

Lesson 3: Arrays and Equal Groups (3 Days)

Getting Started

✿ Questions to Explore

- What are some strategies we can use to multiply and divide?



Facts and Definitions

- The four strategies for multiplication are arrays, equal groups, repeated addition, and number lines.

⦿ Skills

- Interpret products of whole numbers (for example, interpret 5×7 as the total number of objects in 5 groups of 7 objects each)
- Interpret and create arrays that model multiplication
- Use equal groups to model multiplication

✂ Materials

- Cheerios, Goldfish, or small snack food
- counters (kit)
- fine point dry-erase markers (kit)
- Interactive Notebook
- laminated multiplication strategies mat (kit)
- small paper plates (kit)
- whiteboard (kit)

Introduction

Write $5 \times 4 = 20$ on the whiteboard, and pose the following questions:

- What are the factors? (5 and 4)
- What is the product? (20)
- What can you draw to show this multiplication problem?

Give your child the whiteboard and a dry-erase marker so that he can draw a way to show the problem. He might draw an array or 5 circles or boxes that have 4 dots or other small objects each inside of them. If he'd prefer, allow him to show the problem using counters. (5 groups of 4 counters)

Now, say, "You've already learned many strategies for adding numbers. What are some of them?" His answer may include doubles, fact families, turn-around facts/commutative property of addition, making 10, adding multiples of 10, carrying, and regrouping. If needed, remind him of some of these strategies, and review the "Math Strategies Review" sheets in his Interactive Notebook. Say, "Just like with addition, there are some important strategies related to multiplication."

Activities

Activity 1: Overview of Multiplication Strategies

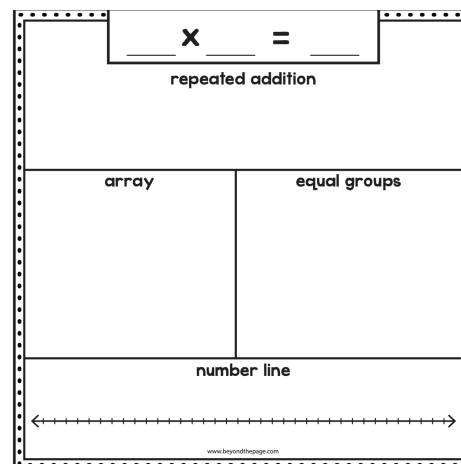
Show your child the video at the following web link. Explain to him that he already knows the strategies in the video but that the video will help him see how they relate to multiplication.



Learning to Multiply Using Multiplication Strategies

www.beyondthepage.com/link/6270/

Once your child is finished watching the video, ask, "What are the four strategies for multiplying?" He should recall the following: arrays, equal groups, repeated addition, and number lines. Now, show him the laminated multiplication strategies mat from the math kit, and point out each section for each strategy. Explain that, after he has practiced each strategy, your child will use this mat to represent and solve multiplication sentences in different ways.



Activity 2: Arrays and Multiplication

Ask your child to draw an array on the whiteboard and explain its parts and what it shows. Next, he will watch the video at the following web link. Explain that he already knows much of what the video explains at the beginning but that he will also begin to see how arrays help with multiplication. While he watches the video, write the following on the whiteboard, leaving space for an additional number sentence: "___ groups of ___" and "___ × ___."



Array Multiplication

www.beyondthepage.com/link/8141/

Once your child has finished watching the video, give him a cup of Cheerios, Goldfish, or another small snack, and ask him to create an array that shows the number 18 in 3 rows. He should show 3 rows with 6 items in each one. Once he has created the array, give him the whiteboard and a dry-erase marker, and tell him to write the following based on the array:

- Repeated addition sentence
- Word form (___ groups of ___)
- Number form (___ × ___)

He should write the following:

- 3+3+3+3+3+3 OR 6+6+6
- 3 groups of 6 OR 6 groups of 3
- 3×6 OR 6×3

Repeat this process for the number 20, but this time don't give him a specified number of rows. He should create one of the following arrays: 2 by 10, 10 by 2, 4 by 5, or 5 by 4. Again, once he's created his array, he should write the following on the whiteboard (erase his previous numbers):

- Repeated addition sentence
- Word form (___ groups of ___)

- Number form ($\underline{\quad} \times \underline{\quad}$)

His answers will vary based on the array that he creates.

