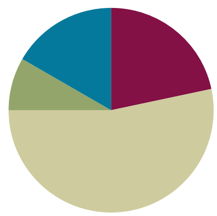
Lesson 14

Objective: Skip-Count objects in models to build fluency with multiplication facts using units of 4.

Related Topics: More Lesson Plans for the Common Core Math

Suggested Lesson Structure

Fluency Practice	(13 minutes)
Application Problem	(5 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Fluency Practice (13 minutes)

- Divide by Three **3.OA.7** (10 minutes)
- Read Tape Diagrams **3.OA.3** (3 minutes)

Sprint: Divide by Three (10 minutes)

Materials: (S) Divide by Three Sprint

Note: This activity builds fluency with division using units of 3. It works toward students' ability to divide fluently within 100. See *Directions for Administration of Sprints* in Lesson 2.

Instead of movement exercises between sprints, have students:

- Count by twos to 20 forward and backward.
- Count by fours to 40 forward and backward.

Read Tape Diagrams (3 minutes)

Materials: (S) Personal white boards

Note: Students practice *reading* the difference between the value of the unit (the size of the groups) and the number of units. The activity anticipates using the tape diagram as a model for commutativity.

T: (Project a tape diagram partitioned into 5 equal units, drawing 2 stars in the first unit.) What is the value of each unit?

S: 2 stars.

T: How many units are there?

S: 5 units.

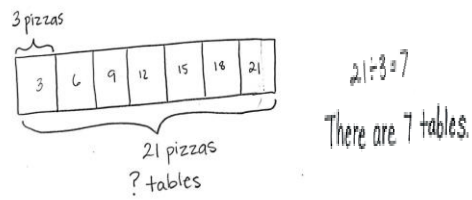
T: Write a multiplication sentence for this tape diagram.

S: (Write 5 × 2 = 10.)

Repeat the process, alternating between finding the number of groups and the size of the groups for 4 × 3 = 12, 8 ÷ 4 = 2, and 15 ÷ 3 = 5.

Application Problem (5 minutes)

Jackie buys 21 pizzas for a party. She places 3 pizzas on each table. How many tables are there?



Note: This problem reviews equal groups division from Lesson 13 where the unknown is the number of groups. In preparation for today's lesson, students solve by skip-counting to add units until they reach the total of 21. When directions are not specified, students may use any model of their choice to solve.

Concept Development (32 minutes)

Materials: (S) Personal white boards, Fours Array template (pictured below)

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

It may be tempting to skip the template for this problem. However, the template helps visual learners connect spoken numbers with their physical value. It illustrates the relationship between counting by fours and multiplying with units of four.

Problem 1: Skip-count by fours using an array to multiply.

T: Let's count to 40 using the array. Hum the number you count as you point to each dot. For the last dot in each row, say the number out loud and write it to the right of the row.

S: Hum, hum, hum, 4! (Write 4.)

T: At the signal, tell what unit we counted by. (Signal.)

S: Fours!

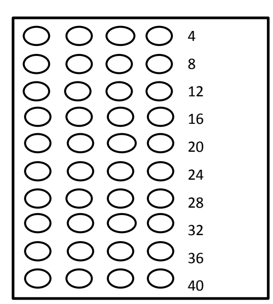
T: I will say a multiplication fact. You find the answer on your array. Write the fact next to the answer. (Say facts that correspond to the array out of order. For example: 4 × 4, 9 × 4, etc.)

S: (Write facts next to each answer.)

T: I will say the answer, you say the complete equation. 20.

S: 5 × 4 = 20!

Fours Array Template (labeled)



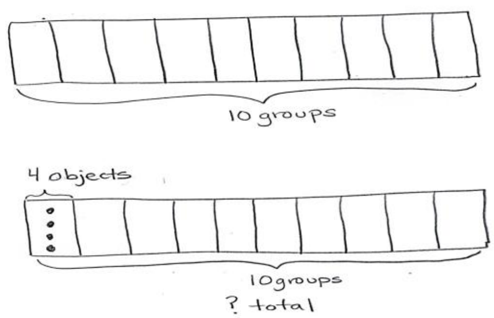
Problem 2: Use a tape diagram to model and solve multiplication.

