value Section 1.2 Adding Integers Section 1.3 Subtracting Integers Section 1.4 Multiplying Integers Section 1.5 Dividing Integers Section 2.2 Adding Rational Numbers Section 2.3 Subtracting Rational Numbers Section 2.4 Multiplying & Dividing Rational Numbers	Big Ideas: Downloads (requires simple knowledge of percents) NC pg. 17 #1-4
7.EE.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients	Section 2.5b Number Properties	Section 3.1 Algebraic Expressions Section 3.2 Adding & Subtracting Linear Expressions	Big Ideas: Expense Report NC pg. 18 #1 NC pg. 19 #3, 5, 6
7.EE.2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.	Section 2.5b Number Properties	Section 3.1 Algebraic Expressions Section 3.2 Adding & Subtracting Linear Expressions	Big Ideas: Part Time Job (requires knowledge of percents) NC pg. 19 #1 NC pg. 19 #2, 3
7.EE.3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	Section 2.1 Rational Numbers	Section 6.1 Percents Section 6.2 Comparing & Ordering Fractions, Decimals, and Percents Section 6.4 The Percent Equation	Big Ideas: Shopping (requires knowledge of percent markup, discount) NC pg. 21 #1 (uses knowledge of percent equation)
7.EE.4: Use variables to represent	Section 2.1 Rational Numbers	Section 3.3 Solving Equations Using	Big Ideas: Car Dealership

quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.	Section 2.4 Solving Equations Using Addition or Subtraction Section 2.5 Solving Equations Using Multiplication or Division Section 2.6 Solving Two-Step Equations Section 2.6b Solving Inequalities	Addition or Subtraction Section 3.4 Solving Equations Using Multiplication or Division Section 3.5 Solving Two-Step Equations Section 4.1 Writing & Graphing Inequalities Section 4.2 Solving Inequalities Using Addition or Subtraction Section 4.3 Solving Inequalities Using Multiplication or Division Section 4.4 Solving Two-Step Inequalities	NC pg. 22 #1 NC pg. 23 #3-5
7.RP.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.	Section 3.1 Ratios/Rates Section 5.4 & 5.4b Scale Drawings	Section 5.1 Ratios and Rates Section 7.5 Scale Drawings	Big Ideas: Orbital Speed NC p. 6 Example 1
7.RP.2: Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the	a) Section 3.3 Proportions Section 3.7 Direct Variation b) Section 3.1 Ratios/Rates Section 3.2 Slope Section 3.7 Direct Variation c) Section 3.7 Direct Variation d) Section 3.5 Solving Proportions Section 3.7 Direct Variation	a) Section 5.2 Proportions Section 5.6 Direct Variation b) Extension 5.2 Graphing Proportional Reasoning Section 5.5 Slope Section 5.6 Direct Variation c) Section 5.3 Writing Proportions Section 5.6 Direct Variation d) Extension 5.2 Graphing Proportional Reasoning Section 5.6 Direct Variation	Big Ideas: Currency Exchange Rates NC p.6 Example 1 NC p.7 Example 2 NC p.8 Example 3 NC p.8 Example 4 NC p.9 Example 5
7.RP.3: Use proportional relationships to solve multistep ratio and percent problems.	Section 3.5 Solving Proportions Section 3.6 Converting Measures Section 3.7 Direct Variation Section 4.1 Percent Equation Section 4.2 Percent of increase/decrease	Section 5.1 Ratios and Rates Section 6.3 Percent Proportion Section 6.4 The Percent Equation Section 6.5 Percent of Increase and Decrease Section 6.6 Discounts/Markups	Big Ideas: Gas Stations NC p.10 Example 1 NC p.11 Example 2 NC p.11 Example 3 NC p.12 Example 4 NC p.12 Example 5

	Section 4.3 Discounts/Markups Section 4.4 Simple Interest Topic 3 Converting Measures Additional Topics: Quantities	Section 6.7 Simple Interest	NC p.12 Example 6 NC p.13 Example 7 NC p.13 Example 8 NC p.13 Example 9
7.EE.2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.	Section 2.5b Algebraic Expressions	Section 3.1 Algebraic Expressions Section 3.2 Adding & Subtracting Linear Expressions	Big Ideas: Part Time Job (requires knowledge of percents) NC pg. 19 #1 NC pg. 19 #2, 3
7.EE.3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	Section 2.1 Rational Numbers	Section 6.1 Percents Section 6.2 Comparing & Ordering Fractions, Decimals, and Percents Section 6.4 The Percent Equation	Big Ideas: Shopping (requires knowledge of percent markup, discount) NC pg. 21 #1 (uses knowledge of percent equation)
7.G.1: Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Section 5.1 Identifying Similar Figures Section 5.2 Perimeter & Areas of Similar Figures Section 5.3 Finding Unknown Measures in Similar Figures Section 5.4 Scale Drawings Section 5.4b Scale Drawings	Section 7.5 Scale Drawings	Big Ideas: Architecture NC p.25 Example 1 NC p.26 Example 2
7.G.2: Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	Topic 2 – Geometry	Section 7.3 Triangles Section 7.4 Quadrilaterals	Big Ideas: Popcorn Container NC p.26,27 Examples 1-6
7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure.	Topic 1 – Angles	Section 7.1 Adjacent & Vertical Angles Section 7.2 Complementary & Supplementary Angles Section 7.3 Angle Measures of Triangles	Big Ideas: Truss Bridge NC p.30,31 Examples 1-3
7.G.3: Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	Missing	Extension 9.5 Cross Sections of Three-Dimension Figures	Big Ideas: Puzzles