Your child will complete the "Multiplication Arrays" sheet by filling in the four blanks under each array. Explain that at this point he is only writing the word and number forms for each array and that he is not providing the products (answers).

"Multiplication Arrays" Answer Key

1. $\begin{array}{l} \underline{3} \text{ groups of } \underline{6} \\ \underline{3} \times \underline{6} \\ \underline{6} \text{ groups of } \underline{3} \\ \underline{6} \times \underline{3} \end{array}$	2. $\begin{array}{l} \underline{3} \text{ groups of } \underline{5} \\ \underline{3} \times \underline{5} \\ \underline{5} \text{ groups of } \underline{3} \\ \underline{5} \times \underline{3} \end{array}$	3. $\begin{array}{l} \underline{4} \text{ groups of } \underline{3} \\ \underline{4} \times \underline{3} \\ \underline{3} \text{ groups of } \underline{4} \\ \underline{3} \times \underline{4} \end{array}$	4. $\begin{array}{l} \underline{2} \text{ groups of } \underline{5} \\ \underline{2} \times \underline{5} \\ \underline{5} \text{ groups of } \underline{2} \\ \underline{5} \times \underline{2} \end{array}$
5. $\begin{array}{l} \underline{5} \text{ groups of } \underline{4} \\ \underline{5} \times \underline{4} \\ \underline{4} \text{ groups of } \underline{5} \\ \underline{4} \times \underline{5} \end{array}$	6. $\begin{array}{l} \underline{2} \text{ groups of } \underline{7} \\ \underline{2} \times \underline{7} \\ \underline{7} \text{ groups of } \underline{2} \\ \underline{7} \times \underline{2} \end{array}$	7. $\begin{array}{l} \underline{2} \text{ groups of } \underline{6} \\ \underline{2} \times \underline{6} \\ \underline{6} \text{ groups of } \underline{2} \\ \underline{6} \times \underline{2} \end{array}$	8. $\begin{array}{l} \underline{3} \text{ groups of } \underline{7} \\ \underline{3} \times \underline{7} \\ \underline{7} \text{ groups of } \underline{3} \\ \underline{7} \times \underline{3} \end{array}$
9. $\begin{array}{l} \underline{5} \text{ groups of } \underline{6} \\ \underline{5} \times \underline{6} \\ \underline{6} \text{ groups of } \underline{5} \\ \underline{6} \times \underline{5} \end{array}$	10. $\begin{array}{l} \underline{5} \text{ groups of } \underline{7} \\ \underline{5} \times \underline{7} \\ \underline{7} \text{ groups of } \underline{5} \\ \underline{7} \times \underline{5} \end{array}$	11. $\begin{array}{l} \underline{1} \text{ groups of } \underline{4} \\ \underline{1} \times \underline{4} \\ \underline{4} \text{ groups of } \underline{1} \\ \underline{4} \times \underline{1} \end{array}$	12. $\begin{array}{l} \underline{2} \text{ groups of } \underline{3} \\ \underline{2} \times \underline{3} \\ \underline{3} \text{ groups of } \underline{2} \\ \underline{3} \times \underline{2} \end{array}$

Activity 3: Basic Skills Review

Your child will complete Basic Skills Reviews during each unit over the course of this year. The number of the reviews will vary based on the length of the unit. The purpose of these reviews is to keep fundamental math skills that your child should have already mastered — such as addition and subtraction, telling time, and counting money — "fresh" in his mind so that he doesn't "lose" them over time. As your child learns new skills this year, these skills will also be incorporated into the reviews. If needed, allow him to use manipulatives, but encourage him to try to find the answers without them first. If he struggles with specific items on the reviews, you may want to look back to previous units and lessons and provide time for him to revisit activities or replay games. He can also refer to his Interactive Notebook for review of previous material, but encourage him to complete the review sheets from memory and by using what he knows as he's able. Most review sheets have at least one money-related question; you may want to have quarters, dimes, nickels, and pennies available for your child to use as he works.