T: Draw a tape diagram that represents the number of groups shown on the array template.

S: (Students draw a rectangle partitioned into 10 units and label as '10 groups'.)

T: Tell your partner the number of objects in each group, then draw and label that information on your diagram.

S: There are 4 objects in each group. (Label 1 unit as '4 objects'.)



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

This is students' first formal experience in Grade 3 using a tape diagram to model multiplication. Some may have used it to solve the application problem in Lesson 12. If they need additional help identifying known and unknown information, prompt them to look back at the array and have them articulate the meaning of each factor.

T: Label the unknown on your diagram. Check your work with your partner's.

S: (Label the total as 'unknown' and check with a partner.)

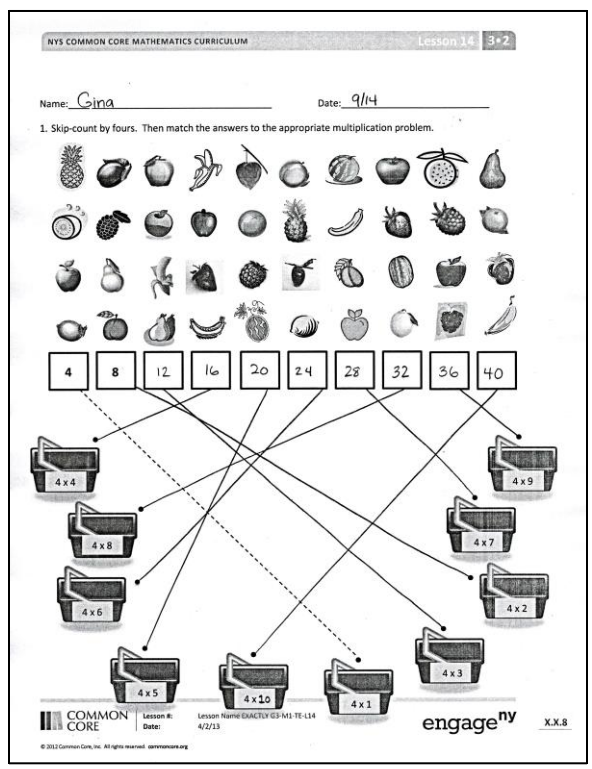
T: Skip-count units to find the total value of your tape diagram.

S: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40.

T: Write and solve a multiplication sentence to represent the problem.

S: (Write 10 × 4 = 40.)

Repeat the process using. 7 × 4 and 4 × 5. You may want to ask students to draw the arrays, or vary practice by adding context to one or both of these problems.



Problem Set (10 minutes)

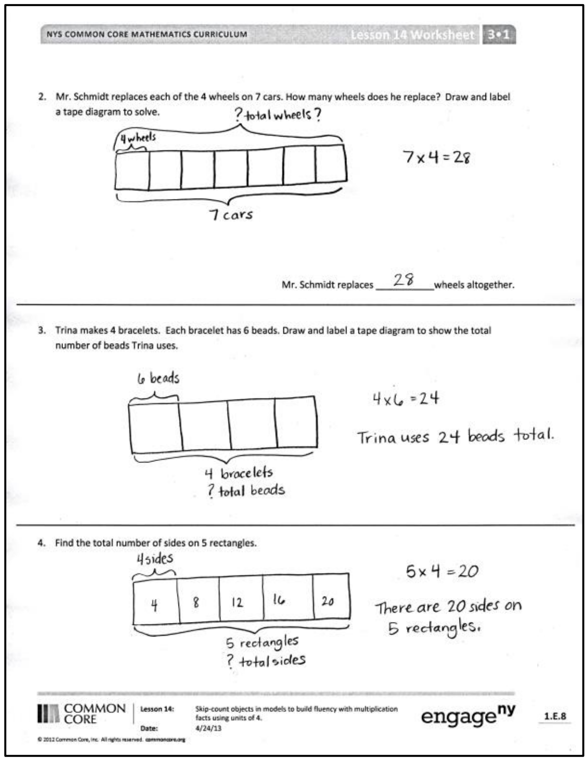
Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the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

Application Problems.

