

7<sup>th</sup> Grade Pre-Algebra Curriculum Map: 2012-2013

The Number System

Time Line: Marking Period 1

*\*Correlated to MEAP*

CCSS	Essential Questions/Learning goals	Skills/ Vocabulary	Formative/ Summative Assessment	Resources
<p><u>IS.1*</u>                      ply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p><u>Math Practices: 4</u></p>	<p><b>In what ways can rational numbers be useful?</b></p> <p>See Below</p>	<p>Positive, negative, opposite, additive inverse, absolute value, integer, rational number.</p>	<p>NWEA/ Common Unit Assessments</p>	<p>Accentuate the Negative Skip Investigation 4</p>
<p><u>IS.1.a*</u>                      describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</p> <p><u>Math Practices: 4</u></p> <p><u>IS.1.b*</u>                      understand <math>p+q</math> as the number located a distance <math> q </math> from <math>p</math>, in the positive or negative direction depending on whether <math>q</math> is positive or negative. Show that a number and its opposite have a sum of 0 (additive inverse) interpret sums of rational numbers by describing real-world contexts.</p> <p><u>Math Practices: 4</u></p>	<p>I can describe real-world situations where opposite quantities have a sum of zero.</p> <p>I can show that a number and its opposite have a sum of Zero.(additive inverse)</p>			

IS.1.c\*  
Understand subtraction of rational numbers as adding the additive inverse of  $p$ .  
 $p - q = p + (-q)$

4th Practices: 4

IS.1.d\*  
Apply properties of operations and strategies to add and subtract rational numbers.

4th Practices: 4

IS.2\*  
Apply and extend previous understandings of multiplication and division and fractions to multiply and divide rational numbers.

8th Practices: 8

IS.2.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 rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

8th Practices: 8

I can rewrite a subtraction problem as an addition problem using the additive inverse.

I can show the distance between two rationals on a number line is the absolute value of their difference.

I can use the properties of operations to add and subtract rational numbers.

I can apply what I already know about multiplying and dividing fractions to multiplying and dividing rationals.

I can use patterns to develop procedures for multiplying rational numbers.  
(Examples: An even number of negative signs yields a positive answer.)

I can represent real world situations using multiplication of rationals.

Terminating decimal,  
repeating decimal,  
distributive property,  
multiplicative inverse property.

IS.2.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,  $-(p/q) = (-p)/q = p/(-q)$ . Interpret quotients of rational numbers by describing real-world contexts.

8th Practices: 8

IS.2.c\*

Apply properties of operations as strategies to multiply and divide rational numbers.

8th Practices: 8

IS.2.d\*

Convert rational numbers to a decimal using long division; show that the decimal form of a rational number terminates in 0s or eventually repeats.

8th Practices: 8

IS.3\*

Solve real-world and mathematical problems involving the four operations with rational numbers.

1st Practices: 1

I can define a rational number.

(Note: Students need to understand that  $-(p/q) = (-p)/q = p/(-q)$ )

I represent real world situations using division of rationals.

How can I apply the properties of operations as strategies to multiply and divide rational numbers?  
(Note: Focus on the distributive property.)

I can convert a rational number to a decimal using long division.

I know that the decimal form of a rational number terminates in 0s or eventually repeats.

I solve real-world problems that involve the addition, subtraction, multiplication, and or division of rational numbers.

Rational Number, complex fraction (fraction within a fraction)

7<sup>th</sup> Grade Pre-Algebra Curriculum Map  
 Ratios and Proportional Relationships  
 Time Line: Marking Period: 1

CCSS	Essential Questions/ Learning Goals	Skills /Vocabulary	Summative/Formative Assessment	Resources
<p><u>P.1*</u></p> <p>compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in two or different units.</p> <p>For example, if a person walks <math>\frac{1}{2}</math> mile each <math>\frac{1}{4}</math> hour, compute the unit rate in miles per hour (complex divisions <math>(\frac{1}{2})/(\frac{1}{4})</math>)</p> <p><u>Math Practices: 2</u></p>	<p><b>How can ratios and proportional relationships be used to determine unknown quantities?</b></p> <p>I can compute unit rates.</p>	<p>Ratio, Rate, Unit Rate</p>		<p>Comparing And Scaling INV: 2,3,4</p> <p>CC Transition Kit INV 1 Graphing Proportions Between 3 and 4</p>
<p><u>P.2a*</u></p> <p>Decide whether two quantities are in a proportional relationship.</p> <p>For example, by graphing for equivalent ratios in a table or plotting on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p><u>Math Practices: 4</u></p>	<p>I can determine whether two quantities are proportional by looking at a table, graph, equation, or as a verbal description.</p>	<p>Proportional relationship, constant of proportionality, unit rate, equivalent ratios, origin</p>		

P.2b\*

Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

Math Practices: 4

I can identify the constant of proportionality in a graph, equation, diagram, or verbal description.