Your child will complete the "Basic Skills Review #1" sheet. Give him a scratch sheet of paper to use as needed. For a review of time and money, your child can refer to the "Time Review" and "Money Review" sheets. These sheets can be stored in his Interactive Notebook for future reference as needed.

"Basic Skills Review #1" Answer Key

1. 4:30	2. 	3. 	4. 89¢
5. \$1.40	6. 360, 370, 380, 390, 400, 410, 420, 430	7. $\begin{array}{r} 287 \\ + 464 \\ \hline 751 \end{array}$	8. $\begin{array}{r} 893 \\ - 278 \\ \hline 615 \end{array}$

Day 2

Activity 4: Using Arrays to Find Products

Ask your child to count from 0 to 40 by 2, 5, and 10. When he is done, explain that he can use skip counting to count objects in arrays. Tell him to draw a 5 by 6 array (5 rows, 6 columns) on the whiteboard. Now, say, "Using another color, circle the groups of 5 that you see." Once he's circled the groups of 5 (each column for a total of 6 groups), show him how to count them by 5. Say, "Since you already know how to skip count by 2, 5, and 10, you can use this skill to find products. You now know that 6 groups of 5 is 30 or 6 times 5 equals 30."

Your child will now complete the "Arrays and Products" sheet by first matching each array to its corresponding multiplication sentence and then finding the product for each sentence.

Remind him to use what he knows about counting by 2, 5, and 10 to figure out the products. The answer key is to the right.

b $5 \times 2 = \underline{10}$	d $6 \times 2 = \underline{12}$
a $3 \times 10 = \underline{30}$	j $5 \times 6 = \underline{30}$
f $2 \times 8 = \underline{16}$	i $2 \times 10 = \underline{20}$
e $5 \times 7 = \underline{35}$	c $4 \times 5 = \underline{20}$
h $8 \times 5 = \underline{40}$	g $10 \times 4 = \underline{40}$

Activity 5: Arrays in *Amanda Bean's Amazing Dream*

Your child will re-watch the beginning of the read aloud of *Amanda Bean's Amazing Dream* at the following web link. This time, he will stop the video along the way as he looks for the specified arrays, writes in words what each array shows (groups of), creates a multiplication sentence based on each array, and finds the product for each sentence. Give him the "Arrays in *Amanda Bean's Amazing Dream*" sheets, and tell him to follow the directions on them. Explain that once he writes down each multiplication sentence, he can skip count or count the given objects either on the video or in his array drawing to figure out the product.



Mr. Boyd Reads: "Amanda Bean's Amazing Dream"

www.beyondthepage.com/link/6272/

"Arrays in Amanda Bean's Amazing Dream" Answer Key

 On the first page of the story, look at one of the windows in the building on the left. How many panes does one window have?	6 groups of 3 Write in words	$6 \times 3 = 18$ Write in numbers
 On the page that shows the bakery, how many cakes are in the display case?	3 groups of 3 Write in words	$3 \times 3 = 9$ Write in numbers
 On the second page of the story, how many green lollipops are there?	2 groups of 2 Write in words	$2 \times 2 = 4$ Write in numbers
 On the bakery page, how many brownies are on the top shelf?	2 groups of 7 Write in words	$2 \times 7 = 14$ Write in numbers
 On the bakery page, how many cookies are on the fourth shelf from the top?	4 groups of 7 Write in words	$4 \times 7 = 28$ Write in numbers

Day 3

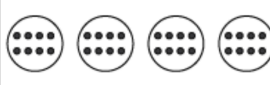
Activity 6: Equal Groups and Multiplication

Without telling him how many counters there are, give your child 24 counters and 4 small paper plates. Tell him to place the same number of counters on each plate. When he's finished, he should have placed 6 counters on each plate. Say, "You've created equal groups of counters. Each group has the same number. Remember that multiplication is about combining equal groups to find a total or the product." Write $4 \times 6 =$ on the whiteboard, and as you point to the numbers, say, "Here, you have 4 groups, and there are 6 items in each group, so you have 4 groups of 6. The first factor represents the number of groups, and the second factor represents the number in each group." Give your child time to figure out the product. (24)

Now, write 3×5 on the whiteboard, and ask your child to use the counters and plates to show the number of groups. He should use 3 plates and put 5 counters on each one. Ask, "What can you do to figure out the product of 3 times 5?" If needed, remind him that he can count the groups by 5. He should find a product of 15.