<p>7.G.4: Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle.</p>	<p>Section 6.2b Circles</p>	<p>Section 8.1 Circles & Circumference Section 8.3 Areas of Circle</p>	<p>Big Ideas: Hiking NC p.29 Example 1 NC p.30 Example 3</p>
<p>7.G.6: Solve real-world and mathematical problems involving area, volume and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. a)Area b)Surface Area c)Volume</p>	<p>a) missing b) Section 6.2 Surface Area of Prisms Section 6.4 Surface Area of Pyramids Section 6.6 Surface Area of Composite Solids c) Section 7.1 Volume of Prisms Section 7.3 Volume of Pyramids Section 7.5 Volume of Composite Solids</p>	<p>a) Section 8.2 Perimeter of Composite Section 8.4 Areas of Composite solids b) Section 9.1 Surface Area of Prisms Section 9.2 Surface Area of Pyramids Missing Surface Area of Composite solids c) Section 9.4 Volume of Prisms Section 9.5 Volume of Pyramids Missing Volume of Composite solids</p>	<p>Big Ideas: Trough NC p.30 Example 4 NC p.32 Example 4 NC p.33 Example 5</p>
<p>7.SP.1: Use random sampling to draw inferences about a population. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.</p>	<p>Section 8.1 Stem-and Leaf Plots Section 8.2 Histograms Section 8.3 Circle Graphs Section 8.4 Samples & Populations</p>	<p>Section 10.6 Samples & Populations</p>	<p>Big Ideas: Using the Internet NC p34 7.SP.1</p>
<p>7.SP.2: Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</p>	<p>Section 8.1 Stem-and Leaf Plots Section 8.2 Histograms Section 8.3 Circle Graphs Section 8.4 Samples & Populations</p>	<p>Section 10.6 Samples & Populations Extension 10.6 Generating Multiple Samples</p>	<p>Big Ideas: Time Spent on Homework NC p34 7.SP.2</p>
<p>7.SP.3: Draw informal comparative inferences about two populations. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.</p>	<p>Section 8.3 Circle Graphs (MAD not included) 8.4b Comparing Populations</p>	<p>Section 10.7 Comparing Populations</p>	<p>Big Ideas: Snakes *MAD is <u>not</u> included (Big Ideas Tasks 2014) NC p35- 37 7.SP.3 *MAD <u>is</u> included in this task</p>
<p>7.SP.4: Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two</p>	<p>Section 8.4 Samples & Populations 8.4b Comparing Populations</p>	<p>Section 10.7 Comparing Populations</p>	<p>Big Ideas: Hotel Room Prices (Big Ideas Tasks 2014) NC p38</p>

populations.			
<p>7.SP.5: Investigate chance processes and develop, use, and evaluate probability models. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</p>	Section 9.1 Intro to Probability	Section 10.1 Outcomes & Events Section 10.2 Probability Section 10.3 Experimental & Theoretical Probability	Big Ideas: Using Spinners NC p39-40 Include Marble Mania and Random drawing Tool links
<p>7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</p>	Section 9.3 Experimental Probability	Section 10.3 Experimental & Theoretical Probability	Big Ideas: Choosing a Block NC p40-41 Examples 1-3
<p>7.SP.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.</p>	Section 9.2 Theoretical Probability	Section 10.3: Experimental and Theoretical Probability	Big Ideas: Reality Show NC p42 Examples 1-4

<p>7.SP.8 - Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</p> <p>a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.</p> <p>b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.</p> <p>c. Design and use a simulation to generate frequencies for compound events</p>	<p>Section 9.4 Independent & Dependent Events</p>	<p>Section 10.4: Compound events Section 10.5: Independent and Dependent Events Extension 10.5: Simulations</p>	<p>Big Ideas: Multiple Choice NC p42-43 Examples 1-4</p>
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The Performance Tasks can be found online at www.bigideasmath.com.

After clicking on either the "Common Core" or "Common Core 2014" Texts, on the bottom left of the screen you will find a section titled Common Core Supports. Each task can be found by the domain and standard. Click on each domain to find the specific task.

NC refers to the document North Carolina 7th Math Unpacked Document.

7 th Grade Chapter 1 (2012): Operations with Integers Unit 1 Big Idea: Character				
Essential Questions	Supporting Questions	Key Terms	Practice Standards Task(s)	Cross Curricular Connections
<ul style="list-style-type: none"> What are the characteristics of rational numbers? How do we use these characteristics to solve equations? 	<ul style="list-style-type: none"> How are velocity and speed related? Is the sum of two integers positive, negative, or zero? How can you tell? How are adding and subtracting integers related? Is the product of two integers positive, negative, or zero? How can you tell? How are multiplying and dividing integers related? 	<p>Words for review (Tier 1): sum, difference, product, quotient, estimate</p> <p>Tier 2: solution, integer, reasonableness</p> <p>Tier 3: Additive Inverse</p>	<ul style="list-style-type: none"> 2012 Chapter 1 Alternative Assessment 	
Utah Core Standards For Mathematics		Student Learning Targets	Curriculum Resources	
<p>HONORS: Research and analyze ancient number systems.</p>		<ul style="list-style-type: none"> I can explore the benefits and limitations of a variety of ancient number systems within their historical context, including Egyptian, Roman, Babylonian, Chinese, or Mayan numerals. I can perform a variety of computations using different number systems. I can compare and contrast ancient number systems and modern number systems. 	<p>Beyond Base 10 pg. 65 2012 7th Big Ideas Book: Project 2 2012 8th Big Ideas Book: Project 2 Make a Million Using Mayan Book: History of Mathematics by Burton ISBN #0-07-009468-3; Chapters 1 & 2. Math Through the Ages http://www.nsa.gov/academia/files/collected_learning/elementary/patterns/math_through_the_ages.pdf Book: Hands-On Math Projects by Muschla ISBN#: 0-7879-8179-6; Pg. 141-147</p>	
<p>7.NS.1 – Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a vertical number line diagram.</p>		<ul style="list-style-type: none"> I can understand, apply, and explain the additive inverse property. I can model addition and subtraction of 	<p>Big Ideas 2012: 1.1** Integers & Absolute Value 1.2 Adding Integers</p>	

<p>a. Describe situations in which opposite quantities combine to make 0.</p> <p>b. Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p> <p>c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p> <p>d. Apply properties of operations as strategies to add and subtract rational numbers.</p>	<p>rational numbers, including integers, decimals, and fractions, on a vertical or horizontal number line.</p> <ul style="list-style-type: none"> I can add and subtraction rational numbers, including integers, decimals, and fractions. 	<p>1.3 Subtracting Integers</p> <p>Big Ideas 2014: 1.1 Integers & Absolute Value 1.2 Adding Integers 1.3 Subtracting Integers</p>
<p>7.NS.2 – Apply and extend previous understandings of multiplication and division and of fractions to multiple and divide rational numbers.</p> <p>a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p> <p>c. Apply properties of operations as strategies to multiply and divide rational numbers.</p>	<ul style="list-style-type: none"> I can multiply and divide rational numbers, including integers, decimals, and fractions, and use properties of arithmetic to model multiplication and division of rational numbers. I can explain why division by zero is undefined. I can use long division to change a fraction into a terminating or repeating decimal. I can interpret products and quotients of rational numbers, including integers, decimals, and fractions, in real-world contexts. 	<p>Big Ideas 2012: 1.4 Multiplying Integers 1.5 Dividing Integers</p> <p>Big Ideas 2014: 1.1 Integers & Absolute Value 1.4 Multiplying Integers 1.5 Dividing Integers</p>
<p>7.NS.3 – Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<ul style="list-style-type: none"> I can model and solve real world problems using numbers and operations. I can explain the solution to a real-world problem in context. 	<p>Big Ideas 2012: 1.1 Integers & Absolute Value 1.2 Adding Integers 1.3 Subtracting Integers 1.4 Multiplying Integers 1.5 Dividing Integers</p> <p>Big Ideas 2014: 1.1 Integers & Absolute Value</p>