Student Debrief (10 minutes)

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

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. You may choose to use any combination of the ideas below to lead the discussion.


NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 14 Worksheet 3•1

2. Mr. Schmidt replaces each of the 4 wheels on 7 cars. How many wheels does he replace? Draw and label a tape diagram to solve.

? total wheels ?
4 wheels
7 cars
7 x 4 = 28

Mr. Schmidt replaces 28 wheels altogether.

3. Trina makes 4 bracelets. Each bracelet has 6 beads. Draw and label a tape diagram to show the total number of beads Trina uses.

6 beads
4 bracelets
? total beads
4 x 6 = 24
Trina uses 24 beads total.

4. Find the total number of sides on 5 rectangles.

4 sides
| 4 | 8 | 12 | 16 | 20 |
5 rectangles
? total sides
5 x 4 = 20
There are 20 sides on 5 rectangles.

COMMON CORE Lesson 14: Skip-count objects in models to build fluency with multiplication facts using units of 4. Date: 4/24/13 engage^ny 1.E.8

MP.4

- Discuss differences between the tape diagrams and unknowns in Problems 2 and 3. (In Problem 2 the value of the unit is four, and in Problem 3 the number 4 represents the number of units.)
- If you skip-counted to solve Problem 3, what would you skip-count by? How would that be different from a skip-counting strategy to solve Problem 4?
- Could you skip-count Problem 4 without drawing a model? How?
- How did the array in Problem 1 help you solve the other problems on the problem set?
- Lesson 15 revisits the commutative property. Compare the arrays used on the problem set and in Problem 1 of the lesson. (It is the same array turned 90 degrees.)

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.

A # Correct _____

Solve.

1	2 x 3 =		23	__ x 3 = 30	
2	3 x 3 =		24	__ x 3 = 6	
3	4 x 3 =		25	__ x 3 = 9	
4	5 x 3 =		26	30 ÷ 3 =	
5	1 x 3 =		27	15 ÷ 3 =	
6	6 ÷ 3 =		28	3 ÷ 1 =	
7	9 ÷ 3 =		29	6 ÷ 3 =	
8	15 ÷ 3 =		30	9 ÷ 3 =	
9	3 ÷ 1 =		31	__ x 3 = 18	
10	12 ÷ 3 =		32	__ x 3 = 21	
11	6 x 3 =		33	__ x 3 = 27	
12	7 x 3 =		34	__ x 3 = 24	
13	8 x 3 =		35	21 ÷ 3 =	
14	9 x 3 =		36	27 ÷ 3 =	
15	10 x 3 =		37	18 ÷ 3 =	
16	24 ÷ 3 =		38	24 ÷ 3 =	
17	21 ÷ 3 =		39	11 x 3 =	
18	27 ÷ 3 =		40	33 ÷ 3 =	
19	18 ÷ 3 =		41	12 x 3 =	
20	30 ÷ 3 =		42	36 ÷ 3 =	
21	__ x 3 = 15		43	13 x 3 =	
22	__ x 3 =12		44	39 ÷ 3 =	

