Lesson 1

Problem Set

1. Use triangle pattern blocks to cover each shape below. Draw lines to show where the triangles meet. Then, write how many triangle pattern blocks it takes to cover each shape.

   Shape A: ______ triangles
   Shape B: ______ triangles

2. Use rhombus pattern blocks to cover each shape below. Draw lines to show where the rhombuses meet. Then, write how many rhombus pattern blocks it takes to cover each shape.

   Shape A: ______ rhombuses
   Shape B: ______ rhombuses

3. Use trapezoid pattern blocks to cover each shape below. Draw lines to show where the trapezoids meet. Then, write how many trapezoid pattern blocks it requires to cover each shape.

   Shape A: ______ trapezoids
   Shape B: ______ trapezoids
Lesson 1: Understand area as an attribute of plane figures.

4. How is the number of pattern blocks needed to cover the same shape related to the size of the pattern blocks?

5. Use square pattern blocks to cover the rectangle below. Draw lines to show where the squares meet. Then, write how many square pattern blocks it requires to cover the rectangle.

6. Use trapezoid pattern blocks to cover the rectangle in Problem 5. Can you use trapezoid pattern blocks to measure the area of this rectangle? Explain your answer.
Lesson 1
Homework

Name ____________________________________________ Date __________________

1. Magnus covers the same shape with triangles, rhombuses, and trapezoids.
   a. How many triangles will it take to cover the shape?
   _____ triangles

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

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

   
   
   
   
   _______ squares

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

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

   Rectangle A
   Rectangle B
   Rectangle C
1. Use all of Paper Strip 1, which you cut into 12 square inches, to complete the chart below.

<table>
<thead>
<tr>
<th>Drawing</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle A</td>
<td></td>
</tr>
<tr>
<td>Rectangle B</td>
<td></td>
</tr>
<tr>
<td>Rectangle C</td>
<td></td>
</tr>
</tbody>
</table>

2. Use all of Paper Strip 2, which you cut into 12 square centimeters, to complete the chart below.

<table>
<thead>
<tr>
<th>Drawing</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle A</td>
<td></td>
</tr>
<tr>
<td>Rectangle B</td>
<td></td>
</tr>
<tr>
<td>Rectangle C</td>
<td></td>
</tr>
</tbody>
</table>
3. Compare the areas of the rectangles you made with Paper Strip 1 and Paper Strip 2. What changed? Why did it change?

4. Maggie uses her square inch pieces to create these two rectangles. Do the two rectangles have the same area? How do you know?

5. Count to find the area of the rectangle below. Then, draw a different rectangle that has the same area.
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.  
   b.  
   c.  

   Area = _______ square units

   Area = _______ square units

   Area = _______ square units

   d.  
   e.  
   f.  

   Area = _______ square units

   Area = _______ square units

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

![Rectangles](image1)

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

![Rectangle](image2)
Lesson 3 Problem Set

Name ____________________________________________ Date ________________

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

A: __________ square units

B: ____________________________________________

C: ____________________________________________

D: ____________________________________________

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

a. ________________________________

b. ________________________________

c. ________________________________

d. ________________________________
3. a. How would the rectangles in Problem 1 be different if they were composed of square inches?

b. Select one rectangle from Problem 1 and recreate it on square inch and square centimeter grid paper.

4. Use a separate piece of square centimeter grid paper. Draw four different rectangles that each has an area of 8 square centimeters.
Lesson 3 Homework

Name ____________________________ Date _________________

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

A: ______ square units
B: _________________
C: _________________
D: _________________

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

a. _________________
b. _________________
c. _________________
d. _________________
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 = ___________________ square units

**B**

Area = _____________________________

**C**

Area = _____________________________
Lesson 3: Model tiling with centimeter and inch unit squares as a strategy to measure area.
Lesson 3: Model tiling with centimeter and inch unit squares as a strategy to measure area.
Lesson 4 Problem Set

Name _______________________________ Date __________________

1. Use a ruler to measure the side lengths of the rectangle in centimeters. Mark each centimeter with a point and connect the points to show the square units. Then, count the squares you drew to find the total area.

   ![Rectangle Diagram]

   Total area: _____________________________________

2. Use a ruler to measure the side lengths of the rectangle in inches. Mark each inch with a point and connect the points to show the square units. Then, count the squares you drew to find the total area.

   ![Rectangle Diagram]

   Total area: _____________________________________

3. Mariana 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.

   ![Rectangle Diagram]

   Total area: _____________________________________
4. Each [ ] is 1 square centimeter. Saffron says that the side length of the rectangle below is 4 centimeters. Kevin says the side length is 5 centimeters. Who is correct? Explain how you know.

![Rectangle with tiles]

5. Use both square centimeter and square inch tiles to find the area of the rectangle below. Which works best? Explain why.

![Rectangle without tiles]

6. How does knowing side lengths A and B help you find side lengths C and D on the rectangle below?

![Rectangle with side lengths A, B, C, D]
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?

2 cm

4 cm

Total area: __________________________

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.

Total area: __________________________

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

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

Total area: ____________________
Lesson 5 Problem Set

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: 18 square centimeters.

\[
3 \times 6 = 18
\]

b. Area: _____ square centimeters.

\[
4 \times 5 = _____
\]

c. Area: 18 square centimeters.

\[
5 \times 3 = _____
\]

d. Area: 24 square centimeters.

\[
____ \times ____ = _____
\]

e. Area: 20 square centimeters.

\[
5 \times ____ = _____
\]

f. Area: _____ square centimeters.

\[
3 \times ____ = _____
\]
2. Lindsey makes a rectangle with 35 square inch tiles. She arranges the tiles in 5 equal rows. What are the side lengths of the rectangle? Use words, pictures, and numbers to support your answer.

