3
GRADE

Mathematics Curriculum

ANSWER KEY

Table of Contents

GRADE 3 • MODULE 4
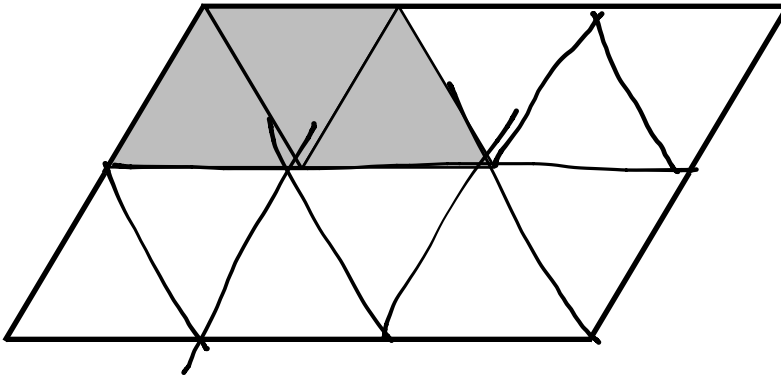
Multiplication and Area

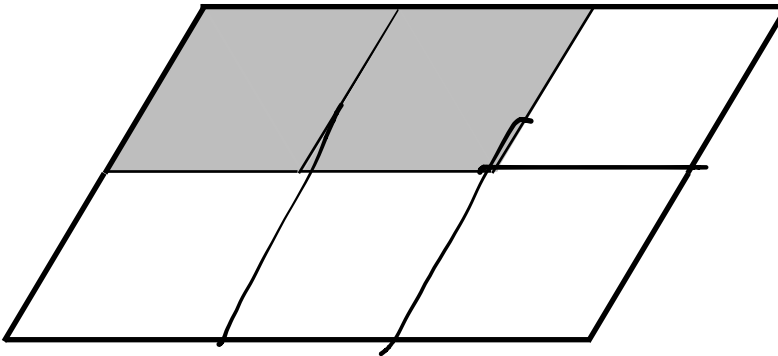ANSWER KEY

Name _____   Date _____

1.   Magnus covers the same shape with triangles, rhombuses, and trapezoids

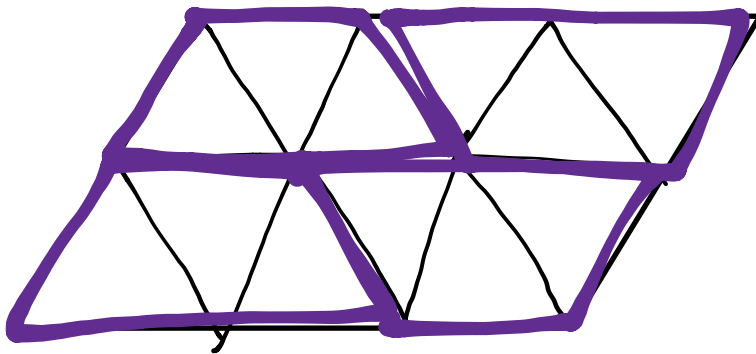   a.   How many triangles will it take to cover the shape?

_12_ triangles

   b.   How many rhombuses will it take to cover the shape?

_6_ rhombuses

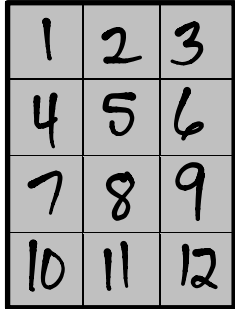   c.   Magnus notices that 3 triangles from Part (a) cover 1 trapezoid. How many trapezoids will it take to cover the shape below? Explain your answer.

_4_ trapezoids

because 12 (from part a) divided by 3 equals 4.

2. Angela uses squares to find the area of a rectangle. Her work is shown below.
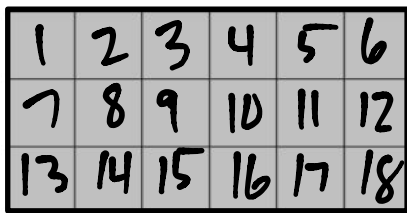   a. How many squares did she use to cover the rectangle?

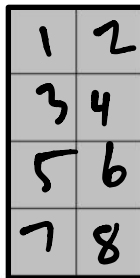| 1	2	3
4	5	6
7	8	9
10	11	12

_12_ squares

   b. What is the area of the rectangle in square units? Explain how you found your answer.

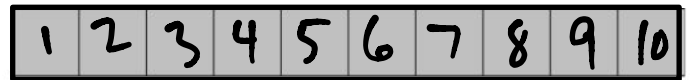The area is 12 square units because the rectangle has 12 squares in it.

3. Each ☐ is 1 square unit. Which rectangle has the biggest area? How do you know?

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18

Rectangle A

1	2
3	4
5	6
7	8

Rectangle B

1	2	3	4	5	6	7	8	9	10

Rectangle C

Rectangle A has the biggest area because it uses more squares than the other figures.

COMMON CORE

Lesson 1: Understand area as an attribute of plane figures.
Date: 9/30/13

engage^ny 4.A.12

Multiply.

4 x 1 = **4**	4 x 2 = **8**	4 x 3 = **12**	4 x 4 = **16**
4 x 5 = **20**	4 x 6 = **24**	4 x 7 = **28**	4 x 8 = **32**
4 x 9 = **36**	4 x 10 = **40**	4 x 5 = **20**	4 x 6 = **24**
4 x 5 = **20**	4 x 7 = **28**	4 x 5 = **20**	4 x 8 = **32**
4 x 5 = **20**	4 x 9 = **36**	4 x 5 = **20**	4 x 10 = **40**
4 x 6 = **24**	4 x 5 = **20**	4 x 6 = **24**	4 x 7 = **28**
4 x 6 = **24**	4 x 8 = **32**	4 x 6 = **24**	4 x 9 = **36**
4 x 6 = **24**	4 x 7 = **28**	4 x 6 = **24**	4 x 7 = **28**
4 x 8 = **32**	4 x 7 = **28**	4 x 9 = **36**	4 x 7 = **28**
4 x 8 = **32**	4 x 6 = **24**	4 x 8 = **32**	4 x 7 = **28**
4 x 8 = **32**	4 x 9 = **36**	4 x 9 = **36**	4 x 6 = **24**
4 x 9 = **36**	4 x 7 = **28**	4 x 9 = **36**	4 x 8 = **32**
4 x 9 = **36**	4 x 8 = **32**	4 x 6 = **24**	4 x 9 = **36**
4 x 7 = **28**	4 x 9 = **36**	4 x 6 = **24**	4 x 8 = **32**
4 x 9 = **36**	4 x 7 = **28**	4 x 6 = **24**	4 x 8 = **32**

© Bill Davidson

COMMON CORE

Lesson 2: Decompose and recompose shapes to compare areas.
Date: 9/30/13

engage^{ny}

4.A.18

Name _____   Date _____
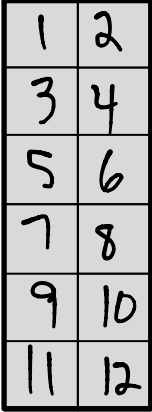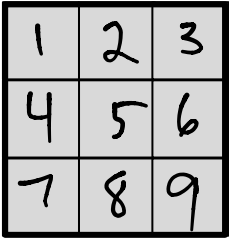
1. Each ☐ is a square unit.   Count to find the area of each rectangle.   Then circle all the rectangles with an area of 12 square units.
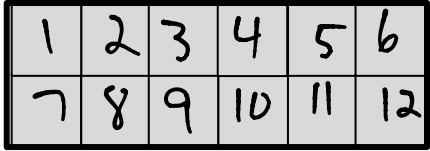
a.

1	2
3	4
5	6
7	8
9	10
11	12

Area = __12__ square units

b.

1	2	3
4	5	6
7	8	9

Area = __9__ square units

c.

| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 |

Area = __12__ square units

d.

1	2	3	4
5	6	7	8
9	10	11	12

Area = __12__ square units

e.

| 1 | 2 | 3 | 4 | 5 |

Area = __5__ square units

f.

1	2
3	4
5	6
7	8

Area = __8__ square units

Lesson 2:   Decompose and recompose shapes to compare areas.
Date: 9/30/13

engage^ny   4.A.22

2. Colin uses square inch pieces to create these rectangles. Do they have the same area? Explain.

| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |

| 1 | 2 | 3 | 4 | 5 | 6 |
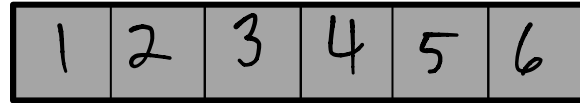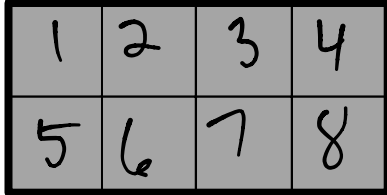
The rectangles do _not_ have the same area, because the rectangle on the left has an area of 8 square units while the rectangle on the right has an area of 6 square units.

3. Each ☐ is a square unit. Count to find the area of the rectangle below. Then draw a different rectangle that has the same area.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Area = 16 sq. u.

or

Lesson 2:   Decompose and recompose shapes to compare areas.
Date: 9/30/13

engage^ny   4.A.23

© 2013 Common Core, Inc. Some rights reserved. commoncore.org
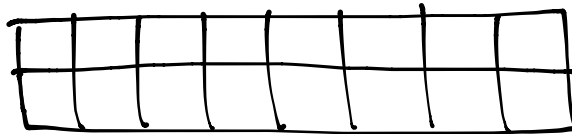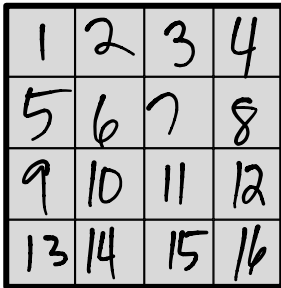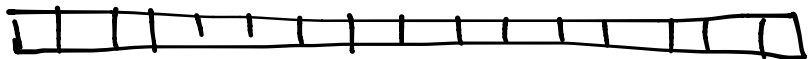
Name _____   Date _____

1. Each ☐ is 1 square unit. What is the area of each of the following rectangles?
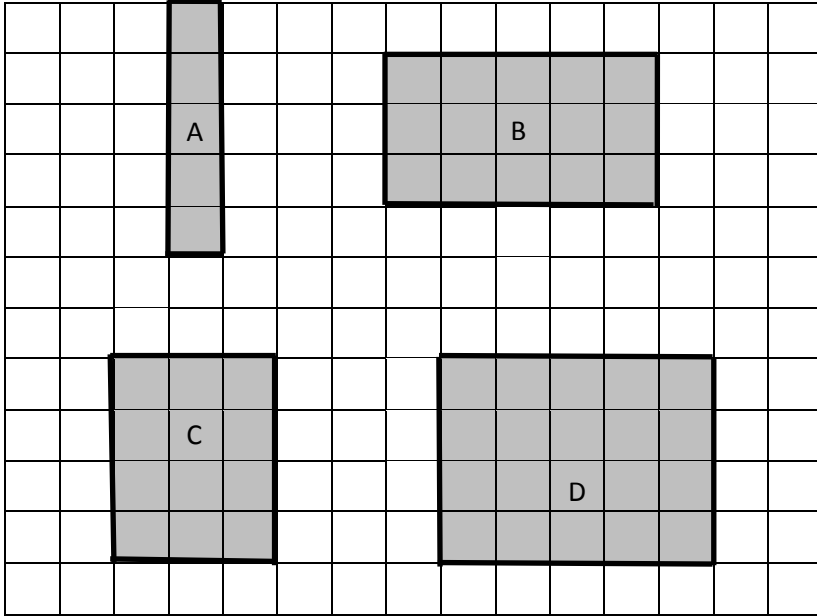
A: ___5___ square units

