



MULTIPLICATION AND DIVISION MODEL MATCHING ACTIVITY

This activity is designed to be used with students as well as educators learning about the various word problem types that involve multiplication and division. Based on the work of Thomas Carpenter et al. in their book *Children's Mathematics: Cognitively Guided Instruction* on various problem types, there is one word problem for each type and with the unknown in each position.

There is also a sample model for each word problem given with labels for the various parts and a question mark for the unknown. There is a 1-1 matchup for each word problem and model. All the word problems in this activity involve buckets of apples and the multiplicative fact family of 4, 8, and 32 so that there is a focus on the structure of the word problem and the unknown. There are various options when using these cards.

Option 1: Make a pile of word problems and lay out all the models on a table. Students take a word problem and match it with its model. Students must explain their reasoning before a match is made and other students must agree before the two cards are put into the discard pile. Student continue doing this until all the cards are gone.

Option 2: This version of the activity is identical to Option 1 except the pile is made up of the model cards and the word problems are all visible on the table.

Option 3: Students take one model card and write a word problem that matches the situation. Students must then share with a partner and explain their thinking.

Option 4: Students take one word problem card and make a model of the situation. They then must meet with a partner and explain their thinking.

The last few pages of this resource include equations that are possible and not possible to solve the problems. They are not an exhaustive list of all the possible equations that can be used for these problems, but they are meant to generate conversation.

Behind these possibilities of equations are the foundational concepts of the commutative property of multiplication, the understanding of equality, the inverse relationship between multiplication and division, and that there is no commutative property of division.

These are NOT a 1-1 matchup with the word problems and models. Instead, they are to be used to engage students in a conversation about what possible equations could be used to solve each situation. We want students to be flexible in their thinking.

Even if a problem situation involves finding a quotient, students could choose to think multiplicatively to arrive at their solution. Thus, the various possible equations that could be used are all the possibilities that students could pick from to arrive at their solutions.

1. There were 4 buckets of apples. If each bucket had 8 apples, how many apples were there in all?

D

Bucket 1	B2	B3	B4	
8	8	8	8	?
Apples				Apples In All

B

2. There were some buckets of apples. If each bucket had 8 apples and there were 32 apples in all, how many buckets were there?

M

Bucket 1	B2	...	B?	
8	8	...	8	32
Apples				Apples In All

K

3. If there were 32 apples split evenly between 4 buckets, how many apples would be in each bucket?

W

Bucket 1	B2	B3	B4	
?	?	?	?	32
Apples				Apples In All

F

4. There were 4 rows of apples in a display case with 8 apples in each row. How many apples were there in all?

J

R1	8 Apples	} ? Apples In All
R2	8	
R3	8	
R4	8	

A

5. If 32 apples were organized into 4 rows with the same number of apples in each row, how many apples were in each row?

Q

R1	? Apples	} 32 Apples In All
R2	?	
R3	?	
R4	?	

Z

6. If there were 32 apples organized into rows with 8 apples in each row, how many rows were there?

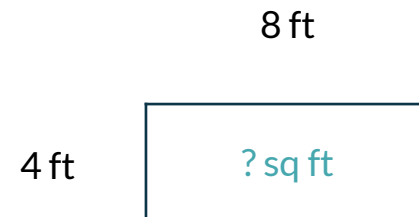
L

R1	8 Apples	} 32 Apples In All
R2	8	
	•	
	•	
R?	8	

X

7. There was a rectangular garden that measured 4 ft by 8 ft. What was the area inside the garden?

C



O

8. The area of a rectangular garden is 32 square feet. If one side measures 4 ft, what is the measurement of the other side?

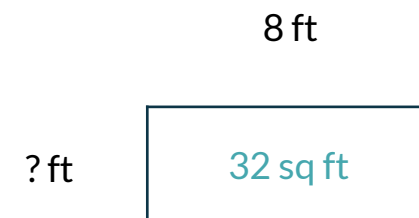
P



Y

9. The area of a rectangular garden is 32 square feet. If one side measures 8 ft, what is the measurement of the other side?

E



T

10. Bucket 1 had 8 apples. Bucket 2 had 4 times as many apples as Bucket 1. How many apples were in Bucket 2?

H

Bucket 1

8

Apples

Bucket 2

8	8	8	8
---	---	---	---

1x

2x

3x

4x

? Apples

S

11. Bucket 1 had 8 apples. Bucket 2 had 32 apples. How many times more apples were in Bucket 2 than Bucket 1?

I

Bucket 1

8

Bucket 2

8	8	8	8
---	---	---	---

1x

2x

3x

?x

32 Apples

U

12. Bucket 1 had some apples. Bucket 2 had 32 apples which was 4 times more than the apples in Bucket 1. How many apples were in Bucket 1?

