

A STORY OF UNITS



Mathematics Curriculum



Grade 3 • MODULE 1

Properties of Multiplication and Division and Solving Problems with Units of 2–5 and 10

Homework

Video tutorials: http://embarc.online

Version 3

GRADE

Mathematics Curriculum



GRADE 3 • MODULE 1

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Properties of Multiplication and Division and Solving Problems with Units of 2–5 and 10

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Name _____

Date ____

1. Fill in the blanks to make true statements.





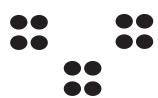




a. 4 groups of five = _____

4 fives = _____

4 × 5 = _____







b. 5 groups of four = _____

5 fours = _____

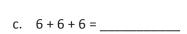
5 × 4 = _____











_____ groups of six = _____

3 × _____ = ____

d. 3+___+__+__+__=

6 groups of _____ = ____

6 × _____ = ____

2. The picture below shows 3 groups of hot dogs. Does the picture show 3×3 ? Explain why or why not.







3. Draw a picture to show $4 \times 2 = 8$.

4. Circle the pencils below to show 3 groups of 6. Write a repeated addition and a multiplication sentence to represent the picture.





Lesson 1: Understand equal groups of as multiplication.

Name	Date
Traine	

Use the arrays below to answer each set of questions.

1.



- a. How many rows of erasers are there? _____
- b. How many erasers are there in each row? _____



- a. What is the number of rows?
- b. What is the number of objects in each row? _____

3.

- a. There are 3 squares in each row. How many squares are in 5 rows? ______
- b. Write a multiplication expression to describe the array. _____

4.



- a. There are 6 rows of stars. How many stars are in each row?
- b. Write a multiplication expression to describe the array. _____



Lesson 2: Relate multiplication to the array model. 5. The triangles below show 3 groups of four.



- a. Redraw the triangles as an array that shows 3 rows of four.
- b. Compare the drawing to your array. How are they the same? How are they different?
- 6. Roger has a collection of stamps. He arranges the stamps into 5 rows of four. Draw an array to represent Roger's stamps. Then, write a multiplication equation to describe the array.

7. Kimberly arranges her 18 markers as an array. Draw an array that Kimberly might make. Then, write a multiplication equation to describe your array.



Date _____

Solve Problems 1–4 using the pictures provided for each problem.

1. There are 5 pineapples in each group. How many pineapples are there in 5 groups?











a. Number of groups: _____ Size of each group: _____

c. There are _____ pineapples altogether.

2. There are _____ apples in each basket. How many apples are there in 6 baskets?













a. Number of groups: _____ Size of each group: _____

c. There are _____ apples altogether.

3. There are 4 bananas in each row. How many bananas are there in _____ rows?



- a. Number of rows: _____ Size of each row: _____
- b. _____×4 = ____
- c. There are ______ bananas altogether.
- 4. There are _____ peppers in each row. How many peppers are there in 6 rows?



a. Number of rows: _____ Size of each row: _____



b. _____ = ____



c. There are _____ peppers altogether.



5. Draw an array using factors 4 and 2. Then, show a number bond where each part represents the amount in one row.

Date _____

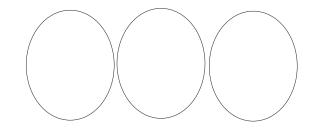
1.



12 chairs are divided into 2 equal groups.

There are _____ chairs in each group.

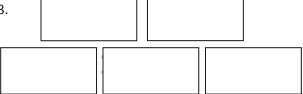
2.



21 triangles are divided into 3 equal groups.

There are _____ triangles in each group.

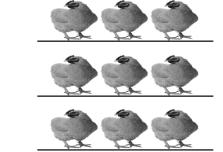
3.



25 erasers are divided into _____ equal groups.

There are ______ erasers in each group.

4.



_ chickens are divided into _____ equal groups.

There are _____ chickens in each group.

9 ÷ 3 = _____

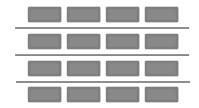
5.



There are _____ buckets in each group.

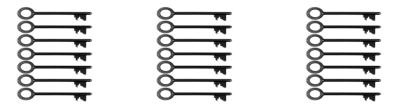
12 ÷ 4 = _____

6.



16 ÷ 4 = _____

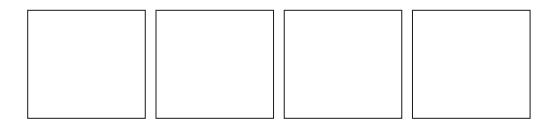
7. Andrew has 21 keys. He puts them in 3 equal groups. How many keys are in each group?