B: __15 square units__
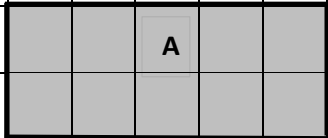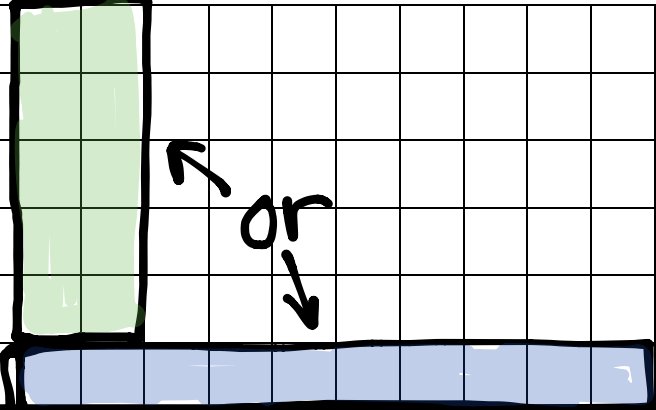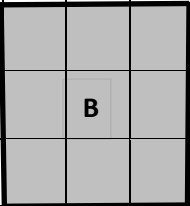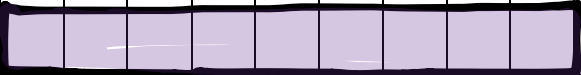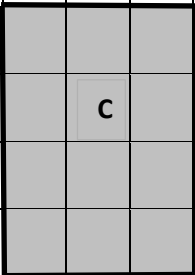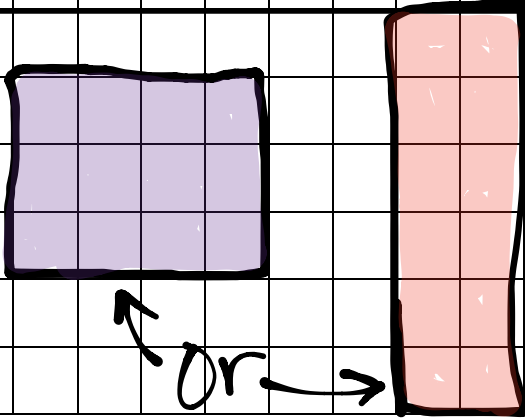
C: __12 square units__

D: __20 square units__

2. Each ☐ is 1 square unit. What is the area of each of the following rectangles?

a.

__9 square units__

b.

__24 square units__

c.

__8 square units__

d.

__18 square units__

Lesson 3:   Model tiling with centimeter and inch unit squares as a strategy to measure area.

Date: 9/30/13

engage^ny   **4.A.32**
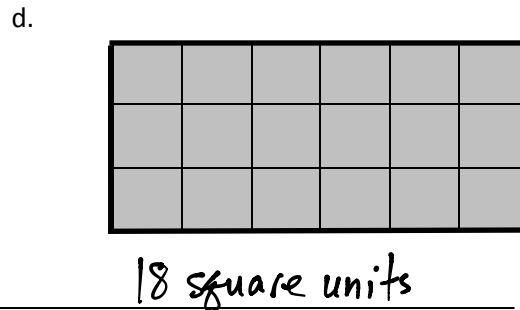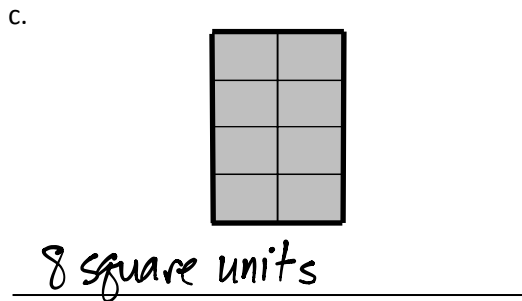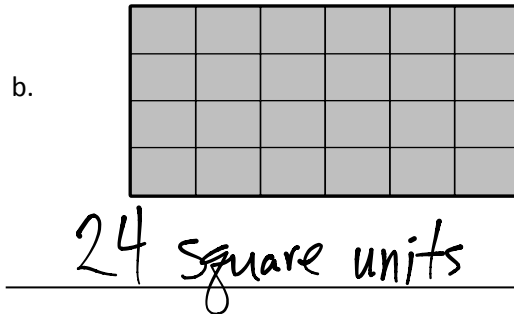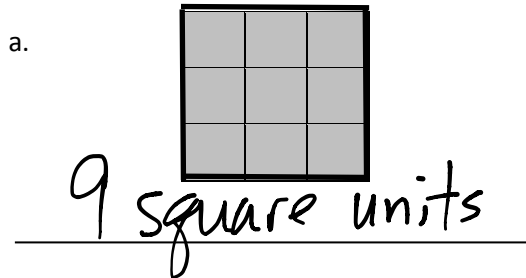
3. Each ⬜ is 1 square unit. Write the area of each rectangle. Then draw another rectangle with the same area in the space provided.

A

Area = _____*10*_____ square units

B

Area = _____*9 square units*_____

C

Area = _____*12 sq. u.*_____

or

or

Lesson 3:   Model tiling with centimeter and inch unit squares as a strategy to measure area.

Date: 9/30/13

engage^ny   **4.A.33**

Name _____   Date _____

1. Ella placed square-centimeter tiles on the rectangle below, and then labeled the side lengths. What is the area of her rectangle?

4 cm

2 cm
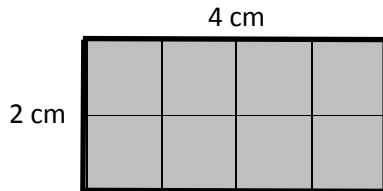
Total area: ___8 square cm.___

2. Kyle uses square-centimeter tiles to find the side lengths of the rectangle below. Label each side length. Then count the tiles to find the total area.

5 cm

4 cm
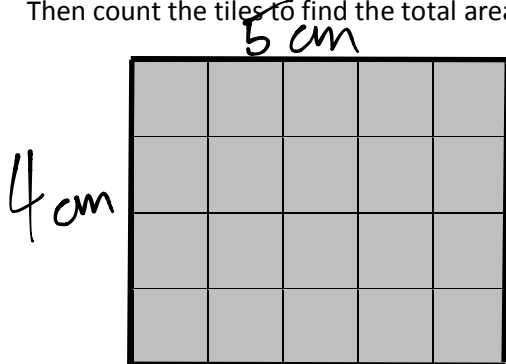
Total area: ___20 sq. cm.___

3. Maura uses square-inch tiles to find the side lengths of the rectangle below. Label each side length. Then find the total area.

7 in.

2 in.
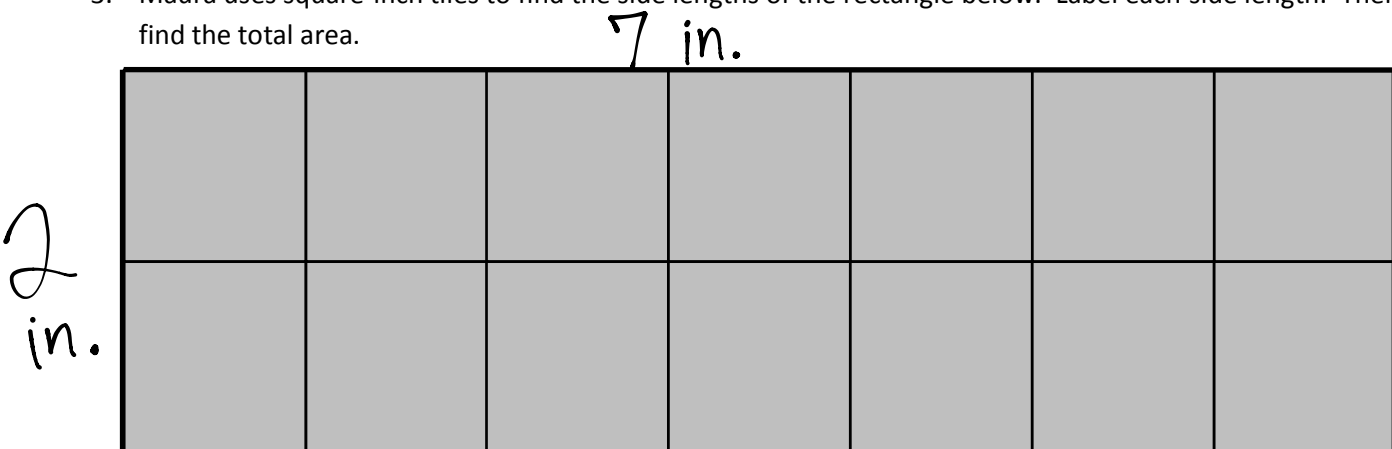
Total area: ___14 sq. in.___

4. Each square unit below is 1 square inch. Claire says that the side length of the rectangle below is 3 inches. Tyler says the side length is 5 inches. Who is correct? Explain how you know.

5 in.

3 in.
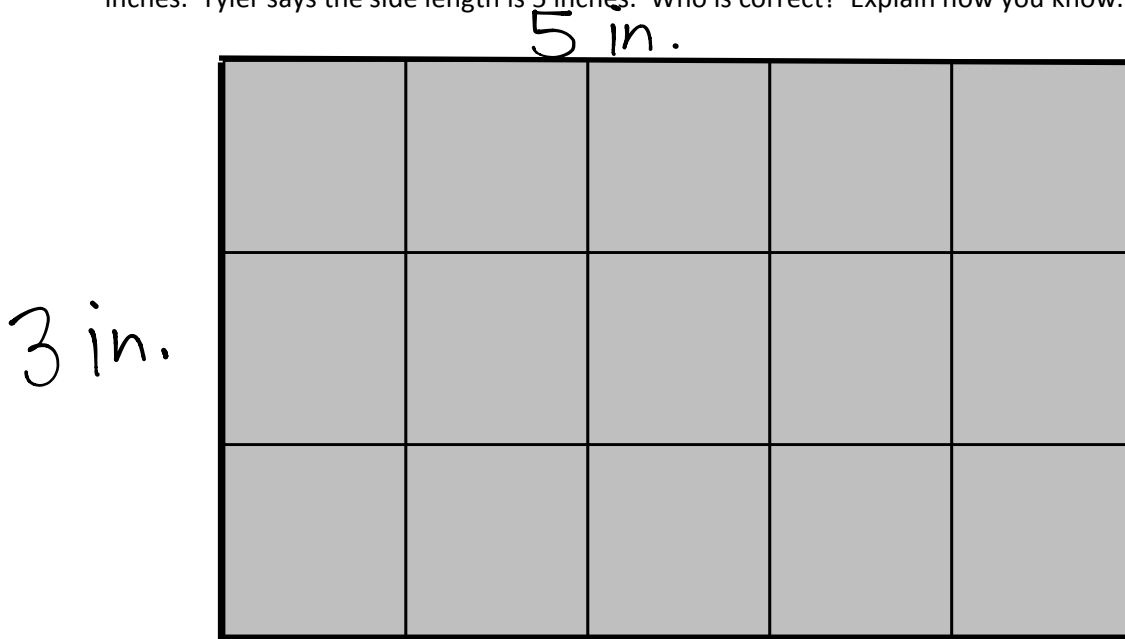
Claire and Tyler are both correct because the rectangle has one side length of 3 inches and another side length of 5 inches.

5. Label the unknown side lengths for the rectangle below, then find the area. Explain how you used the lengths provided to find the unknown lengths and area.

Opposite sides of a rectangle have the same length.

4 inches

2 inches

2 inches

4 inches

Name _____ Date _____

1. Use the centimeter side of a ruler to draw in the tiles, then skip-count to find the unknown side length or area. Write a multiplication sentence for each tiled rectangle.

   a. Area: **24** square centimeters.
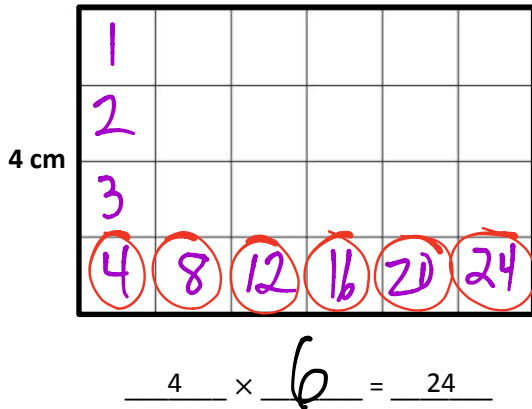
   4 cm

1					
2					
3					
④	⑧	⑫	⑯	㉑	㉔

   ___4___ × __6__ = ___24___

   b. Area: **24** square centimeters.

