# Grade 3 Mathematics Item Specifications

# Table of Contents

# 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.

**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 3 Mathematics

<table>
<tr><th colspan="2">Mathematics</th><th>3.NBT.A.1</th></tr>
<tr><td>NBT<br>A<br>1</td><td colspan="2">Number Sense and Operations in Base Ten<br>Use place value understanding and properties of operations to perform multi-digit arithmetic<br>Round whole numbers to the nearest 10 or 100.</td></tr>
<tr><td colspan="2"><u>Expectation Unwrapped</u><br><br>The student will round one to three digit whole numbers to the nearest ten.<br><br>The student will round two to four digit whole numbers to the nearest one hundred.</td><td><u>DOK Ceiling</u><br>2<br><br><u>Item Format</u><br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br><u>Sample Stems</u><br>“Find the estimate of_____by rounding to the nearest_____.”<br><br>“About how much would_____be rounded to the nearest_____?”<br><br>Select the numbers that round to 3000 when rounded to the nearest thousand. Mark all that apply:</td></tr>
<tr><td colspan="2"><u>Content Limits/Assessment Boundaries</u><br>Limit given numbers to four digits. May use 9,999.</td><td><u>Calculator Designation</u><br><br>NO – a calculator will not be available for items</td></tr>
</table>

# Grade 3 Mathematics

| Mathematics | | 3.NBT.A.2 |
|---|---|---|
| **NBT** | **Number Sense and Operations in Base Ten** | |
| **A** | **Use place value understanding and properties of operations to perform multi-digit arithmetic** | |
| **2** | Read, write and identify whole numbers within one hundred thousand using base ten numerals, number names and expanded form. | |

**Expectation Unwrapped**

The student will write or identify numbers within and including one hundred thousand in base ten numerals (standard form) from number names (word form).

The student will write or identify numbers within and including one hundred thousand in base ten numerals (standard form) from expanded form.

The student will write or identify numbers within and including one hundred thousand in number names (word form) from base ten numerals (standard form).

The student will write or identify numbers within and including one hundred thousand in number names (word form) from expanded form.

The student will identify numbers within and including one hundred thousand in expanded form from base ten numerals (standard form).

The student will identify numbers within and including one hundred thousand in expanded form from number names (word form).

The student will be able to convert between number names (word form), base ten numerals (standard form) and expanded form in numbers up to one hundred thousand.

**DOK Ceiling**

2

**Item Format**

Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

Select two ways that the number 48,321 can be represented.

**Content Limits/Assessment Boundaries**

For large scale assessment purposes, use “base ten numerals”, “number names” and “expanded form”.
For classroom purposes “base ten numerals” and “standard form” may be used interchangeably.
For classroom purposes “number names” and “word form” may be used interchangeably.
Numbers included begin at one and are not greater than one hundred thousand.
**Do not** use multiplication symbols within the expanded form. (e.g., 642= (6x100) + (4x10) + (2x1))
Expanded form must be completely expanded.

**Calculator Designation**

**NO** – a calculator will not be available for items

# Grade 3 Mathematics

| Mathematics | | 3.NBT.A.3 |
|---|---|---|
| **NBT**<br>**A**<br>**3** | **Number Sense and Operations in Base Ten**<br>**Use place value understanding and properties of operations to perform multi-digit arithmetic**<br>Demonstrate fluency with addition and subtraction within 1000. | |

**Expectation Unwrapped**

The student will use multiple representations to model real-world and mathematic problems involving addition and subtraction within one thousand.

The student will critique the reasoning of others, identifying errors and alternate approaches to solving problems involving addition and subtraction within one thousand.

The student will decontextualize and contextualize problems and solutions to explain his or her reasoning in addition and subtraction problems within one thousand.

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 addition and subtraction within one thousand.

The student will communicate his or her reasoning precisely to problems involving addition and subtraction within one thousand.

**DOK Ceiling**

3

**Item Format**

Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

**478 + 292 =**

Determine which sums are close to 600. a. 393 + 225= b. 481 + 315= c. 395 + 215 = d. 372 + 338 =

Determine which differences are close to 600. a. 953 – 472 = b. 845 – 195 = c. 765 – 192 = d. 798 – 212 =

**Content Limits/Assessment Boundaries**

Addends, minuends, subtrahends, sums and differences are limited to one thousand or less.

**Calculator Designation**

**NO –** a calculator will not be available for items

# Grade 3 Mathematics

| Mathematics | | 3.NBT.A.4 |
|---|---|---|
| **NBT**<br>**A**<br>**4** | **Number Sense and Operations in Base Ten**<br>**Use place value understanding and properties of operations to perform multi-digit arithmetic**<br>Multiply whole numbers by multiples of 10 in the range 10-90. | |

**Expectation Unwrapped**

The student will find the product of a one-digit whole number with a multiple of ten using strategies based on place value.

The student will use alternative strategies for computing a one-digit whole number with a multiple of ten using properties of operations.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

Multiply 60x5.

What is a way to solve 6x70? (answer: multiply 6x7 to get 42, then multiply 42x10)

9 x 80
50 x 6

What number makes the equation true? 80 x open box = 240

**Content Limits/Assessment Boundaries**

Limit the multiples of ten to a range of ten to ninety.
Properties of operations limited to commutative and associative properties of multiplication.