N

Bucket 1

?

Bucket 2

?	?	?	?
---	---	---	---

1x

2x

3x

4x

32 Apples

V

Multiplication and Division Model Matching Answer Key

1. D, B	$4 \times 8 = ?$ $? \div 4 = 8$	$8 \times 4 = ?$ $? \div 8 = 4$	$? = 4 \times 8$ $8 = ? \div 4$	$? = 8 \times 4$ $4 = ? \div 8$
2. M, K	$8 \times ? = 32$ $32 = 8 \times ?$	$? \times 8 = 32$ $32 = ? \times 8$	$32 \div 8 = ?$ $? = 32 \div 8$	$32 \div ? = 8$ $8 = 32 \div ?$
3. W, F	$4 \times ? = 32$ $32 = 4 \times ?$	$? \times 4 = 32$ $32 = ? \times 4$	$32 \div 4 = ?$ $? = 32 \div 4$	$32 \div ? = 4$ $4 = 32 \div ?$
4. J, A	$4 \times 8 = ?$ $? \div 4 = 8$	$8 \times 4 = ?$ $? \div 8 = 4$	$? = 4 \times 8$ $8 = ? \div 4$	$? = 8 \times 4$ $4 = ? \div 8$
5. Q, Z	$4 \times ? = 32$ $32 = 4 \times ?$	$? \times 4 = 32$ $32 = ? \times 4$	$32 \div 4 = ?$ $? = 32 \div 4$	$32 \div ? = 4$ $4 = 32 \div ?$
6. L, X	$8 \times ? = 32$ $32 = 8 \times ?$	$? \times 8 = 32$ $32 = ? \times 8$	$32 \div 8 = ?$ $? = 32 \div 8$	$32 \div ? = 8$ $8 = 32 \div ?$
7. C, O	$4 \times 8 = ?$ $? \div 4 = 8$	$8 \times 4 = ?$ $? \div 8 = 4$	$? = 4 \times 8$ $8 = ? \div 4$	$? = 8 \times 4$ $4 = ? \div 8$
8. P, Y	$4 \times ? = 32$	$? \times 4 = 32$	$32 \div 4 = ?$	$32 \div ? = 4$

Multiplication and Division Model Matching Answer Key

	$32 = 4 \times ?$	$32 = ? \times 4$	$? = 32 \div 4$	$4 = 32 \div ?$
9. E, T	$8 \times ? = 32$	$? \times 8 = 32$	$32 \div 8 = ?$	$32 \div ? = 8$
	$32 = 8 \times ?$	$32 = ? \times 8$	$? = 32 \div 8$	$8 = 32 \div ?$
10. H, S	$4 \times 8 = ?$	$8 \times 4 = ?$	$? = 4 \times 8$	$? = 8 \times 4$
	$? \div 4 = 8$	$? \div 8 = 4$	$8 = ? \div 4$	$4 = ? \div 8$
11. I, U	$8 \times ? = 32$	$? \times 8 = 32$	$32 \div 8 = ?$	$32 \div ? = 8$
	$32 = 8 \times ?$	$32 = ? \times 8$	$? = 32 \div 8$	$8 = 32 \div ?$
12. N, V	$4 \times ? = 32$	$? \times 4 = 32$	$32 \div 4 = ?$	$32 \div ? = 4$
	$32 = 4 \times ?$	$32 = ? \times 4$	$? = 32 \div 4$	$4 = 32 \div ?$

Equations included that won't solve any of these situations:

$8 = ? \times 4$	$4 = ? \times 8$	$32 \times 8 = ?$	$32 \times 4 = ?$	$4 \div 32 = ?$
$? = 32 \times 8$	$? = 32 \times 4$	$? = 4 \div 32$	$8 \div 32 = ?$	

$$8 \times 4 = ? \quad 4 \times 8 = ?$$

$$? = 8 \times 4 \quad ? = 4 \times 8$$

$$8 = ? \times 4 \quad 4 = ? \times 8$$

$$32 \div 8 = ? \quad 32 \div 4 = ?$$

$$? = 32 \div 8 \quad ? = 32 \div 4$$

$$32 \times 8 = ? \quad 32 \times 4 = ?$$

$$? = 32 \times 8 \quad ? = 32 \times 4$$

$$? = 4 \div 32 \quad ? \div 8 = 4$$

$$8 \div 32 = ? \quad 4 \div 32 = ?$$

$$8 \times ? = 32 \quad 4 \times ? = 32$$

$$32 = 8 \times ? \quad 32 = 4 \times ?$$

$$32 \div ? = 8 \quad 32 \div ? = 4$$