   6 cm

1			
2			
3			
4			
5			
⑥	⑫	⑱	㉔

   __6__ × __4__ = __24__

   c. Area: **15** square centimeters.

   5 cm

1		
2		
3		
4		
⑤	⑩	⑮

   __5__ × __3__ = __15__

   d. Area: **15** square centimeters.

   3 cm

1				
2				
③	⑥	⑨	⑫	⑮

   __3__ × __5__ = __15__

COMMON CORE | Lesson 5: | Form rectangles by tiling with unit squares to make arrays.
Date: | 9/30/13

engage^ny 4.B.12
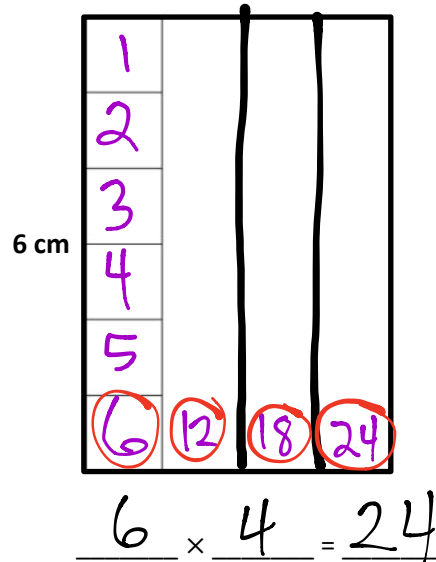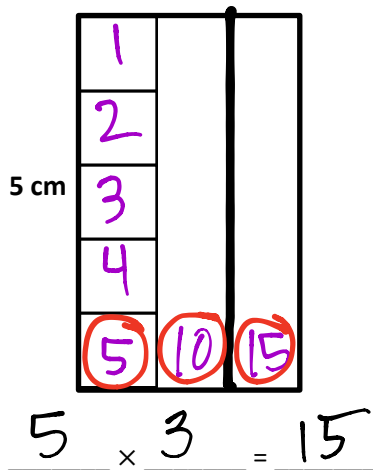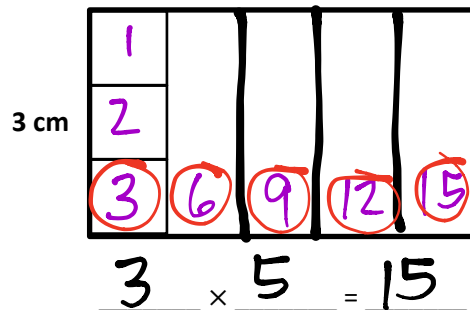
2. Ally makes a rectangle with 45 square-inch tiles. She arranges the tiles in 5 equal rows. How many square-inch tiles are in each row? Use words, pictures, and numbers to support your answer.

9 squares in each row

5 rows

1	6
2	7
3	8
4	9

5 10 15 20 25 30 35 40 45
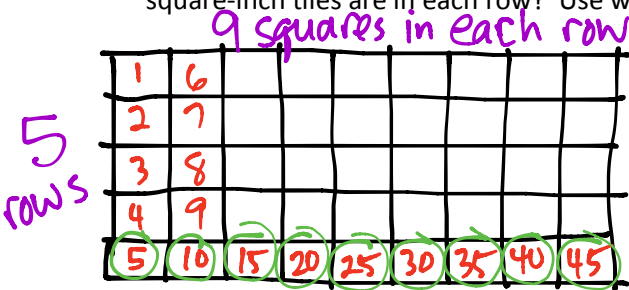
$$5 \times \underline{9} = 45$$

Since 5×9=45, we know there must be 9 square-inch tiles in each of the 5 rows. Skip counting also shows that we need 9 tiles in each row.

3. Leon makes a rectangle with 36 square-centimeter tiles. There are 4 equal rows of tiles.

a. How many tiles are in each row? Use words, pictures, and numbers to support your answer.

$$4 \times \underline{9} = 36$$

9 tiles in each row

4 rows

1	5
2	6
3	7

4 8 12 16 20 24 28 32 36

Since 4×9=36, we know there must be 9 square-inch tiles in each of the 4 rows. Skip counting also shows that we need 9 tiles in each row.

b. Can Leon arrange all of his 36 square-centimeter tiles into 6 equal rows? Use words, pictures, and numbers to support your answer.
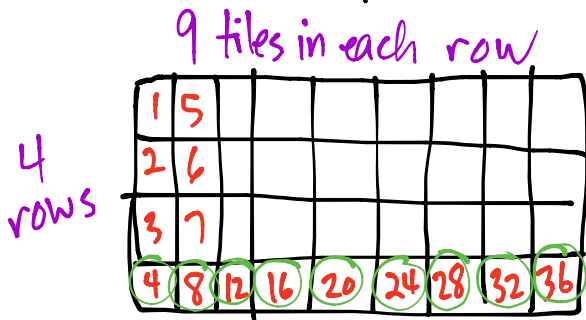
$$6 \times \underline{6} = 36$$

6 rows

1
2
3
4
5

6 12 18 24 30 36
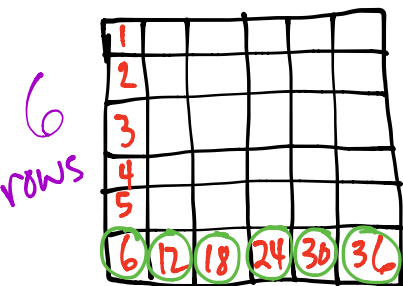
Since 6×6=36, we know there must be 6 square-inch tiles in each of the 6 rows. Skip counting also shows that we need 6 tiles in each row.

c. Do the rectangles in (a) and (b) have the same total area? Explain how you know.
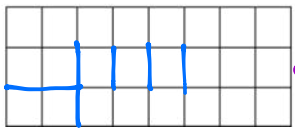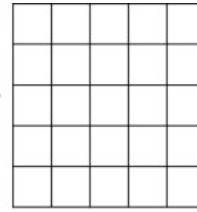
The two rectangles have the same area because each rectangle is made with 36 square-centimeter tiles.

COMMON CORE

Lesson 5: Form rectangles by tiling with unit squares to make arrays.
Date: 9/30/13

engage^ny

4.B.13
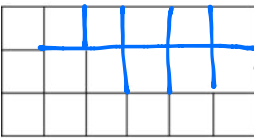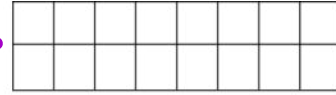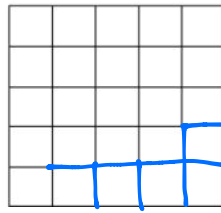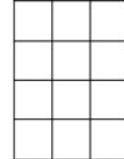
Name _____   Date _____
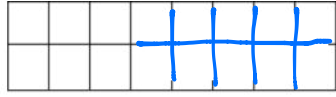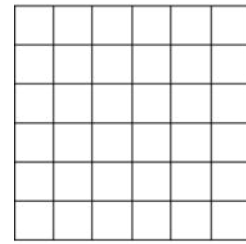
1. Each ☐ represents a 1-cm square. Draw to find the number of rows and columns in each array. Match it to its completed array. Then fill in the blanks to make a true equation to find each array's area.
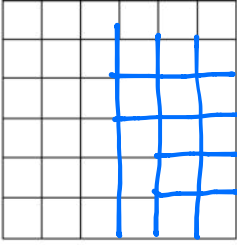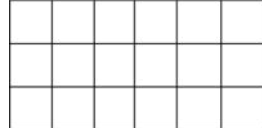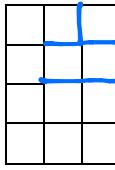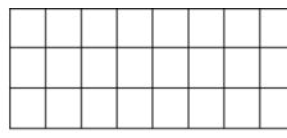
a.

$\underline{3} \times \underline{6} = \underline{18}$ sq cm

b.

$\underline{5} \times \underline{5} = \underline{25}$ sq cm

c.

$\underline{2} \times \underline{8} = \underline{16}$ sq cm

d.

$\underline{4} \times \underline{3} = \underline{12}$ sq cm

e.

$\underline{6} \times \underline{6} = \underline{36}$ sq cm

f.

$\underline{3} \times \underline{8} = \underline{24}$ sq cm

COMMON CORE | Lesson 6: Draw rows and columns to determine the area of a rectangle, given an incomplete array.
Date: 10/1/13

engage^ny   4.B.22

2. Minh skip-counts by sixes to find the total square units in the rectangle below. She says there are 36 square units. Is she correct? Explain your answer.
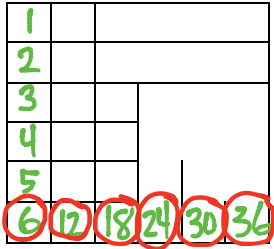
Minh is correct because the drawing shows that there are 6 squares in the first column and there are 6 columns in the rectangle. Also, 6×6 = 36.

Grid labeled down the first column: 1, 2, 3, 4, 5, 6 and across the bottom row circled: 6, 12, 18, 24, 30, 36

3. The tub in Paige's bathroom covers the tile floor as shown below. How many square tiles are on the floor, including the tiles under the tub?

9 tiles (vertical)   *10 tiles* (horizontal)
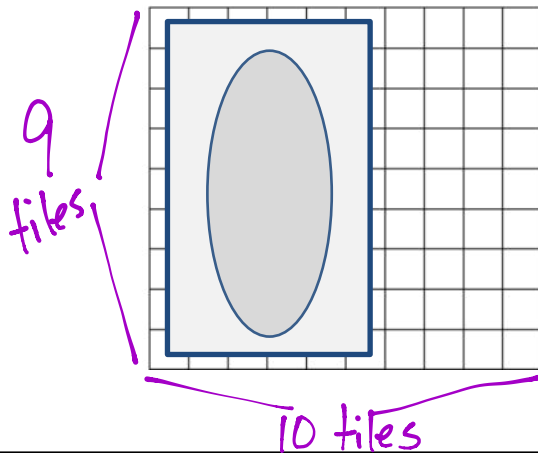
$$9 \times 10 = 90$$

There are 90 square tiles.

4. Frank sees a book on top of his chessboard. How many squares are covered by the book? Explain your answer.

6 squares   *6 square* (vertical)
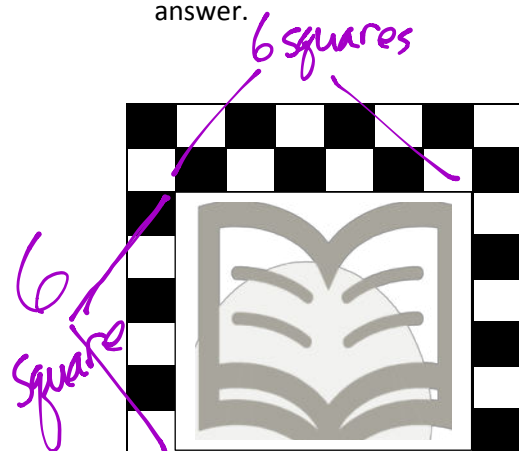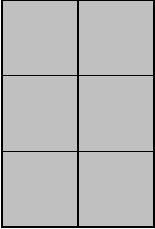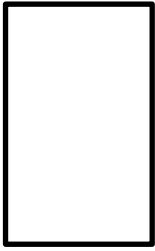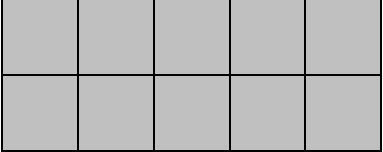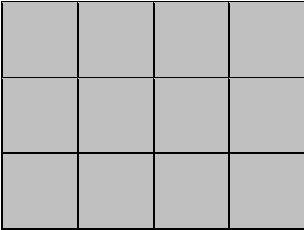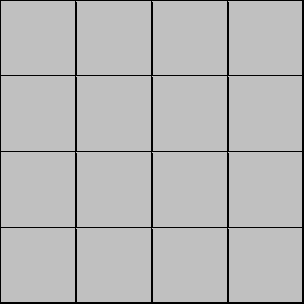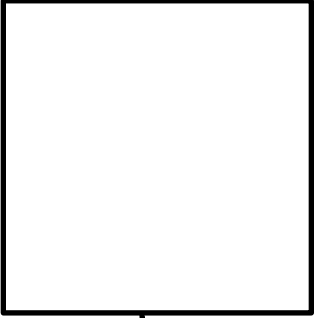
$$6 \times 6 = 36$$

the book covers 36 squares because
6 × 6 = 36.

