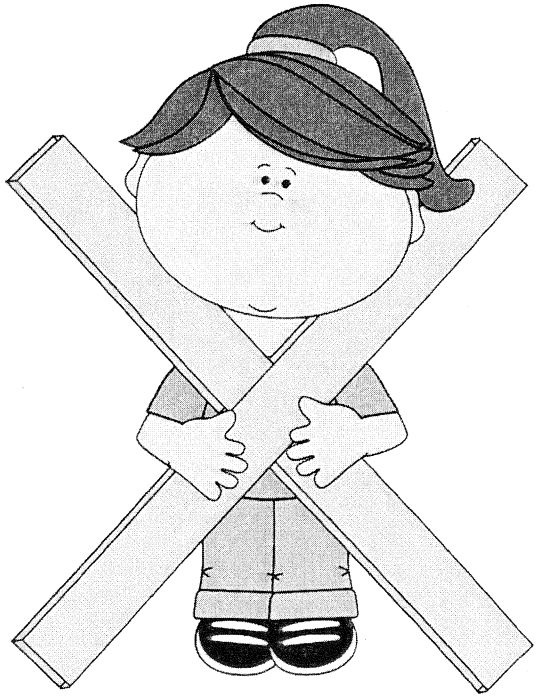
Unit 5

Study Guide

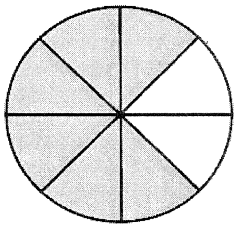
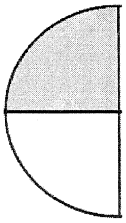
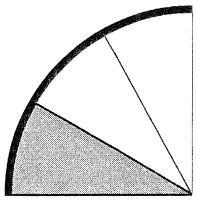
Fractions and Multiplication Strategies



Name: _____ Date: _____

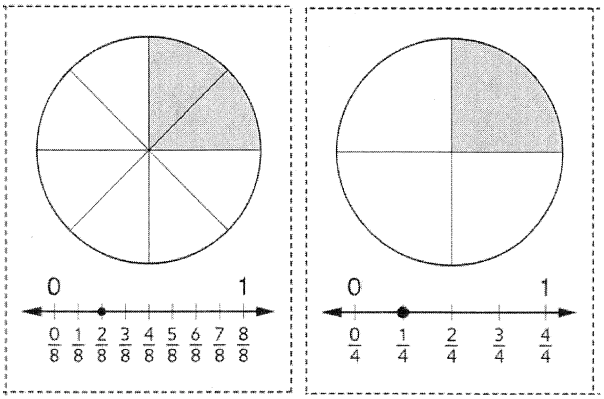
EVERYDAY MATHEMATICS—3rd Grade
Unit 5 Review: Fractions and Multiplication Strategies

1) Use your fraction circle pieces to complete the table.

Picture	Words	Number
Example: The whole is the red piece. 	six-eighths	$\frac{6}{8}$
The whole is the pink piece. 		
The whole is the light blue piece. 		
The whole is the _____ piece.	one-fourth	

Unit 5 Review (continued)

2) Drew turns over these two cards during a game of *Fraction Memory*.



He thinks he found a pair of equivalent fractions.

a. Do you agree?
Explain your thinking.

_____

_____

b. Use your fraction cards to find a different pair of equivalent fractions.
Record your two fractions on the lines below.

_____ = _____

3) Complete the table of 3s multiplication facts below.

Fact	Product
1 X 3	
2 X 3	
3 X 3	
4 X 3	

What patterns do you notice in the products?

_____

_____

_____

Unit 5 Review (continued)

4) For each fact below:

- Record a helper fact.
- Use your helper fact and either add or subtract a group
- Use words, numbers, or pictures to show your thinking.
- Write the product.

a. 4 X 6 = ?

Helper fact: _____ X _____ = _____

How I can use the helper fact:

4 X 6 = _____

b. 8 X 4 = ?

Helper fact: _____ X _____ = _____

How I can use the helper fact:

8 X 4 = _____

5) Mason is playing a round of *Salute!* The dealer says 18. His partner has a 9 on his forehead.

a. What number does Mason have? _____

b. Write a multiplication number sentence and a division number sentence for this problem.

_____ _____

c. How do your number sentences show the same *Salute!* round?

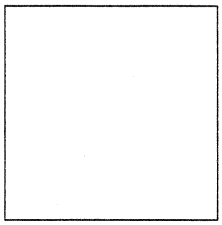
_____

_____

_____

Unit 5 Review (continued)

6) Divide the square below into 4 equal-size parts. Shade and label one part with a fraction.



7) Owen is trying to solve 7 X 9.

He sketches a rectangle to help him think about how to break apart the numbers so that the fact is easier to solve. Here is his sketch:

	9	
7	5 7 X 5	4 7 X 4

Use numbers or words to explain how Owen can use his sketch to solve 7 X 9.

_____

_____

_____

7 X 9 = _____

8) Ava and Olivia are working together to solve 8 X 9.

Ava says: "I think 8 X 8 will work as our helper fact."

Olivia says: "I think 9 X 9 will work as our helper fact."

With whom do you agree? Explain.

_____

_____

_____

Name: _____ Date: _____

EVERYDAY MATHEMATICS—3rd Grade
Unit 5 Challenge Review

1) Explain two different ways you could use doubling to solve 8 X 4 = ?.
You may draw rectangles to help.

a. One way:

Helper fact: _____ X _____ = _____

How I did it:

_____

_____

b. Another way:

Helper fact: _____ X _____ = _____

How I did it:

_____

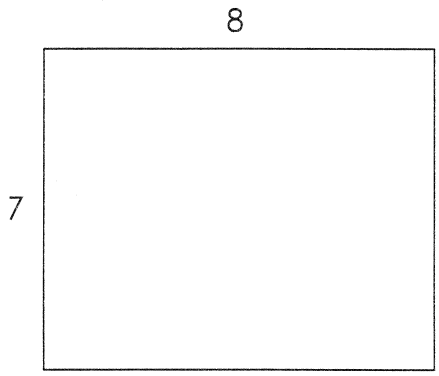
_____

Unit 5 Challenge Review (continued)

2) Jack is trying to solve 7 X 8 = ?.