		1.2 Adding Integers 1.3 Subtracting Integers 1.4 Multiplying Integers 1.5 Dividing Integers
7.EE.3 – Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	<ul style="list-style-type: none"> I can solve multi-step mathematical problems involving calculations with positive and negative rational numbers in a variety of forms. I can solve multi-step real-life problems involving calculations with positive and negative rational numbers in a variety of forms. I can convert between forms of a rational number to simplify calculations or communicate solutions meaningfully. I can assess the reasonableness of answers using mental computation and estimation. 	Big Ideas 2012: 2.1 Rational Numbers Big Ideas 2014: 2.1 Rational Numbers
HONORS: Understand number systems using different bases and their applications.	<ul style="list-style-type: none"> I can research the use of number systems with different bases by different cultures. I can understand the modern applications of number systems with different bases. I can compare and contrast the benefits and limitations of numbers systems with different bases. I can compute using different bases. 	Number Systems Part II Book: Beyond Base Ten by Johnson ISBN#: 978-1-59363-329-5 NLVM Base Blocks Activities http://nlvm.usu.edu/en/nav/grade_g_3.html

Resources

Algebra Tiles:
Exploring Algebra Tiles
Adding Integers with Algebra Tiles
Modeling Multiplying and Dividing with Algebra Tiles

Science and Technical Subject Literacy Standards		Literacy Implementation Ideas
Reading	<p>RI 7.1 – Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</p> <p>RI 7.2 – Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.</p> <p>RI 7.4 – Determine the meaning of words and phrase’s as they are used in a text, including figurative, connotative, and technical meanings: analyze the impact of a specific word choice on meaning and tone.</p>	

	<p>RI 7.5 – Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.</p> <p>RI 7.8 – Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.</p>	
Writing	<p>W 7.1 – Write arguments to support claims with clear reasons and relevant evidence.</p> <p>W 7.2 – Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</p> <p>W 7.3 – Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</p> <p>W 7.7 – Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.</p>	

STATE CURRICULUM GUIDE

Honors Core Content

Cluster Title: Number Systems

Standard: Research and analyze ancient number systems.

Concepts and Skills to Master

- Explore the benefits and limitations of a variety of ancient number systems within their historical context, including Egyptian, Roman, Babylonian, Chinese, or Mayan numerals.
- Perform a variety of computations using different number systems.
- Compare and contrast ancient number systems and modern number systems.

Guiding Instructional Questions

- How did early civilizations keep track of numerical information?
- How did the needs of a civilization influence the development of its mathematics?
- What similarities and differences exist in the way different civilizations represented their numbers?
- How did changes in representation allow for more complex mathematics?
- How did ancient civilizations represent negative numbers and how was that concept developed?
- Has mathematics always existed and people discovered it or did people create it?
- Which ancient number system(s) most influenced our current number systems?
- What happens to mathematics when civilizations meet?

Instructional Strategies

- Write a paper that compares and contrasts two number systems.
- Write an argument that supports the influence of an ancient numbering system on our current system.
- Research and present how ancient civilizations represented and used mathematics.
- Create a unique numbering system and support its benefits.

STATE CURRICULUM GUIDE

Honors Core Content

Cluster Title: Number Bases

Standard: Understand number systems using different bases and their applications.

Concepts and Skills to Master

- Research the use of number systems with different bases by different cultures.
- Understand the modern applications of number systems with different bases.
- Compare and contrast the benefits and limitations of number systems with different bases.
- Compute using different bases.

Guiding Instructional Questions

- Why do you think humans use a base ten system and what base system might a spider or other creature use?
- Why do computers use base 2?
- What applications are there for other bases such as 8, 12, and 16?
- How do the calendars of various cultures relate to the base systems in their mathematics?
- Which computations are made easier in different number systems?
- How are different number system revealed in nature?

Instructional Strategies

- Perform computations in various number bases and compare and contrast the results.
- Research and present applications of various number bases.
- Bring in a guest speaker from a field that uses different bases (e.g. computer engineer) and explore the use of different bases in careers.
- Write an argument for or against converting to a base-ten system for time.

7 th Grade				
Chapter 2 (2012): Rational Numbers and Equations				
Unit 1 Big Idea: Character				
Essential Questions	Supporting Questions	Key Terms	Practice Standards Task(s)	Cross Curricular Connections
<ul style="list-style-type: none"> What are the characteristics of rational numbers? How do we use these characteristics to solve equations? 	<ul style="list-style-type: none"> How can you use a number line to order rational numbers? How does adding and subtracting rational numbers compare with adding and subtracting integers? How can you use operations with rational numbers in story? How can you use inverse operations to solve an equation? How can you use multiplication or division to solve an equation? In a two-step equation, which step should you do first? 	<p>Words for review (Tier 1): integer, sum, difference, product, quotient, estimate</p> <p>Tier 2: rational number, solution, integer, reasonableness</p> <p>Tier 3: Commutative Property, Associative Property, terminating decimal, additive inverse, Commutative Property, Associative Property, terms, coefficient, like-terms, Distributive Property, distribute, expression, rational, linear, expand, factor, simplify, equivalent, algebraic, inequality, equation, inverse operations, solution set, at most, at least, less than, greater than, $<$, $>$, \leq, \geq</p>	<p>Rational Numbers</p> <ul style="list-style-type: none"> Bottling Gasoline Prices HONORS: Downloads <p>Expressions</p> <ul style="list-style-type: none"> Toy Trains The Big Dig <p>Equations</p> <ul style="list-style-type: none"> Car Dealership Part-Time Job Applying Two-Step Equations HONORS: Story Contexts <p>Inequalities</p> <ul style="list-style-type: none"> 8th grade Journal Activity Extended Response Real-World Inequalities 	
Utah Core Standards For Mathematics		Student Learning Targets		Curriculum Resources
<p>7.NS.1 – Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a vertical number line diagram.</p> <p>a. Describe situations in which opposite quantities combine to make 0.</p> <p>b. Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p> <p>c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference,</p>		<ul style="list-style-type: none"> I can understand, apply, and explain the additive inverse property. I can model addition and subtraction of rational numbers, including integers, decimals, and fractions, on a vertical or horizontal number line. I can add and subtraction rational numbers, including integers, decimals, and fractions. 		<p>Big Ideas 2012: 2.2 Adding & Subtracting Rational Numbers</p> <p>Big Ideas 2014: 2.2 Adding Rational Numbers 2.3 Subtracting Integers</p> <p>Performance Task: Bottling</p>