Lesson 6: Draw rows and columns to determine the area of a rectangle, given an incomplete array.

Date: 10/1/13

engage^ny   4.B.23

Name _____   Date _____

1. Find the area of each rectangular array. Label the side lengths of the matching area model and write a multiplication equation for each area model.

Rectangular Arrays	**Area Models**
a. **6** _____ square units	3 $3 \times$ **2** $=$ **6** 2
b. **10** _____ square units	2 5 **2** $\times$ **5** $=$ **10**
c. **12** _____ square units	3 4 **3** $\times$ **4** $=$ **12**
d. **16** _____ square units	**4** **4** **4** $\times$ **4** $=$ **16**

3. Jillian arranges square pattern blocks into a 7 by 4 array. Draw Jillian's array on the the grid below. How many square units are in Jillian's rectangular array?

a.
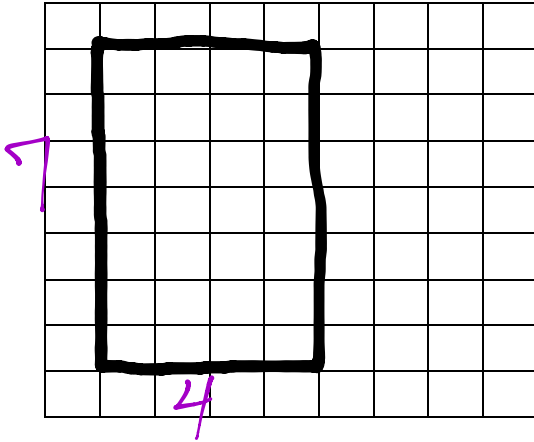
$7 \times 4 = 28$

there are 28 square units in Jillian's array.
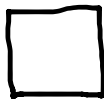
b. Label the side lengths of Jillian's array from Part (a) on the rectangle below. Then write a multiplication sentence to represent the area of the rectangle.

7

4
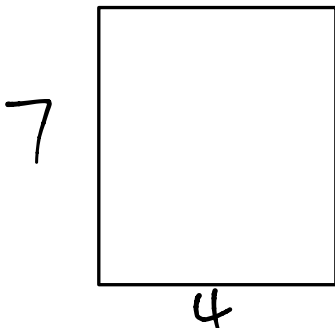
$7 \times 4 = 28$

4. Fiona draws a 24 square-centimeter rectangle. Gregory draws a 24 square-inch rectangle. Whose rectangle is larger in area? How do you know?

1 square centimeter

1 square inch

Both students use 24 square tiles to "build" their rectangles, but 1 square inch is bigger than 1 square centimeter. That makes Gregory's rectangle larger than Fiona's.

Lesson 7: Interpret area models to form rectangular arrays.
Date: 9/30/13

engage^ny   4.B.36

Multiply.

6 x 1 = **6**   6 x 2 = **12**   6 x 3 = **18**   6 x 4 = **24**

6 x 5 = **30**   6 x 6 = **36**   6 x 7 = **42**   6 x 8 = **48**

6 x 9 = **54**   6 x 10 = **60**   6 x 5 = **30**   6 x 6 = **36**

6 x 5 = **30**   6 x 7 = **42**   6 x 5 = **30**   6 x 8 = **48**

6 x 5 = **30**   6 x 9 = **54**   6 x 5 = **30**   6 x 10 = **60**

6 x 6 = **36**   6 x 5 = **30**   6 x 6 = **36**   6 x 7 = **42**

6 x 6 = **36**   6 x 8 = **48**   6 x 6 = **36**   6 x 9 = **54**

6 x 6 = **36**   6 x 7 = **42**   6 x 6 = **36**   6 x 7 = **42**

6 x 8 = **48**   6 x 7 = **42**   6 x 9 = **54**   6 x 7 = **42**

6 x 8 = **48**   6 x 6 = **36**   6 x 8 = **48**   6 x 7 = **42**

6 x 8 = **48**   6 x 9 = **54**   6 x 9 = **54**   6 x 6 = **36**

6 x 9 = **54**   6 x 7 = **42**   6 x 9 = **54**   6 x 8 = **48**

6 x 9 = **54**   6 x 8 = **48**   6 x 6 = **36**   6 x 9 = **54**

6 x 7 = **42**   6 x 9 = **54**   6 x 6 = **36**   6 x 8 = **48**

6 x 9 = **54**   6 x 7 = **42**   6 x 6 = **36**   6 x 8 = **48**

© Bill Davidson

engage^ny

4.B.44

Name _____   Date _____

1. Write a multiplication sentence to find the area of each rectangle.

a.

8 cm

3 cm

Area: **24** sq cm

3 × **8** = **24**

b.

8 cm

6 cm

Area: **48** sq cm

6 × **8** = **48**

c.

4 ft

4 ft

Area: **16** sq ft

4 × **4** = **16**

d.

7 ft

4 ft

Area: **28** sq ft

4 × **7** = **28**
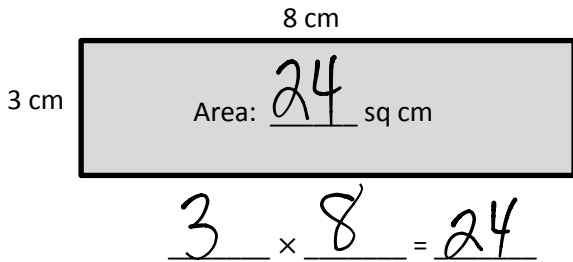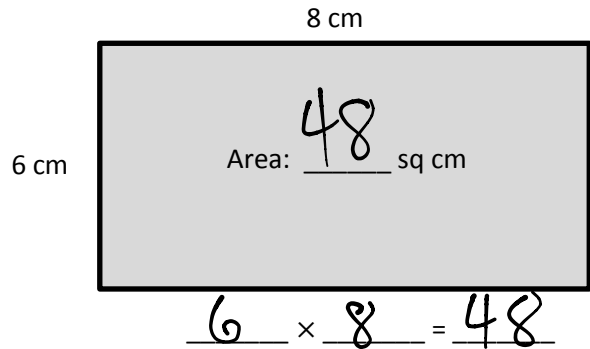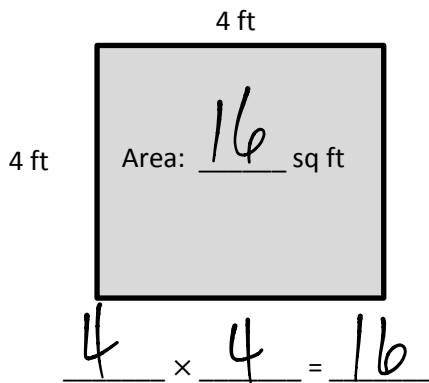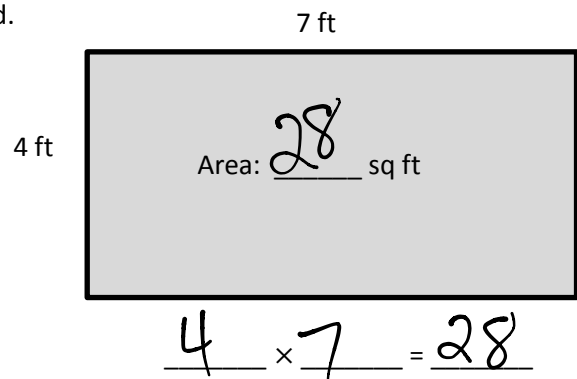
2. Write a multiplication sentence and a division sentence to find the unknown side length for each rectangle.

a.

8 ft.

3 ft

Area: 24 sq ft

3 × **8** = **24**
24 ÷ **3** = **8**

b.

9 ft

4 ft

Area: 36 sq ft

4 × **9** = **36**
36 ÷ **9** = **4**

COMMON CORE | Lesson 8: Find the area of a rectangle through multiplication of the side lengths.
               | Date: 9/30/13

engage^{ny}
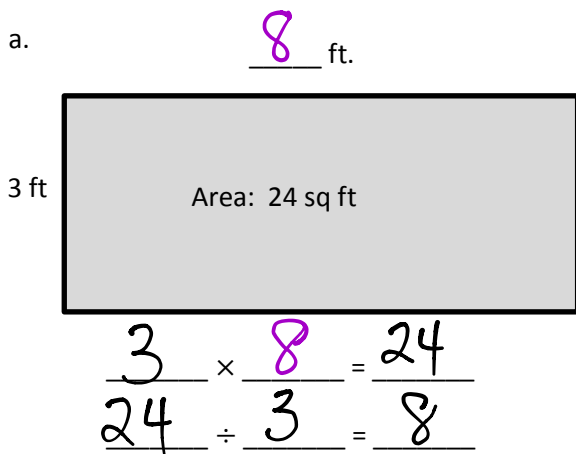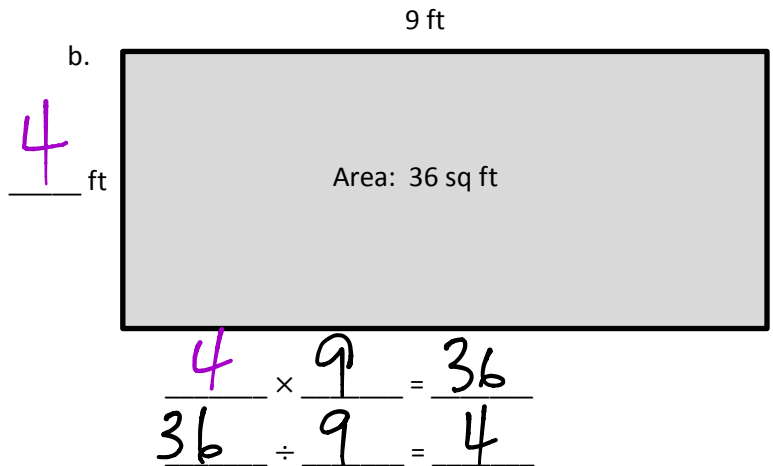
2. On the grid below draw a rectangle that has an area of 32 square centimeters. Label the side lengths.

4
cm

8 cm
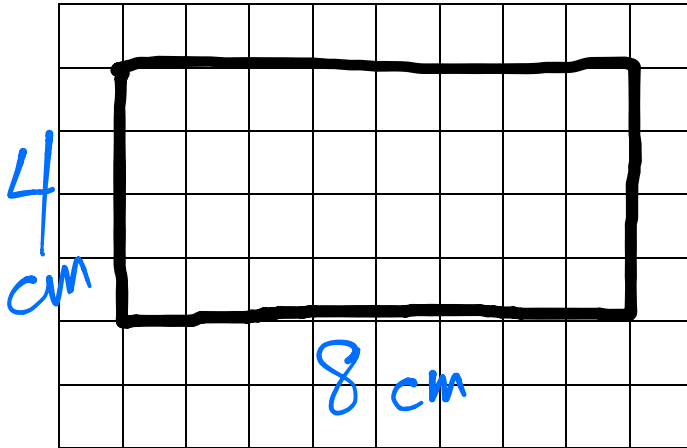
3. Patricia draws a rectangle that has side lengths of 4 centimeters and 9 centimeters. What is the area of the rectangle? Explain how you found your answer.

4 cm

Area: 36 sq. cm.

