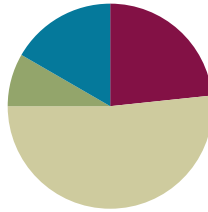


## Lesson 13

**Objective:** Interpret the quotient as the number of groups or the number of objects in each group using units of 3.

### Suggested Lesson Structure

■ Fluency Practice	(14 minutes)
■ Application Problem	(5 minutes)
■ Concept Development	(31 minutes)
■ Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (14 minutes)

- Sprint: Multiply or Divide by 2 **3.OA.7** (9 minutes)
- Group Counting **3.OA.1** (3 minutes)
- Divide **3.OA.7** (2 minutes)

### Sprint: Multiply or Divide by 2 (9 minutes)

Materials: (S) Multiply or Divide by 2 Sprint

Note: This activity builds fluency with multiplication and division using units of 2. It works toward students' ability to multiply and divide fluently within 100. See Lesson 2 for the directions for administering a Sprint.

### Group Counting (3 minutes)

Note: Group counting reviews interpreting multiplication as repeated addition. Counting by threes and fours in this activity reviews multiplication with units of 3 from Topic C and anticipates using units of 4 in Topic E.

- T: Let's count by threes. (Direct students to count forward and backward to 30.)
- T: Let's count by fours. (Direct students to count forward and backward to 40, emphasizing the 20 to 24, 28 to 32, and 36 to 40 transitions.)

### Divide (2 minutes)

Materials: (S) Personal white board

Note: This activity builds fluency with multiplication and division. It works toward students knowing from memory all products of two one-digit numbers.

T: (Write  $2 \times 3 = \underline{\quad}$ .) Say the multiplication sentence.

S:  $2 \times 3 = 6$ .

T: (Write  $2 \times 3 = 6$ . Directly below it, write  $\underline{\quad} \div 3 = 2$ .) On your personal white board, write the equation and fill in the blank.

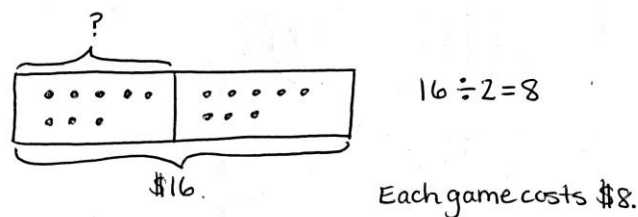
S: (Write  $6 \div 3 = 2$ .)

Repeat the process for the following possible sequence:  $3 \times 3$ ,  $5 \times 3$ , and  $9 \times 3$ .

### Application Problem (5 minutes)

Mark spends \$16 on 2 video games. Each game costs the same amount. Find the cost of each game.

Note: This problem reviews equal groups division from Lesson 12 where the unknown is the number of objects in each group.

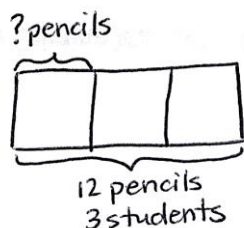


### Concept Development (31 minutes)

Materials: (S) Personal white board

**Pictorial:** Draw and analyze tape diagrams to determine the unknown.

Write or project the following story and the tape diagram drawn below: Three students equally share a pack of 12 pencils.



#### NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

This lesson is similar to Lesson 12. Depending on performance levels, modify guidance so that students work through pictorial examples quickly, in pairs or independently. Meet with groups or individuals who need support. Alternatively, maximize support by skipping the abstract example in favor of slowly working the class through the pictorial. As an additional scaffold, the teacher may choose to model and have students create tape diagrams with drawings inside of each unit to show the value. Students have used tape diagrams drawn with and without this feature in Grade 2.