**Calculator Designation**

**NO** – a calculator will not be available for items

# Grade 3 Mathematics

| Mathematics | | 3.NF.A.1 |
|---|---|---|
| NF<br>A<br>1 | **Number Sense and Operations in Fractions**<br>**Develop understanding of fractions as numbers**<br>Understand a unit fraction as the quantity formed by one part when a whole is partitioned into equal parts. | |

**Expectation Unwrapped**

The student will identify the name of the unit fraction of a whole when that whole is divided into two equal parts.

The student will identify the name of the unit fraction of a whole when that whole is divided into three equal parts.

The student will identify the name of the unit fraction of a whole when that whole is divided into four equal parts.

The student will identify the name of the unit fraction of a whole when that whole is divided into six equal parts.

The student will identify the name of the unit fraction of a whole when that whole is divided into eight equal parts.

**DOK Ceiling**

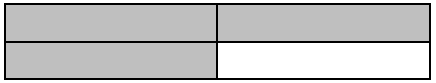
3

**Item Format**

Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

Area models: What fraction names the shaded part?



Which of the following shapes are partitioned into fourths?

Number Lines
What fraction names point A on the number line?
Locate and draw point F on the number line to represent the fraction 1/2
What fraction does the shaded bar represent?

# Grade 3 Mathematics

| Content Limits/Assessment Boundaries | Calculator Designation |
| --- | --- |
| Limit to fractions with denominators 2, 3, 4, 6 or 8. | **NO** – a calculator will not be available for items |

# Grade 3 Mathematics

| Mathematics | | 3.NF.A.2.a |
|---|---|---|
| **NF** | **Number Sense and Operations in Fractions** | |
| **A** | **Develop understanding of fractions as numbers** | |
| **2** | Understand that when a whole is partitioned equally, a fraction can be used to represent a portion of the whole. | |
| **a** | Describe the numerator as representing the number of pieces being considered. | |

**Expectation Unwrapped**

The student will identify the fraction indicated by a whole that has been divided into equal parts.

The student will describe the numerator as representing the number of pieces being considered.

The student will shade the parts of a whole represented by a given fraction.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**
**What does the numerator 3 represent in the given fraction?**

**The model shows one whole. Shade in ¾ of the model.**

**Content Limits/Assessment Boundaries**

Limit to fractions with denominators 2, 3, 4, 6 or 8.
A third grade student is expected to know the term numerator.

**Calculator Designation**

**NO** – a calculator will not be available for items

# Grade 3 Mathematics

| Mathematics | | 3.NF.A.2.b |
|---|---|---|
| **NF** | **Number Sense and Operations in Fractions** | |
| **A** | **Develop understanding of fractions as numbers** | |
| **2** | Understand that when a whole is partitioned equally, a fraction can be used to represent a portion of the whole. | |
| **b** | Describe the denominator as the number of pieces that make the whole. | |

**Expectation Unwrapped**

The student will identify the fraction of a whole that has been divided into equal parts.

The student will describe the denominator as the number of pieces that make up the whole.

The student will choose a picture that has been divided into equal parts based on the given denominator.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**
Carson rode his bike along a bike trail that was ¼ of a mile long. What image represents the length of the bike trail in miles?

Which picture shows a number line partitioned into eighths?

**Content Limits/Assessment Boundaries**
Limit to fractions with denominators 2, 3, 4, 6 or 8.
A third grade student is expected to know the term denominator.

**Calculator Designation**

**NO** – a calculator will not be available for items

# Grade 3 Mathematics

| Mathematics | | 3.NF.A.3.a |
|---|---|---|
| **NF** | **Number Sense and Operations in Fractions** | |
| **A** | **Develop understanding of fractions as numbers** | |
| **3** | Represent fractions on a number line. | |
| **a** | Understand the whole is the interval from 0 to 1. | |

**Expectation Unwrapped**

The student will identify the interval from zero to one on a number line as one whole unit.

The student will recognize the fraction represents the distance from zero on a number line.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**
What fraction names point A on the number line?

Marcia drew a number line partitioned into 8 equal parts. What fraction names point B on the number line?

**Content Limits/Assessment Boundaries**
This concept is foundational for the understanding of fractions.

**Calculator Designation**

**NO** – a calculator will not be available for items

# Grade 3 Mathematics

| Mathematics | | 3.NF.A.3.b |
|---|---|---|
| **NF** | **Number Sense and Operations in Fractions** | |
| **A** | **Develop understanding of fractions as numbers** | |
| **3** | Represent fractions on a number line. | |
| **b** | Understand the whole is partitioned into equal parts. | |

**Expectation Unwrapped**

The student will identify a number line that has been divided into equal parts.

The student will explain that the parts of the whole must be equal in order to represent fractional parts.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

**Content Limits/Assessment Boundaries**

Limit to 2, 3, 4, 6 or 8 parts.

**Calculator Designation**

**NO –** a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.NF.A.3.c |
|---|---|---|
| **NF** | **Number Sense and Operations in Fractions** | |
| **A** | **Develop understanding of fractions as numbers** | |
| **3** | Represent fractions on a number line. | |
| **c** | Understand a fraction represents the endpoint of the length a given number of partitions from 0. | |

**Expectation Unwrapped**

The student will name fractions shown on an unlabeled partitioned number line based on the~~ir~~ relationship to zero.