There are _____ keys in each group.

21 ÷ 3 = _____

8. Mr. Doyle has 20 pencils. He divides them equally between 4 tables. Draw the pencils on each table.



There are _____ pencils on each table.

20 ÷ _____=

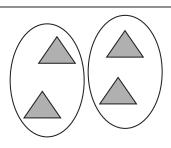
9. Jenna has markers. The picture shows how she placed them on her desk. Write a division sentence to represent how she equally grouped her markers.

There are _____ markers in each row.



Name _____

1.

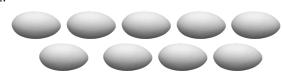


Divide 4 triangles into groups of 2.

There are _____ groups of 2 triangles.

 $4 \div 2 = 2$

2.



Divide 9 eggs into groups of 3.

There are _____ groups.

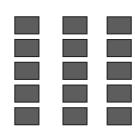
9 ÷ 3 = _____

3.



Divide 12 buckets of paint into groups of 3.

12 ÷ 3 = _____



Group the squares to show $15 \div 5 =$ ______, where the unknown represents the number of groups.

How many groups are there? _____

5. Daniel has 12 apples. He puts 6 apples in each bag. Circle the apples to find the number of bags Daniel makes.



- a. Write a division sentence where the answer represents the number of Daniel's bags.
- b. Draw a number bond to represent the problem.

- 6. Jacob draws cats. He draws 4 legs on each cat for a total of 24 legs.
 - a. Use a count-by to find the number of cats Jacob draws. Make a drawing to match your counting.

b. Write a division sentence to represent the problem.



Date _____

1. Mr. Hannigan puts 12 pencils into boxes. Each box holds 4 pencils. Circle groups of 4 to show the pencils in each box.



Mr. Hannigan needs _____ boxes.

12 ÷ 4 = _____

2. Mr. Hannigan places 12 pencils into 3 equal groups. Draw to show how many pencils are in each group.

There are _____ pencils in each group.

3. Use an array to model Problem 1.

The number in the blanks represents

4. Judy washes 24 dishes. She then dries and stacks the dishes equally into 4 piles. How many dishes are in each pile?

What is the meaning of the unknown factor and quotient?

5. Nate solves the equation $___ \times 5 = 15$ by writing and solving $15 \div 5 = ___$. Explain why Nate's method works.

6. The blanks in Problem 5 represent the number of groups. Draw an array to represent the equations.



Interpret the unknown in division using the array model. Lesson 6:

Name _____ Date ____

- 1. a. Draw an array that shows 7 rows of 2.
- 2. a. Draw an array that shows 2 rows of 7.

- b. Write a multiplication sentence where the first factor represents the number of rows.
 - _____× ____= ____

b. Write a multiplication sentence where the first factor represents the number of rows.

_____× ____ = ____

3. a. Turn your paper to look at the arrays in Problems 1 and 2 in different ways. What is the same and what is different about them?

b. Why are the factors in your multiplication sentences in a different order?

- 4. Write a multiplication sentence to match the number of groups. Skip-count to find the totals. The first one is done for you.
 - a. 2 twos: <u>2 × 2 = 4</u>
- d. 2 fours: _____
- g. 2 fives: _____

- b. 3 twos: _____
- e. 4 twos: _____
- h. 6 twos: _____

- c. 2 threes: _____
- f. 5 twos: _____
- i. 2 sixes: _____



5. Write and solve multiplication sentences where the second factor represents the size of the row.



6. Angel writes $2 \times 8 = 8 \times 2$ in his notebook. Do you agree or disagree? Draw arrays to help explain your thinking.

7. Find the missing factor to make each equation true.

- 8. Tamia buys 2 bags of candy. Each bag has 7 pieces of candy in it.
 - a. Draw an array to show how many pieces of candy Tamia has altogether.
 - b. Write and solve a multiplication sentence to describe the array.
 - c. Use the commutative property to write and solve a different multiplication sentence for the array.

Date ____

1. Draw an array that shows 6 rows of 3.

1 2. Draw an array that shows 3 rows of 6.

3. Write multiplication expressions for the arrays in Problems 1 and 2. Let the first factor in each expression represent the number of rows. Use the commutative property to make sure the equation below is true.