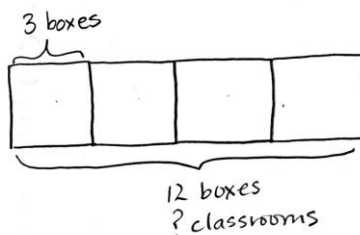
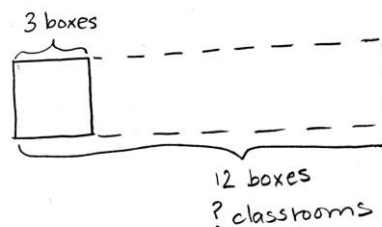
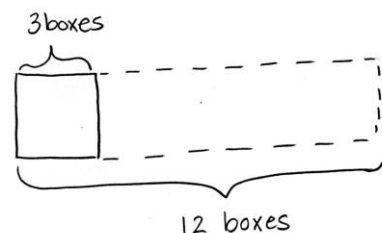
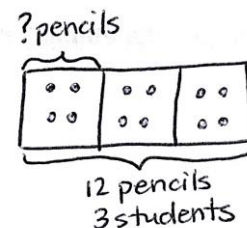
MP.4

- T: What information do we know from reading the story?  
 S: The total pencils and the number of students.  
 T: How does the tape diagram show the story?  
 S: The whole diagram represents 12 pencils, and it's divided into 3 parts. Those are the students. We don't know how many pencils each student gets. That's what the question mark represents.  
 T: Write a division equation to find how many pencils each student gets.  
 S: (Write  $12 \div 3 = \underline{\quad}$ .)  
 T: Draw my tape diagram on your personal white board. Then, draw to share the 12 pencils equally among the 3 students. Fill in your division equation.  
 S: (Draw 4 in each unit on the tape diagram. Write  $12 \div 3 = 4$ .)

Students can check their work by writing a multiplication sentence.

Write or project the following problem and the first tape diagram drawn below: A school buys 12 boxes of pencils. Each classroom gets 3 boxes. How many classrooms get boxes of pencils?

- T: What information do we know from the problem?  
 S: The total boxes and the number of boxes each classroom gets.  
 T: The box drawn with a solid line represents the number of boxes 1 class gets. I used the dotted line to estimate the total boxes. How should I label the unknown on this diagram?  
 S: It's the number of classrooms that get boxes.  
 T: Where can I record my question mark?  
 S: Under *12 boxes*, write *? classrooms*.  
 T: (Label the unknown.) On your board, skip-count by threes to draw more units in the tape diagram. How will you know when to stop?  
 S: We stop when we get to 12. (Draw and count 6, 9, 12.)  
 T: Use the tape diagram to write and solve a division equation that represents the problem.  
 S: (Write  $12 \div 3 = 4$ .) It's the same division problem as before.  
 T: What does the 4 represent in this problem?  
 S: It's the number of classrooms that get boxes of pencils. → It's the number of groups.

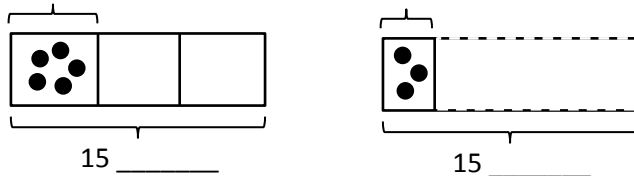


Repeat the process showing division with both types of unknowns using the following suggested expressions.

- $18 \div 3$
- $21 \div 3$

**Abstract: Interpret tape diagrams to determine the unknown and write division problems.**

Draw or project the following tape diagrams. Students work in pairs.



- Write division sentences to represent each diagram. (Division sentences should be the same for both diagrams.)
- Label each tape diagram, including the unknown.
- The tape diagrams and division sentences show solutions. Write a word problem to match each solution.
- Save the word problems to compare with other groups during the Student Debrief.

**Problem Set (10 minutes)**

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

**Student Debrief (10 minutes)**

**Lesson Objective:** Interpret the quotient as the number of groups or the number of objects in each group using units of 3.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.