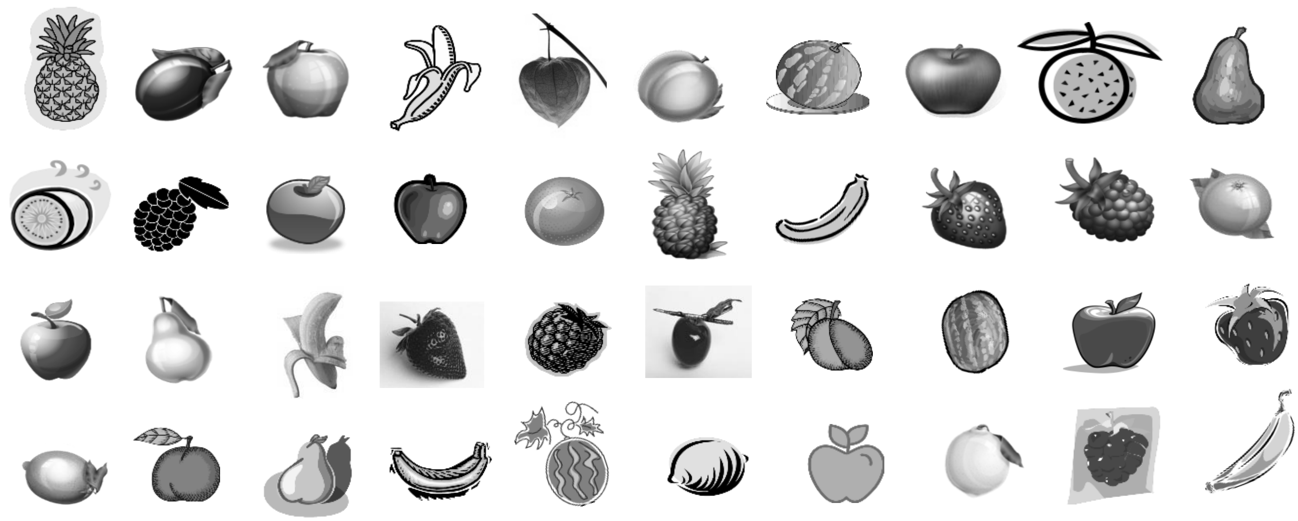
B Improvement _____ # Correct _____

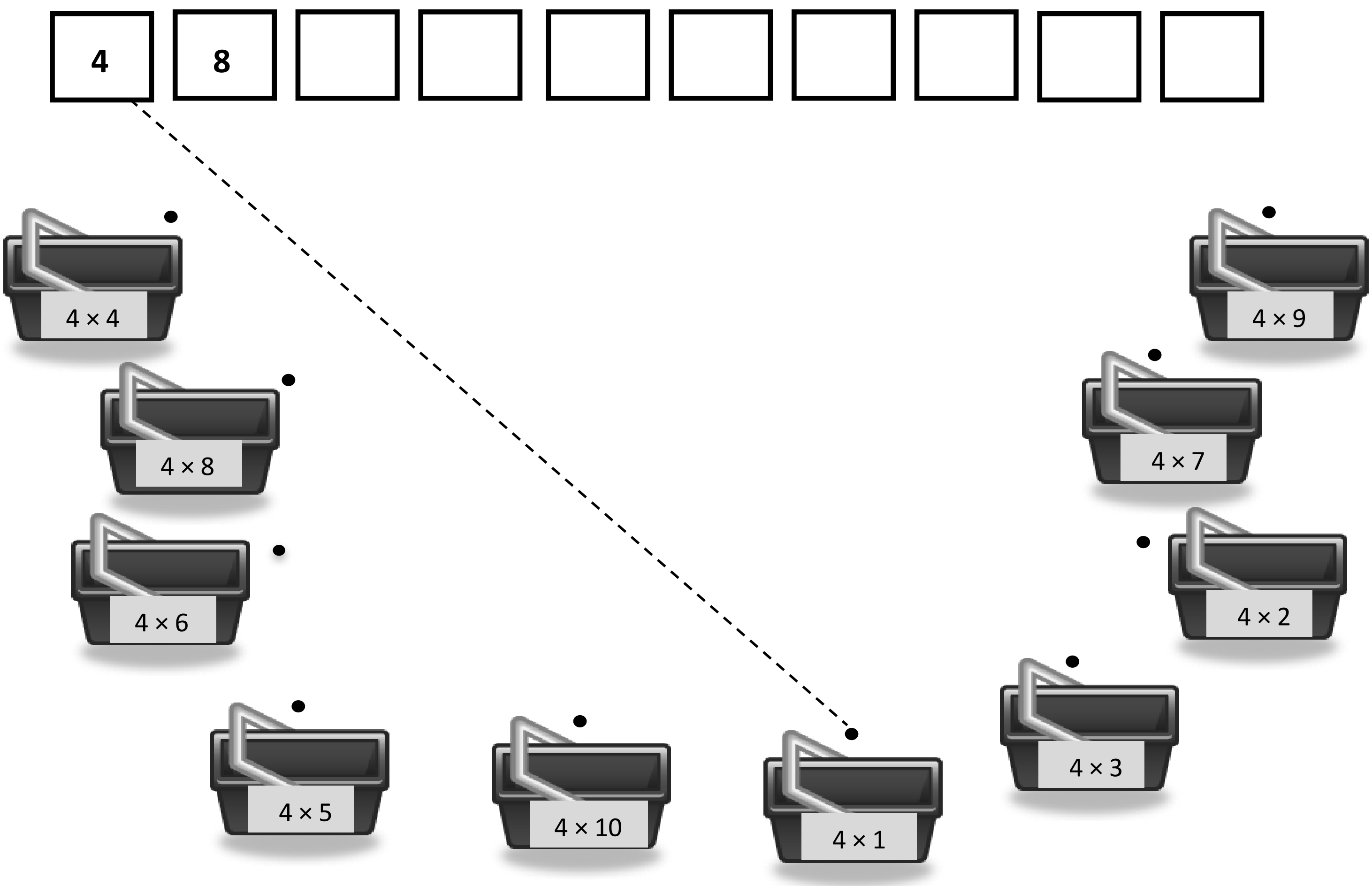
Solve.