<p>and apply this principle in real-world contexts.</p> <p>d. Apply properties of operations as strategies to add and subtract rational numbers.</p>		
<p>7.NS.2 – Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p> <p>Apply properties of operations as strategies to multiply and divide rational numbers.</p>	<ul style="list-style-type: none"> • I can multiply and divide rational numbers, including integers, decimals, and fractions, and use properties of arithmetic to model multiplication and division of rational numbers. • I can explain why division by zero is undefined. • I can use long division to change a fraction into a terminating or repeating decimal. • I can interpret products and quotients of rational numbers, including integers, decimals, and fractions, in real-world contexts. 	<p>Big Ideas 2012: 2.3 Multiplying & Dividing Rational Numbers</p> <p>Big Ideas 2014: 2.1 Rational Numbers 2.4 Multiplying & Dividing Rational Numbers</p> <p>Performance Task: Gasoline Prices</p>
<p>7.NS.3 – Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<ul style="list-style-type: none"> • I can model and solve real world problems using numbers and operations. • I can explain the solution to a real-world problem in context. 	<p>Big Ideas 2012: 2.2 Adding & Subtracting Rational Numbers 2.3 Multiplying & Dividing Rational Numbers</p> <p>Big Ideas 2014: 2.2 Adding Rational Numbers 2.3 Subtracting Rational Numbers 2.4 Multiplying & Dividing Rational Numbers</p> <p>Performance Task: Downloads (requires simple knowledge of percents)</p>
<p>7.EE.1 – Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients</p>	<ul style="list-style-type: none"> • I can use the Distributive Property to expand and factor linear expressions with rational numbers. 	<p>Big Ideas 2012: 2.5b Number Properties</p> <p>Big Ideas 2014: 3.1 Algebraic Expressions</p>

		3.2 Adding & Subtracting Linear Expressions
		Performance Task: Expense Report
7.EE.2 – Understand that rewriting an expression in different forms in a problem context can she light	<ul style="list-style-type: none"> I can recognize and explain the meaning of a given expression and its component parts. I can recognize that different forms of an expression may reveal different attributes of the context. 	Big Ideas 2012: 2.5b Number Properties Big Ideas 2014: 3.1 Algebraic Expressions 3.2 Adding & Subtracting Linear Expressions Performance task: Part Time Job
7.EE.3 – Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	<ul style="list-style-type: none"> I can solve multi-step mathematical problems involving calculations with positive and negative rational numbers in a variety of forms. I can solve multi-step real-life problems involving calculations with positive and negative rational numbers in a variety of forms. I can convert between forms of a rational number to simplify calculations or communicate solutions meaningfully. I can assess the reasonableness of answers using mental computation and estimation. 	Big Ideas 2012: 2.1 Rational Numbers Big Ideas 2014: 2.1 Rational Numbers Performance Task: Shopping
7.EE.4 – Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. <ol style="list-style-type: none"> Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equation of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. Solve word problems leading to inequalities of the form $px + q > r$ where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. 	<ul style="list-style-type: none"> I can use variables to create equations and inequalities that model word problems. I can solve word problems leading to linear equations and inequalities. I can connect arithmetic solution processes that do not use variables to algebraic solution processes that use equations. I can use symbols of inequality to express phrases such as “at most”, “at least”, “as much as”, or “no more than”. 	Big Ideas 2012: 2.1 Rational Numbers 2.4 Solving Equations Using Addition or Subtraction 2.5 Solving Equations Using Multiplication or Division 2.6 Solving Two-Step Equations 2.6b Solving Inequalities Big Ideas 2014: 3.3 Solving Equations Using Addition or Subtraction 3.4 Solving Equations Using Multiplication or Division 3.5 Solving Two-Step Equations 4.1 Writing & Graphing Inequalities

		4.2 Solving Inequalities Using Addition or Subtraction 4.3 Solving Inequalities Using Multiplication or Division 4.4 Solving Two-Step Inequalities Performance Task: Car Dealership
Resources		
Science and Technical Literacy Standards		Literacy Implementation Ideas
Reading	<p>RI 7.1 – Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</p> <p>RI 7.2 – Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.</p> <p>RI 7.4 – Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.</p> <p>RI 7.5 – Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.</p> <p>RI 7.8 – Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.</p>	
Writing	<p>W 7.1 – Write arguments to support claims with clear reasons and relevant evidence.</p> <p>W 7.2 – Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</p> <p>W 7.3 – Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</p> <p>W 7.7 – Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.</p>	

7 th Grade Chapter 3 (2012): Proportions and Variation Unit 2 Big Idea: Perseverance				
Essential Questions	Supporting Questions	Key Terms	Practice Standards Task(s)	Cross Curricular Connections
How does knowing how to solve proportions help you persevere through percent problems?	<ul style="list-style-type: none"> How do rates help you describe real-life problems? How can you compare two rates graphically? How can proportions help you decide when things are “fair”? How can you write a proportion that solves a problem in real life? What can you use to solve proportions in science? How can you use a graph to show the relationship between two variables that vary directly? How can you use an equation? 	<p>Words for review (Tier 1): integer, sum, difference, product, quotient, estimate</p> <p>Tier 2: unit rate, complex fraction, rational number, solution, integer, reasonableness</p> <p>Tier 3: linear, equivalent ratios, proportional relationship, constant of proportionality, percent error, gratuity, commission</p>	<ul style="list-style-type: none"> Lawn-mowing Cheesy Goldfish HONORS: Identifying proportional and non-proportional relationships 	

Utah Core Standards for Mathematics	Student Learning Targets	Curriculum Resources
7.RP.1 – Compute unit rates associate with ratios of fraction, including ratios of lengths, areas, and other quantities measure in like or different units.	<ul style="list-style-type: none"> I can extend the concept of a unit rate to include ratios of fractions. I can compute a unit rate, involving quantities measures in like or different units. 	<p>Big Ideas 2012: 3.1 Ratios/Rates</p> <p>Big Ideas 2014: 5.1 Ratios and Rates</p> <p>Performance Task: Orbital Speed</p>