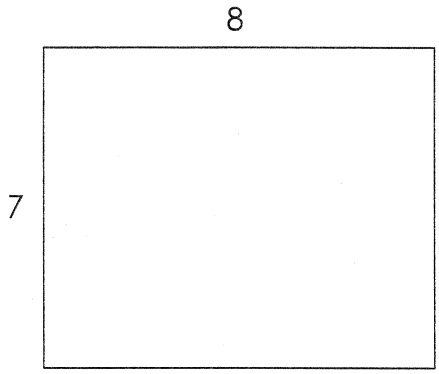
He sketches a rectangle with side lengths of 7 and 8 to help him think about how he could break it apart to make it easier to solve.

a. Show one way Jack could break his rectangle apart.



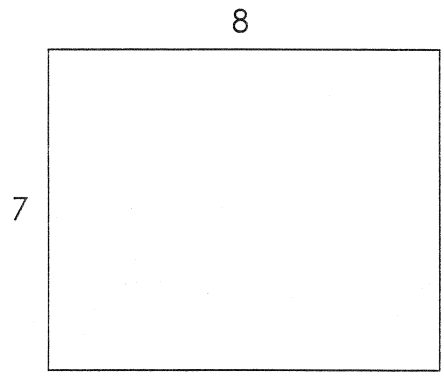
Record number models to show how he can use pieces to solve 7 X 8.

b. Show another way Jack could break his rectangle apart.



Record number models to show how he can use the pieces to solve 7 X 8.

c. Suppose Jack wants to break his rectangle into 3 parts. Show one way he could do this.



Record number models to show how he can use the pieces to solve 7 X 8.

Name: _____ Date: _____

EVERYDAY MATHEMATICS—3rd Grade
Unit 5 Open Response Review
Using Multiplication Facts Strategies

Sydney is learning how to use more efficient strategies for multiplication.
She learned about adding or subtracting a group, doubling, and near squares.

She used the adding-a-group strategy to solve 6 X 9 = ?. She explained:

> "I will use the helper fact 5 X 9. I know that 5 X 9 =45.
> I can add one more group of 9 to 45 to get 54.
> I now have 6 groups of 9, so I know 6 X 9 = 54."

1) Use a picture to show how Sydney solved the problem
Explain how your picture matches Sydney's explanation.

Unit 5 Open Response Review (continued)

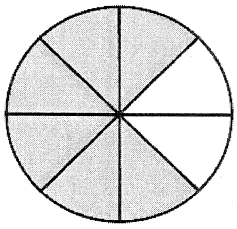
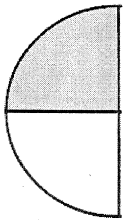
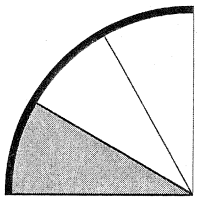
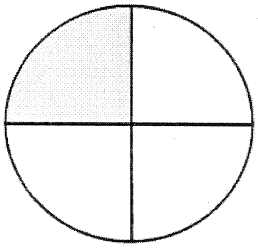
2) Choose at least one other efficient multiplication strategy, such as doubling or near squares, to solve 6 X 9 = ?.
Use pictures and words to show how you solved the problem.

(*Hint:* What helper fact can you use?)

Name: *ANSWER KEY* Date: _____

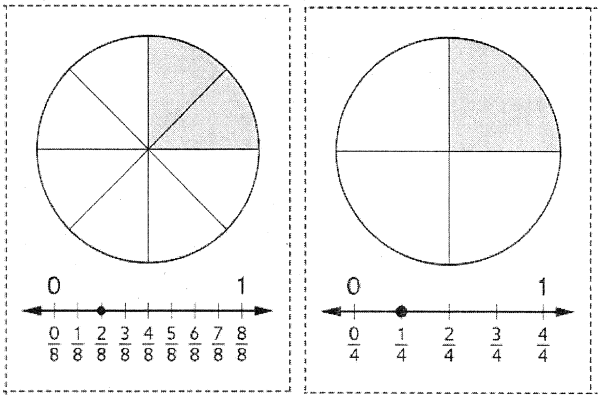
EVERYDAY MATHEMATICS—3rd Grade
Unit 5 Review: Fractions and Multiplication Strategies

1) Use your fraction circle pieces to complete the table.

Picture	Words	Number
Example: The whole is the red piece. 	six-eighths	$\frac{6}{8}$
The whole is the pink piece. 	one-half	$\frac{1}{2}$
The whole is the light blue piece. 	one-third	$\frac{1}{3}$
The whole is the _red_ piece. 	one-fourth	$\frac{1}{4}$

Unit 5 Review (continued) *ANSWER KEY*

2) Drew turns over these two cards during a game of *Fraction Memory*.



He thinks he found a pair of equivalent fractions.

a. Do you agree?
Explain your thinking.

Possible answer: Yes. The shaded area of each circle on the cards is the same size.

b. Use your fraction cards to find a different pair of equivalent fractions.
Record your two fractions on the lines below.

$\frac{1}{3} = \frac{2}{6}$ Answers will vary.

3) Complete the table of 3s multiplication facts below.

Fact	Product
1 X 3	3
2 X 3	6
3 X 3	9
4 X 3	12

What patterns do you notice in the products?

Possible answer: The product switches between even and odd. The products increase by 3 each time.

Unit 5 Review (continued) *ANSWER KEY*

4) For each fact below:

- Record a helper fact.
- Use your helper fact and either add or subtract a group
- Use words, numbers, or pictures to show your thinking.
- Write the product.

a. 4 X 6 = ?