1	1 x 3 =		23	__ x 3 = 6	
2	2 x 3 =		24	__ x 3 = 30	
3	3 x 3 =		25	__ x 3 = 9	
4	4 x 3 =		26	6 ÷ 3 =	
5	5 x 3 =		27	3 ÷ 1 =	
6	9 ÷ 3 =		28	30 ÷ 3 =	
7	6 ÷ 3 =		29	15 ÷ 3 =	
8	12 ÷ 3 =		30	9 ÷ 3 =	
9	3 ÷ 1 =		31	__ x 3 = 18	
10	15 ÷ 3 =		32	__ x 3 = 24	
11	10 x 3 =		33	__ x 3 = 27	
12	6 x 3 =		34	__ x 3 = 21	
13	7 x 3 =		35	24 ÷ 3 =	
14	8 x 3 =		36	27 ÷ 3 =	
15	9 x 3 =		37	18 ÷ 3 =	
16	21 ÷ 3 =		38	21 ÷ 3 =	
17	18 ÷ 3 =		39	11 x 3 =	
18	24 ÷ 3 =		40	33 ÷ 3 =	
19	30 ÷ 3 =		41	12 x 3 =	
20	27 ÷ 3 =		42	36 ÷ 3 =	
21	__ x 3 = 12		43	13 x 3 =	
22	__ x 3 =15		44	39 ÷ 3 =	

Name ______________________________________ Date ____________________

1. Skip-count by fours. Match the answers to the appropriate multiplication problem.





2. Mr. Schmidt replaces each of the 4 wheels on 7 cars. How many wheels does he replace? Draw and label a tape diagram to solve.

Mr. Schmidt replaces ___________wheels altogether.

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3. Trina makes 4 bracelets. Each bracelet has 6 beads. Draw and label a tape diagram to show the total number of beads Trina uses.