> ____ × ____ = ___ × ____ Problem 1 Problem 2

4. Write a multiplication sentence for each expression. You might skip-count to find the totals. The first one is done for you.

a. 5 threes: <u>5 × 3 = 15</u> d. 3 sixes: _____ g. 8 threes: ____

b. 3 fives: ______ e. 7 threes: _____ h. 3 nines: _____

c. 6 threes: _____ i. 10 threes: _____

5. Find the unknowns that make the equations true. Then, draw a line to match related facts.

a. 3+3+3+3+3+3=____

d. 3 × 9 = _____

b. 3 × 5 = _____

e. ____ = 6 × 3

c. 8 threes + 1 three = _____

f. 15 = 5 × _____

- 6. Fernando puts 3 pictures on each page of his photo album. He puts pictures on 8 pages.
 - a. Use circles to draw an array that represents the total number of pictures in Fernando's photo album.

- b. Use your array to write and solve a multiplication sentence to find Fernando's total number of pictures.
- c. Fernando adds 2 more pages to his book. He puts 3 pictures on each new page. Draw x's to show the new pictures on the array in Part (a).
- d. Write and solve a multiplication sentence to find the new total number of pictures in Fernando's album.
- 7. Ivania recycles. She gets 3 cents for every can she recycles.
 - a. How much money does Ivania make if she recycles 4 cans?

b. How much money does Ivania make if she recycles 7 cans?

___× _____ = _____ cents



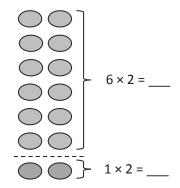
Name _____

Date _____

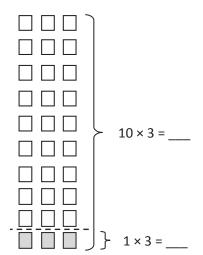
Dan organizes his stickers into 3 rows of four. Irene adds 2 more rows of stickers. Complete the equations to describe the total number of stickers in the array.



- a. (4 + 4 + 4) + (4 + 4) = _____
- b. 3 fours + _____ fours = _____ fours
- c. _____×4=____
- 2. 7 × 2 = _____



3. 9 × 3 = _____



30 –	= 27
	×3=27

- 4. Franklin collects stickers. He organizes his stickers in 5 rows of four.
 - a. Draw an array to represent Franklin's stickers. Use an x to show each sticker.

- b. Solve the equation to find Franklin's total number of stickers. $5 \times 4 =$
- 5. Franklin adds 2 more rows. Use circles to show his new stickers on the array in Problem 4(a).
 - a. Write and solve an equation to represent the circles you added to the array.

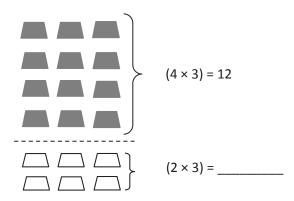
b. Complete the equation to show how you add the totals of 2 multiplication facts to find Franklin's total number of stickers.

c. Complete the unknown to show Franklin's total number of stickers.

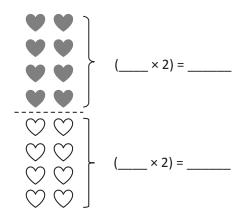
Name _____

Date ____

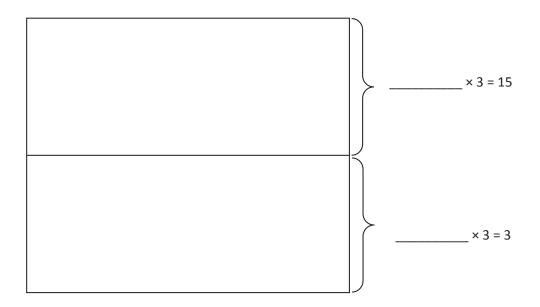
1. 6 × 3 = _____



2. 8 × 2 = _____



- 3. Adriana organizes her books on shelves. She puts 3 books in each row.
 - a. Fill in the equations on the right. Use them to draw arrays that show the books on Adriana's top and bottom shelves.

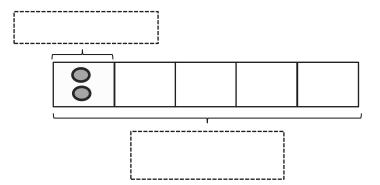


b. Adriana calculates the total number of books as shown below. Use the array you drew to help explain Adriana's calculation.

$$6 \times 3 = 15 + 3 = 18$$

- 1. Fred has 10 pears. He puts 2 pears in each basket. How many baskets does he have?
 - a. Draw an array where each column represents the number of pears in each basket.

b. Redraw the pears in each basket as a unit in the tape diagram. Label the diagram with known and unknown information from the problem.