The student will label or identify fractions on a number line greater than zero but less than one.

The student will label or identify the fractional point as a mixed number on a given number line beyond one whole unit.

The student will label or identify the fractional point as an improper fraction on a given number line beyond one whole unit.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

What fraction names point A on the number line?

Which point on the number line represents 2/3?

**Content Limits/Assessment Boundaries**
Limit to fractions with denominators 2, 3, 4, 6 **or** 8.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

<table>
<tr><th colspan="2">Mathematics</th><th>3.NF.A.4</th></tr>
<tr><td>NF<br>A<br>4</td><td colspan="2">Number Sense and Operations in Fractions<br>Develop understanding of fractions as numbers<br>Demonstrate that two fractions are equivalent if they are the same size, or the same point on a number line.</td></tr>
<tr><td colspan="2" rowspan="2"><u>Expectation Unwrapped</u><br><br>The student will use visual models to demonstrate that two fractions are equivalent if they are the same size.<br><br>The student will use number lines to demonstrate that two fractions are equivalent if they are the same distance from zero.</td><td><u>DOK Ceiling</u><br>2</td></tr>
<tr><td><u>Item Format</u><br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br><u>Sample Stems</u><br><br>Given two images, determine whether or not the fractions are equivalent.<br><br>Image may be a number line partitioned two different ways or a fraction bar partitioned two different ways.</td></tr>
<tr><td colspan="2"><u>Content Limits/Assessment Boundaries</u><br>Limit to fractions with denominators 2, 3, 4, 6 or 8.<br>Visual models include: fraction bars, fraction circles and number lines.</td><td><u>Calculator Designation</u><br><br>NO – a calculator will not be available for items</td></tr>
</table>

## Grade 3 Mathematics

| Mathematics | | 3.NF.A.5 |
|---|---|---|
| **NF A 5** | **Number Sense and Operations in Fractions**<br>**Develop understanding of fractions as numbers**<br>Recognize and generate equivalent fractions using visual models, and justify why the fractions are equivalent. | |

**Expectation Unwrapped**

The student will use visual models to determine if fractions with like denominators are equivalent.

The student will use visual models to determine if fractions with unlike denominators are equivalent.

The student will use visual models to generate equivalent fractions with unlike denominators.

The student will explain why fractions with unlike denominators are equivalent or not.

**DOK Ceiling**

3

**Item Format**

Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

Which of these fractions are equivalent? How do you know?
4/8, 1/2, 6/8, 1/3, 2/4

Students are given various fraction cards to place on a number line. Discuss equivalence.

Students use note cards to create fractions with various denominators.

**Content Limits/Assessment Boundaries**

Limit to fractions with denominators 2, 3, 4, 6 or 8.
With same sized whole unit.
Visual models include: fraction bars, circles and number lines.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.NF.A.6 |
|---|---|---|
| **NF<br>A<br>6** | **Number Sense and Operations in Fractions**<br>**Develop understanding of fractions as numbers**<br>Compare two fractions with the same numerator or denominator using the symbols >, = or <, and justify the solution. | |

**Expectation Unwrapped**

The student will compare two fractions with the same numerator using >, = or <.

The student will compare two fractions with the same denominator using >, = or <.

The student will use visual models including number lines to illustrate why two fractions with the same numerator are >, = or < each other.

The student will use visual models including number lines to illustrate why two fractions with the same denominator are >, = or < each other.

**DOK Ceiling**

3

**Item Format**

Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

**Content Limits/Assessment Boundaries**

Limit to fractions with denominators 2, 3, 4, 6 or 8.
With same sized whole unit.
Visual models include: fraction bars, fraction circles or number lines.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.NF.A.7 |
|---|---|---|
| **NF**<br>**A**<br>**7** | **Number Sense and Operations in Fractions**<br>**Develop understanding of fractions as numbers**<br>Explain why fraction comparisons are only valid when the two fractions refer to the same whole. | |

| **Expectation Unwrapped** | **DOK Ceiling** |
|---|---|
| The student will demonstrate with words or visual models that fraction comparisons are only valid when the two fractions refer to the same sized whole. | 3 |
| | **Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced |
| | **Sample Stems** |

| **Content Limits/Assessment Boundaries** | **Calculator Designation** |
|---|---|
| Limit to fractions with denominators 2, 3, 4, 6 or 8.<br>Visual models include: fraction bars, fraction circles, number lines or drawings. | **NO –** a calculator will not be available for items |