**NOTES ON MULTIPLE MEANS OF REPRESENTATION:**

For the abstract portion of the lesson, some pairs may benefit from looking at word problems completed the previous day to gather ideas and examples upon which to model their work.



**NOTES ON MULTIPLE MEANS OF ENGAGEMENT:**

Have students who need a challenge add a second step to their word problems. Early finishers should solve each other's problems and assess the reasonableness of one another's work.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 13 Problem Set 3•1

Name: Gina Date: \_\_\_\_\_

1. Complete the related equations.

$1 \times 3 = 3$ $3 \div 3 = 1$	$2 \times 3 = 6$ $6 \div 3 = 2$	$3 \times 3 = 9$ $9 \div 3 = 3$	$4 \times 3 = 12$ $12 \div 3 = 4$	$5 \times 3 = 15$ $15 \div 3 = 5$
$6 \times 3 = 18$ $18 \div 3 = 6$	$7 \times 3 = 21$ $21 \div 3 = 7$	$8 \times 3 = 24$ $24 \div 3 = 8$	$9 \times 3 = 27$ $27 \div 3 = 9$	$10 \times 3 = 30$ $30 \div 3 = 10$

2. Mr. Lawton picks tomatoes from his garden. He divides the tomatoes into bags of 3.

a. Circle to show how many bags he packs. Then skip-count to show the total number of tomatoes.

b. Draw and label a tape diagram to represent the problem.

Mr. Lawton packs 4 bags of tomatoes.

$12 \div 3 = 4$

COMMON CORE Lesson 13: Interpret the quotient as the number of groups or the number of objects in each group using units of 3. Date: 5/1/14 engage<sup>ny</sup> 1.0.33

Any combination of the questions below may be used to lead the discussion.

- Describe how the model in Problem 2(a) helped for drawing a tape diagram in Problem 2(b).
- How does the Application Problem connect the work we did yesterday to what we did today?
- Share work for Problem 5. The language *some friends* rather than a number may have presented a challenge.
- Compare Problems 4 and 5. How did your approach to drawing the tape diagram change? Why?
- Share word problems from the abstract activity in the Concept Development. The class may solve, or simply discuss, which is the unknown factor. (Guide students to notice how different the contexts are, but that each pair of problems always shows the same two unknowns.)

**Exit Ticket (3 minutes)**

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

Lesson 13 Problem Set 3•1

3. Camille buys a sheet of stamps that measures 15 centimeters long. Each stamp is 3 centimeters long. How many stamps does Camille buy? Draw and label a tape diagram to solve.

$15 \div 3 = 5$

Camille buys 5 stamps.

---

4. Thirty third-graders go on a field trip. They are equally divided into 3 vans. How many students are in each van?

$30 \div 3 = 10$ 

There are 10 students in each van.

5. Some friends spend \$24 all together on frozen yogurt. Each person pays \$3. How many people buy frozen yogurt?

$\$24 \div \$3 = 8$ 

8 people buy frozen yogurt.

COMMON CORE Lesson 13: Interpret the quotient as the number of groups or the number of objects in each group using units of 3. Date: 5/3/14 engage<sup>ny</sup> 1.D.34

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Number Correct: \_\_\_\_\_

# A

Multiply or Divide by 2

1.	$2 \times 2 =$	
2.	$3 \times 2 =$	
3.	$4 \times 2 =$	
4.	$5 \times 2 =$	
5.	$1 \times 2 =$	
6.	$4 \div 2 =$	
7.	$6 \div 2 =$	
8.	$10 \div 2 =$	
9.	$2 \div 1 =$	
10.	$8 \div 2 =$	
11.	$6 \times 2 =$	
12.	$7 \times 2 =$	
13.	$8 \times 2 =$	
14.	$9 \times 2 =$	
15.	$10 \times 2 =$	
16.	$16 \div 2 =$	
17.	$14 \div 2 =$	
18.	$18 \div 2 =$	
19.	$12 \div 2 =$	
20.	$20 \div 2 =$	
21.	$\_ \times 2 = 10$	
22.	$\_ \times 2 = 12$	