Repeat this process with 4×10 .

Your child will complete the "Showing Equal Groups" sheet by drawing plates and counters to model the given multiplication sentences. Then he will find the product for each sentence. Remind him to use what he knows about addition to find the products. He can also count the counters in his drawings. The answer key is to the right.

$3 \times 7 = \underline{21}$ 	$4 \times 8 = \underline{32}$ 
$5 \times 5 = \underline{25}$ 	$6 \times 4 = \underline{24}$ 

Activity 7: Equal Groups in Amanda Bean's Amazing Dream

Multiplication and Division I — 3: Arrays and Equal Groups

Your child will use the video at the following web link again to work with equal groups in *Amanda Bean's Amazing Dream*. He will answer the questions on the "Equal Groups in *Amanda Bean's Amazing Dream*" sheet as he looks through the video.



Mr. Boyd Reads: "Amanda Bean's Amazing Dream"

www.beyondthepage.com/link/6273/

Answer Key:

1. On the first page, how many windowpanes are in the windows on the top floor of the building on the right? Write a multiplication sentence and find the product. (8 windows $\times$ 4 panes on each window; $8 \times 4 = 32$)
2. How many lollipops are there in all? (5 groups of lollipops $\times$ 4 lollipops in each group; $5 \times 4 = 20$)
3. On the bakery page, how many loaves of bread are there? ($2 \times 4 = 8$)
4. On the page showing the kitchen, how many pickles are in the jars? ($5 \times 3 = 15$)
5. There are 8 sheep riding bicycles during Amanda's dream. How many wheels are there in all? ($8 \times 2 = 16$)
6. How many balls of yarn are all of the sheep holding? Write the multiplication sentence on your own! ($8 \times 5 = 40$)

Wrapping Up

Provide time for your child to play the game at the following web link. Remind him to use what he knows about counting by 2, 5, and 10 and to also use his addition facts as he plays.



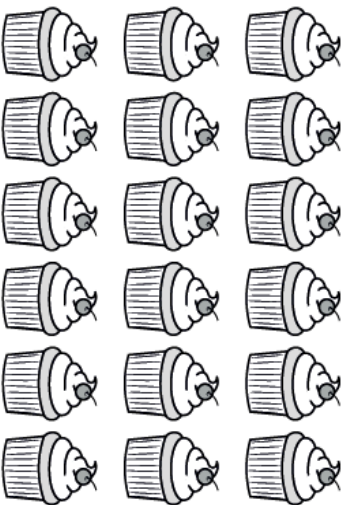
Multiplication with Arrays

www.beyondthepage.com/link/8279/

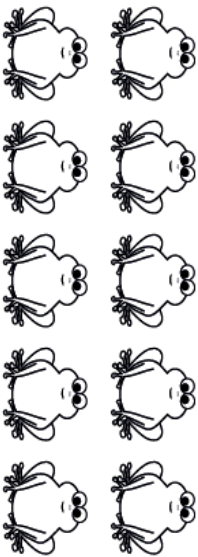
Learning Gates

Have your child take the [Learning Gates quiz](#) for this lesson.