Possible answer:

Helper fact: 3 X 6 = 18

How I can use the helper fact:

Possible answer: I start with 18 and add 1 group of 6 to get 18 + 6 = 24.

4 X 6 = 24

b. 8 X 4 = ?

Possible answer:

Helper fact: 8 X 5 = 40

How I can use the helper fact:

Possible answer: I know 8 X 5 is 40. I took away 1 group of 8 to get 32.

8 X 4 = 32

5) Mason is playing a round of *Salute!* The dealer says 18. His partner has a 9 on his forehead.

a. What number does Mason have? 2

b. Write a multiplication number sentence and a division number sentence for this problem.

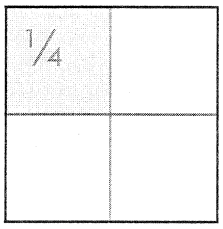
9 X 2 = 18 18 ÷ 9 = 2

c. How do your number sentences show the same *Salute!* round?

Possible answer: I can think multiplication and ask, "9 times what number is 18?" I can also think division and ask, "How many groups of 9 are in 18?" I get the same answer both ways.

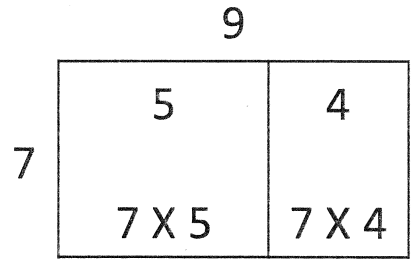
Unit 5 Review (continued) *ANSWER KEY*

6) Divide the square below into 4 equal-size parts. Shade and label one part with a fraction.



7) Owen is trying to solve 7 X 9.

He sketches a rectangle to help him think about how to break apart the numbers so that the fact is easier to solve. Here is his sketch:



Use numbers or words to explain how Owen can use his sketch to solve 7 X 9.

Possible answer: Owen's rectangle is in two pieces. The first rectangle shows 7 X 5 = 35. The second rectangle shows 7 X 4 = 28. So the total is 35 + 28 = 63.

7 X 9 = 63

8) Ava and Olivia are working together to solve 8 X 9.

Ava says: "I think 8 X 8 will work as our helper fact."

Olivia says: "I think 9 X 9 will work as our helper fact."

With whom do you agree? Explain.

Possible answer: I agree with Ava because she can add a group of 8 to 8 X 8 to solve 8 X 9 because of the turn-around rule. I agree with Olivia because she can subtract a group of 9 to get the answer to 8 X 9. I agree with both Ava and Olivia because 8 X 9 is a near-squares fact for 8 X 8 and 9 X 9, so they can either add or subtract a group to get the answer.

Name: *ANSWER KEY* Date: _____

EVERYDAY MATHEMATICS—3rd Grade
Unit 5 Challenge Review

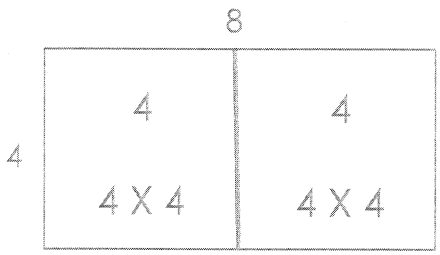
1) Explain two different ways you could use doubling to solve 8 X 4 = ?.
You may draw rectangles to help.

Answers will vary. Possible number models and explanations:

a. One way:

Helper fact: 4 X 4 = 16

How I did it:

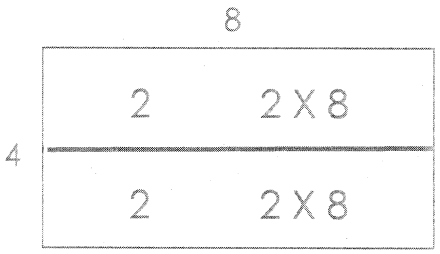


I started with 4 X 4 = 16 and doubled it. 16 + 16 = 32, so 8 X 4 = 32.

b. Another way:

Helper fact: 8 X 2 = 16

How I did it:



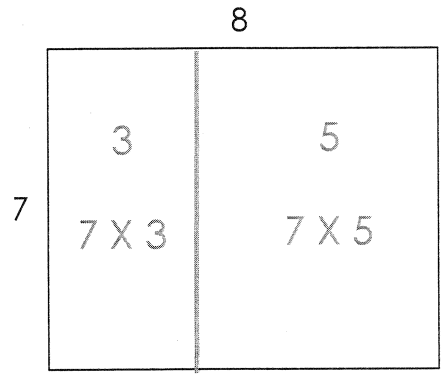
I started with 8 X 2 = 16 and doubled it. 16 + 16 = 32, so 8 X 4 = 32.

Unit 5 Challenge Review (continued) *ANSWER KEY*

2) Jack is trying to solve 7 X 8 = ?. Answers will vary. Possible answers:

He sketches a rectangle with side lengths of 7 and 8 to help him think about how he could break it apart to make it easier to solve.

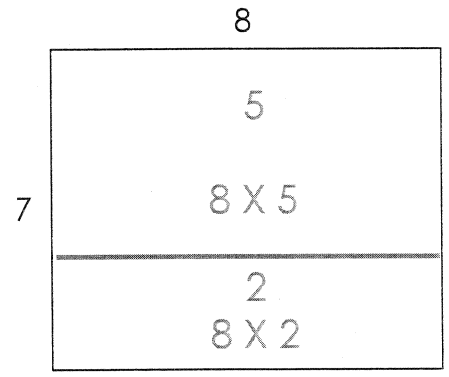
a. Show one way Jack could break his rectangle apart.



Record number models to show how he can use pieces to solve 7 X 8.