P.2c\*

Represent proportional relationships by equations. For example, if total cost  $t$  is proportional to number of items  $n$  purchased at a constant price  $p$ , the relationship between total cost and the number of items can be expressed as  $t=pn$ .

Math Practices:4

I can write an equation that represents a proportional relationship.

P.2d\*

Explain what a point  $(x, y)$  on the graph of a proportional relationship means in terms of the situation, highlighting special attention to the points  $(0,0)$  and  $(1,r)$  where  $r$  is the unit rate.

Math Practices: 4

I can use words to explain the relevance of a specific point on the graph of a proportional relationship, including but not limited to  $(0,0)$  and  $(1,r)$  (Where  $r$  is the unit rate.)

P.3\*

Use proportional relationships to solve multistep ratio and percent problems.

Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease

Math Practices 2

I can use proportional reasoning to solve real-world ratio problems, including those with multiple steps.

I can use proportional reasoning to solve real world PERCENT problems including those with multiple steps.

Proportional relationship, ratio, percent.

7<sup>th</sup> Grade Pre-Algebra Curriculum Map  
Expressions and Equations  
Time Line: Marking Period 2

CCSS	Essential Questions/ Learning Goals	Skills /Vocabulary	Formative/ Summative Assessment	Resources
<p><u>E.1</u> * Apply properties of operations as strategies to multiply, subtract, factor, and divide linear expressions with rational coefficients.</p> <p><u>7<sup>th</sup> Practices: 7</u></p>	<p>1. I can use the commutative and associative properties to add linear expressions with rational coefficients.</p> <p>2. I can use the distributive property to add and subtract linear expressions with rational coefficients</p> <p>3. I can use the distributive property to factor a linear expression with rational coefficients.</p> <p>4. I can use the distributive property to expand a linear expression with rational coefficients.</p>	<p>Linear expression, coefficient, like terms.</p>	<p><u>Two Unit Test</u></p> <p>One for Moving Straight Ahead Use Unit Test from Book</p> <p>One for Say it with Symbols w/ CC Transition Kit 7 INV 2 and 3 Assess: 7.EE.1, 7.EE.2, 7.EE.3, 7.EE.4</p>	<p>1. Moving Straight Ahead</p> <p>*Pre-Algebra Do All INV</p> <p>*Math 7 Skip 4.3 and 4.4</p> <p>2. Say it With Symbols</p> <p>Skip INV: 3.3, 3.4, and 4.4</p> <p>3. CC Transition 7 INV: 2 and 3</p>
<p><u>E.2</u> Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities are related.</p> <p><u>7<sup>th</sup> Practices 2</u></p>	<p>1. I can use equivalent expressions to understand the relationship between quantities.</p>	<p>NONE</p>		

E.3\*  
 ve multi-step real-life  
 l mathematical  
 blems posed with  
 itive and negative  
 onal numbers in any  
 m (whole numbers,  
 ctions, and decimals),  
 ng tools strategically.  
 ply properties of  
 rations to calculate  
 h numbers in any form;  
 ert between forms as  
 ropriate; and assess the  
 onableness of answers  
 ng mental computation  
 l estimation strategies

1. I can solve real-world problems using rational numbers in any form, including those problems involving multiple steps.
2. I can apply the properties of operations to fluently compute with rational numbers in any form.
3. I can use mental math and estimation strategies to determine if my solution is reasonable.

Rational Number

th Practices: 1

E.4a \*  
 ve word problems  
 ding to equations of the  
 m  $px+q=r$  and  $p(x+q)=r$ ,  
 ere p, q, and r are  
 onal. Solve equations of  
 se forms fluently.  
 mpare an algebraic  
 tion to an arithmetic  
 tion, identifying the  
 uence of the operations  
 d in each approach.

1. I can use a variable to represent a unknown quantity.
2. I can write a simple algebraic equation (in the form  $px+q=r$  and  $p(x+q) = r$  to represent a real world problem.
3. I can solve a simple algebraic equation by using the properties of equality or mathematical reasoning, and show or explain my steps.

