

## NJDOE MODEL CURRICULUM PROJECT

CONTENT AREA: Mathematics		GRADE: 6	UNIT #: 1	UNIT NAME: Operations and Statistical Variability
#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS		
1	Compute quotients of fractions.	<b>6.NS.1</b>	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, create a story context for <math>(2/3) \div (3/4)</math> and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that <math>(2/3) \div (3/4) = 8/9</math> because <math>3/4</math> of <math>8/9</math> is <math>2/3</math>. In general, <math>(a/b) \div (c/d) = (ad/bc)</math> How much chocolate will each person get if 3 people share <math>1\ 1/2</math> lb of chocolate equally? How many <math>3/4</math>-cup servings are in <math>2/3</math> of a cup of yogurt? How wide is a rectangular strip of land with length <math>3/4</math> mi and area <math>1/2</math> square mi.?</i>	
2	Construct visual fraction models to represent quotients and explain the relationship between multiplication and division of fractions.			
3	Solve real-world problems involving quotients of fractions and interpret the solutions in the context given.			
4	Fluently add, subtract, multiply and divide multi-digit decimals and whole numbers using standard algorithms.	<b>6.NS.2;</b> <b>6.NS.3</b>	Fluently divide multi-digit numbers using the standard algorithm.  Fluently add, subtract, multiply, and divide multi-digit decimals using the standards algorithm for each operation.	
5	Use positive and negative numbers to describe quantities in real-world situations.	<b>6.NS.5</b>	Understand 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, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts explaining the meaning of 0 in each situation.	
6	Calculate, compare, and interpret measures of center and variability in a data set to answer a statistical question. (Including median, mean, interquartile range, mean absolute deviation and overall pattern).	<b>6.SP.1;</b>  <b>6.SP.2;</b>  <b>6.SP.3;</b>  <b>6.SP.5c,d</b>	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. <i>For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.</i>  Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.  Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.  Summarize numerical data sets in relation to their context, such as by: c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviation from the overall pattern with reference to the context in which the data were gathered. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	

**Major Content** **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks). ***Bold type indicates grade level fluency requirements.*** (Identified by PARCC Model Content Frameworks).

## Selected Opportunities for Connections to Mathematical Practices

1. **Make sense of problems and persevere in solving them.**  
SLO #3 Involve problems that include several givens or those that must be carefully deconstructed before they can be solved.
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**  
SLO #2 Visual fraction models are required.
5. **Use appropriate tools strategically.**  
SLO #2 Tools will include diagrams, words, and equations.
6. **Attend to precision.**  
SLO #6 The use of precise language is needed when answering statistical questions.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

*All content presented at this grade level has connections to the standards for mathematical practices.*

*Bold type identifies possible starting points for connections to the SLOs in this unit.*

## Greater Brunswick Charter School Grade Level Curriculum

Grade level: 6		Subject: Math			Unit #: 1		
Day	Topic	SLO CCSS	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
1	Greatest Common Factor	1	Compute the GCF of two numbers		<i>Fractions can be added with any common multiple and reduce the answer using the GCF. There is no need to use the LCM. Much time is lost looking for the LEAST common multiple. In addition, students often confuse the definition of the two acronyms. Reducing the LCM to a footnote will help all these issues.</i>	<ul style="list-style-type: none"> <li>• Lesson</li> <li>• Guided Practice</li> <li>• Independent Practice</li> <li>• i-Ready</li> </ul>	GlencoeMath p.3-8,10-13 Skip LCM problems unless you wish students to find any common multiple of the two numbers given in exercises.
2	Ratios	1, 2	Use ratios to compare quantities			<ul style="list-style-type: none"> <li>• Lesson</li> <li>• Guided Practice</li> <li>• Independent Practice</li> <li>• i-Ready</li> </ul>	GlencoeMath p.19-25
3	Unit rates	2	Use models to find unit rates			<ul style="list-style-type: none"> <li>• Lesson</li> <li>• Guided Practice</li> <li>• Independent Practice</li> <li>• i-Ready</li> </ul>	GlencoeMath p.27-30
4	Rates as ratios	1, 2, 3	Write rates as unit rates		<i>In most cases, a unit rate is simply a rate with a denominator of 1 obtained by reducing your rate fraction.</i>	<ul style="list-style-type: none"> <li>• Lesson</li> <li>• Guided Practice</li> <li>• Independent Practice</li> <li>• i-Ready</li> </ul>	GlencoeMath p.31-37
5	Tables	2, 3	Use tables to solve ratio problems			<ul style="list-style-type: none"> <li>• Lesson</li> <li>• Guided Practice</li> <li>• Independent Practice</li> <li>• i-Ready</li> </ul>	GlencoeMath p.39-45 GlencoeMath p.47-54 optional