<p>7.RP.2 – Recognize and represent proportional relationship between quantities.</p> <p>a. Decide whether two quantities are in a proportional relationship, e.g. by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>c. Represent proportional relationships by equations.</p> <p>d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.</p>	<ul style="list-style-type: none"> • I can verify that two quantities expressed in a table or in a graph are in a proportional relationship. • I can determine a unit rate from a table, graph, equation, diagram or verbal description and relate it to the constant of proportionality. • I can write an equation for a proportional relationships in the form $y = kx$. • I can explain the meaning of the point (x, y) in the context of a proportional relationship. • I can explain the significance of $(0, 0)$ and $(1, r)$ in a graph of a proportional relationship, where r is the unit rate. 	<p>Big Ideas 2012:</p> <p>a) 3.3 Proportions** 3.7 Direct Variation</p> <p>b) 3.1 Ratios/Rates 3.2 Slope** 3.7 Direct Variation</p> <p>c) 3.7 Direct Variation</p> <p>d) 3.5 Solving Proportions** 3.7 Direct Variation</p> <p>Big Ideas 2014:</p> <p>a) 5.2 Proportions 5.6 Direct Variation</p> <p>b) 5.2 Ext Graphing Proportional Reasoning 5.5 Slope 5.6 Direct Variation</p> <p>c) 5.3 Writing Proportions 5.6 Direct Variation</p> <p>d) 5.2 Ext Graphing Proportional Reasoning 5.6 Direct Variation</p> <p>Performance Task: Currency Exchange Rates</p>
<p>7.RP.3 – Use proportional relationships to solve multi-step ratio and percent problems.</p>	<ul style="list-style-type: none"> • I can solve multi-step problem involving present using proportional reasoning. • I can find the percent of a number and extend the concept to solving real life percent applications. • I can calculate percent, percent increase, decrease, and error. 	<p>Big Ideas 2012:</p> <p>3.5 Solving Proportions** 3.6 Converting Measures** 3.7 Direct Variation 3.7B Proportional Relationships Topic 3 Converting Measures Additional Topics: Quantities</p> <p>Big Ideas 2014:</p> <p>5.1 Ratios and Rates</p> <p>Performance Task: Gas Stations</p>
<p>HONORS: Recognize and appreciate patterns in nature, art, and mathematics.</p>	<ul style="list-style-type: none"> • I can understand the origin of the Fibonacci Sequence, compute consecutive terms in the sequence, and be able to identify the sequence in nature and art. • I can recognize where the Golden Ratio is found in nature and art. • I can create wallpaper patterns and tessellations using mathematical principles. 	<p>Book: Hands-On Math Projects by Muschla ISBN#: 0-7879-8179-6 Pg. 73-77</p> <p><i>Exploring Geometry with Geometer's Sketchpad</i> Book (if available at your school) – lessons on tessellations and fractals, “Creating Tessellations” document</p>

	<ul style="list-style-type: none"> • I can understand fractals as iterations of a process, recognize fractals in nature and art, and recreate basic fractals. • I can study the patterns found in Pascal’s Triangle. • I can research the use of patterns in a variety of cultures. 	<p>“Tessellations” PowerPoint The Golden Ratio Discover Math NLVM: http://nlvm.usu.edu/en/nav/grade_g_3.html Fibonacci Sequence Pascal’s Triangle Fractals Tessellations</p>
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Resources

** These sections are not covered explicitly in the 7th grade core. Teachers should use discretion as to whether or not these sections should be taught for background knowledge, review, or extension based upon the needs of their students - The word “proportion” does not show up in the core. The RP standards are focusing on proportional relationships (direct variation) not solving proportions. Solving proportions is 6th grade core.

Science and Technical Literacy Standards	Literacy Implementation Ideas
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Reading	<p>RI 7.1 – Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</p> <p>RI 7.2 – Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.</p> <p>RI 7.4 – Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings: analyze the impact of a specific word choice on meaning and tone.</p> <p>RI 7.5 – Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.</p> <p>RI 7.8 – Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.</p>	
Writing	<p>W 7.1 – Write arguments to support claims with clear reasons and relevant evidence.</p> <p>W 7.2 – Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</p> <p>W 7.3 – Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</p> <p>W 7.7 – Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.</p>	

STATE CURRICULUM GUIDE

Honors Core Content

Cluster Title: Patterns

Standards: Recognize and appreciate patterns in nature, art, and mathematics.

Concepts and Skills to Master

- Understand the origin of the Fibonacci Sequence, compute consecutive terms in the sequence, and be able to identify the sequence in nature and art.
- Recognize where the Golden Ratio is found in nature and art.
- Create wallpaper patterns and tessellations using mathematical principles.
- Understand fractals as iterations of a process, recognize fractals in nature and art, and recreate basic fractals.
- Study the patterns found in Pascal's Triangle.
- Research the use of patterns in a variety of cultures.

Guiding Instructional questions

- What happens when you color the multiples of 3 (or other factors) on Pascal's Triangle?
- How do cultures use symbols to identify themselves and how do they use these patterns in art?
- How do manufacturers use patterns to create and market products?
- How would you use the Golden Ratio to market a product?
- How is the Golden Ratio used in photography?

Instructional Strategies

- Identify patterns in art and nature.
- Use the principles of a particular pattern to create a work of art.
- Explore patterns created by student-generated rules.