NONE

th Practices: 2

E.4B

ve word problems  
ding to inequalities of  
form  $px+q>r$  or  $px+q<$   
raph the solution set of  
inequality and interpret  
1 the context of the  
blem.

th Practices: 2

1. I can write a simple algebraic equation (in the form  $px+q>r$  and  $p(x+q)<r$  to represent a real world problem.

2. I can solve a simple algebraic inequality and graph the solution on a number line.

3. I can describe the solution to an inequality in relation to the problem

7<sup>th</sup> Grade Pre-Algebra Curriculum Map  
 Geometry  
 Time Line: Marking Period 3

CCSS	Essential Questions/Learning Goals	Skills /Vocabulary	Formative/ Summative Assessment	Resources
<p><u>i.1*</u></p> <p>ve problems involving le drawings of geometric res, including computing ual lengths and areas from scale drawing and roducing a scale drawing i different scale.</p> <p><u>thematical Practices:2</u></p>	<p><b>How does geometry better describe objects?</b></p> <p>I can use a scale drawing to determine the actual dimensions and area of geometric figure.</p> <p>I can use a different scale to reproduce a similar scale drawing.</p>	<p>Scale drawing</p>	<p>Unit Test / NWEA</p> <p>Two Unit Tests</p> <p>1 After <b>Stretching and Shrinking</b>: Assess 7.G.1</p> <p>1 After <b>CC Transition Kit Investigation 4</b>: Assess 7.G.2, 7.G.3, 7.G.4, 7.G.5, 7.G.6</p>	<p><b>Stretching and Shrinking</b> Investigation Skip: 1.1, 1.2, 3.2, Need Additional AAA. SAS, SSS materials</p> <p><b>Filling and Wrapping</b> ONLY DO INV 1.1-1.3 2.1-2.3 *Need to Supplement For triangular Prisms, Surface area, and Volume</p> <p><b>CC Transition Kit Investigation 4</b></p>
<p><u>i.2*</u></p> <p>ow geometric shapes with en conditions. Focus on istricting triangles from e measures of angles or es, noticing when the iditions determine a que triangle, more than : triangle, or no triangle.</p> <p><u>thematical Practices:</u></p>	<p>1. I can draw a geometric shape with specific conditions.</p> <p>2. I can construct a triangle when given 3 measurements. 3 side lengths, 3 angle measures, or a combination of side and angle measurements.</p> <p>3. I can determine when three specific measurements will result in one unique triangle, more than one possible triangle, or no possible</p>	<p>NONE</p>		

3.3

Describe the two-dimensional figures that result from slicing three-dimensional figures, as in the sections of right rectangular prisms and right rectangular pyramids.

Mathematical Practices:

3.4

Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

Mathematical Practices:

3.5

Use facts about complementary, supplementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

Mathematical Practices: 7

triangle.

1. I can name the two-dimensional figure that represents a particular slice of a three-dimensional figure.

Right rectangular prism, right rectangular pyramid.

1. I can state the formula for finding the circumference and area of a circle.

Radius, diameter, circumference, area, pi.

2. I can use the formulas to compute the area and circumference of a circle.

3. I can determine the diameter or radius of a circle when the circumference is given.

4. I can use a ratio and algebraic reasoning to compare the area and circumference of a circle.

1. I can state the relationship between supplementary, complementary and vertical angles.

Supplementary angles, complementary angles, vertical angles, adjacent angles.

2. I can use angle relationships to write algebraic equations for

unknown angles.

3. I can use algebra reasoning and angle relationships to solve multi-step problems.

1. I can determine the area of 2-dimensional figures.

2. I can determine the surface area and volume of three-dimensional figures.

3. I can solve real world-problems involving area, surface area, and volume.

Length, width, base, height, altitude, area, surface area, and volume

3.6

olve real-world problems involving area, volume, and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, rectangles, and right prisms

thematical Practices:

7<sup>th</sup> Grade Pre-Algebra Curriculum Map  
 Statistics  
 Time Line: Marking Period 4