## Grade 3 Mathematics

<table>
<tr><th colspan="2">Mathematics</th><th>3.RA.A.1</th></tr>
<tr><td>RA<br>A<br>1</td><td colspan="2">Relationships and Algebraic Thinking<br>Represent and solve problems involving multiplication and division.<br>Interpret products of whole numbers.</td></tr>
<tr><td colspan="2">The student will identify the repeated addition expression which correctly represents the product of given multiplication fact.<br><br>The student will identify the picture which correctly represents the product of given a multiplication fact.<br><br>The student will write or choose the multiplication expression that represents “____equal groups of_____”.<br><br>The student will identify the arrays which correctly represent the product of given a multiplication fact.</td><td><u>DOK Ceiling</u><br>2<br><br><u>Item Format</u><br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br><u>Sample Stems</u><br><br>Which picture represents 4 groups of 6?<br><br>Select two answers that show a product of 24.</td></tr>
<tr><td colspan="2"><u>Content Limits/Assessment Boundaries</u><br>Limits up to 10x10.</td><td><u>Calculator Designation</u><br><br>NO – a calculator will not be available for items</td></tr>
</table>

## Grade 3 Mathematics

| Mathematics | | 3.RA.A.2 |
|---|---|---|
| **RA**<br>**A**<br>**2** | **Relationships and Algebraic Thinking**<br>**Represent and solve problems involving multiplication and division.**<br>Interpret quotients of whole numbers. | |

**Expectation Unwrapped**

The student will identify the repeated subtraction expression which correctly represents the quotient of a given division fact.

The student will identify the picture which correctly represents the quotient of a given division fact.

The student will explain the quotient as a number of groups in a given division problem.

The student will explain the quotient as the number/amount in each group in a given division problem.

**DOK Ceiling**

2

**Item Format**

Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

The teacher separated the 18 students into 3 groups. How many students are in each group?

Choose all of the statements that are true about the quotient of the following problem: 42÷7=6

a. There are 42 items in each of the 6 equal sets.
b. There are 7 sets with 6 items in each set.
**c.** There are 7 items in each set. There are 6 sets**.**
d. There are 42 sets with 6 items in each set.

**Content Limits/Assessment Boundaries**

Divisors no greater than ten and quotients no greater than one hundred.
The picture may be an array or equal groups.

**Calculator Designation**

**NO –** a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.RA.A.3 |
|---|---|---|
| **RA**<br>**A**<br>**3** | **Relationships and Algebraic Thinking**<br>**Represent and solve problems involving multiplication and division.**<br>Describe in words or drawings a problem that illustrates a multiplication or division situation. | |

**Expectation Unwrapped**

The student will use words or pictures to solve and explain their solution to a given multiplication situation.

The student will use words or pictures to solve and explain their solution to a given division situation.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

There are 12 muffins. Darwin plans to give an equal amount of muffins to each of his 3 friends. How many muffins would each friend get?

**Content Limits/Assessment Boundaries**

Limits up to 10x10.
Divisors no greater than ten and quotients no greater than one hundred.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.RA.A.4 |
|---|---|---|
| RA<br>A<br>4 | **Relationships and Algebraic Thinking**<br>**Represent and solve problems involving multiplication and division.**<br>Use multiplication and division within 100 to solve problems. | |

**Expectation Unwrapped**

The student will solve single digit multiplication problems and problems involving multiples of ten.

The student will solve a multiplication word problem.

The student will solve division problems with single digit divisors or divisors that are a multiple of ten.

The student will solve a division word problem.

**DOK Ceiling**
3

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

A book is 64 pages long. If each chapter is 8 pages long, how many chapters are there?

Sarah received three treat bags at school with 10 pieces of candy in each bag. How many pieces of candy did Sarah receive?

**Content Limits/Assessment Boundaries**

Limits up to 10x10.
Divisors no greater than ten and quotients no greater than one hundred.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.RA.A.5 |
|---|---|---|
| **RA**<br>**A**<br>**5** | **Relationships and Algebraic Thinking**<br>**Represent and solve problems involving multiplication and division.**<br>Determine the unknown number in a multiplication or division equation relating three whole numbers. | |

**Expectation Unwrapped**

The student will determine the unknown number in a multiplication equation relating three whole numbers (fact families/ number bonds).

The student will determine the unknown number in a division equation relating three whole numbers (fact families/number bonds).

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**
Determine the number that makes the equation true:

5 x ☐ = 30

**Content Limits/Assessment Boundaries**

Limits up to 10x10.
Divisors no greater than ten and quotients no greater than one hundred.
The term “fact families” or “number bonds” will not be used as part of the stem or answer.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.RA.B.6 |
|---|---|---|
| RA<br>B<br>6 | **Relationships and Algebraic Thinking**<br>**Understand properties of multiplication and the relationship between multiplication and division.**<br>Apply properties of operations as strategies to multiply and divide. | |

**Expectation Unwrapped**

The student will identify an expression that is equivalent to a given expression using the commutative property.

The student will identify an expression that is equivalent to a given expression using the associative property.

The student will identify an expression that is equivalent to a given expression using the distributive property.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

Select which statements are true:
10 X 8 = 8 x 10
4 X 10 = 8 X 2 X 5
5 X 4 = 4 X 2

Is 16 divided by 4 equivalent to 16 divided by 2 and then divided by 2 again?

**Content Limits/Assessment Boundaries**

Students should **not** be expected to use or recognize the formal names for the properties although they may be taught in the classroom.
Limit factors of zero to ten and final products of one hundred.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.RA.C.7 |
|---|---|---|
| RA<br>C<br>7 | **Relationships and Algebraic Thinking**<br>**Multiply and divide within 100**<br>Multiply and divide with numbers and results within 100 using strategies such as the relationship between multiplication and division or properties of operations. Know all products of two one-digit numbers. | |

**Expectation Unwrapped**

The student will identify related multiplication equations that are the inverse of a given division equation.

