

# Grade 7 Mathematics Item Specifications



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## Grade 7 Mathematics

### Introduction

In 2014 Missouri legislators passed House Bill 1490, mandating the development of the Missouri Learning Expectations. In April of 2016, these Missouri Learning Expectations were adopted by the State Board of Education. Groups of Missouri educators from across the state collaborated to create the documents necessary to support the implementation of these expectations.

One of the documents developed is the item specification document, which includes all Missouri grade level/course expectations arranged by domains/strands. It defines what could be measured on a variety of assessments. The document serves as the foundation of the assessment development process.

Although teachers may use this document to provide clarity to the expectations, these specifications are intended for summative, benchmark, and large-scale assessment purposes.

Components of the item specifications include:

**Expectation Unwrapped** breaks down a list of clearly delineated content and skills the students are expected to know and be able to do upon mastery of the Expectation.

**Depth of Knowledge (DOK) Ceiling** indicates the highest level of cognitive complexity that would typically be assessed on a large scale assessment. The DOK ceiling is not intended to limit the complexity one might reach in classroom instruction.

**Item Format** indicates the types of items used in large scale assessment. For each expectation, the item format specifies the type best suited for that particular expectation.

**Text Types** suggests a broad list of text types for both literary and informational expectations. This list is not intended to be all inclusive: other text types may be used in the classroom setting. The expectations were written in grade level bands; for this reason, the progression of the expectations relies upon increasing levels of quantitative and qualitative text complexities.

## Grade 7 Mathematics

**Content Limits/Assessment Boundaries** are parameters that item writers should consider when developing a large scale assessment. For example, some expectations should not be assessed on a large scale assessment but are better suited for local assessment.

**Sample stems** are examples that address the specific elements of each expectation and address varying DOK levels. The sample stems provided in this document are in no way intended to limit the depth and breadth of possible item stems. The expectation should be assessed in a variety of ways.

# Grade 7 Mathematics

Mathematics		7.RP.A.1
<b>RP A 1</b>	<b>Ratios and Proportional Relationships</b> <b>Analyze proportional relationships and use them to solve problems</b> Compute unit rates, including those that involve complex fractions, with like or different units.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
<p>The student will understand that a unit rate is a comparison of two quantities (<math>\frac{a}{b}</math>, <math>b=1</math>).</p> <p>The student will compute fractional unit rates (<math>\frac{a}{b}</math>, <math>a</math> is a fraction and <math>b=1</math>).</p> <p>The student will compute a unit rate from fractional input values (<math>\frac{a}{b}</math>, <math>a</math> and <math>b</math> are given as fractions).</p> <p>The student will compute unit rates that involve negative (loss) values.</p> <p>The student will describe rates in terms of the units involved.</p>		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Numerators and denominators may involve fractions.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.RP.A.2.a</b>
<b>RP</b>	<b>Ratios and Proportional Relationships</b>	
<b>A</b>	<b>Analyze proportional relationships and use them to solve problems</b>	
<b>2</b>	Recognize and represent proportional relationships between quantities.	
<b>a</b>	Determine when two quantities are in a proportional relationship.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will determine if two quantities are proportional from a table of values.		3
The student will determine if two quantities are proportional from a context.		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
		Given an incomplete table the student will fill in the missing values in a proportional relationship.
		Apples cost \$4 for six or \$1 for one. Is this a proportional relationship?
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
In each case the value at zero (e.g., (0, 0) or (0, 2)) need not be given in the prompt.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

Mathematics		7.RP.A.2.b
<b>RP</b>	<b>Ratios and Proportional Relationships</b>	
<b>A</b>	<b>Analyze proportional relationships and use them to solve problems</b>	
<b>2</b>	Recognize and represent proportional relationships between quantities.	
<b>b</b>	Identify and/or compute the constant of proportionality (unit rate).	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
The student will be able to identify the constant of proportionality between quantities in tables.		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
The student will be able to identify the constant of proportionality between quantities in equations.		
The student will be able to identify the constant of proportionality between quantities in graphs.		
The student will be able to identify the constant of proportionality between quantities in real-world situations.		
The student will be able to compute the constant of proportionality between quantities using the values in tables.		
The student will be able to compute the constant of proportionality between quantities using the values in equations.		
The student will be able to compute the constant of proportionality between quantities using the values in graphs.		
The student will be able to compute the constant of proportionality between quantities using the values in real-world situations.		<b><u>Sample Stems</u></b>
<ul style="list-style-type: none"> <li>•</li> </ul>		<p>Given a graph the student computes the constant of proportionality.</p> <p>John’s pay is a proportional relationship. He made \$200 for working 20 hours one week. What is the constant of proportionality? What are the units of the value?</p> <p>Jane’s pay is not a proportional relationship. She made \$200 for working 20 hours. How much will she make for working 30 hours? (no way to determine it is not proportional)</p>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
In each case the value at zero (e.g., (0, 0) or (0, 2)) need not be given in the prompt.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

Mathematics		7.RP.A.2.c
<b>RP</b>	<b>Ratios and Proportional Relationships</b>	
<b>A</b>	<b>Analyze proportional relationships and use them to solve problems</b>	
<b>2</b>	Recognize and represent proportional relationships between quantities.	
<b>c</b>	Explain what a point $(x, y)$ on the graph of a proportional relationship means in terms of the situation.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
<p>The student will be able to explain what a point <math>(x, y)</math> on the graph of a proportional relationship means in terms of the situation.</p> <p>The student will be able to explain what the point <math>(0, 0)</math> represents on the graph in terms of the situation.</p> <p>The student will understand that <math>r</math> is the unit rate in the ordered pair <math>(1, r)</math>.</p> <p>The student will use units as way of explaining a proportional relationship.</p>		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b> Given a graph of a proportional relationship (with scaling, axis labels and a title) the student describes the proportional relationship.
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b> <b>NEUTRAL</b> – a calculator may or may not be available for items



# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.RP.A.2.d</b>
<b>RP</b>	<b>Ratios and Proportional Relationships</b>	
<b>A</b>	<b>Analyze proportional relationships and use them to solve problems</b>	
<b>2</b>	Recognize and represent proportional relationships between quantities.	
<b>d</b>	Recognize that the graph of any proportional relationship will pass through the origin.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will be able to identify graphs of proportional and non-proportional relationships.		3
The student will understand that the graph of any proportional relationship will pass through the origin.		<b><u>Item Format</u></b>
The student will explain why a proportional relationship must pass through the origin.		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
The response may involve graphing a relationship to solve the problem.		<b>NEUTRAL</b> – a calculator may or may not be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.RP.A.3</b>
<b>RP A 3</b>	<p><b>Ratios and Proportional Relationships</b></p> <p><b>Analyze proportional relationships and use them to solve problems</b></p> <p>Solve problems involving ratios, rates, percentages and proportional relationships.</p>	
<p style="text-align: center;"><b><u>Expectation Unwrapped</u></b></p> <p>The student will be able to solve problems involving ratios.</p> <p>The student will be able to solve problems involving rates.</p> <p>The student will be able to solve problems involving percentages.</p> <p>The student will be able to solve problems involving proportional relationships.</p> <p>The student will use units as a way of describing the problem.</p>		<p style="text-align: center;"><b><u>DOK Ceiling</u></b></p> <p style="text-align: center;">3</p> <hr/> <p style="text-align: center;"><b><u>Item Format</u></b></p> <p>Selected Response Constructed Response Technology Enhanced</p> <hr/> <p style="text-align: center;"><b><u>Sample Stems</u></b></p> <p>Todd drove from Cole Camp to St. Louis, which is 180 miles. The time it took to drive was 2 hours and 30 minutes. What was his average speed for the trip?</p>
<p style="text-align: center;"><b><u>Content Limits/Assessment Boundaries</u></b></p> <p>Equivalent (simplify, simplest, reduced) forms may be required, but not assumed. Problems may involve context or real-world applications.</p> <p>Provide formula for simple interest problems.</p> <p>Avoid unit conversions in problems not expressly designed to assess the conversion.</p>		<p style="text-align: center;"><b><u>Calculator Designation</u></b></p> <p><b>YES</b> – a calculator will be available for items</p>

# Grade 7 Mathematics

Mathematics		7.NS.A.1.a
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>1</b>	Apply and extend previous understandings of numbers to add and subtract rational numbers.	
<b>a</b>	Add and subtract rational numbers.	
<u><b>Expectation Unwrapped</b></u>		<u><b>DOK Ceiling</b></u> 2
The student will be able to add fractions.		<u><b>Item Format</b></u> Selected Response Constructed Response Technology Enhanced
The student will be able to add decimals.		
The student will be able to add integers.		
The student will be able to subtract fractions.		
The student will be able to subtract decimals.		
The student will be able to subtract integers.		
The student will be able to solve problems that involve adding and subtracting rational numbers.		<u><b>Sample Stems</b></u> 3.4 + 7.04  John found the difference of two negative numbers and it was positive. Jane said that cannot happen. Who is correct, why?
<u><b>Content Limits/Assessment Boundaries</b></u>		<u><b>Calculator Designation</b></u>
Limit decimals to the hundredths place.		<b>NO</b> – a calculator will not be available for items
Equivalent (simplify, simplest, reduced) forms may be required, but not assumed.		
Problems may involve different forms of rational numbers in the same prompt (e.g., fractions and decimals).		

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.NS.A.1.b</b>
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>1</b>	Apply and extend previous understandings of numbers to add and subtract rational numbers.	
<b>b</b>	Represent addition and subtraction on a horizontal or vertical number line.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will be able to represent addition on a horizontal number line.		3
The student will be able to represent addition on a vertical number line.		<b><u>Item Format</u></b>
The student will be able to represent subtraction on a horizontal number line.		Selected Response Constructed Response Technology Enhanced
The student will be able to represent subtraction on a vertical number line.		<b><u>Sample Stems</u></b>
		Represent the following difference on a number line.  The student will find the error in a student's work on a number line.
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Problems will include integers only. The number lines may be provided or the prompt may require their construction.		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

Mathematics		7.NS.A.1.c
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>1</b>	Apply and extend previous understandings of numbers to add and subtract rational numbers.	
<b>c</b>	Describe situations and show that a number and its opposite have a sum of 0 (additive inverses).	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
The student will give examples of additive inverses.		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
The student will describe situations involving additive inverses.		
The student will use a number line to show that the sum of a number and its opposite is zero.		
The student will be able to explain why the sum of a number and its additive inverse is zero.		
The student will understand the concept of additive inverses.		
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Sample Stems</u></b> What is the additive inverse of -3?  $7 + ? = 0$  Given $a + b = 0$ . John says b must be negative. Janes does not agree. Who is correct, why?
Items may use the phrase additive inverse.		<b><u>Calculator Designation</u></b> <b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