2. Ms. Meyer organizes 15 clipboards equally into 3 boxes. How many clipboards are in each box? Model the problem with both an array and a labeled tape diagram. Show each column as the number of clipboards in each box.

There are _____ clipboards in each box.



3.	Sixteen action figures are arranged equally on 2 shelves. How many action figures are on each shelf?
	Model the problem with both an array and a labeled tape diagram. Show each column as the number of
	action figures on each shelf.

4. Jasmine puts 18 hats away. She puts an equal number of hats on 3 shelves. How many hats are on each shelf? Model the problem with both an array and a labeled tape diagram. Show each column as the number of hats on each shelf.

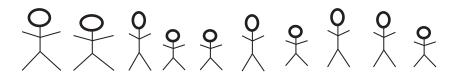
5. Corey checks out 2 books a week from the library. How many weeks will it take him to check out a total of 14 books?



Name _____

Date _____

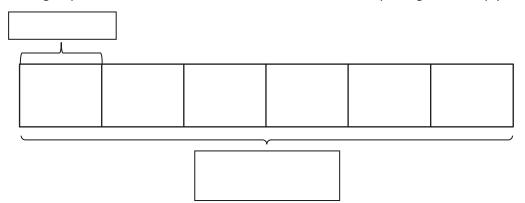
1. Ten people wait in line for the roller coaster. Two people sit in each car. Circle to find the total number of cars needed.



10 ÷ 2 =

There are _____ cars needed.

2. Mr. Ramirez divides 12 frogs equally into 6 groups for students to study. Draw frogs to find the number in each group. Label known and unknown information on the tape diagram to help you solve.



6 × ____ = 12

12 ÷ 6 = _____

There are _____ frogs in each group.

3. Match.



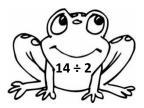






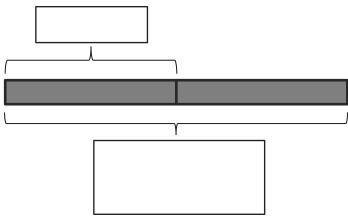








4. Betsy pours 16 cups of water to equally fill 2 bottles. How many cups of water are in each bottle? Label the tape diagram to represent the problem, including the unknown.



There are _____ cups of water in each bottle.

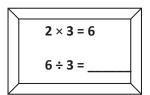
5. An earthworm tunnels 2 centimeters into the ground each day. The earthworm tunnels at about the same pace every day. How many days will it take the earthworm to tunnel 14 centimeters?

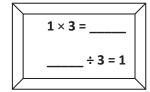
6. Sebastian and Teshawn go to the movies. The tickets cost \$16 in total. The boys share the cost equally. How much does Teshawn pay?

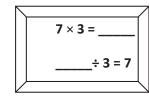


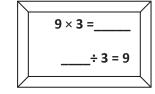
Name _____ Date ____

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

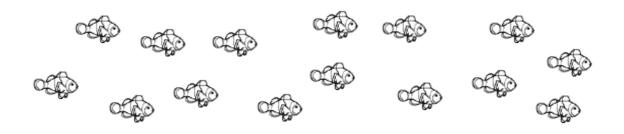








- 2. Ms. Gillette's pet fish are shown below. She keeps 3 fish in each tank.
 - a. Circle to show how many fish tanks she has. Then, skip-count to find the total number of fish.



