

## **Grade 3 Target A**

### **Domain, Target, Standards, DOK, Vertical Alignments, Achievement Levels, Evidence Required, Vocabulary, Response Types, Materials, Attributes, Question Types, and Question Banks (Examples)**

[Content Domain: Operations and Algebraic Thinking](#)

[Target A \[m\]: 3.OA.A Represent and solve problems involving multiplication and division.](#)

[Standards included in Target A: 3.OA.A.1,3.OA.A.2, 3.OA.A.3, 3.OA.A.4](#)

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### **Content Domain: Operations and Algebraic Thinking**

#### **Target A [m]: 3.OA.A Represent and solve problems involving multiplication and division.**

#### **Standards included in Target A: 3.OA.A.1,3.OA.A.2, 3.OA.A.3, 3.OA.A.4**

Standards 3.OA.A.1 and 3.OA.A.2, which probe student understanding of the meanings of multiplication and division, will be assessed through Claim 4.

**3.OA.A:** Represent and solve problems involving multiplication and division.

**3.OA.A.1:** Interpret products of whole numbers, e.g., interpret  $5 \times 7$  as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as  $5 \times 7$ .

**3.OA.A.2:** Interpret whole-number quotients of whole numbers, e.g., interpret  $56 \div 8$  as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as  $56 \div 8$ .

**3.OA.A.3:** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

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**3.OA.A.4:** Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations  $8 \times ? = 48$ ,  $5 = \square \div 3$ , and  $6 \times 6 = ?$ .

### **Vertical Alignment**

#### **Related Grade 2 standards**

2.OA.A Represent and solve problems involving addition and subtraction.

2.OA.A.1: Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.OA.C Work with equal groups of objects to gain foundations for multiplication.

2.OA.C.4: Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

#### **Related Grade 4 Standards**

4.OA.A Use the four operations with whole numbers to solve problems.

4.OA.A.3: Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.NBT.C Use place value understanding and properties of operations to perform multi-digit arithmetic.

4.NBT.C.5: Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

4.NBT.C.6: Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

### **Achievement Level Descriptors**

**Level 1** Students should be able to represent multiplication and division problems within 100

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involving equal groups of objects.

**Level 2** Students should be able to use multiplication and division within 100 to solve one-step problems using arrays, to interpret the meaning of multiplication of two whole numbers and to determine the unknown number in a multiplication equation relating three whole numbers.

**Level 3** Students should be able to select the appropriate operation (multiplication or division) within 100 to solve one-step problems involving measurement quantities of single-digit whole numbers and determine the unknown number in a division equation relating three whole numbers. They should be able to interpret the meaning of whole-number quotients of whole numbers.

**Level 4** Students should be able to use multiplication and division within 100 to solve one-step problems involving measurement quantities.

### **Evidence Required**

1. The student uses multiplication and division within 100 to solve straightforward one-step word problems in situations involving equal groups, arrays, and measurement quantities such as length, liquid volume and masses of objects.
2. The student determines an unknown whole number in a multiplication or division equation relating three whole numbers with single-digit factors within 100.

### **Vocabulary**

grams (g), kilograms (kg), liters (L), estimate, time, time intervals, minute, hour, measure, liquid volume, mass, standard units, metric

### **Response Types**

Equation/Numeric

### **Materials**

arrays, equal-group models, drawings, graphics of measuring tools (scale, balance, measuring cup)

### **Attributes**

Numbers required to solve multiplication or division problems must be within 100 and use single-digit factors.

### **Claim 1: Concepts and Procedures (DOK 1) Question Banks**

Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

### **Claim 1 3.OA.A.3 DOK Level 1**

Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

### **Evidence Required**

The student uses multiplication and division **within** 100 to solve straightforward one-step word problems in situations involving equal groups, arrays, and measurement quantities such as length, liquid volume and masses of objects.

**Question Type 1:** The student is presented with a one-step word problem for a situation involving an array composed of objects familiar to 8–9 year olds.

1. There are 3 rows of pictures with 2 pictures in each row.

How many pictures are there?

2. The pictures on a page in a picture album are in 3 rows and 2 columns.

How many pictures are on the page?

3. Tim has 6 pictures arranged into 3 equal rows on a page.

How many pictures are in each row?

4. Claire arranges 6 pictures into an array with 3 rows.

How many columns of pictures are in the array?

5. Chris arranges 6 pictures into equal rows of 2 pictures.

How many rows are there?

6. Lisa arranges 6 pictures into an array with 2 columns.

How many rows of pictures are in the array?

Rubric: (1 point) The student correctly enters the solution (e.g., 6; 6; 2; 2; 3; 3).

Response Type: Equation/Numeric

**Question Type 2:** The student is presented with a one-step word problem for a situation involving equal groups composed of objects familiar to 8–9 year olds.

1. There are 3 bags with 9 blocks in each bag.

How many blocks are there in all?

2. Mary has 27 blocks. She puts them into 3 bags. Each bag has an equal number of blocks.

How many blocks are in each bag?

3. Mary has 27 blocks. She can put 9 blocks in each bag.

How many bags does she need for all 27 blocks?

Rubric: (1 point) The student enters the correct solution (e.g., 27; 9; 3).