7 X 3 = 21, 7 X 5 = 35, 21 + 35 = 56

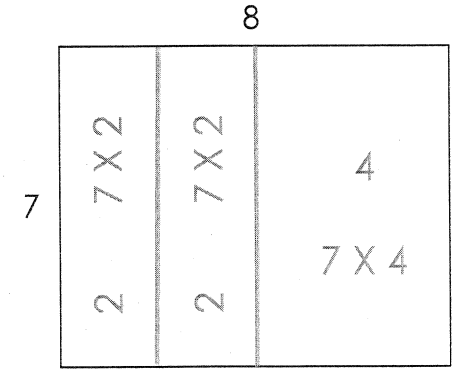
b. Show another way Jack could break his rectangle apart.



Record number models to show how he can use the pieces to solve 7 X 8.

8 X 5 = 40, 8 X 2 = 16, 40 + 16 = 56

c. Suppose Jack wants to break his rectangle into 3 parts. Show one way he could do this.



Record number models to show how he can use the pieces to solve 7 X 8.

7 X 2 = 14, 7 X 2 = 14, 7 X 4 = 28, 14 + 14 + 28 = 56

Name: *ANSWER KEY* Date: _____

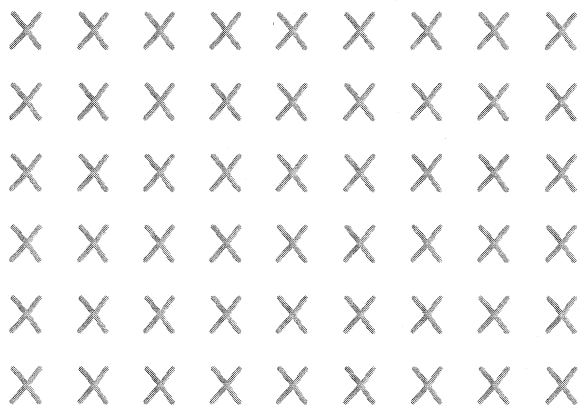
EVERYDAY MATHEMATICS—3rd Grade
Unit 5 Open Response Review
Using Multiplication Facts Strategies

Sydney is learning how to use more efficient strategies for multiplication.
She learned about adding or subtracting a group, doubling, and near squares.

She used the adding-a-group strategy to solve 6 X 9 = ?. She explained:

> "I will use the helper fact 5 X 9. I know that 5 X 9 =45.
> I can add one more group of 9 to 45 to get 54.
> I now have 6 groups of 9, so I know 6 X 9 = 54."

1) Use a picture to show how Sydney solved the problem
Explain how your picture matches Sydney's explanation.



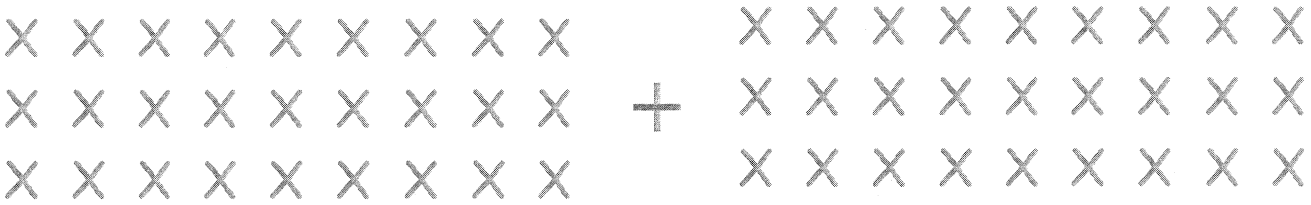
Possible answer: I drew an array to show that I know 5 X 9 = 45, like Sydney. Then I added one more row of 9 to the array because Sydney added one more group of 9. Now my array shows that 6 groups of 9 equals 54, like Sydney said.

Unit 5 Open Response Review (continued) *ANSWER KEY*

2) Choose at least one other efficient multiplication strategy, such as doubling or near squares, to solve 6 X 9 = ?.
Use pictures and words to show how you solved the problem.

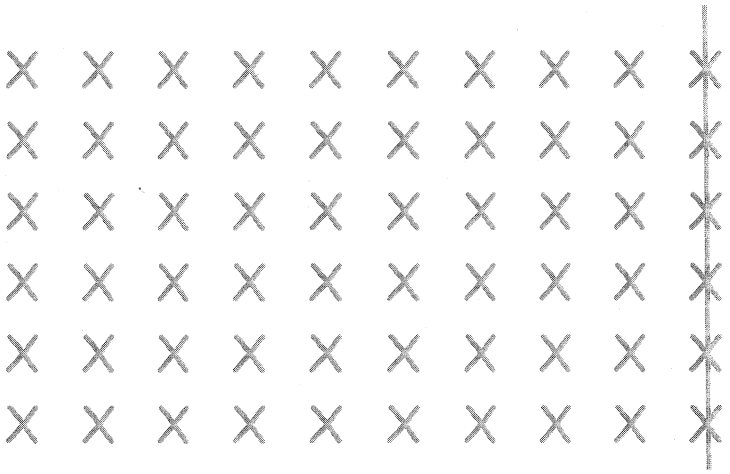
(*Hint:* What helper fact can you use?)

Answers will vary.