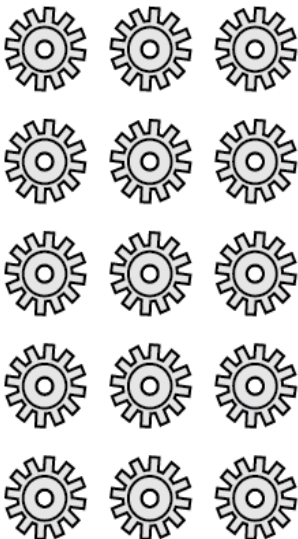
Multiplication Arrays



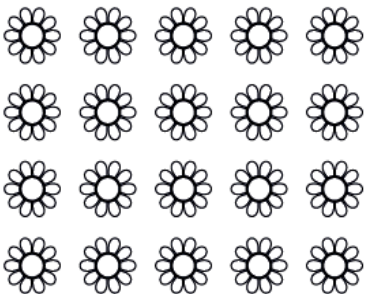
3 groups of 6
 3×6
6 groups of 3
 6×3



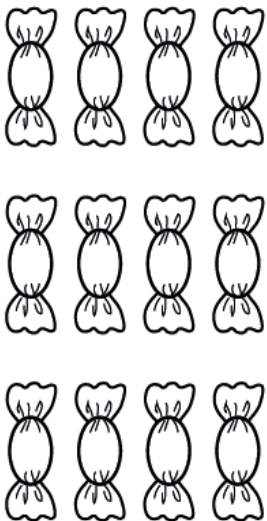
4 groups of 2
 4×2
2 groups of 4
 2×4



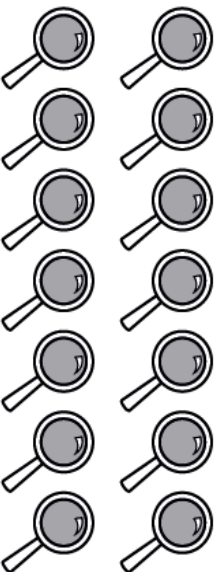
2 groups of 5
 2×5
5 groups of 2
 5×2



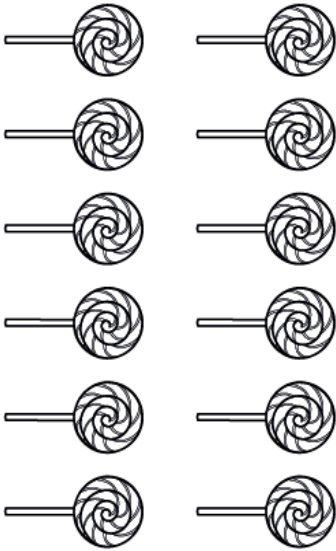
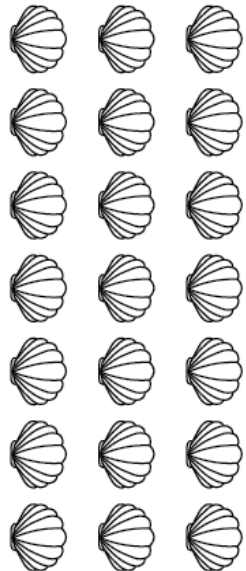
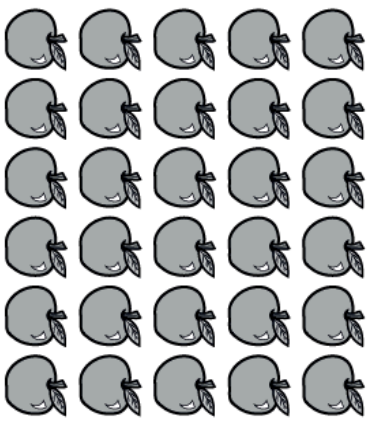
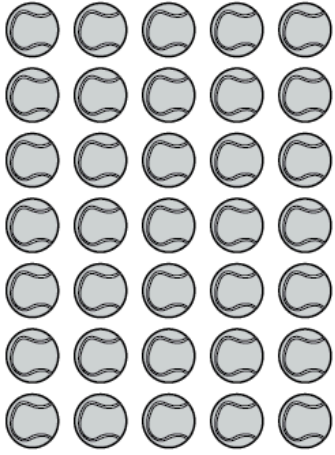
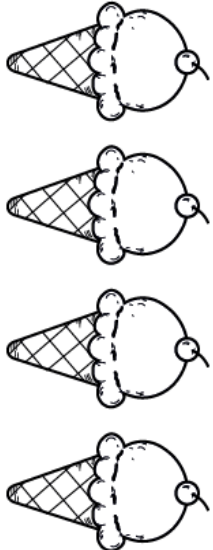
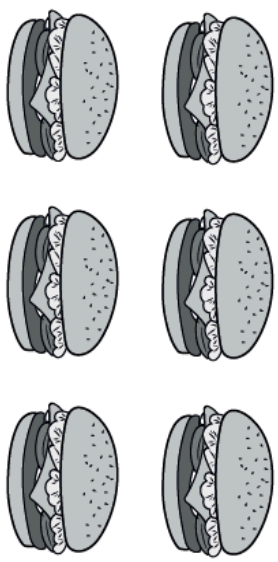
5 groups of 4
 5×4
4 groups of 5
 4×5



