



Marietta City Schools
2023–2024 District Unit Planner

Honors Grade 6 Mathematics

Unit title	Unit 7: Rational Explorations: Numbers and their Opposites	MYP year	1	Unit duration (hrs)	20 hours
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Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

GA DoE Standards

Standards

6.NR.2 Apply operations with whole numbers, fractions and decimals within relevant applications.

6.NR.3: Solve a variety of problems involving whole numbers and their opposites; model rational numbers on a number line to describe problems presented in relevant, mathematical situations.

6.MP: Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.

MCS.Gifted.S3C Use a variety of strategies for solving authentic, complex, real world problems through evaluative thinking and the engineering design processes.

MCS.Gifted.S4B Recognize and examine the value of others strengths, thoughts, ideas, and feelings during collaboration.

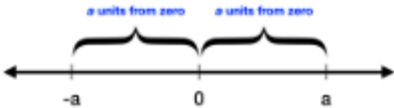
MCS.Gifted.S4D Respectfully collaborate and effectively communicate exchanges of constructive/critical feedback.

MCS.Gifted.S6 Students will become self-directed, independent learners.

Concepts/Skills to be Mastered by Students

6.NR.2.3	Interpret numerical data to answer a statistical investigative question created. Describe the distribution of a quantitative (numerical) variable collected, including its center, variability, and overall shape.	Fundamentals <ul style="list-style-type: none"> In sixth grade, students should explore the conceptual idea of MAD – not the formula. Students should be able to determine the number of observations from a context or diagram. Students should be able to describe the distribution of a quantitative (numerical) variable collected, including its center (median, mean), variability (interquartile range (IQR), mean absolute deviation (MAD), and range), and overall shape (symmetrical vs non-symmetrical). 	Terminology <ul style="list-style-type: none"> Students should be able to apply their understanding of absolute value (rather than use operations on negative integers) in the context of MAD. 	Strategies and Methods <ul style="list-style-type: none"> Students should explore conceptually the measures of center (mean, median) and variability (interquartile range and range) for a set of numerical data gathered from relevant, mathematical situations and use these measures to describe the shape of the data presented in various forms. 	Example <ul style="list-style-type: none"> Arthur and Aaron are on the same 6th grade basketball team. Both players have scored an average of ten points over the past ten games. Here are the students' number of points scored during each of the last ten games. Arthur: 9, 10, 10, 11, 11, 9, 10, 10, 10, 10 Aaron: 16, 18, 4, 3, 5, 13, 18, 3, 13, 7 Which student is more consistent? Possible Student Response/Solution: Arthur is more consistent because his MAD is smaller than Aaron's MAD; Arthur has less variability than Aaron.
		<ul style="list-style-type: none"> Data sets can be limited to no more than 10 data points when exploring the mean absolute deviation. Students should be able to describe the nature of the attribute under investigation, including how it was measured and its units of measurement. 			

6.NR.2.4	Design simple experiments and collect data. Use data gathered from realistic scenarios and simulations to determine quantitative measures of center (median and/or mean) and variability (interquartile range and range). Use these quantities to draw conclusions about the data, compare different numerical data sets, and make predictions.	<p>Fundamentals</p> <ul style="list-style-type: none"> Students should be able to use quantitative measures of center and variability to draw conclusions about data sets and make predictions based on comparisons. Students should be able to identify that each quartile represents 25% of the data set. 	<p>Strategies and Methods</p> <ul style="list-style-type: none"> Students should apply understanding of the measures of center (mean, median) and variability (interquartile range and range) to determine quantitative measures of center and variability, draw conclusions about the data, compare different-numerical data sets and make predictions using data gathered from realistic scenarios and simulations.
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6.NR.3.1	Identify and compare integers and explain the meaning of zero based on multiple authentic situations.	<p>Relevance and Application</p> <ul style="list-style-type: none"> Students should be able to use numerical reasoning to explain that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, debits/credits, positive/negative electric charge). Students should be able to use positive and negative numbers to represent quantities in authentic situations and explain the meaning of zero based on each situation. Students should be able to interpret relevant, mathematical problems related to positive and negative numbers. 			<p>Example</p> <ul style="list-style-type: none"> Write $-5^{\circ}\text{C} > -9^{\circ}\text{C}$ to express the fact that -5°C is warmer than -9°C.
6.NR.3.2	Order and plot integers on a number line and use distance from zero to discover the connection between integers and their opposites.	<p>Strategies and Methods</p> <ul style="list-style-type: none"> Students should have opportunities to explore this concept using visual models to develop a deeper understanding. Number lines should be indicated both vertically and horizontally. 			<p>Example</p> <ul style="list-style-type: none"> Students should be able to recognize that $-a$ is the same distance from zero as a, and therefore, are opposites of each other. 
6.NR.3.3	Recognize and explain that opposite signs of integers indicate locations on opposite sides of zero on the number line; recognize and explain that the opposite of the opposite of a number is the number itself.	<p>Fundamentals</p> <ul style="list-style-type: none"> Students should be able to explain that zero is its own opposite. Students should be able to explain that the sign of an integer represents its position relative to zero on a number line. Students should be able to show and explain why $-(-a) = a$. Which is read as, "The opposite of the opposite of a is the same as a." 			
6.NR.3.4	Write, interpret, and explain statements of order for rational numbers in authentic, mathematical situations. Compare rational	<p>Strategies and Methods</p> <ul style="list-style-type: none"> Students should be able to use numerical reasoning to interpret and explain the meaning of numerical statements of inequality as the 	<p>Terminology</p> <ul style="list-style-type: none"> Rational numbers are numbers that can be written as a fraction where the numerator and denominator are integers. 	<p>Examples</p> <ul style="list-style-type: none"> Write -3 degrees Celsius $>$ -7 degrees Celsius to express the fact that -3 degree Celsius is warmer than -7 degrees Celsius. 	