3 X 9 = 27 + 3 X 9 = 27

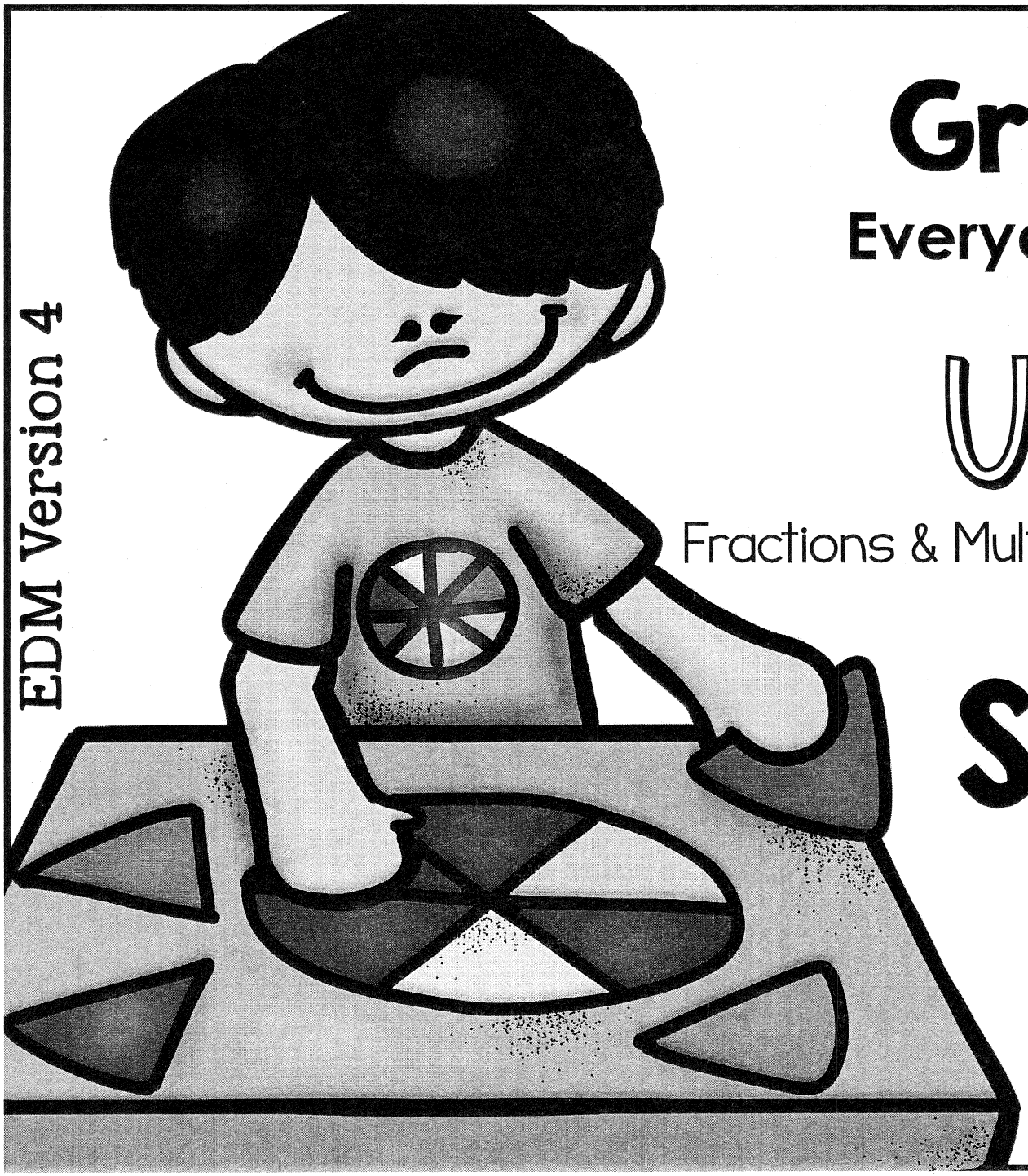
Possible answer: I knew 3 X 9 = 27, so I doubled the product. 27 + 27 is 54, so I know 6 X 9 = 54.



6 X 10 = 60 60 – 6 = 54

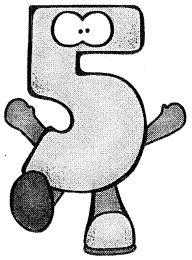
Possible answer: I know 6 X 10 is 60, so I took away one group of 6. 60 – 6 = 54.

EDM Version 4



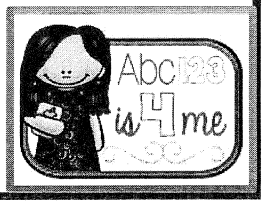
Grade 3

Everyday Math:



Fractions & Multiplication Strategies

Study Guide



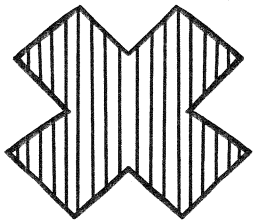
Name: _____ Test Date: ___ - ___ - ___

Grade 3

Everyday Math: Unit 5

Fractions and Multiplication Strategies

Study Guide



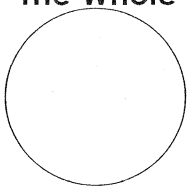
Unit Vocabulary:

add a group, break-apart strategy, decompose, denominator, doubling, equal parts, equivalent fractions, even, factor, fraction, helper facts, missing factor, multiples, near squares, numerator, odd, product, subtract a group, unit fraction, whole

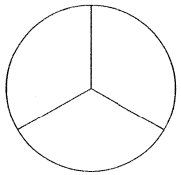
Lesson 5.1:

Exploration A: How do you create equal parts of different wholes?
Circle the picture that shows 1-thirds of the whole.

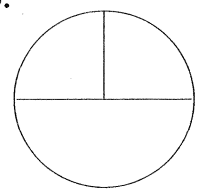
The Whole



A.

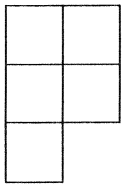


B.

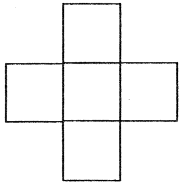


Exploration B: How do you solve problems involving area and perimeter?
Circle the pentominoe that has a different perimeter measurement than the other two.

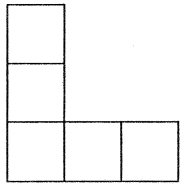
A.



B.

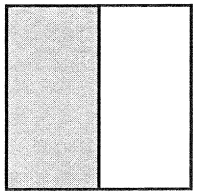


C.



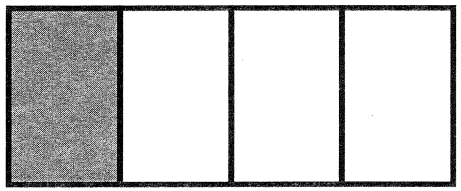
Exploration C: How do you represent fractions of different wholes?

A. The square is the whole.



A fraction that names the shaded part is _____.