23.	$\_ \times 2 = 20$	
24.	$\_ \times 2 = 4$	
25.	$\_ \times 2 = 6$	
26.	$20 \div 2 =$	
27.	$10 \div 2 =$	
28.	$2 \div 1 =$	
29.	$4 \div 2 =$	
30.	$6 \div 2 =$	
31.	$\_ \times 2 = 12$	
32.	$\_ \times 2 = 14$	
33.	$\_ \times 2 = 18$	
34.	$\_ \times 2 = 16$	
35.	$14 \div 2 =$	
36.	$18 \div 2 =$	
37.	$12 \div 2 =$	
38.	$16 \div 2 =$	
39.	$11 \times 2 =$	
40.	$22 \div 2 =$	
41.	$12 \times 2 =$	
42.	$24 \div 2 =$	
43.	$14 \times 2 =$	
44.	$28 \div 2 =$	

Number Correct: \_\_\_\_\_

Improvement: \_\_\_\_\_

# B

Multiply or Divide by 2

1.	$1 \times 2 =$	
2.	$2 \times 2 =$	
3.	$3 \times 2 =$	
4.	$4 \times 2 =$	
5.	$5 \times 2 =$	
6.	$6 \div 2 =$	
7.	$4 \div 2 =$	
8.	$8 \div 2 =$	
9.	$2 \div 1 =$	
10.	$10 \div 2 =$	
11.	$10 \times 2 =$	
12.	$6 \times 2 =$	
13.	$7 \times 2 =$	
14.	$8 \times 2 =$	
15.	$9 \times 2 =$	
16.	$14 \div 2 =$	
17.	$12 \div 2 =$	
18.	$16 \div 2 =$	
19.	$20 \div 2 =$	
20.	$18 \div 2 =$	
21.	$\_\_ \times 2 = 12$	
22.	$\_\_ \times 2 = 10$	

23.	$\_\_ \times 2 = 4$	
24.	$\_\_ \times 2 = 20$	
25.	$\_\_ \times 2 = 6$	
26.	$4 \div 2 =$	
27.	$2 \div 1 =$	
28.	$20 \div 2 =$	
29.	$10 \div 2 =$	
30.	$6 \div 2 =$	
31.	$\_\_ \times 2 = 12$	
32.	$\_\_ \times 2 = 16$	
33.	$\_\_ \times 2 = 18$	
34.	$\_\_ \times 2 = 14$	
35.	$16 \div 2 =$	
36.	$18 \div 2 =$	
37.	$12 \div 2 =$	
38.	$14 \div 2 =$	
39.	$11 \times 2 =$	
40.	$22 \div 2 =$	
41.	$12 \times 2 =$	
42.	$24 \div 2 =$	
43.	$13 \times 2 =$	
44.	$26 \div 2 =$	

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Fill in the blanks to make true number sentences.

$1 \times 3 = 3$   
 $3 \div 3 = \underline{\quad}$

$2 \times 3 = 6$   
 $6 \div 3 = \underline{\quad}$

$3 \times 3 = 9$   
 $\underline{\quad} \div 3 = 3$

$4 \times 3 = \underline{\quad}$   
 $\underline{\quad} \div 3 = 4$

$5 \times 3 = \underline{\quad}$   
 $\underline{\quad} \div 3 = 5$

$6 \times 3 = \underline{\quad}$   
 $\underline{\quad} \div 3 = 6$

$7 \times 3 = \underline{\quad}$   
 $\underline{\quad} \div 3 = 7$

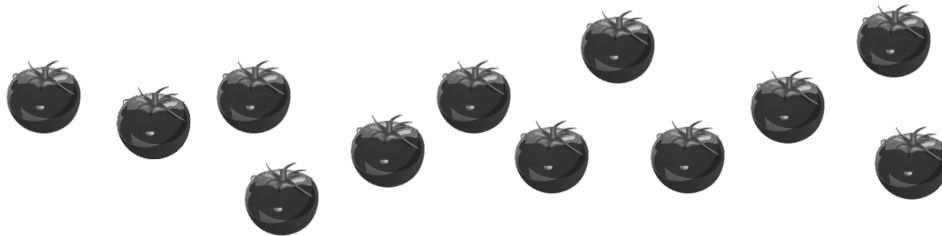
$8 \times 3 = \underline{\quad}$   
 $\underline{\quad} \div 3 = 8$