Mathematics		7.NS.A.1.d
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>1</b>	Apply and extend previous understandings of numbers to add and subtract rational numbers.	
<b>d</b>	Understand subtraction of rational numbers as adding the additive inverse.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
The student will rewrite a subtraction problem as a sum of the additive inverse.		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
The student will understand that subtraction of rational numbers is equivalent to adding the additive inverse.		
		<b><u>Sample Stems</u></b> Rewrite the following problem as an addition problem. $8 - 4 = 4$
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b> <b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

Mathematics		7.NS.A.1.e
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>1</b>	Apply and extend previous understandings of numbers to add and subtract rational numbers.	
<b>e</b>	Determine the distance between two rational numbers on the number line is the absolute value of their difference.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
The student will understand that a distance is always positive.		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
The student will understand that $ a - b  = a - b$ if $a > b$ , and $ a - b  = b - a$ if $a < b$ .		
The student will understand that the distance between the points a and b on a number line can be found by $ a - b $ or $ b - a $ .		
The student will be able to show that the distance between two rational numbers on a number line is equal to the absolute value of their difference.		
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Sample Stems</u></b> Find the distance between these to points on a number line. -7 and 8.  What is the distance between $\frac{1}{4}$ and $-\frac{2}{3}$ on a number line?  John says that the distance between two points a and b is $ a  -  b $ . Jane thinks it is $ a - b $ . Who is correct and why.
<b><u>Calculator Designation</u></b>		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.NS.A.1.f</b>
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>1</b>	Apply and extend previous understandings of numbers to add and subtract rational numbers.	
<b>f</b>	Interpret sums and differences of rational numbers.	
<u><b>Expectation Unwrapped</b></u>		<u><b>DOK Ceiling</b></u>
The student will interpret sums of rational numbers.		3
The student will interpret differences of rational numbers.		<u><b>Item Format</b></u>
The student will interpret sums and differences of rational numbers in real-world contexts.		Selected Response Constructed Response Technology Enhanced
		<u><b>Sample Stems</b></u>
		Give an example where $a + b < a - b$ .
		In the mile relay track event a team of four runners each run one lap around a track. The team wants to finish in a time of 4 minutes. The first three runners ran their laps in the following times 57.6 secs, 61.1 secs, and 63.9 secs. What is the slowest time the fourth runner can run to reach the goal of 4 minutes?
<u><b>Content Limits/Assessment Boundaries</b></u>		<u><b>Calculator Designation</b></u>
Problems may involve absolute value.		<b>NO</b> – a calculator will not be available for items



# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.NS.A.2.a</b>
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>2</b>	Apply and extend previous understandings of numbers to multiply and divide rational numbers.	
<b>a</b>	Multiply and divide rational numbers.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
<p>The student will use multiple representations to model real-world and mathematic problems involving multiplication and division of rational numbers.</p> <p>The student will critique the reasoning of others, identifying errors and alternate approaches to solving problems involving multiplication and division of rational numbers.</p> <p>The student will decontextualize and contextualize problems and solutions to explain his or her reasoning in multiplication and division of rational numbers.</p> <p>The student will identify and explain patterns and the structure of the problems with specific focus on the properties of mathematics when solving problems involving multiplication and division of rational numbers.</p> <p>The student will communicate his or her reasoning precisely to problems involving multiplication and division of rational numbers.</p>		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
		$2\frac{2}{3} \div \frac{2}{3}$  $22.3 \times 6.1$  $220.67 \div 12.2$  Find the error(s) in the following calculation.
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit decimals to the hundredths place. This limit is in place only for assessments, to avoid large amounts of time being spent on calculations.		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

Mathematics		7.NS.A.2.b
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>2</b>	Apply and extend previous understandings of numbers to multiply and divide rational numbers.	
<b>b</b>	Determine that a number and its reciprocal have a product of 1 (multiplicative inverse).	
<u><b>Expectation Unwrapped</b></u>		<u><b>DOK Ceiling</b></u>
The student will find the reciprocal of any non-zero rational number.		3
The student will be able to understand that a number and its reciprocal have a product of one.		<u><b>Item Format</b></u>
The student will understand that if the product of two numbers is one then the numbers are multiplicative inverses.		Selected Response Constructed Response Technology Enhanced
		<u><b>Sample Stems</b></u>
		Find the multiplicative inverse of .02.
		Find the multiplicative inverse of $-2\frac{2}{3}$ .
<u><b>Content Limits/Assessment Boundaries</b></u>		<u><b>Calculator Designation</b></u>
Items may use the phrase multiplicative inverse Equivalent (simplest) forms of solutions may be expected, but not assumed.		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

Mathematics		7.NS.A.2.c
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>2</b>	Apply and extend previous understandings of numbers to multiply and divide rational numbers.	
<b>c</b>	Understand that every quotient of integers (with non-zero divisor) is a rational number.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
The student will understand that dividing an integer by another integer, other than zero, results in a rational number.		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
The student will understand any number that can be expressed as the ratio of two integers is a rational number.		
The student will understand that any value divided by zero is undefined.		
The student will understand the definition of a rational number as compared to other groups of numbers (naturals, wholes and integers).		
The student will understand that the natural numbers are a subset of the whole numbers which are a subset of the integers which are a subset of the rational numbers.		
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Sample Stems</u></b> $\frac{1}{2}$ Is $\frac{1}{2}$ rational? Explain your answer. $\frac{3}{1}$ Is $\frac{\pi}{1}$ rational?  John says $\frac{1}{3}$ is not rational. Jane believes $\frac{1}{3}$ is rational. Who is correct? John, with correct reasoning John, with incorrect reasoning Jane, with correct reasoning Jane, with incorrect reasoning  John believes zero is not rational because $\frac{1}{0}$ does not work on his calculator.
<b><u>Calculator Designation</u></b>		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