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6	Planning for solutions  Optional: Using the coordinate plane to see ratios visually	3	Use the 4 step plan to solve problems	<i>How can making a movie in my mind help me understand what is occurring in a problem?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.55-57  GlencoeMath p.47-54 optional
7	Equal ratios	1, 2	Determine equivalent ratios	<i>How does finding a unit rate tell me if the ratios are the same?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.59-65
8	Equivalent Ratios	2, 3	Use models to solve problems	<i>How do tables and drawings help me solve ratio problems?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.67-70
9	Problems involving ratios and rates	1, 2, 3	Using models, 4 steps, and mental movies to solve problems	<i>Does it matter which method works best for me if I come to the correct answer?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.71-77
10						<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	<a href="#">Khan Academy</a> <a href="#">IXL problems</a> <a href="#">Algebra 101</a> <a href="#">Math Aids</a>
11	Ratios	1, 2, 3				<ul style="list-style-type: none"> <li>Review</li> <li>Assessment</li> </ul>	
12	Ratios Operations with Decimals	1, 2, 3, 4	Determine background knowledge and readiness for operations with decimals	<i>What do I already know about working with decimals?</i>		<ul style="list-style-type: none"> <li>Review assessment</li> <li>Intro operations with decimals</li> </ul>	GlencoeMath p.253-256

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Day	Topic	SLO CCSS	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
13	Add & Subtract Decimals	4	Add and subtract numbers with up to 2 decimal places	<i>How does lining up the decimal points make it easier to add and subtract?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.177-183
14	Multiply decimals	4	Multiply numbers with up to 3 decimal places	<i>Why is counting decimal places important in multiplying them?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.193-199
15	Multiply decimals	4	Multiply two decimals	<i>What is different about multiplying decimals or whole numbers?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.201-207
16	Mental multiplication	4	Multiply decimals by powers of 10	<i>How does moving the decimal point make me multiply by a power of 10?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.209-213
17	Estimating products	4	Use rounding strategies to estimate products and check reasonableness of answers	<i>How can rounding a factor make it easier for me to find the answer?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.185-191
18	Divide decimals	4	Divide decimals by whole numbers	<i>How does the dividend's decimal point act when I divide by a whole number?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.231-237

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19	Divide decimals	4	Divide decimals by decimals	<i>How does the dividend's decimal act differently when I divide by a decimal?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.239-245
20	Estimate quotients	4	Use rounding strategies to estimate quotients and check reasonableness of answers	<i>How can rounding make it easier for me to find the answer?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.223-229
21	Operations with decimals	4	Review all four operations	<i>How do I treat the decimal point differently when I add/Subtract or multiply or divide?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	<a href="#">MathIsFun: +/- decimals</a> <a href="#">CoolMath: +/- decimals</a> <a href="#">Adding math drill</a> <a href="#">Math.com: X decimals</a> <a href="#">CoolMath: X decimals</a> <a href="#">CoolMath: Dividing decimals</a> <a href="#">K5 Learning worksheets</a>
22	Operations with decimals	4				<ul style="list-style-type: none"> <li>Review</li> <li>Assessment</li> </ul>	
23	Operations with decimals Integers	5	Determine background knowledge and readiness for working with integers	<i>What do I already know about positive and negative numbers?</i>		<ul style="list-style-type: none"> <li>Review assessment</li> <li>Intro integers</li> </ul>	GlencoeMath p.339-342
24	Integers	5	Use integers to represent real world situations	<i>How can I represent something less than zero?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.345-352

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Day	Topic	SLO CCSS	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
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24	Comparing and ordering integers	5	Place integers in order	<i>Which is larger, 10 or -20?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.363-369
25	Problems	5	Solve problems using positive and negative numbers	<i>How can I be sure my answer is reasonable?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.371-
26	Integers	5				<ul style="list-style-type: none"> <li>Review</li> <li>Assessment</li> </ul>	
27	Integers Statistical measures	5, 6				<ul style="list-style-type: none"> <li>Review assessment</li> <li>Intro mean, median, mode</li> </ul>	GlencoeMath p.801-804
28	Mean	6	Compute the mean	<i>What is the average of a group of data?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.809-815
29	Median, Mode	6	Find the median and mode of a set of data	<i>What is the best way to determine the middle of a set of data?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.817-823
30	Measure of variation	6	Find the interquartile range,	<i>What is a good measure of variation between the numbers in a set of data?</i>		<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	GlencoeMath p.829-835
31						<ul style="list-style-type: none"> <li>Lesson</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>i-Ready</li> </ul>	<a href="#">Khan Academy</a> <a href="#">MathIsFun: Quartiles</a> <a href="#">WikiHow: Finding the IQR</a> <a href="#">IQR worksheets</a>
32	RTI as needed						

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Word Wall Candidates

Equivalent	Ratio	GCF	Common multiple	Prime factorization
Factor	Product	Quotient	Divisor	Dividend
Mean	Median	Mode	Interquartile range	Outlier
Variation				

Authentic Application

Your Goal: To find statistical measures of variations in temperature between New Brunswick and one of five locations in the world over a period of time.

Your Role: Your team is a group of meteorologists researching climate change and weather conditions.

Your Audience: Your fellow meteorologists and the world, in general.

The Situation: Each day, you must determine the low temperature forecast for New Brunswick and the location your team selects from: Nome, Alaska; Vladivostok, Russia; Johannesburg, South Africa; Narvik, Norway; and Rio Grande, Argentina. Each team selects a difference location.

The Product: You must compute the difference in the temperatures, the mean difference, the median difference, the mode difference, and the interquartile range for your complete set of data, each data and it grows. This data is to be presented in a table that shows the forecast low temperature for each of your two locations each day, the mean, median, and mode of the temperature differences each day, and the interquartile range each day.

Success Criteria: Success will be measured by the clarity of the chart, the accuracy of the statistics, and the description the team can provide of the data during a 3 minute presentation.