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

_____ ÷ 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. H	low many pieces
	of wire does he cut?	

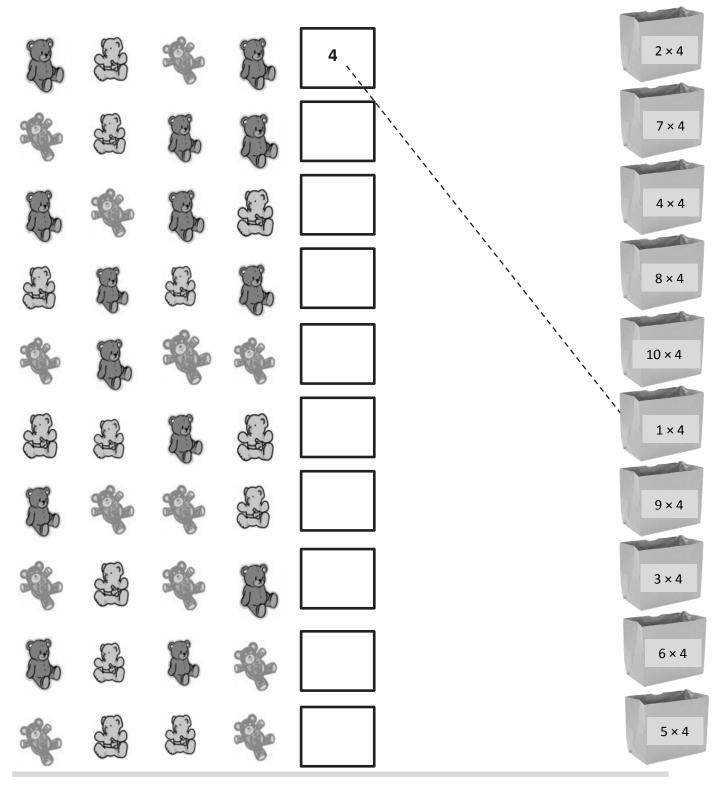
4. A teacher has 24 pencils. They are divided equally among 3 students. How many pencils does each student get?

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



Date _____ Name _____

1. Skip-count by fours. Match each answer to the appropriate expression.





Lesson 14: Skip-count objects in models to build fluency with multiplication facts using units of 4.

2.	Lisa places 5 rows of 4 juice boxes in the refrigerator	. Draw an array and skip-count to find the total
	number of juice boxes.	

There are _____ juice boxes in total.

3. Six folders are placed on each table. How many folders are there on 4 tables? Draw and label a tape diagram to solve.

4. Find the total number of corners on 8 squares.

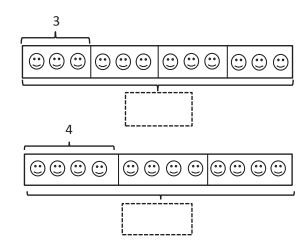


Name _____

Date _____

1. Label the tape diagrams and complete the equations. Then, draw an array to represent the problems.

a.

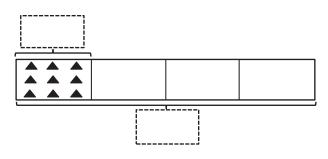


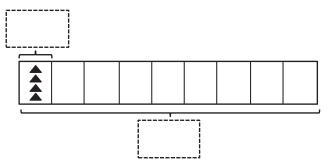
4 × 3 = ____



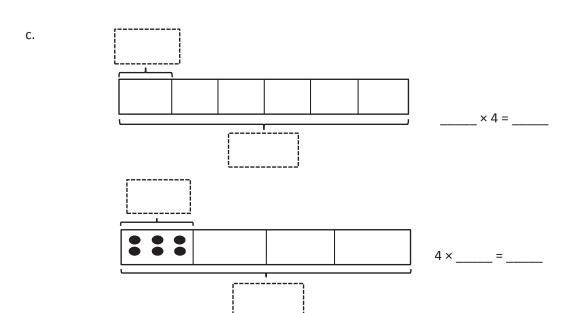
3 × 4 = ____

b.





____×4=____



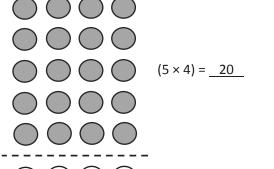
2. Seven clowns hold 4 balloons each at the fair. Draw and label a tape diagram to show the total number of balloons the clowns hold.

3. George swims 7 laps in the pool each day. How many laps does George swim after 4 days?

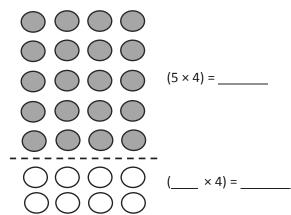


Date _____

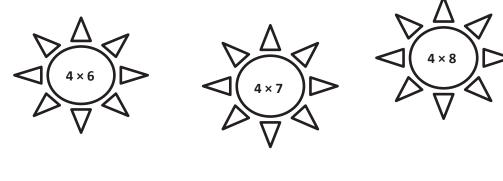
- 1. Label the array. Then, fill in the blanks below to make true number sentences.
 - a. **6 × 4 =** _____



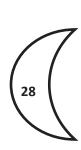
b. **8** × **4** = ____

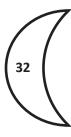


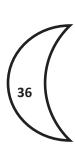
2. Match the multiplication expressions with their answers.