9 cm
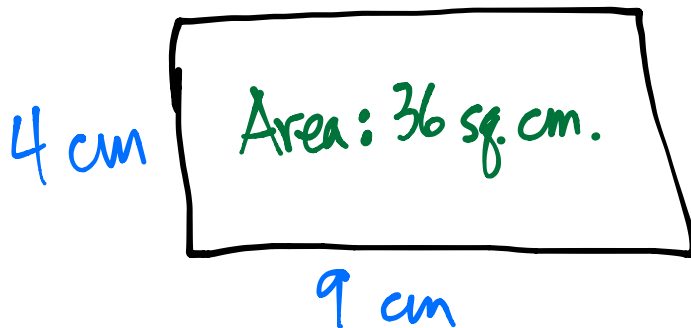
$$4 \times 9 = 36$$

The area is 36 sq cm because $4 \times 9 = 36$.

4. Charles draws a rectangle with a side length of 9 inches and an area of 27 square inches. What is the other side length? How do you know?

9 in

___ in
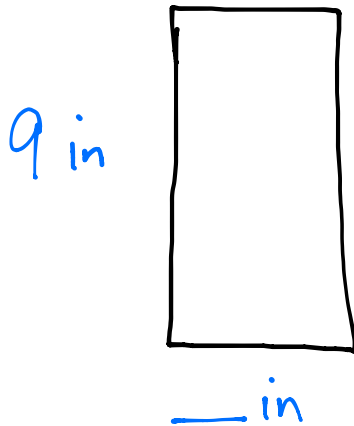
$$9 \times \underline{3} = 27$$

Since $9 \times 3 = 27$, we know the other side length is 3 inches.

Lesson 8: Find the area of a rectangle through multiplication of the side lengths.
Date: 9/30/13

engage^{ny}

4.B.49

Name _____   Date _____

1. Use the grid to answer the questions below.

8

4
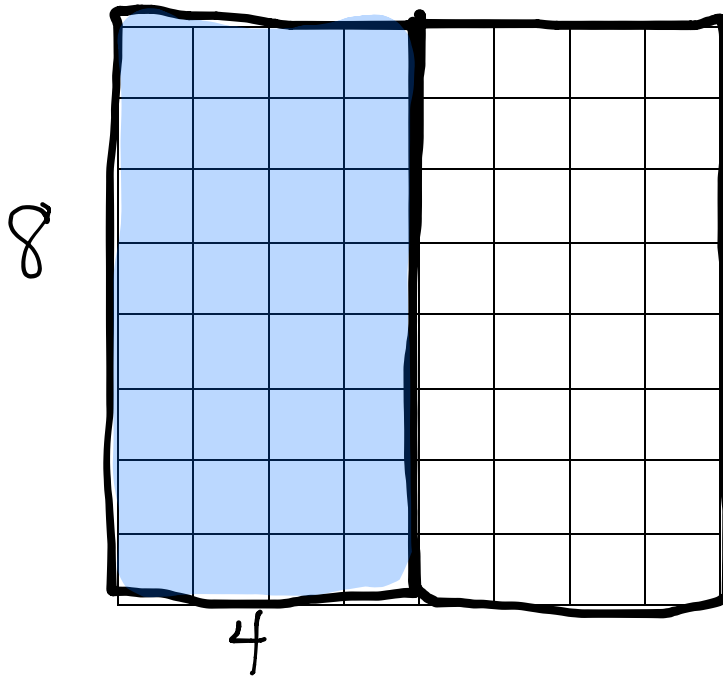
a. Draw a line to show how to divide the grid into 2 equal rectangles. Shade in 1 of the rectangles.

b. Label the side lengths of each rectangle.

c. Write an equation to show the total area of the 2 rectangles.

$$(8 \times 4) \times 2 \quad \text{or} \quad 2 \times (8 \times 4)$$

$$\text{or} \quad (8 \times 4) + (8 \times 4)$$

2. Alexa cuts out the 2 equal rectangles from Problem 1(a) and puts the two shorter sides together.

    a. Draw Alexa's new rectangle and label the side lengths below.
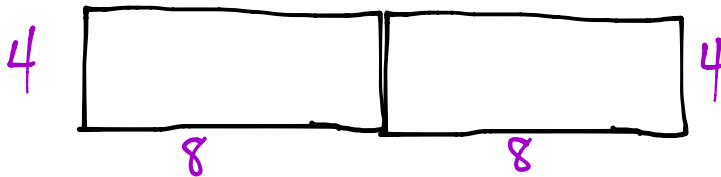
    b. Find the total area of the new, longer rectangle.

$$(4 \times 8) \times 2 = 32 \times 2$$
$$= 64 \text{ sq. units}$$

or

$$(4 \times 8) + (4 \times 8)$$
$$32 + 32$$
$$64 \text{ sq. units}$$

    c. Is the area of the new, longer rectangle equal to the total area in Problem 1(c)? Explain why or why not.

The area of the new, longer rectangle is equal to the square in Problem 1(c) because both figures use 64 square tiles to make them.

COMMON CORE

Lesson 9:   Analyze different rectangles and reason about their area.
Date: 9/30/13

engage^ny   4.C.12

Name _____   Date _____

1. Label the side lengths of the shaded and unshaded rectangles. Then find the total area of the large rectangle by adding the areas of the 2 smaller rectangles.

a.
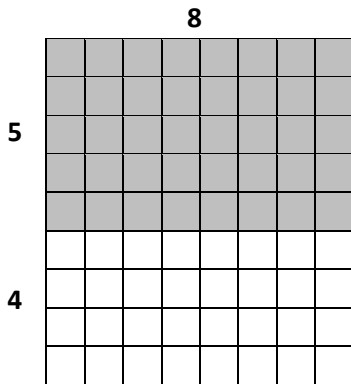
$9 \times 8 = (5 + 4) \times 8$

$= (5 \times 8) + (4 \times 8)$

$= \underline{40} + \underline{32}$

$= \underline{72}$ square units

b.
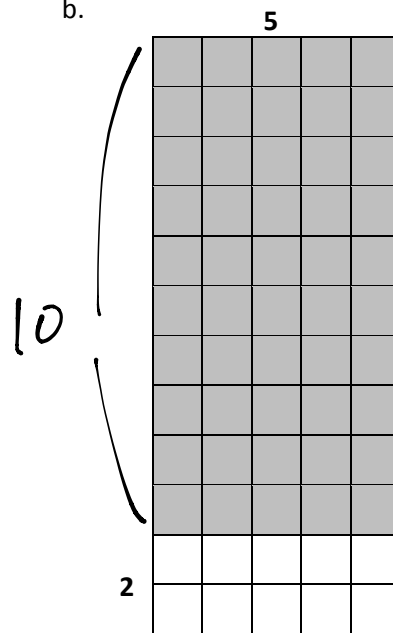
$12 \times 5 = (\underline{10} + 2) \times 5$

$= (\underline{10} \times 5) + (2 \times 5)$

$= \underline{50} + 10$

$= \underline{60}$ square units

c.
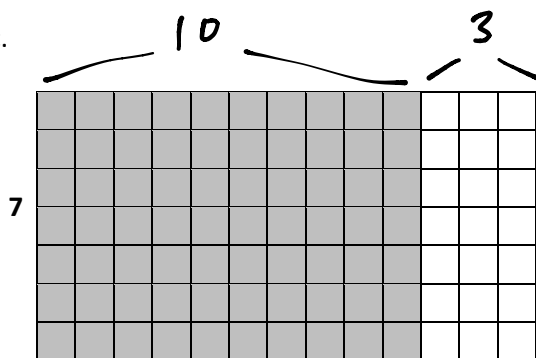
$7 \times 13 = 7 \times (\underline{10} + 3)$

$= (7 \times \underline{10}) + (7 \times 3)$

$= \underline{70} + \underline{21}$

$= \underline{91}$ square units
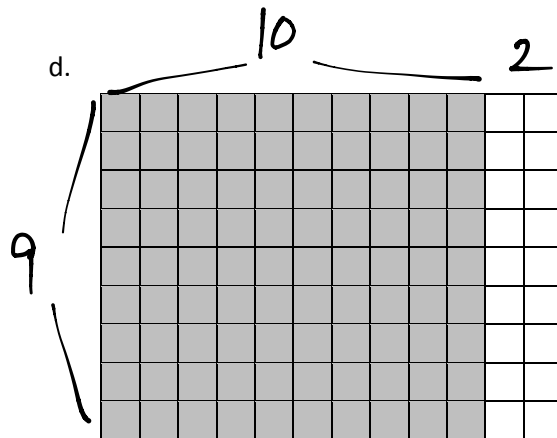
d.

$9 \times 12 = 9 \times (\underline{10} + \underline{2})$

$= (9 \times \underline{10}) + (9 \times \underline{2})$

$= \underline{90} + \underline{18}$

$= \underline{108}$ square units

Lesson 10: Apply the distributive property as a strategy to find the total area of a large rectangle by adding two products.

Date: 9/30/13

engage^ny   4.C.22

2. Finn imagines 1 more row of nine to find the total area of 9 × 9 rectangle. Explain how this could help him solve 9 × 9.
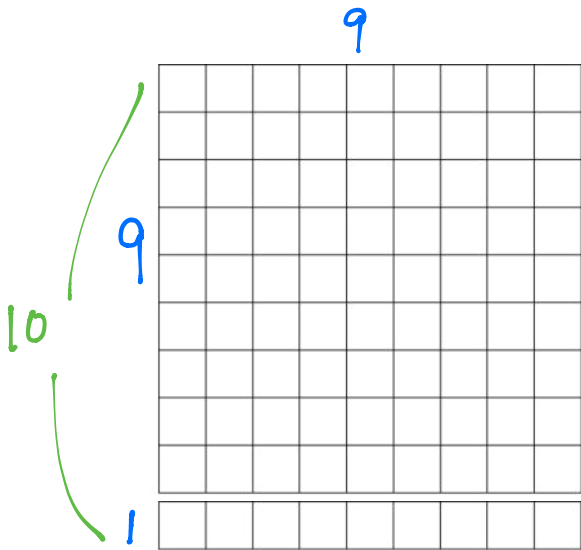
$$9 \times 9 = (10 - 1) \times 9$$
$$= (10 \times 9) - (1 \times 9)$$
$$= 90 - 9$$
$$= 81$$

10 nines is 90, but Finn only wanted 9 nines, so he needed to subtract one nine from 90, which gives 81 as the product.

3. Shade to break the 16 × 4 rectangle into 2 smaller rectangles. Then find the sum of the areas of the 2 smaller rectangles to find the total area. Explain your thinking.
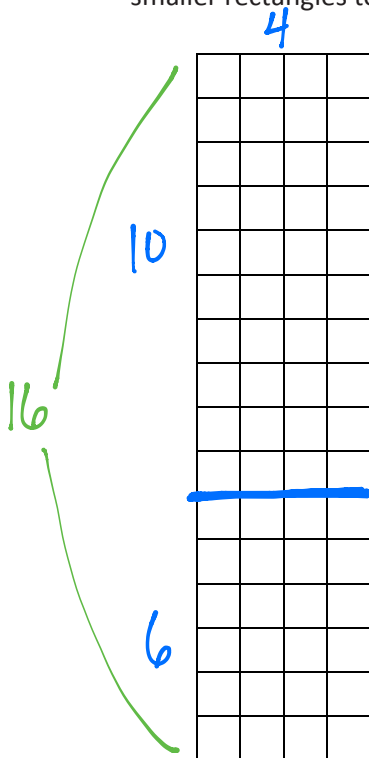
$$16 \times 4 = (10 + 6) \times 4$$
$$= (10 \times 4) + (6 \times 4)$$
$$= 40 + 24$$
$$= 64$$

We cut the 16 x 4 rectangle into two smaller rectangles: one is 10x4 and the other is 6x4. Their areas are 40 square units and 24 square units. The total area is 40+24 =64 square units.

COMMON CORE

Lesson 10: Apply the distributive property as a strategy to find the total area of a large rectangle by adding two products.