$9 \times 3 = \underline{\quad}$   
 $\underline{\quad} \div 3 = 9$

$10 \times 3 = \underline{\quad}$   
 $\underline{\quad} \div 3 = 10$

2. Mr. Lawton picks tomatoes from his garden. He divides the tomatoes into bags of 3.

a. Circle to show how many bags he packs. Then, skip-count to show the total number of tomatoes.



b. Draw and label a tape diagram to represent the problem.

\_\_\_\_\_  $\div 3 =$  \_\_\_\_\_

Mr. Lawton packs \_\_\_\_\_ bags of tomatoes.



3. Camille buys a sheet of stamps that measures 15 centimeters long. Each stamp is 3 centimeters long. How many stamps does Camille buy? Draw and label a tape diagram to solve.

Camille buys \_\_\_\_\_ stamps.

---

4. Thirty third-graders go on a field trip. They are equally divided into 3 vans. How many students are in each van?

5. Some friends spend \$24 altogether on frozen yogurt. Each person pays \$3. How many people buy frozen yogurt?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Andrea has 21 apple slices. She uses 3 apple slices to decorate 1 pie. How many pies does Andrea make? Draw and label a tape diagram to solve.

2. There are 24 soccer players on the field. They form 3 equal teams. How many players are on each team?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Fill in the blanks to make true number sentences.

$2 \times 3 = 6$ $6 \div 3 = \underline{\quad}$
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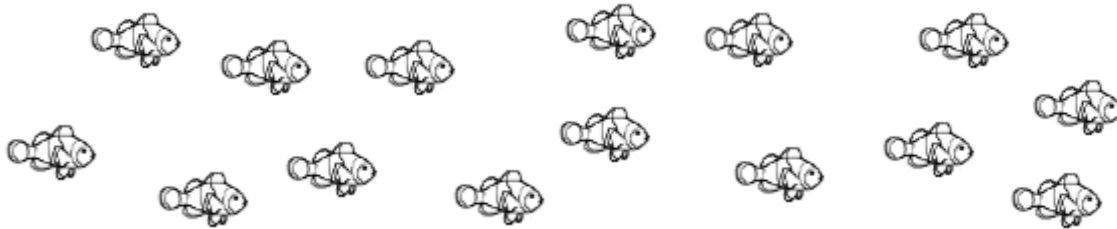
$1 \times 3 = \underline{\quad}$ $\underline{\quad} \div 3 = 1$
--

$7 \times 3 = \underline{\quad}$ $\underline{\quad} \div 3 = 7$
--

$9 \times 3 = \underline{\quad}$ $\underline{\quad} \div 3 = 9$
--

2. Ms. Gillette’s pet fish are shown below. She keeps 3 fish in each tank.

a. Circle to show how many fish tanks she has. Then, skip-count to find the total number of fish.



b. Draw and label a tape diagram to represent the problem.

\_\_\_\_\_  $\div$  3 = \_\_\_\_\_

Ms. Gillette has \_\_\_\_\_ fish tanks.

3. Juan buys 18 meters of wire. He cuts the wire into pieces that are each 3 meters long. How many pieces of wire does he cut?

---

4. A teacher has 24 pencils. They are divided equally among 3 students. How many pencils does each student get?

---

5. There are 27 third-graders working in groups of 3. How many groups of third-graders are there?