CCSS	Essential Questions/Learning Goals	Skills /Vocabulary	Formative/ Summative Assessment	Resources
<p><b>P.1</b>            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><u>Math Practices: 3</u></p>	<p><b>EQ: How are statistics used to make informed decisions about uncertain events?</b></p> <p>1. I can explain that random sampling tends to produce representative samples and can be used to make inferences about overall populations.</p> <p>2.I can explain why the validity of the sample depends on whether the sample is representative of the population.</p>	<p>sample, population, random sample, representative sample</p>	<p>Unit Test/ NWEA</p>	<p>Review Mean, median, and mode.</p> <p>Samples and Population INV: 1 AND ONLY</p> <p>CC Transition Kit INV 5: Variability</p>

<p><b>P.3</b>            Formally assess the degree of overlap of two numerical distributions with similar variabilities, measuring the difference between the centers expressing it as a multiple of measure of variability.</p> <p><u>Math Practices: 3</u></p>	<p>1. I can find the difference in the mean or median of two different data sets.</p> <p>2. I can demonstrate how two data sets that are very different can have similar variabilities.</p> <p>3. I can draw inferences about the data sets by making a comparison of these differences relative to the mean absolute deviation or interquartile range of either set of data.</p>	<p>Centers, variabilities, mean, median, mean absolute deviation, interquartile range</p>		
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**P.4**

measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

For example, decide whether the words in a chapter of a tenth-grade science book are generally longer than the words in the chapter of a fourth-grade science book.

Math Practices: 1-3

1: I can compare two populations by using the means and/or medians of data collected from random samples.

2: I can compare two populations by using the mean absolute deviations and/or interquartile ranges of data from random samples.

Measures of variability, measures of center, mean, median, mean absolute deviation, interquartile range, population, random sample

**P.2**

Draw 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.

For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.

Math Practices: 3,

1 I can draw inferences about a population based on data generated by a random sample.

2. I can generate multiple samples from the same population and analyze the estimates or predictions based on the variation of each sample.

population, sample, random sample

Unit Test / NWEA

7<sup>th</sup> Grade Pre-Algebra Curriculum Map  
 Probability Unit  
 Time Line: Marking Period 4

CCSS	Essential Questions/Learning goals	Skills/ Vocabulary	Formative/ Summative Assessment	Resources
<p><u>P.5</u></p> <p>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 near <math>\frac{1}{2}</math> indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</p> <p><u>Math Practices: 3</u></p>	<p><b>How is probability used to make informed decisions about uncertain events?</b></p> <ol style="list-style-type: none"> <li>1. I can define probability as a ratio that compares favorable outcomes to all possible outcomes.</li> <li>2. I can recognize and explain that probabilities are expressed as a number between 0 and 1.</li> <li>3. I can interpret a probability near 0 as unlikely to occur and a probability near 1 as likely to occur.</li> <li>4. I can interpret a probability near <math>\frac{1}{2}</math> as being as equally likely to occur as not to occur.</li> </ol>	<p>Likely, unlikely</p>	<p>Unit Test/ NWEA</p>	<p><b>What Do You Expect?</b> Complete All Investigations</p>
<p><u>P.6</u></p> <p>Use data to approximate the probability of an event by collecting data on a chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</p> <p>For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</p> <p><u>Math Practices: 3</u></p>	<ol style="list-style-type: none"> <li>1. I can collect data on a chance process to approximate its probability.</li> <li>2. I can use probability to predict the number of times a particular event will occur given a specific number of trials.</li> <li>3. I can use variability to explain why the experimental probability will not always exactly equal the theoretical probability.</li> </ol>	<p>Theoretical probability, experimental probability, relative frequency</p>		

P.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 discrepancies.

Math Practices: 4

P.7a

Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.

For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.

Math Practices: 4

P.7b

Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

For example, find the approximate probability that a spinning penny will land heads or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?

Math Practices: 4

1. I can develop a simulation to model a situation in which all events are equally likely to occur.

1. I can utilize the simulation to determine the probability of specific events.

1. I can determine the probability of events that may not be equally likely to occur, by utilizing a simulation model.

8.P.8:

Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

8th Practices: 1

P.8.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.

8th Practices: 1

P.8.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.

8th Practices: 1

1. I can create a sample space of all possible outcomes for a compound event by using an organized list, a table, or a tree diagram.

1. I can use the sample space to compare the number of favorable outcomes to the total number of outcomes and determine the probability of the compound event.

1. I can create a sample space of all possible outcomes for a compound event by using an organized list, a table, or a tree diagram.

P.8.c

design and use a simulation to approximate frequencies for compound events.

For example, use random digits or a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at most 4 donors to find one with type A blood.

Math Practices: 1

1. I can design and utilize a simulation to predict the probability of a compound event.