7 th Grade Chapter 4 (2012): Percents Unit 2 Theme: Perseverance				
Essential Questions	Supporting Questions	Key Terms	Practice Standards Task(s)	Cross Curricular Connections
How does knowing how to solve proportions help you persevere through percent problems?	<ul style="list-style-type: none"> How can you use models to estimate percent questions? What is a percent of decrease? What is a percent of increase? How can you find discounts and markups efficiently? How can you find the amount of simple interest earned on a savings account? How can you find the amount of interest owed on a loan? 	<p>Words for review (Tier 1): integer, sum, difference, product, quotient, estimate</p> <p>Tier 2: unit rate, complex fraction, rational number, solution, integer, reasonableness</p> <p>Tier 3: percent error, percent increase, percent decrease, markup, markdown, simple interest, gratuity, commission</p>	<ul style="list-style-type: none"> Shopping Yogurt T-shirt sale Sale! HONORS: Simple Interest 	

Utah Core Standards for Mathematics	Student Learning Targets	Curriculum Resources
7.RP.3 – Use proportional relationships to solve multistep ratio and percent problems.	<ul style="list-style-type: none"> I can solve multistep problems involving percent using proportional reasoning. I can find the percent of a number and extend the concept to solving real life percent applications. I can calculate percent, percent increase, decrease, and error. 	<p>Big Ideas 2012: 4.1 Percent Equation 4.2 Percent of increase/decrease 4.3 Discounts/Markups 4.4 Simple Interest</p> <p>Big Ideas 2014: 6.3 Percent Proportion 6.4 The Percent Equation 6.5 Percent of Increase and Decrease 6.6 Discounts/Markups 6.7 Simple Interest</p> <p>Performance Task: Gas Stations</p>
7.EE.2 – Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.	<ul style="list-style-type: none"> I can recognize and explain the meaning of a given expression and its component parts. I can recognize that different forms of an expression may reveal different attributes of the context. 	Performance Task: Part Time Job
7.EE.3 – Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools	<ul style="list-style-type: none"> I can solve multi-step mathematical problems involving calculators with positive and negative rational 	Big Ideas 2014: 6.1 Percents 6.2 Comparing & Ordering Fractions,

<p>strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>	<p>numbers in a variety of forms.</p> <ul style="list-style-type: none"> • I can solve multi-step real-life problems involving calculations with positive and negative rational numbers in a variety of forms. • I can convert between forms of a rational number to simplify calculations or communicate solutions meaningfully. • I can assess the reasonableness of answers using mental computation and estimation. 	<p>Decimals, and Percents 6.4 The Percent Equation</p> <p>Performance Task: Shopping (requires knowledge of percent markup, discount)</p>
Resources		
Science and Technical Literacy Standards		Literacy Implementation Ideas
Reading	<p>RI 7.1 – Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</p> <p>RI 7.2 – Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.</p> <p>RI 7.4 – Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings: analyze the impact of a specific word choice on meaning and tone.</p> <p>RI 7.5 – Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.</p> <p>RI 7.8 – Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.</p>	
Writing	<p>W 7.1 – Write arguments to support claims with clear reasons and relevant evidence.</p> <p>W 7.2 – Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</p> <p>W 7.3 – Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</p> <p>W 7.7 – Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.</p>	

7 th Grade				
Chapter 5 (2012): Similarity				
Unit 3 Big Idea: Challenges & Choices				
Essential Questions	Supporting Questions	Key Terms	Practice Standards Task(s)	Cross Curricular Connections
What life applications do you see for similarity and transformations?	<ul style="list-style-type: none"> How do changes in dimensions of similar geometric figures affect the perimeters and areas of the figures? What information do you need to know to find the dimensions of a figure that is similar to another figure? How can you use a scale drawing to estimate the cost of painting a room? How do the different types angles affect similarity of shapes? 	<p>Words for review (Tier 1): integer, sum, difference, product, quotient, estimate</p> <p>Tier 2: unit rate, rational number, solution, integer, reasonableness</p> <p>Tier 3: angle (\angle), angle measure ($m\angle$), acute, obtuse, right, degrees ($^\circ$), polygon, vertex, line segment (side AB of $\triangle ABC$), scale, scale factor, scale drawing, enlarge, reduce, scale model, supplementary, complementary, vertical angles, adjacent angles, intersecting lines</p>	<ul style="list-style-type: none"> Architecture Math Map HONORS: Scale Drawings 	
Utah Core Standards For Mathematics		Student Learning Targets		Curriculum Resources
7.G.1 – Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.		<ul style="list-style-type: none"> I can use a scale or scale factor to find a measurement. I can find actual lengths and areas from a scale drawing, using a scale factor. I can create multiple scale drawings from the original model or drawing, using different scales. 		Big Ideas 2012: 5.1** Identifying Similar Figures 5.2** Perimeter & Areas of Similar Figures 5.3** Finding Unknown Measures in Similar Figures 5.4 Scale Drawings 5.4b Scale Drawings Big Ideas 2014: 7.5 Scale Drawings Performance Task: Architecture
7.G.2 – Draw geometric shapes with given conditions. Focus on constructing triangle from three measures of angles or sides noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.		<ul style="list-style-type: none"> I can draw precise geometric figures based on given conditions. I can discover the conditions necessary for a given set of angles or sides to make a triangle. I can explore conditions that determine 		Big Ideas 2012: Topic 2 – Geometry Big Ideas 2014: 7.3 Triangles 7.4 Quadrilaterals

	unique triangles, multiple triangles, or no triangles.	Performance Task: Popcorn Containers
7.G.5 – Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	<ul style="list-style-type: none"> I can define and understand properties of supplementary, complementary, vertical, and adjacent angles. I can use properties of supplementary, complementary, vertical, and adjacent angles to solve for unknown angles in a figure. I can write and solve equations based on diagram of intersecting lines with some known angle measures. 	Big Ideas 2012: Topic 1 – Angles Big Ideas 2014: 7.1 Adjacent & Vertical Angles 7.2 Complementary & Supplementary Angles 7.3 Angle Measures of Triangles Performance Task: Truss Bridge
Resources		
<p>** These sections are not covered explicitly in the 7th grade core. Teachers should use discretion as to whether or not these sections should be taught for background knowledge, review, or extension based upon the needs of their students – if sections 5.5, 5.6, 5.7 are used for enrichment, focus on just visual transformations, these topics are also taught in the 8th grade core with an emphasis on the algebra behind each transformation</p>		
Science and Technical Literacy Standards		Literacy Implementation Ideas
Reading	<p>RI 7.1 – Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</p> <p>RI 7.2 – Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.</p> <p>RI 7.4 – Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.</p> <p>RI 7.5 – Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.</p> <p>RI 7.8 – Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.</p>	
Writing	<p>W 7.1 – Write arguments to support claims with clear reasons and relevant evidence.</p> <p>W 7.2 – Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</p> <p>W 7.3 – Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</p> <p>W 7.7 – Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.</p>	