Date: 9/30/13

engage^{ny}

4.C.23

Name _____   Date _____

1. The rectangles below have the same area. Move the ( ) to find the missing side lengths. Then solve.

36 cm

1 cm

b.   Area: $1 \times 36 =$ **36** sq cm

18 cm
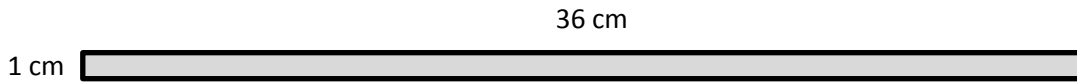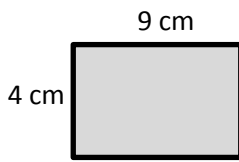
2 cm
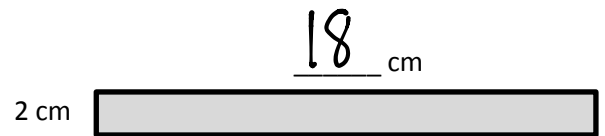
b.   Area: **4 × 9** = (2 × 2) × 9

= 2 × (2 × 9)

= **2** × **18**

= **36** sq cm

9 cm

4 cm

a. Area: $4 \times$ **9** $=$ **36** sq cm

3 cm

12 cm
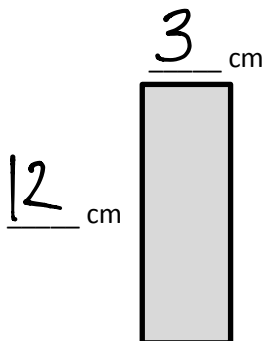
c.   Area: **4 × 9** = 4 × (3 × 3)

= (4 × 3) × 3

= **12** × **3**

= **36** sq cm

6 cm

6 cm
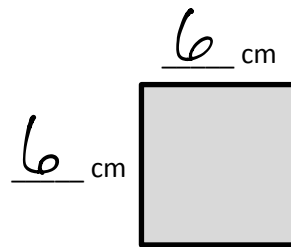
d. Area: **12 × 3** = (6 × 2) × 3

= 6 × (2 × 3)

= **6** × **6**

= **36** sq cm

2. Does Problem 1 show all the possible whole number side lengths for a rectangle with an area of 36 square centimeters? How do you know?

1 × 36   4 × 9
2 × 18   6 × 6
3 × 12

We know that we found all of the possible whole number side lengths because there is no other number that can be multiplied to equal 36.

3.

a. Find the area of the rectangle below.

6 cm

8 cm
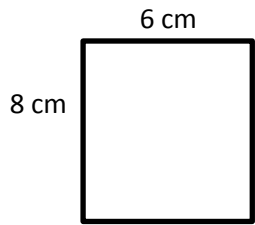
$8 \times 6 = 48$

48 sq. cm.

b. Hilda says a 4 cm by 12 cm rectangle has the same area as the rectangle in Part (a). Place ( ) in the equation to find the related fact and solve. Is Hilda correct? Why or why not?

4 × 12 = 4 × (2 × 6)

= (4 × 2) × 6

= __8__ × __6__

= __48__ sq cm

$8 \times 6 = 48$
$4 \times 12 = 48$

Both rectangles have an area of 48 sq cm.

c. Use the expression 8 × 6 to find different side lengths for a rectangle that has the same area as the rectangle in Part (a). Show your equations using ( ). Then estimate to draw the rectangle and label the side lengths.

$8 \times 6 = 8 \times (2 \times 3)$
$= (8 \times 2) \times 3$
$= 16 \times 3$

or

$8 \times 6 = (2 \times 4) \times 6$
$= 2 \times (4 \times 6)$
$= 2 \times 24$

16

3

2

24

Lesson 11: Demonstrate possible whole number side lengths of rectangles with areas of 24, 36, 48, or 72 square units using the associative property.

Date: 9/30/13

engage^ny 4.C.34

Multiply.

7 x 1 = **7**   7 x 2 = **14**   7 x 3 = **21**   7 x 4 = **28**

7 x 5 = **35**   7 x 6 = **42**   7 x 7 = **49**   7 x 8 = **56**

7 x 9 = **63**   7 x 10 = **70**   7 x 5 = **35**   7 x 6 = **42**

7 x 5 = **35**   7 x 7 = **49**   7 x 5 = **35**   7 x 8 = **56**

7 x 5 = **35**   7 x 9 = **63**   7 x 5 = **35**   7 x 10 = **70**

7 x 6 = **42**   7 x 5 = **35**   7 x 6 = **42**   7 x 7 = **49**

7 x 6 = **42**   7 x 8 = **56**   7 x 6 = **42**   7 x 9 = **63**

7 x 6 = **42**   7 x 7 = **49**   7 x 6 = **42**   7 x 7 = **49**

7 x 8 = **56**   7 x 7 = **49**   7 x 9 = **63**   7 x 7 = **49**

7 x 8 = **56**   7 x 6 = **42**   7 x 8 = **56**   7 x 7 = **49**

7 x 8 = **56**   7 x 9 = **63**   7 x 9 = **63**   7 x 6 = **42**

7 x 9 = **63**   7 x 7 = **49**   7 x 9 = **63**   7 x 8 = **56**

7 x 9 = **63**   7 x 8 = **56**   7 x 6 = **42**   7 x 9 = **63**

7 x 7 = **49**   7 x 9 = **63**   7 x 6 = **42**   7 x 8 = **56**

7 x 9 = **63**   7 x 7 = **49**   7 x 6 = **42**   7 x 8 = **56**

© Bill Davidson

COMMON CORE

Lesson 12:   Solve word problems involving area.
Date: 9/30/13

engage^{ny}

4.D.8

Name _____   Date _____

1. A square calendar has sides that are 9 inches long. What is the calendar's area?

   9 in

   9 in
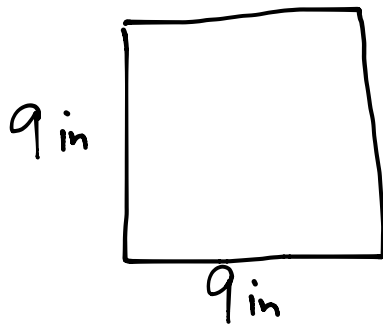
   $9 \times 9 = 81$

   Area is 81 sq in.

2. Each ☐ is 1 square unit. Sienna uses the same square units to draw a 6 × 2 rectangle and says that it has the same area as the rectangle below. Is she correct? Explain why or why not.

   4

   3
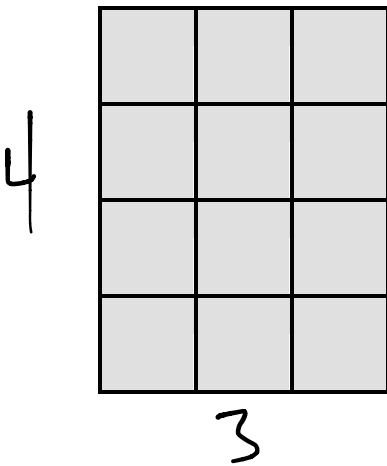
   $4 \times 3 = 12$

   $6 \times 2 = 12$

   Both rectangles have an area of 12 square inches.

3. The surface of an office desk has an area of 15 square feet. Its length is 5 feet. How wide is the office desk?

   ___ ft   Area: 15 sq ft

   5 ft
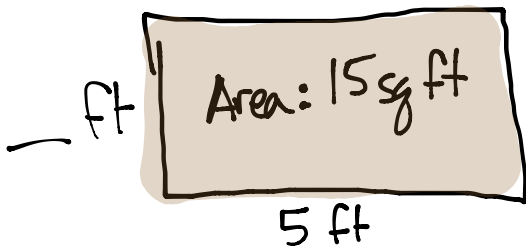
   $\underline{3} \times 5 = 15$

   The width of the desk is 3 ft, since $3 \times 5 = 15$.

4. A rectangular garden has a total area of 48 square yards. Draw and label two possible rectangular gardens with different side lengths having the same area.

6 yd | Area: 48 sq yd

8 yd
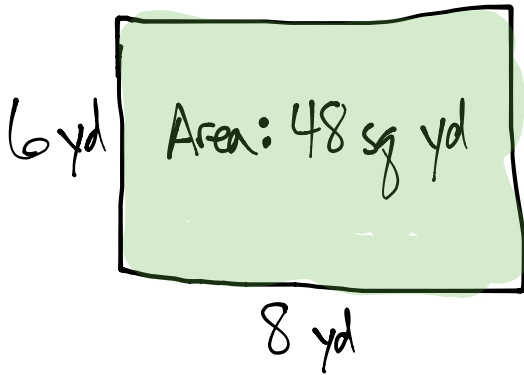
5. Lila makes the pattern below. Find and explain her pattern. Then draw the **fifth** figure in her pattern.

1   2   2   2   2
  2   2   2   2   2
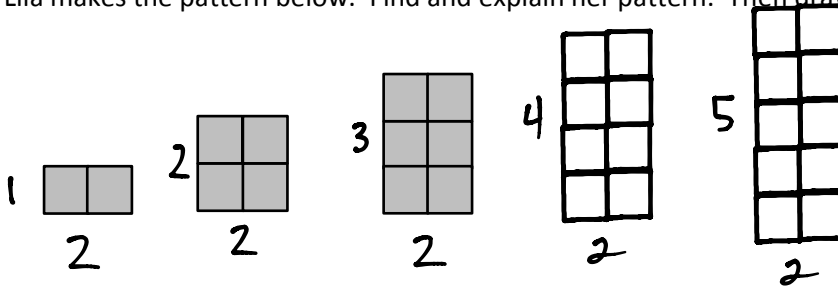
Each figure is always 2 squares wide. The height increases by 1 each time.

Lesson 12: Solve word problems involving area.
Date: 9/30/13

engage^ny   4.D.13

Name _____   Date _____

1. Each of the following figures is made up of 2 rectangles. Find the total area of each figure.

Figure 1

A

15

B

9

Figure 2   *24*   C

D

20

Figure 3

E   F

12   *32*

Figure 4

15   G   H   *25*
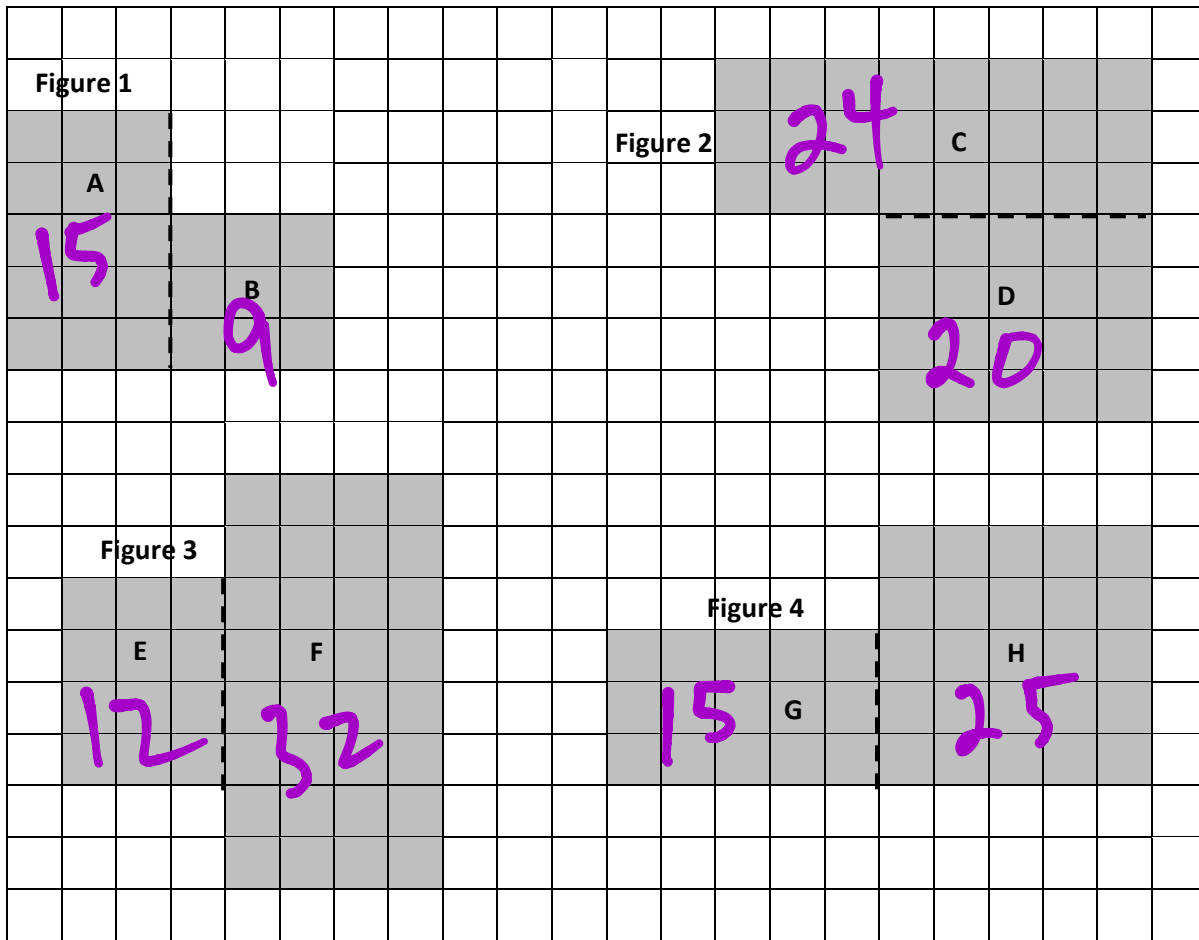
Figure 1: Area of A + Area of B: ___*15*___ + ___*9*___ = ___*24*___ sq units