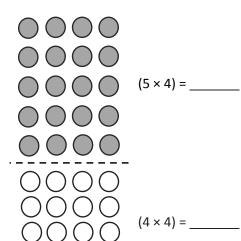








3. The array below shows one strategy for solving 9×4 . Explain the strategy using your own words.



Name _____

Date _____

1. Use the array to complete the related equations.



























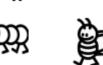






































2.	The teacher puts 32 students into groups of 4.	How many groups does she make?	Draw and label a
	tape diagram to solve.		

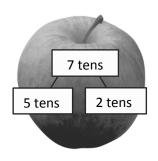
3. The store clerk arranges 24 toothbrushes into 4 equal rows. How many toothbrushes are in each row?

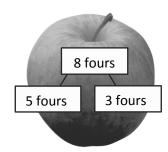
4. An art teacher has 40 paintbrushes. She divides them equally among her 4 students. She finds 8 more brushes and divides these equally among the students, as well. How many brushes does each student receive?

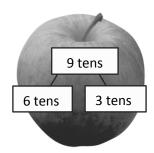


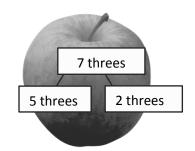
Date _____ Name _____

1. Match.









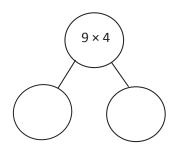








2. 9 × 4 = _____



3.	Lydia makes 10 pancakes. She tops each pancake with 4 blueberries. How many blueberries does Lydia
	use in all? Use the break apart and distribute strategy, and draw a number bond to solve.

Lydia uses _____ blueberries in all.

4. Steven solves 7 × 3 using the break apart and distribute strategy. Show an example of what Steven's work might look like below.

5. There are 7 days in 1 week. How many days are there in 10 weeks?



Date _____

- 1. Label the array. Then, fill in the blanks to make true number sentences.
 - a. $18 \div 3 =$



$$\triangle \triangle \triangle$$

$$(9 \div 3) = 3$$







$$\triangle \triangle \triangle$$

$$(18 \div 3) = (9 \div 3) + (9 \div 3)$$

21 ÷ 3 =





 $(6 \div 3) =$ _____

$$(21 \div 3) = (15 \div 3) + (6 \div 3)$$

 $(15 \div 3) = 5$

= _____

c. 24 ÷ 4 = ____











36 ÷ 4 = ____





$$\triangle \triangle \triangle \triangle$$

$$(36 \div 4) = (\underline{} \div 4) + (\underline{} \div 4)$$

2. Match equal expressions.









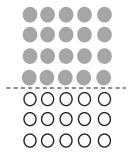






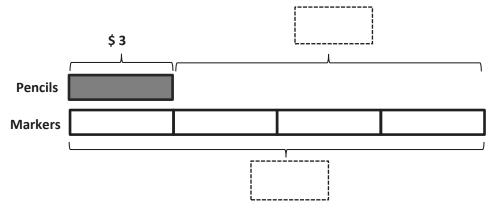


3. Alex draws the array below to find the answer to $35 \div 5$. Explain Alex's strategy.

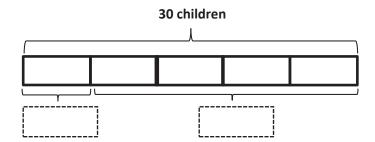


Name	Date	

1. Jerry buys a pack of pencils that costs \$3. David buys 4 sets of markers. Each set of markers also costs \$3.



- a. What is the total cost of the markers?
- b. How much more does David spend on 4 sets of markers than Jerry spends on a pack of pencils?
- 2. Thirty students are eating lunch at 5 tables. Each table has the same number of students.
 - a. How many students are sitting at each table?



b. How many students are sitting at 4 tables?

3.	The teacher has 12 green stickers and 15 purple stickers. Three students are given an equal number of each
	color sticker. How many green and purple stickers does each student get?

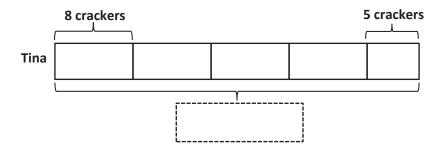
4. Three friends go apple picking. They pick 13 apples on Saturday and 14 apples on Sunday. They share the apples equally. How many apples does each person get?