The student will identify related division equations that are the inverse of a given multiplication equation.

The student will find the product of two numbers up to 10x10.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**
A class has nine boxes of markers. Each box has eight markers. How many makers does the class have?

**Content Limits/Assessment Boundaries**
Limit factors of zero to ten and final products of one hundred.
Divisors no greater than ten and quotients no greater than one hundred.

**Calculator Designation**

**NO** – a calculator will not be available for items

# Grade 3 Mathematics

<table>
<tr><th colspan="2">Mathematics</th><th>3.RA.C.8</th></tr>
<tr><td>RA<br>C<br>8</td><td colspan="2">Relationships and Algebraic Thinking<br>Multiply and divide within 100<br>Demonstrate fluency with products within 100.</td></tr>
<tr><td colspan="2"><u>Expectation Unwrapped</u><br><br>The student will use multiple representations to model real-world and mathematic problems involving products within one hundred.<br><br>The student will critique the reasoning of others, identifying errors and alternate approaches to solving problems involving products within one hundred.<br><br>The student will decontextualize and contextualize problems and solutions to explain his or her reasoning in products within one hundred<br><br>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 products within one hundred.<br><br>The student will communicate his or her reasoning precisely to problems involving products within one hundred.</td><td><u>DOK Ceiling</u><br>2<br><br><u>Item Format</u><br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br><u>Sample Stems</u><br>What is 8 x 3? How can you use 8 x 3 to help you solve 8 x 6?<br><br>Jackie solved 6 x 9 by using 6 x 10. How did she find the product?<br><br>Brian solved 7 x 7 by using 7 x 5 and 7 x 2. How did he find the product?</td></tr>
<tr><td colspan="2"><u>Content Limits/Assessment Boundaries</u><br>Limit factors of zero to ten and final products of one hundred.</td><td><u>Calculator Designation</u><br><br>NO – a calculator will not be available for items</td></tr>
</table>

## Grade 3 Mathematics

| Mathematics | | 3.RA.D.9 |
|---|---|---|
| RA<br>D<br>9 | **Relationships and Algebraic Thinking**<br>**Use the four operations to solve word problems**<br>Write and solve two-step problems involving variables using any of the four operations. | |

| **Expectation Unwrapped** | **DOK Ceiling** |
|---|---|
| The student will write the correct equation using a variable for the unknown quantity that may be used to solve a given a one-step word problem.<br><br>The student will identify the correct equation using a variable for the unknown quantity that may be used to solve a given a two-step word problem.<br><br>The student will identify a one-step word problem that matches a given equation which uses a variable for the unknown quantity.<br><br>The student will identify a two-step word problem that matches a given equation which uses a variable for the unknown quantity.<br><br>The student will solve a one-step word problem by creating an equation to solve for the unknown quantity.<br><br>The student will solve a two-step word problem by creating an equation to solve for the unknown quantity. | 3<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |

| **Content Limits/Assessment Boundaries** | **Calculator Designation** |
|---|---|
| Addends, minuends, subtrahends, sums and differences are limited to one thousand or less.<br>Divisors no greater than ten and quotients no greater than one hundred.<br>Limit factors of zero to ten and final products of one hundred.<br>Only facts up to 10x10 should be used within multiplication or division.<br>It should be noted that there may be more than one correct way to write an equation for a given word problem. The variable may be used on either side of the equal sign. | **NO** – a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.RA.D.10 |
|---|---|---|
| **RA<br>D<br>10** | **Relationships and Algebraic Thinking**<br>**Use the four operations to solve word problems**<br>Interpret the reasonableness of answers using mental computation and estimation strategies including rounding. | |
| **Expectation Unwrapped**<br><br>The student will recognize a strategy that can be used to determine the reasonableness of a solution to a word problem.<br><br>The student will identify the errors in a given strategy that has been used to solve a given problem. | | **DOK Ceiling**<br>3<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>Addends, minuends, subtrahends, sums and differences are limited to one thousand or less.<br>Divisors no greater than ten and quotients no greater than one hundred.<br>Limit factors of zero to ten and final products of one hundred.<br>Only basic facts up to 10x10 should be used within multiplication or division. | | **Calculator Designation**<br><br>**NO** – a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.RA.E.11 |
|---|---|---|
| **RA<br>E<br>11** | **Relationships and Algebraic Thinking**<br>**Identify and explain arithmetic patterns.**<br>Identify arithmetic patterns and explain the patterns using properties of operations. | |

**Expectation Unwrapped**

The student will identify the type of change shown in a sequence of given numbers.

The student will identify the rule of a given input/output table.

The student will complete a pattern with missing numbers.

The student will recognize other features of a given set of numbers beyond the amount of change.

**DOK Ceiling**
2

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

Explain why four groups of any number is always equal.

How can four times any number be decomposed into two equal addends?

The table shows a pattern between the input and output values. What is/are the missing value(s) in the table?