	numbers, including integers, using equality and inequality symbols.	relative position of two integers positioned on a number line. <ul style="list-style-type: none"> Students are introduced to rational numbers. Students should connect their understanding of fractions and integers to comprehend rational numbers as numbers that can be written as a fraction where the numerator and denominator are integers. 		<ul style="list-style-type: none"> Interpret $-8.3 > -12.3$ as a statement that -8.3 is located to the right of -12.3 on a number line oriented from left to right.
6.NR.3.5	Explain the absolute value of a rational number as its distance from zero on the number line; interpret absolute value as distance for a positive or negative quantity in a relevant situation.	Terminology <ul style="list-style-type: none"> Absolute value is a number's distance from zero (0) on a number line. 	Fundamentals <ul style="list-style-type: none"> Students should be introduced to the absolute value symbol with this learning objective, i.e., $- \frac{3}{4}$. Students should conclude through exploration that absolute value and distance are always expressed as a positive value. 	Example For an account balance of -51.25 dollars, write $ -51.25 = 51.25$ to describe the size of the debt in dollars.
6.NR.3.6	Distinguish comparisons of absolute value from statements about order.	Example <ul style="list-style-type: none"> Recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars. 		

Vocabulary: [K-12 Mathematics Glossary](#)

Absolute Value	Negative Numbers	Distance	Opposite	Inequality	Positive Numbers
Integers	Rational Number	Magnitude	Sign		

Key concept	Related concept(s)	Global context
Relationships The connections and associations between properties, objects, people and ideas.	Equivalence, Generalization	Identities and Relationships
Statement of inquiry		

Modeling using a logical process helps us to understand the world		
Inquiry questions		
<p>Factual— Why is it useful for me to know the absolute value of a number? Where do I place positive and negative rational numbers on the number line? What are opposites, and how are opposites shown on a number line? How do statements of inequality help me place numbers on a number line? How can I use coordinates to find the distances between points? How can I use number lines to find the distances between points? How can I use absolute value to find the lengths of the sides of polygons on the coordinate plane?</p> <p>Conceptual— How do I use positive and negative numbers to represent quantities in real-world contexts?</p> <p>Debatable-When are negative numbers used and why are they important? When is graphing on the coordinate plane helpful? How do I use positive and negative numbers in everyday life?</p>		
MYP Objectives	Assessment Tasks	
<i>What specific MYP objectives will be addressed during this unit?</i>	<i>Relationship between summative assessment task(s) and statement of inquiry:</i>	<i>List of common formative and summative assessments.</i>
Criteria C (Communication) Criteria D (Applying Math to real-world context)	Students will understand, interpret, write, and explain the relationships between numbers: positive, negative, and rational numbers using a number line, coordinate plane, and absolute value.	<p>Formative Assessment(s): Unit 7 CFA</p> <p>Summative Assessment(s): Unit 7 Summative Test</p>
Approaches to learning (ATL)		
<p>Category: Social Cluster: Collaboration Skills Skill Indicator: Give and receive meaningful feedback.</p> <p>Category: Communication Cluster: Communication Skill Indicator: Organize and depict information logically</p>		

<u>Learning Experiences</u> Add additional rows below as needed.		
Objective or Content	Learning Experiences	Personalized Learning and Differentiation
6.NR.3.4 Write, interpret, and explain statements of order for rational numbers in authentic, mathematical situations. Compare rational numbers, including integers, using equality and inequality symbols. 6.NR.3.6 Distinguish comparisons of absolute value from statements about order.	<u>Above and Below</u> Students match integers with the descriptions of them that relate to a real-world context. They also use real-world statements of order to compare and order integers. Fluency with interpreting positive and negative numbers in context as well as ordering them on a number line is necessary for success.	Students will be supported through intentional planning and implementation using the 5 Practices. Teachers will support through assessing and advancing questions and aggressive monitoring of students through the task. Students will have access to number lines, xy pegboards, and various manipulatives to support their work with absolute value.
Content Resources		
Savvas- Topic 2 Savvas online tools: https://media.pk12ls.com/curriculum/math/enVision6-8/enV6-8_html5tools_launch/index.html Interactive Math Tools: https://polypad.amplify.com/ Interactive Geoboard - https://apps.mathlearningcenter.org/geoboard/ Illustrative Mathematics Number Lines, Fraction Models, Visual Models, and XY Pegboards		