5. The store has 28 notebooks in packs of 4. Three packs of notebooks are sold. How many packs of notebooks are left?



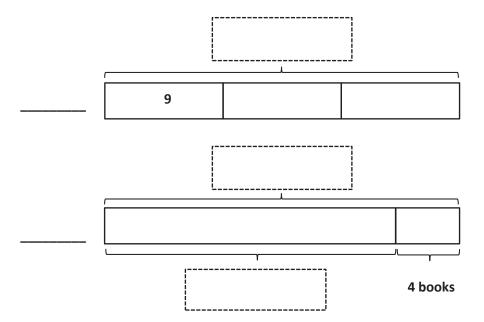
Name	Date	
Name	Date	

1. Tina eats 8 crackers for a snack each day at school. On Friday, she drops 3 and only eats 5. Write and solve an equation to show the total number of crackers Tina eats during the week.



Tina eats _____ crackers.

2. Ballio has a reading goal. He checks 3 boxes of 9 books out from the library. After finishing them, he realizes that he beat his goal by 4 books! Label the tape diagrams to find Ballio's reading goal.



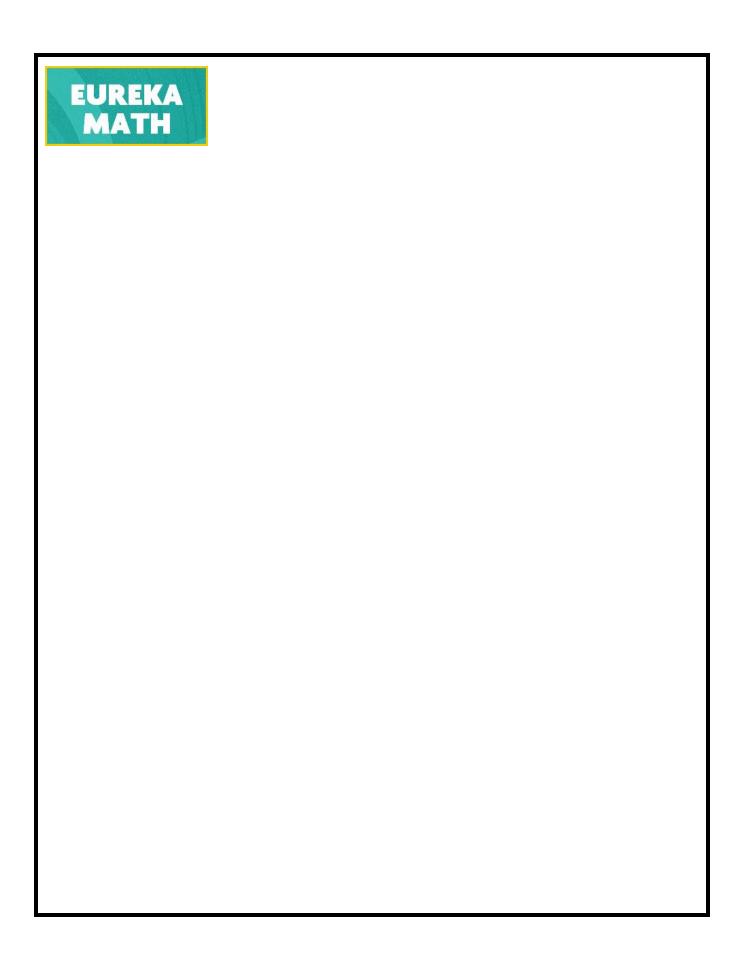
Ballio's goal is to read _____ books.