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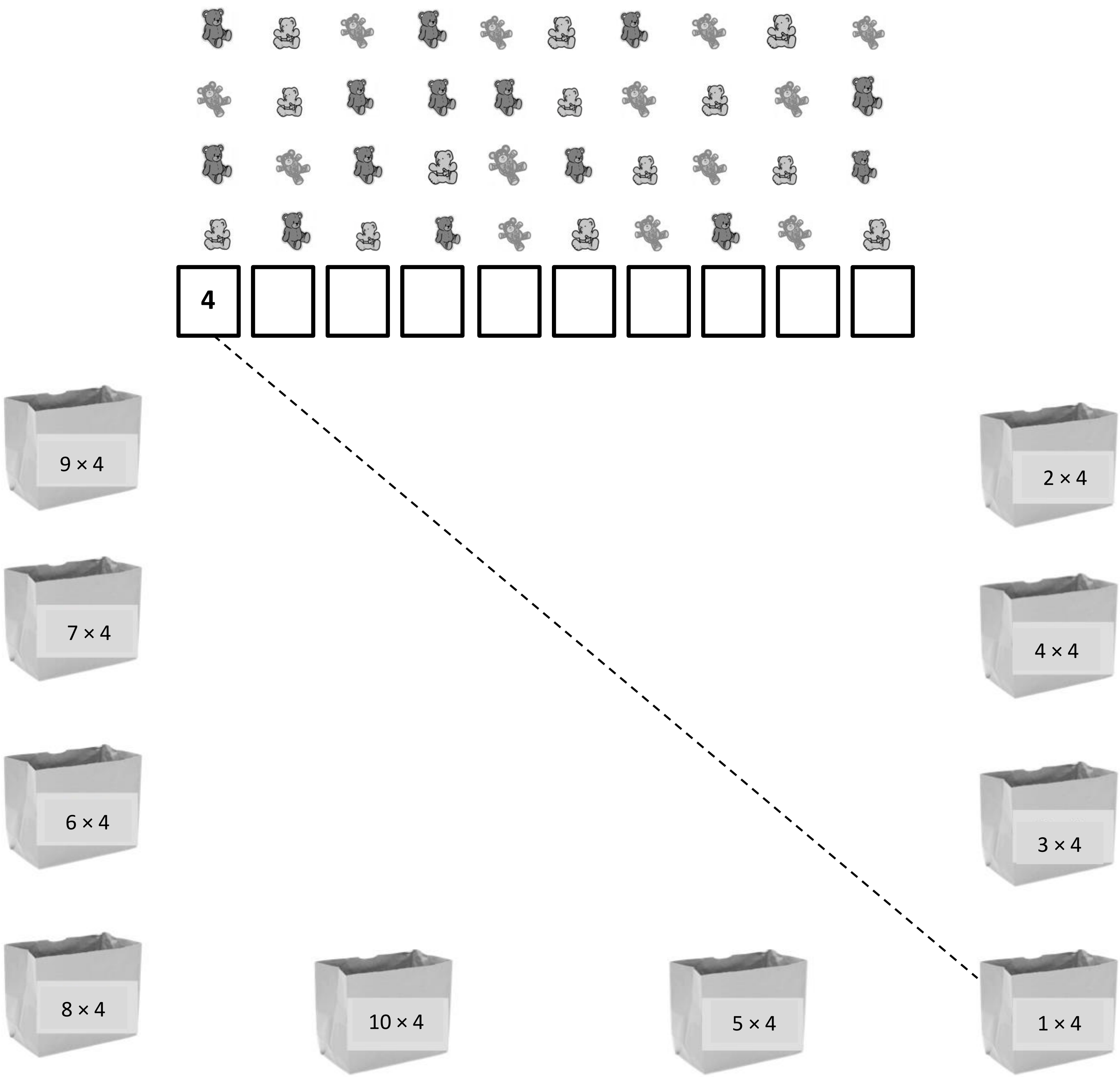
4. Find the total number of sides on 5 rectangles.

Name ____ Date ________________________

Arthur has 4 boxes of chocolates. Each box has 6 chocolates inside. How many chocolates does Arthur have altogether? Draw and label a tape diagram to solve.

Name ______________________________ Date ____________________

1. Skip-count by fours. Match the answers to the appropriate multiplication problem.



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.

___________× 4 = ____________

There are ___________juice boxes in total.

3. 6 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.