**Content Limits/Assessment Boundaries**

Limited to addition and subtraction.
Addends, minuends, subtrahends, sums and differences are limited to one thousand or less.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.GM.A.1 |
|---|---|---|
| **GM<br>A<br>1** | **Geometry and Measurement**<br>**Reason with shapes and their attributes.**<br>Understand that shapes in different categories may share attributes and that the shared attributes can define a larger category. | |

| **Expectation Unwrapped** | **DOK Ceiling** |
|---|---|
| The student will identify common attributes of a set of given shapes.<br><br>The student will identify contrasting attributes of a set of given shapes. | 2 |
| | **Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced |
| | **Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>Limit to circles, triangles, quadrilaterals, pentagons, hexagons and octagons.<br>Limit to two-dimensional figures. | **Calculator Designation**<br><br>**NO –** a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.GM.A.2 |
|---|---|---|
| **GM<br>A<br>2** | **Geometry and Measurement**<br>**Reason with shapes and their attributes.**<br>Distinguish rhombuses and rectangles as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to these subcategories. | |

| **Expectation Unwrapped** | **DOK Ceiling** |
|---|---|
| The student will classify rhombuses and rectangles, including squares, as quadrilaterals.<br><br>The student will identify examples of quadrilaterals that are not examples of rhombuses and rectangles. | 2<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |
| **Content Limits/Assessment Boundaries** | **Calculator Designation** |
| Limit to two-dimensional figures. | **NO** – a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.GM.A.3 |
|---|---|---|
| GM<br>A<br>3 | **Geometry and Measurement**<br>**Reason with shapes and their attributes.**<br>Partition shapes into parts with equal areas, and express the area of each part as a unit fraction of the whole. | |

| **Expectation Unwrapped** | **DOK Ceiling** |
|---|---|
| The student will partition a given shape into equal areas.<br><br>The student will name the unit fraction of a shape that has been partitioned into equal areas. | 2<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |

| **Content Limits/Assessment Boundaries** | **Calculator Designation** |
|---|---|
| Limit denominators 2, 3, 4, 6 or 8.<br>Limit to two-dimensional figures. | **NO –** a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.GM.B.4 |
|---|---|---|
| GM<br>B<br>4 | **Geometry and Measurement**<br>**Solve problems involving the measurement of time, liquid volumes and weights of objects.**<br>Tell and write time to the nearest minute. | |
| **Expectation Unwrapped**<br><br>The student will write the time that is shown on an analog clock to the nearest minute.<br><br>The student will manipulate the hands of an analog clock to show a given time to the nearest minute.<br><br>The student will choose the clock that displays a given time. | | **DOK Ceiling**<br>2<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>Limit to the minute and hour hands only (not the second hand). | | **Calculator Designation**<br><br>**NO –** a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.GM.B.5 |
|---|---|---|
| **GM<br>B<br>5** | **Geometry and Measurement**<br>**Solve problems involving the measurement of time, liquid volumes and weights of objects.**<br>Estimate time intervals in minutes. | |

**Expectation Unwrapped**

The student will give an approximate elapsed time given a start time and an end time at least one or both of these times must be shown on an analog clock.

The student will choose appropriate elapsed time interval given a particular situation.

**DOK Ceiling**
3

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

Will it take more than 5 minutes or less than 5 minutes to read 5 chapters of a book?

The class went to lunch at the time shown on the clock. Their lunch is 25 minutes. At what time will their lunch be over?

**Content Limits/Assessment Boundaries**
The student will give a reasonable estimated interval of the passage of time within fifty-nine minutes.

**Calculator Designation**

**NO –** a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.GM.B.6 |
|---|---|---|
| GM<br>B<br>6 | **Geometry and Measurement**<br>**Solve problems involving the measurement of time, liquid volumes and weights of objects.**<br>Solve problems involving addition and subtraction of minutes. | |
| **Expectation Unwrapped**<br><br>The student will solve one step word problems involving addition of minutes to solve time problems.<br><br>The student will solve one step word problems involving subtraction of minutes to solve time problems. | | **DOK Ceiling**<br>3<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>Students may use any strategy to solve for the passage of time within fifty-nine minutes.<br>These problems may involve finding the start time, the end time or the interval. | | **Calculator Designation**<br><br>**NO** – a calculator will not be available for items |

# Grade 3 Mathematics

| Mathematics | | 3.GM.B.7 |
|---|---|---|
| GM<br>B<br>7 | **Geometry and Measurement**<br>**Solve problems involving the measurement of time, liquid volumes and weights of objects.**<br>Measure or estimate length, liquid volume and weight of objects. | |

**Expectation Unwrapped**

The student will choose the appropriate tool for measuring length.
The student will choose the appropriate tool for measuring liquid volume.
The student will choose the appropriate tool for measuring weight.
The student will choose a reasonable unit of length given an object.
The student will choose a reasonable unit of liquid volume.*
The student will choose a reasonable unit of weight.
The student will ~~give~~ determine the measurement of the length of a picture of an object to the nearest centimeter or quarter inch.
The student will ~~give~~ determine the measurement to the nearest milliliter given a picture of liquid in a marked container.
The student will be given a picture of an object on a scale to determine the weight to the nearest pound, ounce, gram or kilogram.