Response Type: Equation/Numeric

**Question Type 3:** The student is presented with a word problem involving measurement quantities such as length, liquid volume, or mass of objects familiar to 8–9 year olds.

1. A penny has a mass of 3 grams.

What is the mass, in grams, of 4 pennies?

2. There are 48 liters of water in a water tank. The water is shared equally into 8 containers.

How many liters of water are in each container?

3. Sarah has 72 inches of string. She cuts the string into pieces that are 9 inches long.

How many pieces of string does Sarah have?

Rubric: (1 point) The student enters the correct solution (e.g., 12; 6; 8).

**Claim 1 3.OA.A.4 DOK Level 1**

Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations  $8 \times ? = 48$ ,  $5 = \square \div 3$ , and  $6 \times 6 = ?$ .

**Evidence Required:**

The student determines an unknown whole number in a multiplication or division equation relating three whole numbers with single-digit factors **within** 100.

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**Question Type 1:** The student is presented with a multiplication equation with an unknown factor or product represented by a box ( $\square$ ) or “?”.

1. What unknown number makes this equation true?

$$8 \times \square = 56$$

2. What unknown number makes this equation true?

$$63 = \square \times 7$$

3. What unknown number makes this equation true?

$$7 \times 5 = ?$$

Rubric: (1 point) The student correctly identifies the unknown product (e.g., 7; 9; 35).

Response Type: Equation/Numeric

### **Claim 1 3.OA.A.4 DOK Level 1**

**Question Type 2:** The student is presented with a division equation with an unknown number represented by either a box ( $\square$ ) or “?”.

1. What unknown number makes this equation true?

$$24 \div 4 = ?$$

2. What unknown number makes this equation true?

$$56 \div \square = 8$$

3. What unknown number makes this equation true?

$$\square \div 7 = 8$$

4. What unknown number makes this equation true?

$$4 = \square \div 6$$

Rubric: (1 point) The student correctly identifies the unknown dividend (e.g., 6; 7; 56; 24).

Response Type: Equation/Numeric

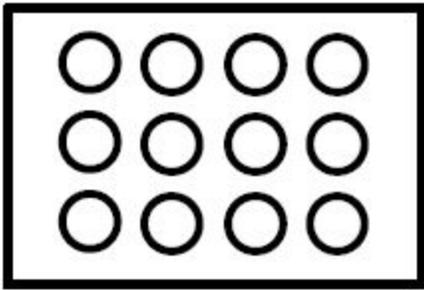
### **Claim 2 Problem Solving Questions Banks**

[Claim Descriptors and Targets](#)

Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies.

Example 1

Steven is baking cupcakes. A cupcake pan has 3 rows with a place to put 4 cupcakes in each row. He filled two pans completely and part of another pan.



How many cupcakes could Steven have made? Enter your answer in the response box.

Rubric: (1 point) The student enters a whole number between 25 and 35, inclusive.

Response Type: Equation/Numeric

Example 2

Vera is making 6 picture frames. Each picture frame requires 9 craft sticks. Craft sticks are sold in packs of 10.

What is the **fewest** number of packs of craft sticks Vera can buy to get the total she needs?

Enter your answer in the response box.

Rubric: (1 point) The student enters the correct number of packs (5).

Response Type: Equation/Numeric

Example 3

Billy has 9 full cans of juice. He has  $9 \times 8$  ounces of juice all together. What could the 8 mean?

- A. There are 8 ounces of juice in one full can.
- B. There are 8 people who want juice.
- C. He already drank 8 cans of juice.

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D. He spilled 8 ounces of juice.

Rubric: (1 point) The student selects the correct option (A).

Response Type: Multiple choice, single correct response

### **Claim 3 Communicating Reasoning Question Banks**

#### **[Claim Descriptors and Targets](#)**

Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.

#### **Example 1**

Select all the ways you can divide 15 children into equal groups with none left over.

- A. 2 groups
- B. 3 groups
- C. 4 groups
- D. 5 groups

Rubric: (1 point) The student selects the possible number of groups (B and D).

Response Type: Multiple Choice, multiple select response

#### **Example 2**

Tasha is solving this problem:

The are 4 tanks with 10 fish in each tank. How many fish are there all together?

Tasha claims, "There are  $4 + 10 = 14$  fish all together."

- A. Tasha correctly added to find the total.
- B. Tash should subtract instead.
- C. Tasha should multiple instead.
- D. Tasha should divide instead.

Rubric: (1 point) The student selects the correct statement (C).

Response Type: Multiple Choice, single correct response

### **Claim 4 Modeling and Data Analysis Question Banks**

#### **[Claim Descriptors and Targets](#)**

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Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.

Example 1

Tina has 4 packs of gum. Each pack has the same number of pieces of gum. Altogether there are 60 pieces of gum.

**Part A**

Make an equation to find the number of pieces of gum in each pack. Use  $n$  for the number of pieces in each pack.

**Part B**

How many pieces of gum are in each pack?

Rubric: (2 points) One point for a correct answer to each part. For Part A, the student enters a correct equation (e.g.,  $n = 60 \div 4$ ,  $4 \times n = 60$ ,  $4 = 60 \div n$ ). For Part B, the student enters the correct number.

Response Type: Equation/Numeric (2 response boxes; label them Part A and Part B)