3 groups of 4
 3×4
4 groups of 3
 4×3



6 groups of 2
 6×2
2 groups of 6
 2×6

7  ___ groups of ___ ___ x ___ ___ groups of ___ ___ x ___	8  ___ groups of ___ ___ x ___ ___ groups of ___ ___ x ___	9  ___ groups of ___ ___ x ___ ___ groups of ___ ___ x ___
10  ___ groups of ___ ___ x ___ ___ groups of ___ ___ x ___	11  ___ groups of ___ ___ x ___ ___ groups of ___ ___ x ___	12  ___ groups of ___ ___ x ___ ___ groups of ___ ___ x ___

Time Review



Time Facts

- ⌚ There are 60 seconds in a minute.
- ⌚ There are 60 minutes in an hour.
- ⌚ There are 24 hours in a day.
- ⌚ The short hand on an analog clock tells the hour, and the long hand tells the minute.
- ⌚ AM refers to times before midday, and PM refers to times after midday.
- ⌚ Midnight (12:00 AM) occurs in the middle of the night while noon (12:00 PM) occurs in the middle of the day.

Analog	Digital	Word
	1:00	1 o'clock
	3:30	three thirty, half past three
	4:15	four fifteen, a quarter past/after four, fifteen minutes past/after four
	5:45	fifteen minutes to six, a quarter to six, five forty-five, forty-five minutes past/after five
	8:25	eight twenty-five, twenty-five minutes past/after eight
	9:55	nine fifty-five, five minutes to ten, fifty-five minutes past/after nine

Money Review

\$ is the symbol for dollars and ¢ is the symbol for cents



a penny is worth one cent (1¢)



a nickel is worth five cents (5¢)



a dime is worth ten cents (10¢)



a quarter is worth twenty-five cents (25¢)



a half dollar is worth fifty cents (50¢)

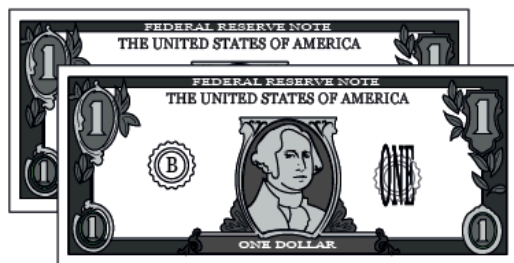


a one-dollar bill is worth one hundred cents or one dollar (\$1.00)



a five-dollar bill is worth five dollars (\$5.00)

\$2.87



\$3.63



Basic Skills Review #1

1. What is the digital time?



2. Circle the activity that happens in the AM.



wake up



go to bed

3. Draw hands to show 6:45 on the clock.



4. How much?



5. How much?



6. Count by 10s.

360, _____, _____, _____,
_____, _____, _____, _____

7.

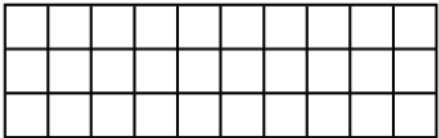
$$\begin{array}{r} 287 \\ + 464 \\ \hline \end{array}$$

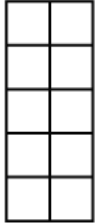
8.