**DOK Ceiling**

2

**Item Format**

Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

Which unit would be the best choice for measuring the liquid volume of a glass of water?
a) milliliters
b) liters
c) grams
d) cm

**Content Limits/Assessment Boundaries**

Limit tools for length to rulers, yardsticks and meter sticks.
Limit tools for liquid volume to pictures of a marked container/graduated cylinder.
Limit tools for weight to scales.
For estimating reasonable units of length, limit units to the nearest centimeter, inch, meters, kilometers, feet, yards or miles
For estimating reasonable units of liquid volume, limit to milliliters, liters, cups or gallons.
For estimating reasonable units of weight, limit to ounces, pounds, grams or kilograms.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.GM.B.8 |
|---|---|---|
| GM<br>B<br>8 | **Geometry and Measurement**<br>**Solve problems involving the measurement of time, liquid volumes and weights of objects.**<br>Use the four operations to solve problems involving lengths, liquid volumes or weights given in the same units. | |

| **Expectation Unwrapped** | **DOK Ceiling** |
|---|---|
| The student will use the four operations to solve one step problems involving lengths.<br><br>The student will use the four operations to solve one step problems involving liquid volume.<br><br>The student will use the four operations to solve one step problems involving weight. | 3<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |
| **Content Limits/Assessment Boundaries** | **Calculator Designation** |
| Addends, minuends, subtrahends, sums and differences are limited to one thousand or less.<br>Divisors no greater than ten and quotients no greater than one hundred.<br>Limits up to 10x10.<br>Limit units of length to centimeters, inches, meters, kilometers, feet, yards and miles.<br>Limit units of liquid volume to milliliters, liters, cups or gallons.<br>Limit units of weight to ounces, pounds, grams or kilograms. | **NO** – a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.GM.C.9 |
|---|---|---|
| **GM<br>C<br>9** | **Geometry and Measurement**<br>**Understand concepts of area**<br>Calculate area by using unit squares to cover a plane figure with no gaps or overlaps. | |
| **Expectation Unwrapped**<br><br>The student will calculate area of squares and rectangles.<br><br>The student will calculate area of irregular shaped figures composed of squares and rectangles. | | **DOK Ceiling**<br>2<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>Limited to no gaps or overlaps.<br>Students should not have to use the formula.<br>They should be able to count the unit squares.<br>Grid lines or unit squares should be shown on the figures. | | **Calculator Designation**<br><br>**NO –** a calculator will not be available for items |

## Grade 3 Mathematics

<table>
<tr><th colspan="2">Mathematics</th><th>3.GM.C.10</th></tr>
<tr><td>GM<br>C<br>10</td><td colspan="2">Geometry and Measurement<br>Understand concepts of area<br>Label area measurements with squared units.</td></tr>
<tr><td colspan="2"><u>Expectation Unwrapped</u><br><br>The student will label area measurement as squared units.</td><td><u>DOK Ceiling</u><br>2<br><br><u>Item Format</u><br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br><u>Sample Stems</u></td></tr>
<tr><td colspan="2"><u>Content Limits/Assessment Boundaries</u><br>Limited to “square units” or “units squared”.<br>Limit units of length to centimeters, inches, meters, kilometers, feet, yards and miles.</td><td><u>Calculator Designation</u><br><br>NO – a calculator will not be available for items</td></tr>
</table>

## Grade 3 Mathematics

| Mathematics | | 3.GM.C.11 |
|---|---|---|
| **GM<br>C<br>11** | **Geometry and Measurement**<br>**Understand concepts of area**<br>Demonstrate that tiling a rectangle to find the area and multiplying the side lengths result in the same value. | |

**Expectation Unwrapped**

The student will identify the tiled rectangle that goes with a given multiplication problem.

The student will identify the multiplication problem that goes with a given tiled rectangle.

**DOK Ceiling**
3

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

Enter a multiplication expression that could be used to find the area of the rectangle.

**Content Limits/Assessment Boundaries**

Limits up to 10x10.
Limited to no gaps or overlaps.
Grid lines of unit squares should be shown within the objects.
Distractors can have the same value as the correct area, but do not reflect multiplication of sides. (If correct answer is 3x4 then 6x2 may be a distractor.)

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.GM.C.12 |
|---|---|---|
| **GM C 12** | **Geometry and Measurement**<br>**Understand concepts of area**<br>Multiply whole-number side lengths to solve problems involving the area of rectangles. | |

**Expectation Unwrapped**

The student will use multiplication to find the area of a rectangle or square that does not have the grid lines or tiled units shown.

The student will find the area of a rectangle within a given word problem.