Figure 2: Area of C + Area of D: ___*24*___ + ___*20*___ = ___*44*___ sq units

Figure 3: Area of E + Area of F: ___*12*___ + ___*32*___ = ___*44*___ sq units

Figure 4: Area of G + Area of H: ___*15*___ + ___*25*___ = ___*40*___ sq units

Lesson 13:   Find areas by decomposing into rectangles or completing composite figures to form rectangles.
Date: 9/30/13

engage^{ny}   4.D.23

2. The figure shows a small rectangle cut out of a big rectangle. Find the area of the shaded region.

7 cm

8 cm

3 cm

3 cm
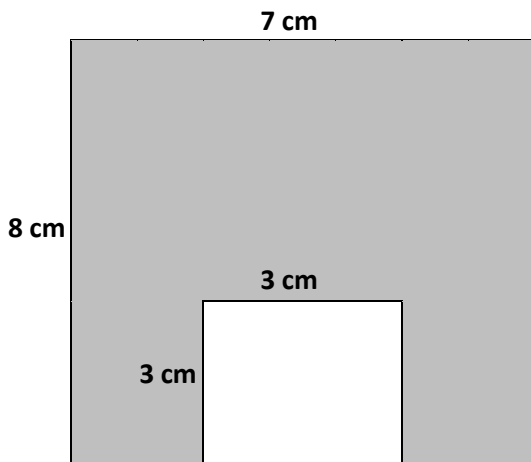
Area of the shaded region: $\underline{56} - \underline{9} = \underline{47}$ sq cm

3. The figure shows a small rectangle cut out of a big rectangle.

3 _____ cm   **6 cm**

4 _____ cm

8 cm

4 cm

9 cm
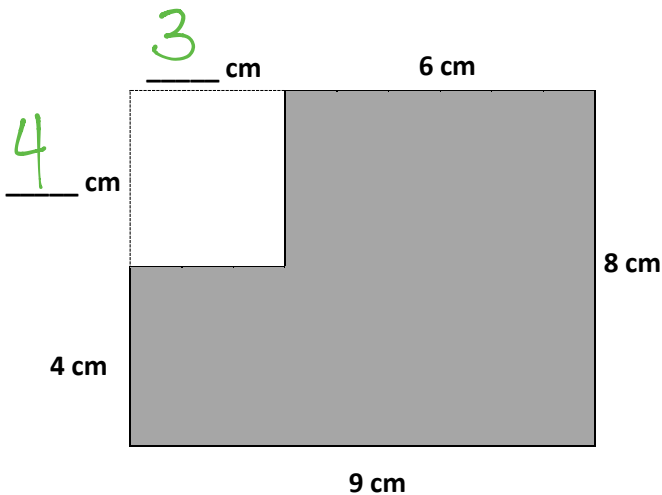
a. Label the missing measurements.

b. Area of the big rectangle: $\underline{9} \times \underline{8} = \underline{72}$ sq cm

c. Area of the small rectangle: $\underline{4} \times \underline{3} = \underline{12}$ sq cm

d. Find the area of the shaded region.

$$72 - 12 = 60$$

60 sq cm

COMMON CORE

Lesson 13: Find areas by decomposing into rectangles or completing composite figures to form rectangles.

Date: 9/30/13

engage^ny

4.D.24

Multiply.

8 x 1 = __8__   8 x 2 = __16__   8 x 3 = __24__   8 x 4 = __32__

8 x 5 = __40__   8 x 6 = __48__   8 x 7 = __56__   8 x 8 = __64__

8 x 9 = __72__   8 x 10 = __80__   8 x 5 = __40__   8 x 6 = __48__

8 x 5 = __40__   8 x 7 = __56__   8 x 5 = __40__   8 x 8 = __60__

8 x 5 = __40__   8 x 9 = __72__   8 x 5 = __40__   8 x 10 = __80__

8 x 6 = __48__   8 x 5 = __40__   8 x 6 = __48__   8 x 7 = __56__

8 x 6 = __48__   8 x 8 = __64__   8 x 6 = __48__   8 x 9 = __72__

8 x 6 = __48__   8 x 7 = __56__   8 x 6 = __48__   8 x 7 = __56__

8 x 8 = __64__   8 x 7 = __56__   8 x 9 = __72__   8 x 7 = __56__

8 x 8 = __64__   8 x 6 = __48__   8 x 8 = __64__   8 x 7 = __56__

8 x 8 = __64__   8 x 9 = __72__   8 x 9 = __72__   8 x 6 = __48__

8 x 9 = __72__   8 x 7 = __56__   8 x 9 = __72__   8 x 8 = __64__

8 x 9 = __72__   8 x 8 = __64__   8 x 6 = __48__   8 x 9 = __72__

8 x 7 = __56__   8 x 9 = __72__   8 x 6 = __48__   8 x 8 = __64__

8 x 9 = __72__   8 x 7 = __56__   8 x 6 = __48__   8 x 8 = __64__

© **Bill Davidson**

COMMON CORE | **Lesson 14:** Find areas by decomposing into rectangles or completing composite figures to form rectangles.

Date: 10/1/13

engage^ny   4.D.32

NOTE: Multiple solution methods are possible! We are only showing one of the possible solution methods.

Name _____   Date _____

1. Find the area of each of the following figures. All figures are made up of rectangles.

a.

6 feet   3 feet

8 feet

A

B

3 feet

9

A: 8 × 6 = 48 sq ft

B: 9 × 3 = 27 sq ft

$$\begin{array}{r} \overset{1}{48} \\ +\,27 \\ \hline 75 \end{array}$$

Total area: 75 sq ft

b.

8 inches

5 inches

C

3 inches

2

3 D

2 inches   2   4 inches
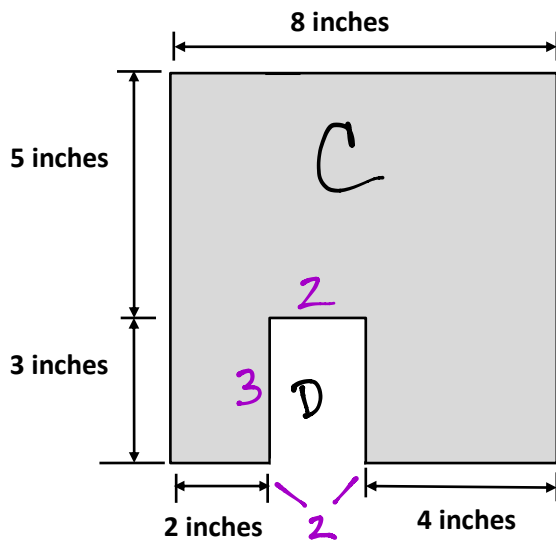
C: 8 × 8 = 64 sq in

D: 3 × 2 = 6 sq in

64 − 6 = 58

Total area: 58 sq in

Lesson 14: Find areas by decomposing into rectangles or completing composite figures to form rectangles.

Date: 10/1/13

engage^{ny}

4.D.36

2. The figure below shows a small rectangle cut out of a big rectangle.

$7-2-2=3$

$10-3-2=5$

10 feet

2 feet

7 feet

3 feet   2 feet

3ft

2 feet

5 ft
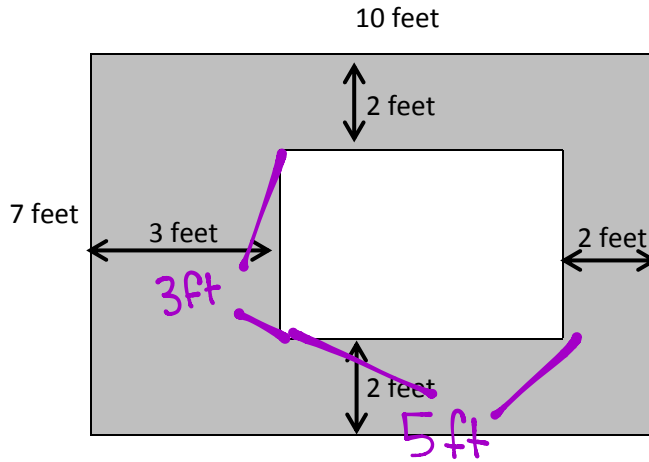
a. Label the side lengths of the unshaded region.

3ft

5 ft
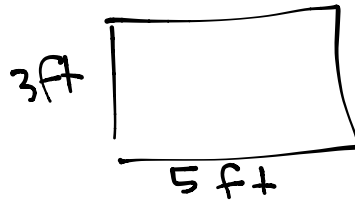
b. Find the area of the shaded region.

$7 \times 10 - 3 \times 5$

$70 - 15$

55

55 sq ft

Lesson 14:   Find areas by decomposing into rectangles or completing composite figures to form rectangles.

Date: 10/1/13

engage^{ny}   **4.D.37**
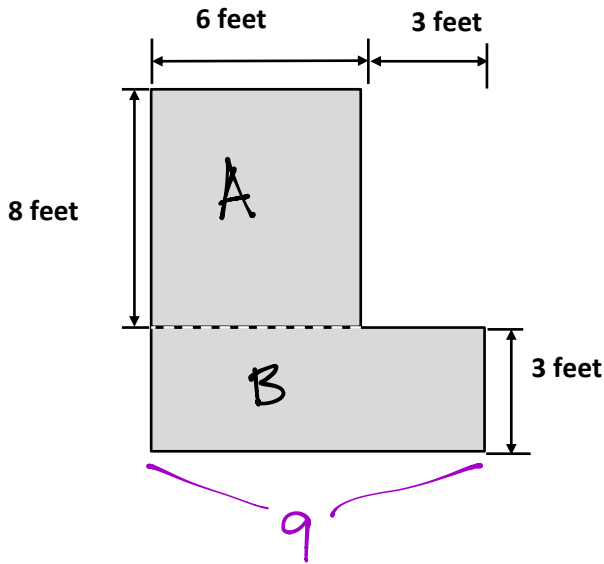
Multiply.