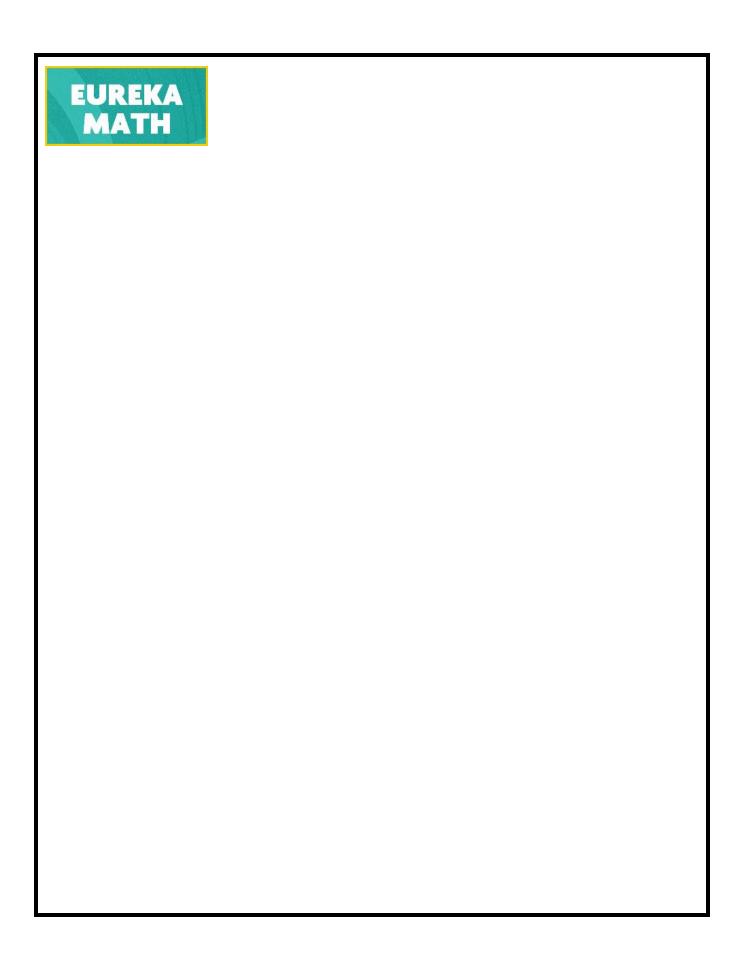


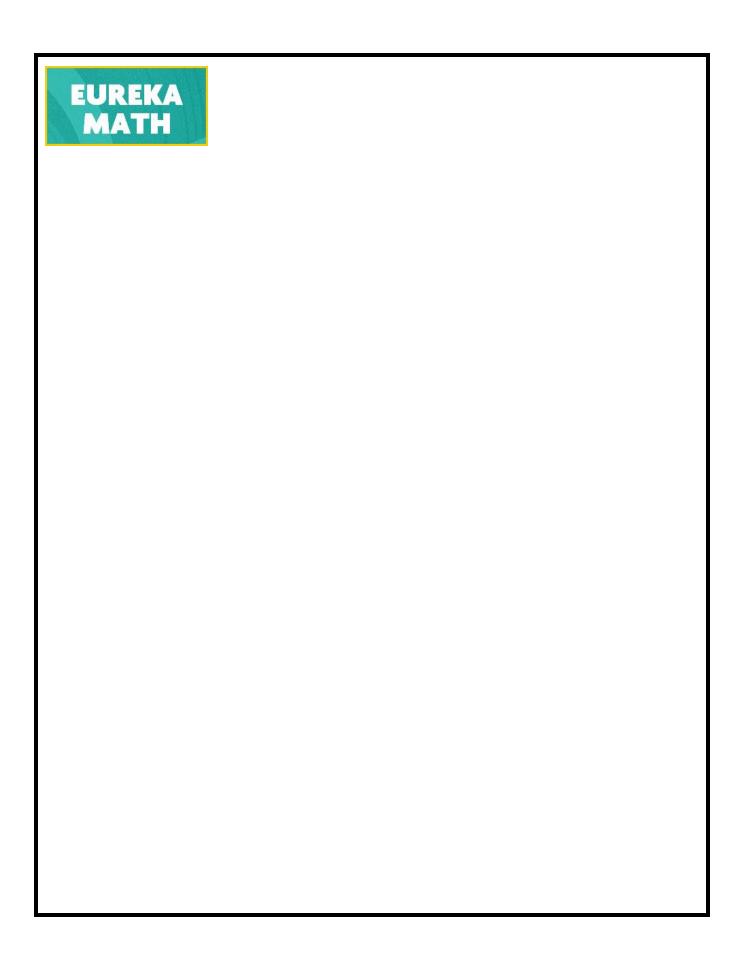
3. Mr. Nguyen plants 24 trees around the neighborhood pond. He plants equal numbers of maple, pine, spruce, and birch trees. He waters the spruce and birch trees before it gets dark. How many trees does Mr. Nguyen still need to water? Draw and label a tape diagram.

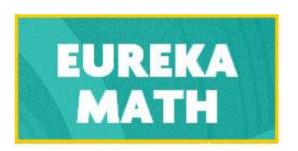
4. Anna buys 24 seeds and plants 3 in each pot. She has 5 pots. How many more pots does Anna need to plant all of her seeds?











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