Mathematics		7.NS.A.2.d
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>2</b>	Apply and extend previous understandings of numbers to multiply and divide rational numbers.	
<b>d</b>	Convert a rational number to a decimal.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will understand that all rational numbers can be written as a decimal or as a fraction.		3
The student will be able to convert a rational number to a decimal.		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
May include terminating decimals or repeating decimals that are:		<b>NO</b> – a calculator will not be available for items
<ul style="list-style-type: none"> <li>• Single digit repeaters that are not benchmarks. (e.g., <math>2/9 = 0.\overline{2}</math>)</li> <li>• Two digit repeating pattern. (e.g., <math>43/99 = 0.\overline{43}</math>)</li> <li>• One non-repeating before the repeating (start repeating at the hundredths place). (e.g., <math>5/6 = 0.8\overline{3}</math>)</li> </ul>		
Assessments will use the vinculum notation (“bar” $0.\overline{43}$ ) to denote repeated digits and not the ellipsis (...) or other notation.		

# Grade 7 Mathematics

Mathematics		7.NS.A.2.e
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>2</b>	Apply and extend previous understandings of numbers to multiply and divide rational numbers.	
<b>e</b>	Understand that all rational numbers can be written as fractions or decimal numbers that terminate or repeat.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will understand that some rational numbers can be written as integers.		3
The student will understand that all rational numbers can be written as a ratio of integers.		<b><u>Item Format</u></b>
The student will understand that all rational numbers can be written as a decimal that terminate or repeat.		Selected Response Constructed Response Technology Enhanced
The student will understand how to represent non-ending and nonrepeating decimals.		<b><u>Sample Stems</u></b>
The student will understand that the symbols that denote repetition of the decimal expansion of a rational number allow for the use of an equal sign ( $2/9 = 0.\overline{2}$ , $2/9 \approx 0.22222222$ ).		
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
May include terminating decimals or repeating decimals that are: <ul style="list-style-type: none"> <li>• Single digit repeaters that are not benchmarks. (e.g., <math>2/9 = 0.\overline{2}</math>)</li> <li>• Two digit repeating pattern. (e.g., <math>43/99 = 0.\overline{43}</math>)</li> <li>• One non-repeating before the repeating (start repeating at the hundredths place). (e.g., <math>5/6 = 0.8\overline{3}</math>)</li> </ul> Assessments will use the vinculum notation ("bar" $0.\overline{43}$ ) to denote repeated digits and not the ellipsis (...) or other notation.		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.NS.A.2.f</b>
<b>NS</b>	<b>Number Sense and Operations</b>	
<b>A</b>	<b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b>	
<b>2</b>	Apply and extend previous understandings of numbers to multiply and divide rational numbers.	
<b>f</b>	Interpret products and quotients of rational numbers by describing real-world contexts.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will solve problems involving multiplication of rational numbers.		3
The student will solve problems involving division of rational numbers.		<b><u>Item Format</u></b>
The student will interpret products of rational numbers by describing real-world contexts.		Selected Response Constructed Response Technology Enhanced
The student will interpret quotients of rational numbers by describing real-world contexts.		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Equivalent (simplify, simplest, reduced) forms may be required, but not assumed.		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.NS.A.3</b>
<b>NS A 3</b>	<p><b>Number Sense and Operations</b></p> <p><b>Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.</b></p> <p>Solve problems involving the four arithmetic operations with rational numbers.</p>	
<u><b>Expectation Unwrapped</b></u>		<u><b>DOK Ceiling</b></u> 3
<p>The student will be able to add rational numbers.</p> <p>The student will be able to subtract rational numbers.</p> <p>The student will be able to multiply rational numbers.</p> <p>The student will be able to divide rational numbers.</p> <p>The student will be able to solve real-world problems using the four arithmetic operations with rational numbers.</p>		<u><b>Item Format</b></u> Selected Response Constructed Response Technology Enhanced
		<u><b>Sample Stems</b></u>
<u><b>Content Limits/Assessment Boundaries</b></u>		<u><b>Calculator Designation</b></u>
Equivalent (simplify, simplest, reduced) forms may be required, but not assumed.		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.EE1.A.1</b>
<b>EEI A 1</b>	<p><b>Expressions, Equations and Inequalities</b></p> <p><b>Use properties of operations to generate equivalent expressions.</b></p> <p>Apply properties of operations to simplify and to factor linear algebraic expressions with rational coefficients.</p>	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
<p>The student will understand and apply properties of operations to simplify linear algebraic expressions with rational coefficients.</p> <p>The student will find common multiples in algebraic expressions.</p> <p>The student will understand and apply properties of operations to factor linear algebraic expressions with rational coefficients.</p>		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Decimals should be limited to the hundredths place.		<b>NEUTRAL</b> – a calculator may or may not be available for items



# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.EE1.A.2</b>
<b>EEI A 2</b>	<p><b>Expressions, Equations and Inequalities</b></p> <p><b>Use properties of operations to generate equivalent expressions.</b></p> <p>Understand how to use equivalent expressions to clarify quantities in a problem.</p>	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
<p>The student will be able to use equivalent expressions to clarify quantities in a problem.</p> <p>The student will be able to recognize and combine like terms.</p>		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
<p>Decimals should be limited to the hundredths place.</p> <p>Limit variables to the first power.</p>		<b>YES – a calculator will be available for items</b>