B. The rectangle is the whole.

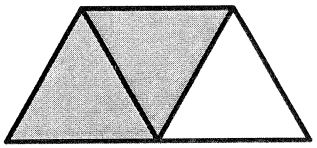
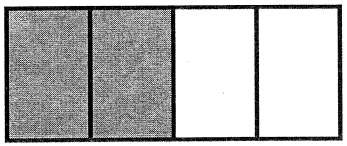
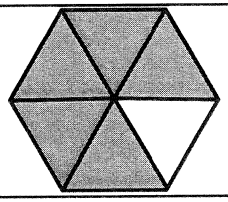


A fraction that names the shaded part is _____.

Lesson 5.2:

How do you represent fractions using standard notation, words, and drawings?

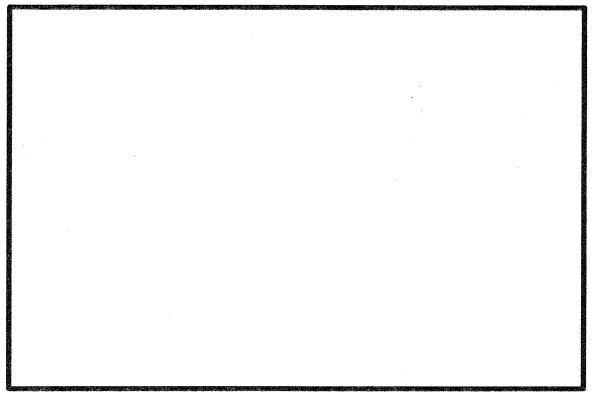
Complete the table.

Picture	Words	Number
Example: 	two-thirds	$\frac{2}{3}$
		
		
The whole is the circle you will draw in this box below. Divide the circle into four equal parts. Shade up to three of its parts.		

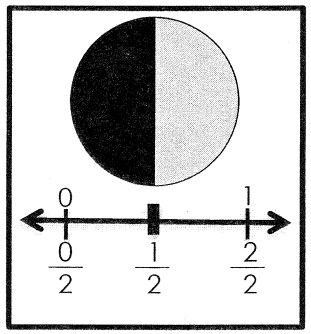
Lesson 5.3:

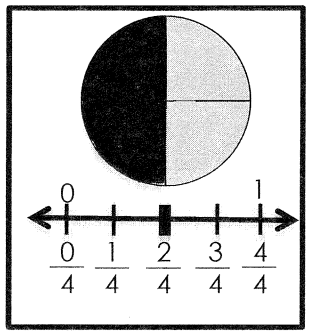
How can you recognize equivalent fractions?

 # 1: Divide the rectangle into 4 equal-size parts. Shade and label one part with a fraction.



#2: Diego turns over these two cards during a game of Fraction Memory. He thinks he found a pair of equivalent fractions.





a. Do you agree? Explain your thinking.

_____

_____

b. Use your fraction cards to find a different pair of equivalent fractions. Record your fractions on the lines below.

_____ = _____

Lesson 5.4:
How do you apply your knowledge of helper facts to solve harder multiplication facts?

#1: For the helper fact below:

* Record a helper fact.
* Use your helper fact and either add or subtract a group.
* Use words, numbers, or pictures to show your thinking.
* Write the product.

9 x 8 = ?

Helper Fact: _____ x _____ = _____

How can I use the helper fact: _____

_____

9 X 8 = _____

#2: Lynne and Dan are working together to solve 6 x 7.

* Lynne says: "I think 6 x6 will help as our helper fact."
* Dan says: "I think 7 x 7 will help as our helper fact."

With whom do you agree? Explain.

_____

_____

_____

Lesson 5.5:

How does using the strategy of doubling help to find the area of a larger rectangle?

Explain two different ways you could use doubling to solve **4 x 6 = ?**
You may draw rectangles to help.

a. One way:

Helper fact: _____ x _____ = _____

How I did it:

_____

_____

b. Another way:

Helper fact: _____ x _____ = _____

How I did it:

_____

_____

Lesson 5.6:

How do you apply the doubling strategy to solve multiplication facts?

Show how you can solve 5 x 6 using doubling.

Factor I will split in half: _____

Sketch:

5 x 6 = _____

What helper fact did you double to solve 5 x 6?

_____

Lesson 5.7:

How do you identify and explain arithmetic patterns using properties of operations?

Complete the table of 5s multiplication facts below.

Fact	Product
1 x 5	
2 x 5	
3 x 5	
4 x 5	

What patterns did you notice in the products?

_____

_____

Lesson 5.8:

How do you identify the missing factor in a multiplication problem?

Mike is playing a round of *Salute!* The dealer says 32. His partner has a 8 on her forehead.

a. What number does Mike have? _____

b. Write a multiplication number sentence and a division number sentence for this problem.

_____ _____

c. How do your number sentences show the same *Salute!* round?

_____

_____

Lesson 5.9:

How can the product of a multiplication square help you find the product of near squares?

Near square: 6 x 7 = ?

Square helper fact: _____ x _____ = _____

How does your square helper fact help you solve the near square?

_____

_____

6 x 7 = _____

Lesson 5.10:

How do you solve a number story?

Solve the number story.

People are donating $10 each to the animal shelter. The animal shelter has collected $130 so far. Its goal is to collect $200. How many more people do they need to donate money?

_____

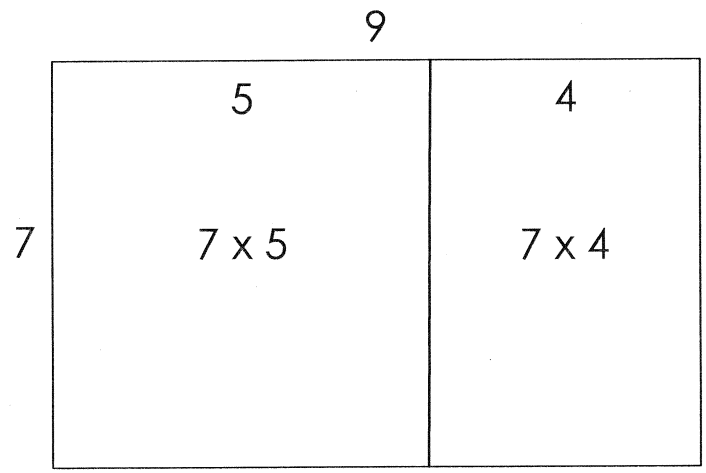
(unit)

Lesson 5.11:

How do you use the break-apart strategy to solve multiplication problems?