**DOK Ceiling**
3

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

**Content Limits/Assessment Boundaries**

Limits up to 10x10
Limits to whole numbers.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.GM.C.13 |
|---|---|---|
| **GM C 13** | **Geometry and Measurement**<br>**Understand concepts of area**<br>Find rectangular arrangements that can be formed for a given area. | |

| **Expectation Unwrapped** | **DOK Ceiling** |
|---|---|
| The student will determine dimensions for a given rectangular area.<br><br>The student will determine multiple dimensions for a given rectangular area. | 2 |
| | **Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced |
| | **Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>Limits up to 10x10 and no area greater than one hundred squared units. | **Calculator Designation**<br><br>**NO** – a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.GM.C.14 |
|---|---|---|
| **GM C 14** | **Geometry and Measurement**<br>**Understand concepts of area**<br>Decompose a rectangle into smaller rectangles to find the area of the original rectangle. | |

| Expectation Unwrapped | DOK Ceiling |
|---|---|
| The student will partition a rectangle into smaller rectangles, find their areas and combine those amounts to determine the area of the original rectangle. | 3 |
| | **Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced |
| | **Sample Stems** |

| Content Limits/Assessment Boundaries | Calculator Designation |
|---|---|
| Limit to whole numbers.<br>The smaller rectangles can have dimensions no longer than ten. | **NO** – a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.GM.D.15 |
|---|---|---|
| GM<br>D<br>15 | **Geometry and Measurement**<br>**Understand concepts of perimeter**<br>Solve problems involving perimeters of polygons. | |

| **Expectation Unwrapped** | **DOK Ceiling** |
|---|---|
| The student will find the perimeter of a polygon given all the side lengths.<br><br>The student will find the measurement of a missing side of a polygon given the perimeter in all but not one of the side lengths. | 2 |
| | **Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced |
| | **Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>Can be assessed as a word problem with context. | **Calculator Designation**<br><br>**NO** – a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.GM.D.16 |
|---|---|---|
| **GM D 16** | **Geometry and Measurement**<br>**Understand concepts of perimeter**<br>Understand that rectangles can have equal perimeters but different areas, or rectangles can have equal areas but different perimeters. | |

**Expectation Unwrapped**

The student will compare two rectangles with the same area and different side dimensions (different perimeters).

The student will compare two rectangles with the same perimeter and different areas.

**DOK Ceiling**
3

**Item Format**
Selected Response
Constructed Response
Technology Enhanced

**Sample Stems**

**Content Limits/Assessment Boundaries**
Dimensions of rectangles will be shown.

**Calculator Designation**

**NO** – a calculator will not be available for items

## Grade 3 Mathematics

| Mathematics | | 3.DS.A.1 |
|---|---|---|
| DS<br>A<br>1 | **Data and Statistics**<br>**Represent and analyze data**<br>Create frequency tables, scaled picture graphs and bar graphs to represent a data set with several categories. | |

| **Expectation Unwrapped** | **DOK Ceiling** |
|---|---|
| The student will use given data to complete a frequency table with several categories.<br><br>The student will use given data to complete a scaled picture graph with several categories.<br><br>The student will use given data to complete a scaled bar graph with several categories. | 2<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |

| **Content Limits/Assessment Boundaries** | **Calculator Designation** |
|---|---|
| Limit the scale of the bar graph from zero-one hundred with intervals of 1s, 2s, 5s and 10s.<br>Limit the key of the picture graph to one picture=1, 2, 5 or 10.<br>Whole numbers only. | **NO** – a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.DS.A.2 |
|---|---|---|
| **DS**<br>**A**<br>**2** | **Data and Statistics**<br>**Represent and analyze data**<br>Solve one- and two-step problems using information presented in bar and/or picture graphs. | |
| **Expectation Unwrapped**<br><br>The student will solve one step problems based on information found in a bar graph or a picture graph.<br><br>The student will solve two step problems based on information found in a bar graph or a picture graph. | | **DOK Ceiling**<br>3<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>Limit the scale of the bar graph from zero to one hundred with intervals of 1s, 2s, 5s and 10s.<br>Limit the key of the picture graph to one picture=1, 2, 5 and 10.<br>Whole numbers only.<br>Addends, minuends, subtrahends, sums and differences are limited to one hundred or less.<br>Divisors no greater than ten and quotients no greater than one hundred.<br>Limit factors of zero to ten and final products of one hundred.<br>Only basic facts up to 10x10 should be used within multiplication or division | | **Calculator Designation**<br><br>**NO** – a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.DS.A.3 |
|---|---|---|
| DS<br>A<br>3 | **Data and Statistics**<br>**Represent and analyze data**<br>Create a line plot to represent data. | |
| **Expectation Unwrapped**<br><br>The student will use a list of given data from a table to create a line plot. | | **DOK Ceiling**<br>2<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>If listing numbers, it should be limited to whole numbers.<br>When using halves and quarters the intervals should be listed for them.<br>Limit the range to numbers between zero and twenty. | | **Calculator Designation**<br><br>**NO –** a calculator will not be available for items |

## Grade 3 Mathematics

| Mathematics | | 3.DS.A.4 |
|---|---|---|
| DS<br>A<br>4 | **Data and Statistics**<br>**Represent and analyze data**<br>Use data shown in a line plot to answer questions. | |
| **Expectation Unwrapped**<br><br>The student will answer questions about the data on a given line plot. | | **DOK Ceiling**<br>2<br><br>**Item Format**<br>Selected Response<br>Constructed Response<br>Technology Enhanced<br><br>**Sample Stems** |
| **Content Limits/Assessment Boundaries**<br>Limit formal terms such as mode, range, median, mean or maximum.<br>Limited to addition or subtraction operations based on whole number data. May be groups of data which would be calculated through multiplication for efficiency. | | **Calculator Designation**<br><br>**NO** – a calculator will not be available for items |