# Grade 7 Mathematics

Mathematics		7.EE1.B.3.a
<b>EEI</b>	<b>Expressions, Equations and Inequalities</b>	
<b>B</b>	<b>Solve problems using numerical and algebraic expressions and equations.</b>	
<b>3</b>	Solve multi-step problems posed with rational numbers.	
<b>a</b>	Convert between equivalent forms of the same number.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will be able to translate between equivalent forms of rational numbers to solve problems.		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit decimals to the hundredths place. Limit converting decimals to fractions to ending decimals to the hundredths place. Limit order of operation items to five operations		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.EE1.B.3.b</b>
<b>EEI</b>	<b>Expressions, Equations and Inequalities</b>	
<b>B</b>	<b>Solve problems using numerical and algebraic expressions and equations.</b>	
<b>3</b>	Solve multi-step problems posed with rational numbers.	
<b>b</b>	Assess the reasonableness of answers using mental computation and estimation strategies.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will be able to use mental computation and estimation strategies, in order to assess the reasonableness of their answers when solving problems.		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
		Sale of 30% off and then an additional 10% off. Which of the following calculations are correct?  An investment lost 12% of its value.
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit decimals to the hundredths place.		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.EE1.B.4.a</b>
<b>EEI</b>	<b>Expressions, Equations and Inequalities</b>	
<b>B</b>	<b>Solve problems using numerical and algebraic expressions and equations.</b>	
<b>4</b>	Write and/or solve linear equations and inequalities in one variable.	
<b>a</b>	Write and/or solve equations of the form $x+p = q$ and $px = q$ in which $p$ and $q$ are rational numbers.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
<p>The student will be able to write one-step equations with rational numbers involving addition or subtraction with unknowns in all positions.</p> <p>The student will be able to write one-step equations with rational numbers involving multiplication or division with unknowns in all positions.</p> <p>The student will be able to solve one-step equations with rational numbers involving addition or subtraction with unknowns in all positions.</p> <p>The student will be able to solve one-step equations with rational numbers involving multiplication or division with unknowns in all positions.</p>		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit decimals to the hundredths place. The variable cannot be in the denominator. When prompted to write an equation the problem should be in a real-world context. Equivalent (simplify, simplest, reduced) forms may be required, but not assumed.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.EE1.B.4.b</b>
<b>EEI</b>	<b>Expressions, Equations and Inequalities</b>	
<b>B</b>	<b>Solve problems using numerical and algebraic expressions and equations.</b>	
<b>4</b>	Write and/or solve linear equations and inequalities in one variable.	
<b>b</b>	Write and/or solve two-step equations of the form $px + q = r$ and $p(x + q) = r$ , where $p$ , $q$ and $r$ are rational numbers, and interpret the meaning of the solution in the context of the problem.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
<p>The student will write two-step equations involving the four operations on rational numbers, including those with the distributive property and with the unknown in all positions.</p> <p>The student will solve two-step equations involving the four operations on rational numbers, including those with the distributive property and with the unknown in all positions.</p> <p>The student will interpret the meaning of the solution in the two-step equation in the context of the problem.</p>		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
<p>Limit decimals to the hundredths place.</p> <p>When prompted to write an equation the problem should be in a real-world context.</p> <p>Equivalent (simplify, simplest, reduced) forms may be required, but not assumed.</p>		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.EE1.B.4.c</b>
<b>EEI</b>	<b>Expressions, Equations and Inequalities</b>	
<b>B</b>	<b>Solve problems using numerical and algebraic expressions and equations.</b>	
<b>4</b>	Write and/or solve linear equations and inequalities in one variable.	
<b>c</b>	Write, solve and/or graph inequalities of the form $px + q > r$ or $px + q < r$ , where $p$ , $q$ and $r$ are rational numbers.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will write two-step inequalities with rational numbers.		3
The student will solve two-step inequalities with rational numbers.		<b><u>Item Format</u></b>
The student will graph two-step inequalities with rational numbers.		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit decimals to the hundredths place.		YES – a calculator will be available for items
When prompted to write an inequality the problem should be in a real-world context.		
Equivalent (simplify, simplest, reduced) forms may be required, but not assumed.		

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.GM.A.1</b>
<b>GM A 1</b>	<p><b>Geometry and Measurement</b></p> <p><b>Draw and describe geometrical figures and describe the relationships between them.</b></p> <p>Solve problems involving scale drawings of real objects and geometric figures, including computing actual lengths and areas from a scale drawing and reproducing the drawing at a different scale.</p>	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
<p>The student will solve problems involving scale drawings of real objects and geometric figures.</p> <p>The student will be able to compute actual lengths from scale drawings of real objects and geometric figures.</p> <p>The student will be able to compute actual area from scale drawings of real objects and geometric figures.</p> <p>The student will be able to produce a scale drawing using a different scale.</p>		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
<p>May include fractions limited to the benchmark fractions and/or their decimal equivalents.</p>		<p><b>YES</b> – a calculator will be available for items</p>

# Grade 7 Mathematics

Mathematics		7.GM.A.2.a
<b>GM</b>	<b>Geometry and Measurement</b>	
<b>A</b>	<b>Draw and describe geometrical figures and describe the relationships between them.</b>	
<b>2</b>	Use a variety of tools to construct geometric shapes.	
<b>a</b>	Determine if provided constraints will create a unique triangle through construction.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
<p>The student will determine through construction if three provided side lengths defines a unique triangle.</p> <p>The student will determine through construction if two provided side lengths and the included angle measure defines a unique triangle.</p> <p>The student will determine through construction if two provided angle measures and the included side length defines a unique triangle.</p> <p>The student will determine through construction if two provided angle measures and a non-included side length defines a unique triangle.</p> <p>The student will determine through construction if three provided angle measures defines a unique triangle.</p> <p>The student will determine through construction if two provided side lengths and a non-included angle measure defines a unique triangle.</p> <p>The student will determine through construction the relationship between the side lengths of a triangle (triangle inequality).</p>		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit side lengths and angle measures to whole numbers.		<b>YES</b> – a calculator will be available for items



# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.GM.A.2.b</b>
<b>GM</b>	<b>Geometry and Measurement</b>	
<b>A</b>	<b>Draw and describe geometrical figures and describe the relationships between them.</b>	
<b>2</b>	Use a variety of tools to construct geometric shapes.	
<b>b</b>	Construct special quadrilaterals given specific parameters.	
<u><b>Expectation Unwrapped</b></u>		<u><b>DOK Ceiling</b></u>
The student will construct special quadrilaterals given specific parameters.		3
		<u><b>Item Format</b></u>
		Selected Response Constructed Response Technology Enhanced
<u><b>Content Limits/Assessment Boundaries</b></u>		<u><b>Sample Stems</b></u>
Limit side lengths and angle measures to whole numbers.		
		<u><b>Calculator Designation</b></u>
		<b>NEUTRAL</b> – a calculator may or may not be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.GM.A.3</b>
<b>GM</b>	<b>Geometry and Measurement</b>	
<b>A</b>	<b>Draw and describe geometrical figures and describe the relationships between them.</b>	
<b>3</b>	Describe two-dimensional cross sections of pyramids, prisms, cones and cylinders.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
<p>The student will be able to identify the two-dimensional cross sections of pyramids, prisms, cones and cylinders when the figures are sliced parallel to the base.</p> <p>The student will be able to identify the two-dimensional cross sections of pyramids, prisms, cones and cylinders when the figures are sliced perpendicular to the base.</p>		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
All items should include a graphic. All graphics must include a clear representation of the cross section. Cones that are sliced perpendicular to the base must go through the vertex.		<b>NO</b> – a calculator will not be available for items

# Grade 7 Mathematics

Mathematics		7.GM.A.4.a
<b>GM</b>	<b>Geometry and Measurement</b>	
<b>A</b>	<b>Draw and describe geometrical figures and describe the relationships between them.</b>	
<b>4</b>	Understand the concepts of circles.	
<b>a</b>	Analyze the relationships among the circumference, the radius, the diameter, the area and Pi in a circle.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will understand that two times the radius is diameter $2r = d$ .		3
The student will understand that radius is the one half the diameter $r = d/2$ .		<b><u>Item Format</u></b>
The student will understand that circumference is $C = \pi d$ .		Selected Response Constructed Response Technology Enhanced
The student will understand that Area of a circle is pi times radius squared $A = \pi r^2$ .		<b><u>Sample Stems</u></b>
The student will understand that the value of pi can be derived by taking the circumference of circle and dividing it by its diameter $\pi = \frac{C}{d}$ .		
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
<p style="background-color: yellow;">In the item embed the most appropriate value of <math>\pi</math>.</p> Answers should not be given in terms of $\pi$ . Indicate the expected place value of the rounded answer.		YES – a calculator will be available for items

# Grade 7 Mathematics

Mathematics		7.GM.A.4.b
<b>GM</b>	<b>Geometry and Measurement</b>	
<b>A</b>	<b>Draw and describe geometrical figures and describe the relationships between them.</b>	
<b>4</b>	Understand the concepts of circles.	
<b>b</b>	Know and apply the formulas for circumference and area of circles to solve problems.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will know the formula for circumference $C = \pi d$ .		3
The student will be able to use the formula $C = \pi d$ to solve problems involving circumference of circles.		<b><u>Item Format</u></b>
The student will know the formula for area of a circle $A = \pi r^2$ .		Selected Response Constructed Response Technology Enhanced
The student will be able to use $A = \pi r^2$ to solve problems involving areas of circles.		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
<p style="background-color: yellow;">In the item embed the most appropriate value of <math>\pi</math>.</p> Answers should not be given in terms of $\pi$ . Indicate the expected place value of the rounded answer. Items will not expect students to solve for the radius.		YES – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.GM.B.5</b>
<b>GM B 5</b>	<p><b>Geometry and Measurement</b></p> <p><b>Apply and extend previous understanding of angle measure, area and volume.</b></p> <p>Use angle properties to write and solve equations for an unknown angle.</p>	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
<p>The student will understand the complementary angles have a sum of <math>90^\circ</math>.</p> <p>The student will understand the supplementary angles have a sum of <math>180^\circ</math>.</p> <p>The student will understand that vertical angles are congruent.</p> <p>The student will understand that adjacent angles share a vertex and side.</p> <p>The student will use their knowledge of angle properties listed above, to write and solve multi-step problems for an unknown angle measure.</p>		3
		<b><u>Item Format</u></b>
		<p>Selected Response</p> <p>Constructed Response</p> <p>Technology Enhanced</p>
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
<p>Equations should be limited to one or two-step equations when solving for an unknown value.</p>		<p><b>YES</b> – a calculator will be available for items</p>

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.GM.B.6.a</b>
<b>GM</b>	<b>Geometry and Measurement</b>	
<b>B</b>	<b>Apply and extend previous understanding of angle measure, area and volume.</b>	
<b>6</b>	Understand the relationship between area, surface area and volume.	
<b>a</b>	Find the area of triangles, quadrilaterals and other polygons composed of triangles and rectangles.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The students will be able to find the area of quadrilaterals and other polygons composed of triangles and rectangles.		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit to rational numbers.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