Julio is trying to solve 7 x 9.

He sketched a rectangle to help him think about how to break apart the numbers so that the fact is easier to solve. Here is his sketch:



Use numbers or words to explain how Julio can use his sketch to solve 7 x 9

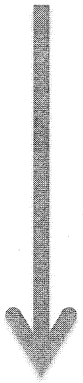
_____

_____

_____

7 x 9 = _____

ANSWER KEY



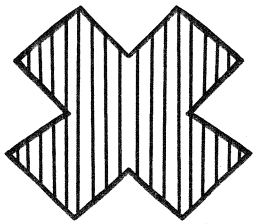
Name: Answer Key Test Date: ___ - ___ - ___

Grade 3

Everyday Math: Unit 5

Fractions and Multiplication Strategies

Study Guide



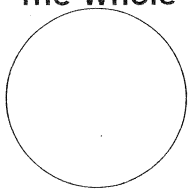
Unit Vocabulary:

add a group, break-apart strategy, decompose, denominator, doubling, equal parts, equivalent fractions, even, factor, fraction, helper facts, missing factor, multiples, near squares, numerator, odd, product, subtract a group, unit fraction, whole

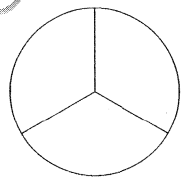
Lesson 5.1:

Exploration A: How do you create equal parts of different wholes?
Circle the picture that shows 1-thirds of the whole.

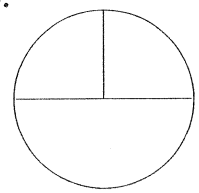
The Whole



A.

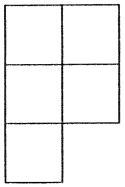


B.

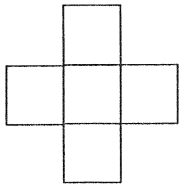


Exploration B: How do you solve problems involving area and perimeter?
Circle the pentominoe that has a different perimeter measurement than the other two.

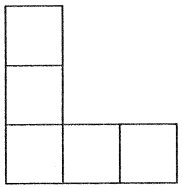
A.



B.

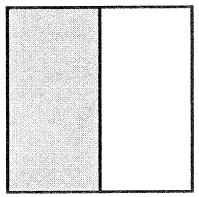


C.



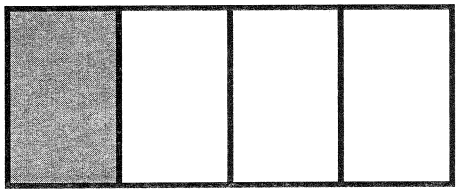
Exploration C: How do you represent fractions of different wholes?

A. The square is the whole.



A fraction that names the shaded part is 1-half.

B. The rectangle is the whole.

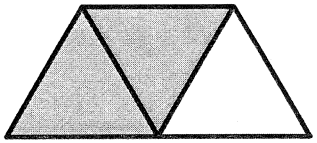
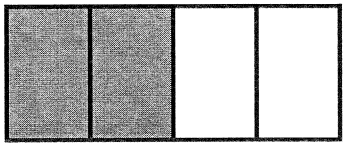
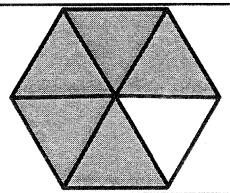


A fraction that names the shaded part is 1-fourth.

Lesson 5.2:

How do you represent fractions using standard notation, words, and drawings?

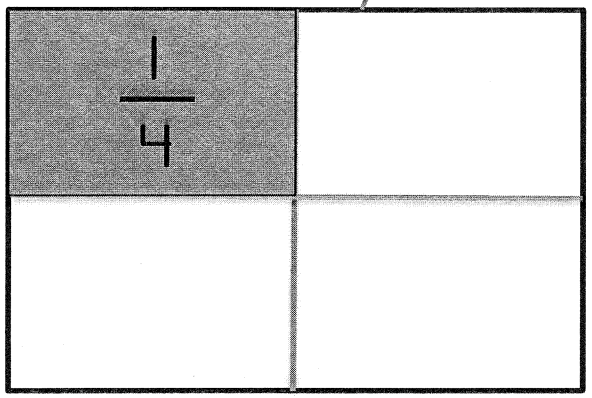
Complete the table.

Picture	Words	Number
Example: 	two-thirds	$\frac{2}{3}$
	two - fourths OR one-half	$\frac{2}{4}$ OR $\frac{1}{2}$
	five - sixths	$\frac{5}{6}$
The whole is the circle you will draw in this box below. Divide the circle into four equal parts. Shade up to three of its parts.	Answers will vary	

Lesson 5.3:

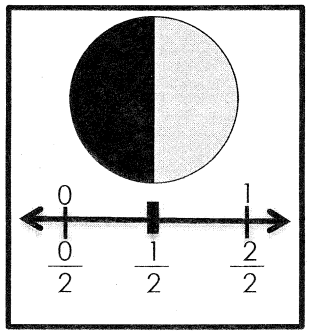
How can you recognize equivalent fractions?

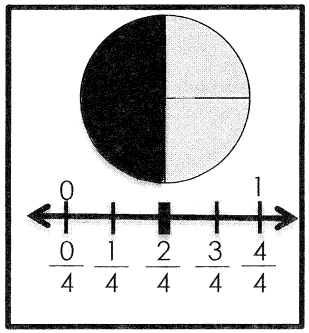
Answers will vary:



 # 1: Divide the rectangle into 4 equal-size parts. Shade and label one part with a fraction.

#2: Diego turns over these two cards during a game of Fraction Memory. He thinks he found a pair of equivalent fractions.





a. Do you agree? Explain your thinking.