7 th Grade				
Chapter 6/7 (2012): Surface Area and Volume of Solids				
Unit 4 Big Idea: Adaptation & Survival				
Essential Questions	Supporting Questions	Key Terms	Practice Standards Task(s)	Cross Curricular Connections
How will knowing surface area and volume help you “survive” in life?	<ul style="list-style-type: none"> How can you use a net to find the surface area of a prism? How can you find the surface area of a cylinder? 	<p>Word for review (Tier 1): three-dimensional figure (3D), cube, two-dimensional figure (2D), integer, sum, difference, product, quotient, estimate</p> <p>Tier 2: unit rate, rational number, solution, integer, reasonableness</p> <p>Tier 3: cross sections, plane sections, slant height, base, altitude, height, circumference, radius, diameter, center, Pi (π), altitude, height regular, pyramid, area, right rectangular prism, right rectangular pyramid, surface area, volume, base</p>	<ul style="list-style-type: none"> Slicing Puzzles Truss Bridge Pizza Crust HONORS: Popcorn Containers (use if you teach 6.3, 6.5, 7.2, 7.4) HONORS: Trough 	

Utah Core Standards for Mathematics	Student Learning Targets	Curriculum Resources
7.G.3 – Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	<ul style="list-style-type: none"> I can describe the different ways to slice a 3D figure (i.e. vertical slice, horizontal slice, and angled slice). I can describe the different 2D cross-sections that will result depending on how you slice the 3D figure. 	<p>Big Ideas 2012: missing</p> <p>Big Ideas 2014: 9.5 Ext - Cross Sections of Three-Dimension Figures</p> <p>Performance Task: Puzzles</p>
7.G.4 – Know the formulas for the area and circumference of a circle and use them to solve problems; given an informal derivation of the relationship between circumference and area of a circle. THIS IS THE FIRST TIME STUDENTS WORK WITH CIRCLES	<ul style="list-style-type: none"> I can use the formulas for area and circumference of a circle to solve problems. I can understand the relationship between diameter, circumference, and pi. I can show and explain how the circumference and area of a circle are related. 	<p>Big Ideas 2012: 6.2b Circles</p> <p>Big Ideas 2014: 8.1 Circles & Circumference 8.3 Areas of Circle</p> <p>Performance Task: Hiking</p>

<p>7.G.6 – Solve real world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p>	<ul style="list-style-type: none"> • I can find the areas of triangles, quadrilaterals, polygons, and composite figures, including those found in real-world contexts. • I can find surface areas of cubes, right prisms, and right pyramids whose faces are triangles, quadrilaterals, and polygons, including those found in real-world contexts. • I can find volumes of cubes, right prisms, and composite polyhedra including those found in real-world contexts. 	<p>Big Ideas 2012:</p> <p>a) missing</p> <p>b) 6.2 Surface Area of Prisms 6.4 Surface Area of Pyramids 6.6 Surface Area of Composite Solids c) 7.1 Volume of Prisms 7.3 Volume of Pyramids 7.5 Volume of Composite Solids</p> <p>Big Ideas 2014:</p> <p>a) 8.2 Perimeter of Composite 8.4 Areas of Composite solids b) 9.1 Surface Area of Prisms 9.2 Surface Area of Pyramids Missing Surface Area of Composite solids c) 9.4 Volume of Prisms 9.5 Volume of Pyramids Missing Volume of Composite solids</p> <p>Performance Task: Trough</p>
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Resources

** These sections are not covered explicitly in the 7th grade core. Teachers should use discretion as to whether or not these sections should be taught for background knowledge, review, or extension based upon the needs of their students - 7.2, and 7.4 are taught in the 8th grade

Additional Resources:
Cross Sections and Solids

Science and Technical Literacy Standards		Literacy Implementation Ideas
Reading	<p>RI 7.1 – Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</p> <p>RI 7.2 – Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.</p> <p>RI 7.4 – Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.</p> <p>RI 7.5 – Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.</p> <p>RI 7.8 – Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.</p>	
Writing	<p>W 7.1 – Write arguments to support claims with clear reasons and relevant evidence.</p> <p>W 7.2 – Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant</p>	

	<p>content.</p> <p>W 7.3 – Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</p> <p>W 7.7 – Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.</p>	
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7 th Grade Chapter 8 (2012): Data Analysis and Samples Unit 5 Big Idea: Innovation				
Essential Questions	Supporting Questions	Key Terms	Practice Standards Task(s)	Cross Curricular Connections
<p>How does data analysis help determine facts in science?</p> <p>Which types of data representations are seen most commonly in science writing?</p>	<ul style="list-style-type: none"> How can you use a survey to make conclusions about the general population? 	<p>Word for review (Tier 1): integer, sum, difference, product, quotient, estimate</p> <p>Tier 2: rational number, solution, integer, reasonableness</p> <p>Tier 3: inference, sample, random sample, population, variation, prediction, sampling error, variability</p>	<ul style="list-style-type: none"> Time Spent on Homework Snakes HONORS: Ducklings (students need to show two graphic representations of the data) 	

Utah Core Standards for Mathematics	Student Learning Targets	Curriculum Resources
<p>7.SP.1 – Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative sample and support valid inferences.</p>	<ul style="list-style-type: none"> I understand that representative samples can be used to make valid inferences about a population. I can understand that a random sample increases the likelihood of obtaining a representative sample of a population. 	<p>Big Ideas 2012: 8.1** Stem-and Leaf Plots 8.2** Histograms 8.3** Circle Graphs 8.4 Samples & Populations</p> <p>Big Ideas 2014: 10.6 Samples & Populations</p> <p>Performance Task: Using the Internet</p>
<p>7.SP.2 – Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</p>	<ul style="list-style-type: none"> I can make inferences about a population based on a sample. I can explore the variation in estimates or predictions based on multiple samples of the same data. 	<p>Big Ideas 2012: 8.1** Stem-and Leaf Plots 8.2** Histograms 8.3** Circle Graphs 8.4 Samples & Populations</p> <p>Big Ideas 2014: 10.6 Samples & Populations 10.6 Ext Generating Multiple Samples</p> <p>Performance Task: Time Spent on Homework</p>
<p>7.SP.3 – Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference</p>	<ul style="list-style-type: none"> I can understand that the measure of mean is independent of the measure of variability. I can use visual representations to compare and contrast 	<p>Big Ideas 2012: 8.3** Circle Graphs (mean absolute deviation not included)</p>

between the centers by expressing it as a multiple of a measure of variability.	numerical data from two populations using measures of variability and center.	8.4b Comparing Populations Big Ideas 2014: 10.7 Comparing Populations Performance Task: Snakes (mean absolute deviation not included)
7.SP.4 – Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.	<ul style="list-style-type: none"> I can make comparative inferences about two populations using measures of center and variability. 	Big Ideas 2012: 8.3** Circle Graphs (mean absolute deviation not included) 8.4b Comparing Populations Big Ideas 2014: 10.7 Comparing Populations Performance Task: Hotel Room Prices