Mathematics		7.GM.B.6.b
<b>GM</b>	<b>Geometry and Measurement</b>	
<b>B</b>	<b>Apply and extend previous understanding of angle measure, area and volume.</b>	
<b>6</b>	Understand the relationship between area, surface area and volume.	
<b>b</b>	Find the volume and surface area of prisms, pyramids and cylinders.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
<p>The student will understand the relationship of area, surface area and volume:</p> <ul style="list-style-type: none"> <li>• Surface Area is the sum of the areas of all of the bases and faces of the solid.</li> <li>• Volume of a prisms and cylinders is the area of the base x height of the solid.</li> </ul> <p>Volume of a pyramid is the area of the base x height of the solid x one third..</p> <p>The student will be able to find the volume and surface area of prisms.</p> <ul style="list-style-type: none"> <li>• Cubes</li> <li>• Right rectangular prisms</li> <li>• Right triangular prisms</li> </ul> <p>The student will be able to find the volume and surface area of pyramids.</p> <ul style="list-style-type: none"> <li>• Right rectangular pyramids</li> <li>• Right triangular pyramids</li> </ul> <p>The student will be able to find the volume and surface areas of cylinders.</p>		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Provide formulas for volume and surface area of prisms, pyramids and cylinders.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.DSP.A.1.a</b>
<b>DSP A 1 a</b>	<p><b>Data Analysis, Statistics and Probability</b></p> <p><b>Use random sampling to draw inferences about a population</b></p> <p>Understand that statistics can be used to gain information about a population by examining a sample of the population.</p> <p>Understand that a sample is a subset of a population.</p>	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
<p>The student will understand that a sample is a subset of a population.</p> <p>The student will understand that both the population and both the sample and the population have similar characteristics.</p>		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b> <b>NEUTRAL</b> – a calculator may or may not be available for items



# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.DSP.A.1.b</b>
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>A</b>	<b>Use random sampling to draw inferences about a population</b>	
<b>1</b>	Understand that statistics can be used to gain information about a population by examining a sample of the population.	
<b>b</b>	Understand that generalizations from a sample are valid only if the sample is representative of the population.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will understand that generalizations from a sample are valid only if the sample is representative of the population.		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
		<b>NEUTRAL</b> – a calculator may or may not be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.DSP.A.1.c</b>
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>A</b>	<b>Use random sampling to draw inferences about a population</b>	
<b>1</b>	Understand that statistics can be used to gain information about a population by examining a sample of the population.	
<b>c</b>	Understand that random sampling is used to produce representative samples and support valid inferences.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will understand the concept of random sampling.		3
The student will understand that random sampling is used to produce representative samples of a given population.		<b><u>Item Format</u></b>
The student will use random sampling to support valid inferences about a given population.		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
		YES – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.DSP.A.2</b>
<b>DSP A 2</b>	<p><b>Data Analysis, Statistics and Probability</b></p> <p><b>Use random sampling to draw inferences about a population</b></p> <p>Use data from multiple samples to draw inferences about a population and investigate variability in estimates of the characteristic of interest.</p>	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
<p>The student will be able to use data from multiple samples to make conclusions about a population as a whole.</p> <p>The student will be able to make comparisons of data from the multiple samples and the actual results.</p> <p>The student will be able to determine the variation between the estimates or predictions from the sample, and the actual event.</p>		3
		<b><u>Item Format</u></b>
		<p>Selected Response</p> <p>Constructed Response</p> <p>Technology Enhanced</p>
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
		<p><b>YES</b> – a calculator will be available for items</p>

# Grade 7 Mathematics

Mathematics		7.DSP.B.3
<b>DSP B 3</b>	<b>Data Analysis, Statistics and Probability</b> <b>Draw informal comparative inferences about two populations.</b> Analyze different data distributions using statistical measures.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
The student will analyze two different data distributions using mean.  The student will analyze two different data distributions using mean absolute deviation.		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Not creating or computing statistical measures, only analyzing.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

Mathematics		7.DSP.B.4
<b>DSP B 4</b>	<p><b>Data Analysis, Statistics and Probability</b></p> <p><b>Draw informal comparative inferences about two populations.</b></p> <p>Compare the numerical measures of center, measures of frequency and measures of variability from two random samples to draw inferences about the population.</p>	
<u><b>Expectation Unwrapped</b></u>		<u><b>DOK Ceiling</b></u> 3
<p>The student will be able to compare measures of center of two random samples, and use them to make inferences about the population.</p> <ul style="list-style-type: none"> <li>• Mean</li> <li>• Median</li> </ul> <p>The student will be able to compare measures of frequency of two random samples, and use them to make inferences about the population.</p> <ul style="list-style-type: none"> <li>• Mode</li> </ul> <p>The student will be able to compare measures of variability of two random samples, and use them to make inferences about the population.</p> <ul style="list-style-type: none"> <li>• Range</li> <li>• Interquartile Range</li> <li>• Mean Absolute Deviation</li> </ul>		<u><b>Item Format</b></u> Selected Response Constructed Response Technology Enhanced
<u><b>Content Limits/Assessment Boundaries</b></u>		<u><b>Calculator Designation</b></u>
Limit data sets to no more than seven values.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