Yes: Sample Answer: The shaded area of each circle on the cards is the same size.

b. Use your fraction cards to find a different pair of equivalent fractions. Record your fractions on the lines below.

Answers will vary

_____ = _____

Lesson 5.4:

How do you apply your knowledge of helper facts to solve harder multiplication facts?

#1: For the helper fact below:

* Record a helper fact.
* Use your helper fact and either add or subtract a group.
* Use words, numbers, or pictures to show your thinking.
* Write the product.

Sample Answer:

9 x 8 = ?

Helper Fact: 8 x 8 = 64

How can I use the helper fact: I know that 8 x 8 = 64, so then I add a group of 8. 64 + 8 = 72.

9 X 8 = 72

#2: Lynne and Dan are working together to solve 6 x 7.

* Lynne says: "I think 6 x6 will help as our helper fact."
* Dan says: "I think 7 x 7 will help as our helper fact."

With whom do you agree? Explain. Sample Explanations:

I agree with Lynne because she can add a group of 6 to 6 × 6 to find 6 × 7 because of the turn-around rule. I agree with Dan because he can subtract a group of 7 from 7 × 7 to get the answer to 6 × 7. I agree with both because 6 × 7 is a near-squares fact for 6 × 6 and 7 × 7, so they can either add or subtract a group to get the answer.

Lesson 5.5:
How does using the strategy of doubling help to find the area of a larger rectangle?

Explain two different ways you could use doubling to solve **4 x 6 = ?**
You may draw rectangles to help.

a. One way:

Helper fact: 2 x 6 = 12

How I did it:

I started with 2 x 6 = 12 and doubled it. 12 + 12 = 24,
so 4 x 6 = 24

b. Another way:

Helper fact: 4 x 3 = 12

How I did it:

I started with 4 x 3 = 12 and doubled it. 12 + 12 = 24,
so 4 x 6 = 24

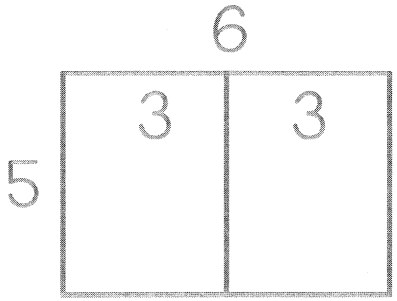
Lesson 5.6:

How do you apply the doubling strategy to solve multiplication facts?

Show how you can solve 5 x 6 using doubling.

Factor I will split in half: 6

Sketch:



$3 \times 5 = 15$

$15 + 15 = 30$

5 x 6 = 30

What helper fact did you double to solve 5 x 6?

3 x 5 = 15

Lesson 5.7:

How do you identify and explain arithmetic patterns using properties of operations?

Complete the table of 5s multiplication facts below.

Fact	Product
1 x 5	5
2 x 5	10
3 x 5	15
4 x 5	20

What patterns did you notice in the products?

The product goes in an odd, even pattern. The product always ends in a 5 and then a 0. The product increases by 5 each time.

Lesson 5.8:

How do you identify the missing factor in a multiplication problem?

Mike is playing a round of *Salute!* The dealer says 32. His partner has a 8 on her forehead.

a. What number does Mike have? 4

b. Write a multiplication number sentence and a division number sentence for this problem.

8 x 4 = 32 32 ÷ 8 = 4

c. How do your number sentences show the same *Salute!* round?

I can think multiplication and ask, "8 times what number is 32?" I can also think division and ask, "How many groups of 8 are There in 32?"

Lesson 5.9:

How can the product of a multiplication square help you find the product of near squares?

Near square: 6 x 7 = ?

Square helper fact: 6 x 6 = 36

How does your square helper fact help you solve the near square?

I can start at 36 and add one more group of 6. 36 + 6 = 42.

6 x 7 = 42

Lesson 5.10:

How do you solve a number story?

Solve the number story.

People are donating $10 each to the animal shelter. The animal shelter has collected $130 so far. Its goal is to collect $200. How many more people do they need to donate money?

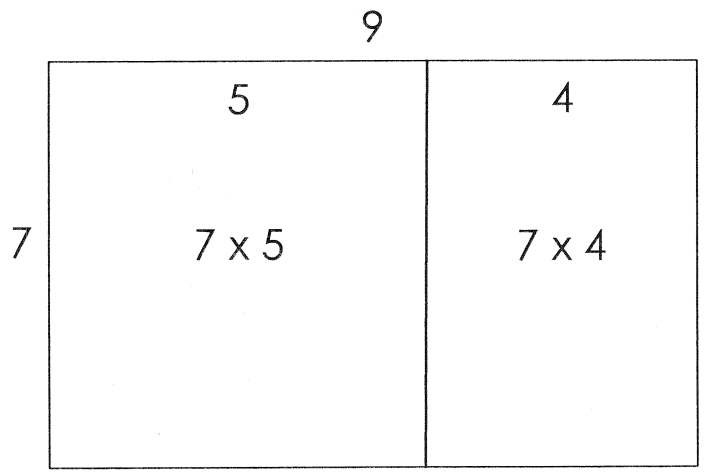
7 people
(unit)

Lesson 5.11:

How do you use the break-apart strategy to solve multiplication problems?

Julio is trying to solve 7 x 9.

He sketched a rectangle to help him think about how to break apart the numbers so that the fact is easier to solve. Here is his sketch:



Use numbers or words to explain how Julio can use his sketch to solve 7 x 9

Julio's rectangle is in two pieces. The first rectangle shows 7 x 5 = 35. The second rectangle shows 7 x 4 = 28. So the total is 35 + 28 = 63.

7 x 9 = _____