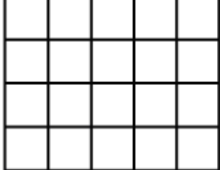
$$\begin{array}{r} 893 \\ - 278 \\ \hline \end{array}$$

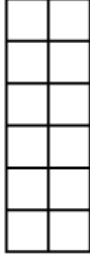
Arrays and Products

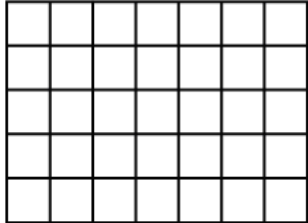
Instructions: Match the arrays with their number sentences by writing the correct letter in the box next to each sentence. Then, find the product for each sentence.

a


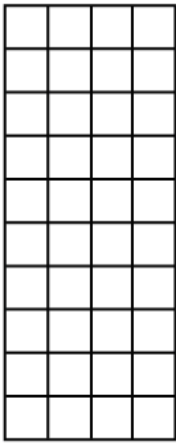
b


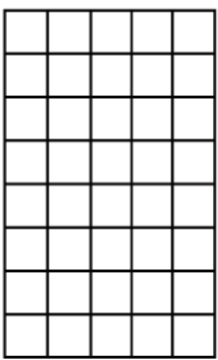
c


d


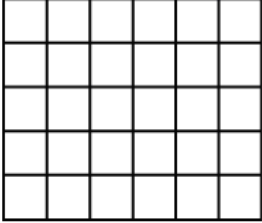
e


f


g


h


i


j


$5 \times 2 = \underline{\quad}$

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

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

$5 \times 6 = \underline{\quad}$

$2 \times 8 = \underline{\quad}$

$2 \times 10 = \underline{\quad}$

$5 \times 7 = \underline{\quad}$

$4 \times 5 = \underline{\quad}$

$8 \times 5 = \underline{\quad}$

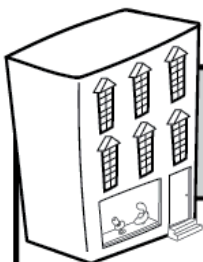
$10 \times 4 = \underline{\quad}$

Arrays in

Amanda Bean's Amazing Dream



Instructions: Find the correct array in the story, draw a picture of it, write what it shows in words, create a multiplication sentence for it, and find its product.



On the first page of the story, look at one of the windows in the building on the left. How many panes does one window have?

Draw

Write in words

Write in numbers

_____ groups of _____

_____ × _____ = _____

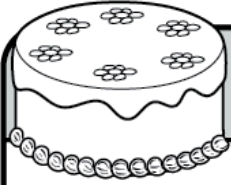


On the second page of the story, how many green lollipops are there?

Draw

Write in words

Write in numbers



On the page that shows the bakery, how many cakes are in the display case?

Draw

Write in words

Write in numbers



On the bakery page, how many brownies are on the top shelf?

Draw

Write in words

Write in numbers

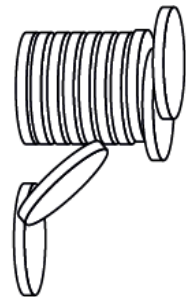


On the bakery page, how many cookies are on the fourth shelf from the top?

Draw

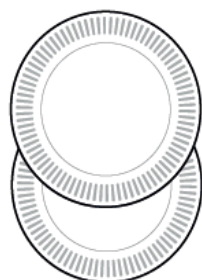
Write in words

Write in numbers



Showing Equal Groups

Instructions: Draw plates and counters to model each multiplication sentence.



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

$$4 \times 8 = \underline{\quad}$$

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

$$6 \times 4 = \underline{\quad}$$

Equal Groups in Amanda Bean's Amazing Dream

Instructions: Watch the video to answer the questions below. Use what you know about equal groups!

1. On the first page, how many windowpanes are in the windows on the top floor of the building on the right? Write a multiplication sentence and find the product.

_____ windows $\times$ _____ panes on each window

_____ $\times$ _____ = _____



2. On the second page, how many lollipops are there in all?

_____ groups of lollipops $\times$ _____ lollipops in each group

_____ $\times$ _____ = _____



3. On the bakery page, how many loaves of bread are there?

_____ $\times$ _____ = _____



4. On the page showing the kitchen, how many pickles are in the jars?

_____ $\times$ _____ = _____



5. There are 8 sheep riding bicycles during Amanda's dream. How many wheels are there in all?

_____ $\times$ _____ = _____



6. How many balls of yarn are all of the sheep holding? Write the multiplication sentence on your own!