Mathematics		7.DSP.C.5.a
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>C</b>	<b>Develop, use and evaluate probability models.</b>	
<b>5</b>	Investigate the probability of chance events.	
<b>a</b>	Determine probabilities of simple events.	
<p style="text-align: center;"><b><u>Expectation Unwrapped</u></b></p> <p>The student will understand the concept of a simple event.</p> <p>The student will be able to determine the probabilities of simple events.</p>		<p style="text-align: center;"><b><u>DOK Ceiling</u></b></p> <p style="text-align: center;">3</p> <hr/> <p style="text-align: center;"><b><u>Item Format</u></b></p> <p>Selected Response Constructed Response Technology Enhanced</p> <hr/> <p style="text-align: center;"><b><u>Sample Stems</u></b></p>
<p style="text-align: center;"><b><u>Content Limits/Assessment Boundaries</u></b></p>		<p style="text-align: center;"><b><u>Calculator Designation</u></b></p> <p>YES – a calculator will be available for items</p>

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.DSP.C.5.b</b>
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>C</b>	<b>Develop, use and evaluate probability models.</b>	
<b>5</b>	Investigate the probability of chance events.	
<b>b</b>	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
<p>The student will understand the probability of a chance event is a number between 0 and 1:</p> <p>The student will understand the value of the number between 0 and 1 expresses the likelihood of the event occurring.</p> <ul style="list-style-type: none"> <li>• A probability closer to “0” indicates an unlikely event.</li> <li>• A probability closer to “<math>\frac{1}{2}</math>” indicates the event is neither likely nor unlikely.</li> <li>• A probability closer to “1” indicates a likely event.</li> </ul>		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit percentage value to whole percents.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

Mathematics		7.DSP.C.6.a
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>C</b>	<b>Develop, use and evaluate probability models.</b>	
<b>6</b>	Investigate the relationship between theoretical and experimental probabilities for simple events.	
<b>a</b>	Predict outcomes using theoretical probability.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b> 3
The student will understand the concept of theoretical probability.		<b><u>Item Format</u></b> Selected Response Constructed Response Technology Enhanced
The student will be able to predict outcomes using theoretical probability.		
		<b><u>Sample Stems</u></b> A spinner has 10 equal sections. 4 blue, 2 yellow, 3 green, and 1 red. If the spinner is spun 200 times, how many times would you expect to land on yellow?
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit percentage value to whole percents.		<b>YES</b> – a calculator will be available for items



# Grade 7 Mathematics

Mathematics		7.DSP.C.6.b
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>C</b>	<b>Develop, use and evaluate probability models.</b>	
<b>6</b>	Investigate the relationship between theoretical and experimental probabilities for simple events.	
<b>b</b>	Perform experiments that model theoretical probability.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will perform experiments that model theoretical probability.		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
		<b>NEUTRAL</b> – a calculator may or may not be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.DSP.C.6.c</b>
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>C</b>	<b>Develop, use and evaluate probability models.</b>	
<b>6</b>	Investigate the relationship between theoretical and experimental probabilities for simple events.	
<b>c</b>	Compare theoretical and experimental probabilities.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will understand the difference between theoretical and experimental probabilities.		3
The student will be able to compare theoretical and experimental probability.		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit percentage value to whole percents.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.DSP.C.7.a</b>
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>C</b>	<b>Develop, use and evaluate probability models.</b>	
<b>7</b>	Explain possible discrepancies between a developed probability model and observed frequencies.	
<b>a</b>	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will develop a uniform probability model by assigning equal probability to all outcomes.		3
The student will use a probability model to determine probabilities of events.		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
		If a student is selected at random, find the probability that Jane will be selected and the probability that a girl will be selected.
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit percentage value to whole percents.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.DSP.C.7.b</b>
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>C</b>	<b>Develop, use and evaluate probability models.</b>	
<b>7</b>	Explain possible discrepancies between a developed probability model and observed frequencies.	
<b>b</b>	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will be able to explain discrepancies between theoretical probability and frequencies of an experiment.		3
The student will use observations from a chance process to develop a probability model.		<b><u>Item Format</u></b>
The student will be able to observe frequencies in data, in a chance process, to assess the probability.		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit percentage value to whole percents.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

Mathematics		7.DSP.C.8.a
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>C</b>	<b>Develop, use and evaluate probability models.</b>	
<b>8</b>	Find probabilities of compound events using organized lists, tables, tree diagrams and simulations.	
<b>a</b>	Represent the sample space of a compound event.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
<p>The student will be able to represent sample space for compound events by creating:</p> <ul style="list-style-type: none"> <li>• Organized lists</li> <li>• Tables</li> <li>• Tree diagrams</li> <li>• Simulations</li> </ul> <p>The student will be able to identify the outcomes in the sample space which represents the compound event.</p>		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limited to two events.		<b>YES</b> – a calculator will be available for items

# Grade 7 Mathematics

<b>Mathematics</b>		<b>7.DSP.C.8.b</b>
<b>DSP</b>	<b>Data Analysis, Statistics and Probability</b>	
<b>C</b>	<b>Develop, use and evaluate probability models.</b>	
<b>8</b>	Find probabilities of compound events using organized lists, tables, tree diagrams and simulations.	
<b>b</b>	Design and use a simulation to generate frequencies for compound events.	
<b><u>Expectation Unwrapped</u></b>		<b><u>DOK Ceiling</u></b>
The student will be able to design and use a simulation to generate the frequencies for compound events.		3
		<b><u>Item Format</u></b>
		Selected Response Constructed Response Technology Enhanced
		<b><u>Sample Stems</u></b>
<b><u>Content Limits/Assessment Boundaries</u></b>		<b><u>Calculator Designation</u></b>
Limit percentage value to whole percents. Limit the item to assess either design or use but not both.		<b>YES</b> – a calculator will be available for items