Resources

** These sections are not covered explicitly in the 7th grade core. Teachers should use discretion as to whether or not these sections should be taught for background knowledge, review, or extension based upon the needs of their students

Social Studies Literacy Standards		Literacy Implementation Ideas
Reading	<p>RI 7.1 – Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</p> <p>RI 7.2 – Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.</p> <p>RI 7.4 – Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.</p> <p>RI 7.5 – Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.</p> <p>RI 7.8 – Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.</p>	
Writing	<p>W 7.1 – Write arguments to support claims with clear reasons and relevant evidence.</p> <p>W 7.2 – Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</p> <p>W 7.3 – Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</p> <p>W 7.7 – Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.</p>	

7 th Grade Chapter 9 (2012): Probability Unit 6 Big Idea: Making Sense of Our World				
Essential Questions	Supporting Questions	Key Terms	Practice Standards Task(s)	Cross Curricular Connections
<p>Which professions use probability to make sense of their “worlds”?</p> <p>**This is students’ first exposure to probability in the Utah Core</p>	<ul style="list-style-type: none"> How can you predict the results of spinning a spinner? How can you find a theoretical probability? What is meant by experimental probability? What is the difference between dependent and independent events? 	<p>Word for review (Tier 1): integer, sum, difference, product, quotient, estimate</p> <p>Tier 2: rational number, solution, integer, reasonableness</p> <p>Tier 3: probability, event, chance event, likelihood, outcome, probability model, uniform probability, sample space, theoretical probability, sample space, discrepancy, experimental probability, relative frequency, simple event, compound events, tree diagram, simulation, sample space</p>	<ul style="list-style-type: none"> Using Spinners Choosing a Block Reality Show HONORS: Multiple Choice 	

Utah State Core Standards for Mathematics	Student Learning Targets	Curriculum Resources
<p>7.SP.5 – Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and probability near 1 indicates a likely event.</p>	<ul style="list-style-type: none"> I can represent the probability of an event as a fraction or decimal from 0 to 1 from 0% to 100%. I can understand that a probability of 0 is impossible. I can understand that probabilities near 0 are unlikely to occur. I can understand that probabilities of .5 are equally likely and unlikely. I can understand that probabilities near 1 are more likely to occur. I can understand that probability of 1 is certain. 	<p>Big Ideas 2012: 9.1 Intro to Probability</p> <p>Big Ideas 2014: 10.1 Outcomes & Events 10.2 Probability 10.3 Experimental & Theoretical Probability</p> <p>Performance Task: Using Spinners</p>
<p>7.SP.6 – Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency given the probability.</p>	<ul style="list-style-type: none"> I can perform an experiment and collect data on a chance event. I can relate the results of an experiment to the theoretical relative frequency of an event. I can use the results of an experiment to estimate the probability of an event. I can estimate the long-run relative frequency of an event given the probability of the event. 	<p>Big Ideas 2012: 9.3 Experimental Probability</p> <p>Big Ideas 2014: 10.3 Experimental & Theoretical Probability</p> <p>Performance Task: Choosing a Block</p>
<p>7.SP.7 – Develop a probability model and use it to</p>	<ul style="list-style-type: none"> I can use theoretical probabilities to create 	<p>Big Ideas 2012:</p>

<p>find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possibly sources of discrepancy.</p> <p>a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.</p> <p>b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.</p>	<p>probability model (e.g. table showing the potential outcomes of an experiment or random process with their corresponding probabilities) in which all outcomes are equally likely (uniform).</p> <ul style="list-style-type: none"> • I can use observed frequencies to create a probability model for the data generated from a chance process. • I can use probability models to find probabilities of events. • I can compare theoretical and experimental probability. • I can compare theoretical and experimental probability. 	<p>Theoretical Probability</p> <p>Big Ideas 2014: 10.3: Experimental and Theoretical Probability</p> <p>Performance Task: Reality Show</p>
<p>7.SP.8 – Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</p> <p>a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.</p> <p>b. Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (e.g. “rolling double sixes”), identify the outcomes in the sample space which composes the event.</p> <p>c. Design and use a simulation to generate frequencies for compound events.</p>	<ul style="list-style-type: none"> • I can represent probabilities of simple and compound events as a fraction, decimal, or percent. • I can find the sample space of a compound event. • I can create organized lists, tables, tree diagrams, and simulations to determine the probability of compound events. • I can generate frequencies for compound events using random number generators (e.g. tables, calculators, manipulatives). 	<p>Big Ideas 2012: 9.4 Independent & Dependent Events</p> <p>Big Ideas 2014: 10.4: Compound events 10.5: Independent and Dependent Events 10.5 Ext: Simulations</p> <p>Performance Task: Multiple Choice</p>
<p>HONORS: Examine the use of mathematics in creating codes</p>	<ul style="list-style-type: none"> • I can explore codes used in everyday life such as zip codes, area codes, license plates, and social security numbers. • I can explore codes used in commerce such as check digits, UPC codes, and bank numbers. • I can explore various codes used in cryptography. 	<p>HONORS: Codes Cryptography</p> <p>http://en.wikipedia.org/wiki/Cryptography</p> <p>http://www.purdue.edu/discoverypark/gk12/downloads/Cryptography.pdf</p> <p>How UPC Bar Codes Work: http://electronics.howstuffworks.com/gadgets/high-tech-gadgets/upc.htm</p>

Resources		
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Writing	<p>W 7.1 – Write arguments to support claims with clear reasons and relevant evidence.</p> <p>W 7.2 – Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</p> <p>W 7.3 – Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</p> <p>W 7.7 – Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.</p>	

STATE CURRICULUM GUIDE

Honors Core Content

Cluster Title: Codes

Standard: Examine the use of mathematics in creating codes.

Concepts and Skills to Master

- Explore codes used in everyday life such as zip codes, area codes, license plates, and social security numbers.
- Explore codes used in commerce such as check digits, UPC codes, and bank numbers.
- Explore various codes used in cryptography.

Guiding Instructional Questions

- How does the use of codes facilitate commerce and other aspects of everyday life?
- Why do stores scan your receipt when you return an item?
- How does the use of codes protect our identity?
- How have codes been used throughout history?
- How do codes facilitate the collection of information?

Instructional Strategies

- Create codes to send messages to other students.
- Investigate your own ID numbers and determine how they reveal information about you.
- Research the use of codes during World War II and present your findings.
- Collect a variety of UPCs and compare the codes to investigate product information.
- Give students coded information to decode.