9 x 1 = **9**   9 x 2 = **18**   9 x 3 = **27**   9 x 4 = **36**

9 x 5 = **45**   9 x 1 = **9**   9 x 2 = **18**   9 x 1 = **9**

9 x 3 = **27**   9 x 1 = **9**   9 x 4 = **36**   9 x 1 = **9**

9 x 5 = **45**   9 x 1 = **9**   9 x 2 = **18**   9 x 3 = **27**

9 x 2 = **18**   9 x 4 = **36**   9 x 2 = **18**   9 x 5 = **45**

9 x 2 = **18**   9 x 1 = **9**   9 x 2 = **18**   9 x 3 = **27**

9 x 1 = **9**   9 x 3 = **27**   9 x 2 = **18**   9 x 3 = **27**

9 x 4 = **36**   9 x 3 = **27**   9 x 5 = **45**   9 x 3 = **27**

9 x 4 = **36**   9 x 1 = **9**   9 x 4 = **36**   9 x 2 = **18**

9 x 4 = **36**   9 x 3 = **27**   9 x 4 = **36**   9 x 5 = **45**

9 x 4 = **36**   9 x 5 = **45**   9 x 1 = **9**   9 x 5 = **45**

9 x 2 = **18**   9 x 5 = **45**   9 x 3 = **27**   9 x 5 = **45**

9 x 4 = **36**   9 x 2 = **18**   9 x 4 = **36**   9 x 3 = **27**

9 x 5 = **45**   9 x 3 = **27**   9 x 2 = **18**   9 x 4 = **36**

9 x 3 = **27**   9 x 5 = **45**   9 x 2 = **18**   9 x 4 = **36**

© Bill Davidson

NOTE: This is an older version with errors. EngageNY has since updated this page. (See next page.)

Name _____   Date _____

Use a ruler to measure the side lengths of each lettered room in centimeters. Then find the area. Use the measurements below to match and label the rooms with the correct areas.

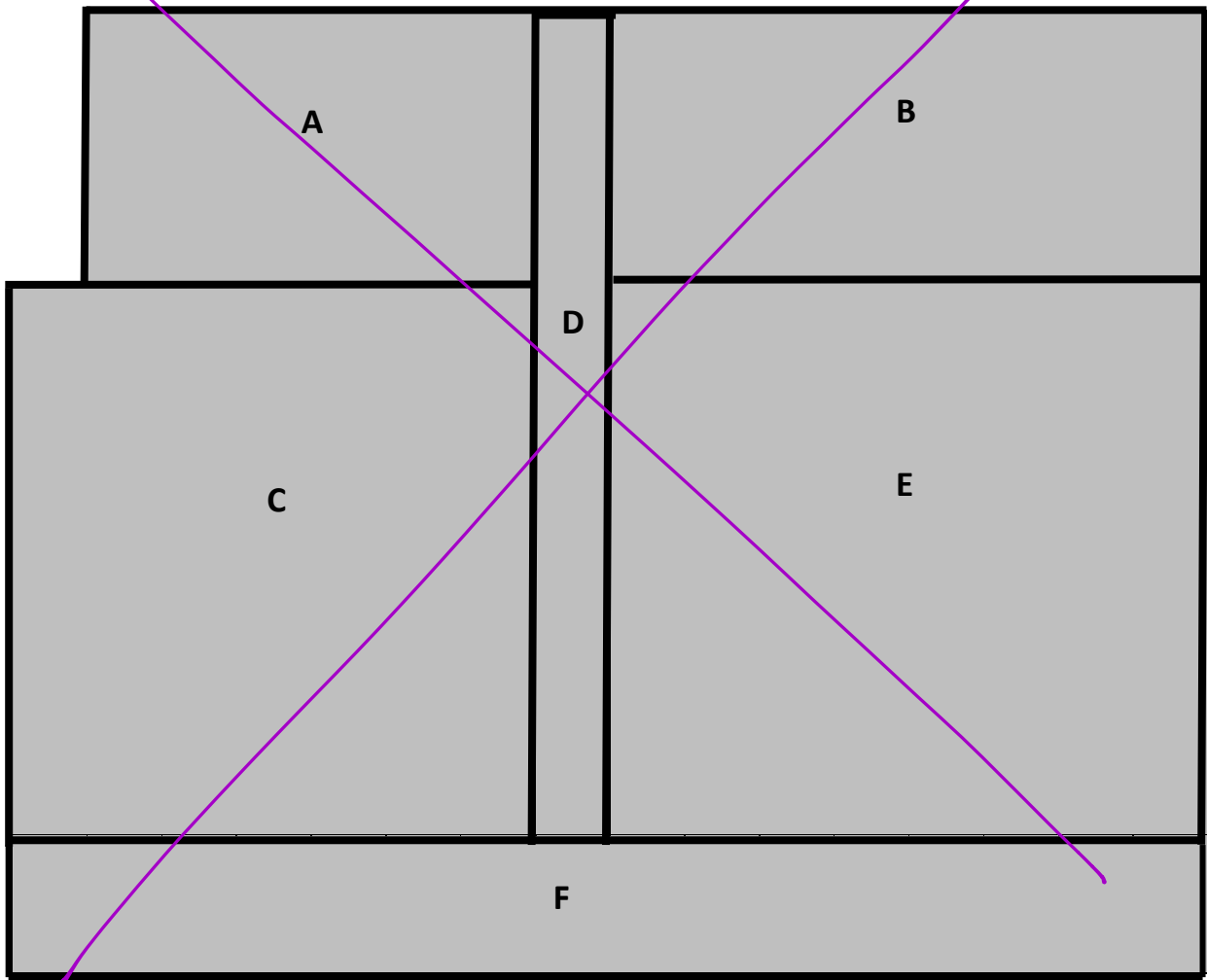Kitchen - 28 square centimeters   Garage – 72 square centimeters

Porch – 32 square centimeters   Bedroom – 56 square centimeters

Bathroom – 24 square centimeters   Hallway – 12 square centimeters

A

B

D

C

E

F

Lesson 15: Apply knowledge of area to determine areas of rooms in a given floor plan.
Date: 9/30/13

engage^ny   4.D.48

Name _____   Date _____

Use a ruler to measure the side lengths of each lettered room in centimeters. Then, find the area. Use the measurements below to match, and label the rooms with the correct areas.

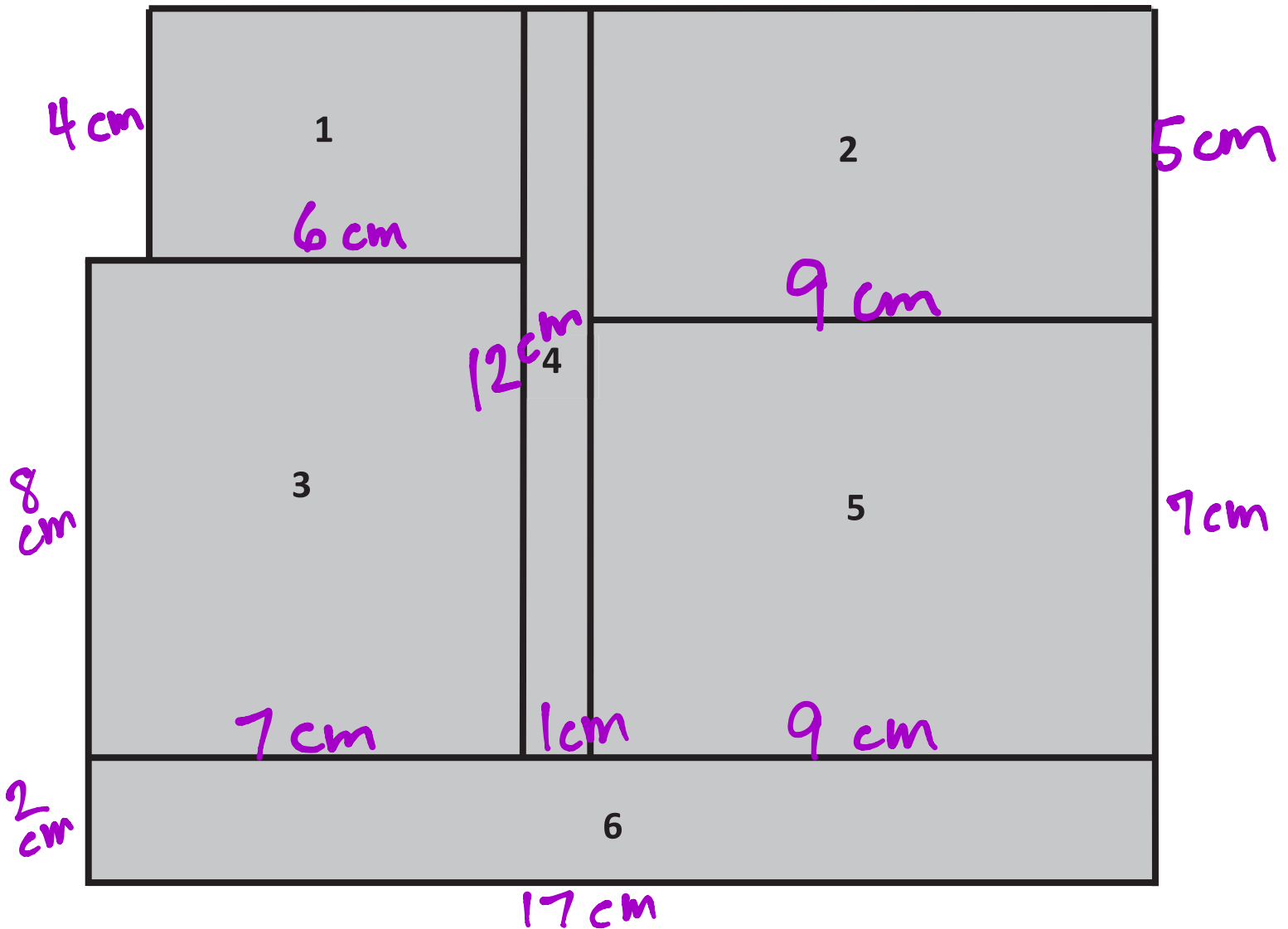#2   Kitchen: 45 square centimeters   #5   Living Room: 63 square centimeters

#6   Porch: 34 square centimeters   #3   Bedroom: 56 square centimeters

#1   Bathroom: 24 square centimeters   #4   Hallway: 12 square centimeters

EUREKA MATH™

Lesson 15:   Apply knowledge of area to determine areas of rooms in a given floor plan.

© 2014 Common Core, Inc. All rights reserved. commoncore.org

67

Multiply.

9 x 1 = **9**   9 x 2 = **18**   9 x 3 = **27**   9 x 4 = **36**

9 x 5 = **45**   9 x 6 = **54**   9 x 7 = **63**   9 x 8 = **72**

9 x 9 = **81**   9 x 10 = **90**   9 x 5 = **45**   9 x 6 = **54**

9 x 5 = **45**   9 x 7 = **63**   9 x 5 = **45**   9 x 8 = **72**

9 x 5 = **45**   9 x 9 = **81**   9 x 5 = **45**   9 x 10 = **90**

9 x 6 = **54**   9 x 5 = **45**   9 x 6 = **54**   9 x 7 = **63**

9 x 6 = **54**   9 x 8 = **72**   9 x 6 = **54**   9 x 9 = **81**

9 x 6 = **54**   9 x 7 = **63**   9 x 6 = **54**   9 x 7 = **63**

9 x 8 = **72**   9 x 7 = **63**   9 x 9 = **81**   9 x 7 = **63**

9 x 8 = **72**   9 x 6 = **54**   9 x 8 = **72**   9 x 7 = **63**

9 x 8 = **72**   9 x 9 = **81**   9 x 9 = **81**   9 x 6 = **54**

9 x 9 = **81**   9 x 7 = **63**   9 x 9 = **81**   9 x 8 = **72**

9 x 9 = **81**   9 x 8 = **72**   9 x 6 = **54**   9 x 9 = **81**

9 x 7 = **63**   9 x 9 = **81**   9 x 6 = **54**   9 x 8 = **72**

9 x 9 = **81**   9 x 7 = **63**   9 x 6 = **54**   9 x 8 = **72**

© Bill Davidson

Lesson 16: Apply knowledge of area to determine areas of rooms in a given floor plan.

Date: 9/30/13

engage^ny

4.D.53

Name _____   Date _____

Jeremy plans and designs his own dream playground on grid paper. His new playground will cover a total area of 72 square units. The chart shows how much space he gives for each piece of equipment, or area. Use the information in the chart to draw and label a possible way Jeremy can plan his playground.

Basketball Court	10 square units
Jungle Gym	9 square units
Slide	6 square units
Soccer Area	24 square units

Answers will vary! Here is one possible solution.

Basketball Court

Slide

Soccer Area

Jungle Gym

Lesson 16: Apply knowledge of area to determine areas of rooms in a given floor plan.
Date: 9/30/13

4.D.57