3. Mark has a total of 24 square inch tiles. He uses 18 square inch tiles to build one rectangular array. He uses the remaining square inch tiles to build a second rectangular array. Draw two arrays that Mark might have made. Then, write multiplication sentences for each.

4. Leon makes a rectangle with 32 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.
   b. Can Leon arrange all of his 32 square centimeter tiles into 6 equal rows? Explain your answer.
Lesson 5: Form rectangles by tiling with unit squares to make arrays.

Name ____________________________________________ Date ____________________

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

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

![Rectangle with 4 cm side](image)

\[
4 \times \_ = 24
\]

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

![Rectangle with 6 cm side](image)

\[
\_ \times \_ = 24
\]

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

![Rectangle with 5 cm side](image)

\[
\_ \times \_ = 15
\]

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

![Rectangle with 3 cm side](image)

\[
\_ \times \_ = 15
\]
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.

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.

   b. Can Leon arrange all of his 36 square centimeter tiles into 6 equal rows? Use words, pictures, and numbers to support your answer.

   c. Do the rectangles in Parts (a) and (b) have the same total area? Explain how you know.
Lesson 6 Problem Set

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. 
      
      
      
      
      
      
   _____ × _____ = _____ sq cm

   b. 
      
      
      
      
      
      
   _____ × _____ = _____ sq cm

   c. 
      
      
      
      
      
      
   _____ × _____ = _____ sq cm

   d. 
      
      
      
      
      
      
   _____ × _____ = _____ sq cm

   e. 
      
      
      
      
      
      
   _____ × _____ = _____ sq cm

   f. 
      
      
      
      
      
      
   _____ × _____ = _____ sq cm
2. Sheena skip-counts by sixes to find the total square units in the rectangle below. She says there are 42 square units. Is she right? Explain your answer.

![Rectangle](image1)

3. The tile floor in Brandon's living room has a rug on it as shown below. How many square tiles are on the floor, including the tiles under the rug?

![Floor](image2)

4. Abdul is creating a stained glass window with square inch glass tiles as shown below. How many more square inch glass tiles does Abdul need to finish his glass window? Explain your answer.

![Window](image3)
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. ____________________________ ____________________________  
   ______ × _____ = _____ sq cm

b. ____________________________ ____________________________  
   ______ × _____ = _____ sq cm

c. ____________________________ ____________________________  
   ______ × _____ = _____ sq cm

d. ____________________________ ____________________________  
   ______ × _____ = _____ sq cm

e. ____________________________ ____________________________  
   ______ × _____ = _____ sq cm

f. ____________________________ ____________________________  
   ______ × _____ = _____ sq cm
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.

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?

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

array 1
Lesson 6: Draw rows and columns to determine the area of a rectangle given an incomplete array.
1. Use a straight edge to draw a grid of equal size squares within the rectangle. Find and label the side lengths. Then, multiply the side lengths to find the area.

   a. Area: _____ × _____ = _____ square units
   
   b. Area: _____ × _____ = _____ square units
   
   c. Area: _____ × _____ = _____ square units
   
   d. Area: _____ × _____ = _____ square units
   
   e. Area: _____ × _____ = _____ square units
   
   f. Area: _____ × _____ = _____ square units
2. The area of Benjamin’s bedroom floor is shown on the grid to the right. Each square = 1 square foot. How many total square feet is Benjamin’s floor?
   a. Label the side lengths.
   b. Use a straight edge to draw a grid of equal size squares within the rectangle.
   c. Find the total number of squares.

3. Mrs. Young’s art class needs to create a mural that covers exactly 35 square feet. Mrs. Young marks the area for the mural as shown on the grid. Each square = 1 square foot. Did she mark the area correctly? Explain your answer.

4. Mrs. Barnes draws a rectangular array. Mila skip-counts by fours and Jorge skip-counts by sixes to find the total number of square units in the array. When they give their answers, Mrs. Barnes says that they are both right.
   a. Use pictures, numbers, and words to explain how Mila and Jorge can both be right.
   b. How many square units might Mrs. Barnes’ array have had?
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.

<table>
<thead>
<tr>
<th>Rectangular Arrays</th>
<th>Area Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td><img src="https://via.placeholder.com/150" alt="Image" /> 3 × ____ = ____</td>
</tr>
<tr>
<td>b.</td>
<td><img src="https://via.placeholder.com/150" alt="Image" /> ____ × ____ = ____</td>
</tr>
<tr>
<td>c.</td>
<td><img src="https://via.placeholder.com/150" alt="Image" /> ____ × ____ = ____</td>
</tr>
<tr>
<td>d.</td>
<td><img src="https://via.placeholder.com/150" alt="Image" /> ____ × ____ = ____</td>
</tr>
</tbody>
</table>
2. Jillian arranges square pattern blocks into a 7 by 4 array. Draw Jillian’s array on the grid below. How many square units are in Jillian’s rectangular array?

a. 

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.

3. Fiona draws a 24 square centimeter rectangle. Gregory draws a 24 square inch rectangle. Whose rectangle is larger in area? How do you know?
Lesson 7: Interpret area models to form rectangular arrays.
Name __________________________________________ Date __________________________

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

   a. 7 ft
       4 ft
       Area: ______ sq ft
       ______ × ______ = ______

   b. 7 ft
       8 ft
       Area: ______ sq ft
       ______ × ______ = ______

   c. 6 ft
       Area: ______ sq ft
       ______ × ______ = ______

2. Write a multiplication equation and a division equation to find the unknown side length for each rectangle.

   a. 9 ft
       Area = 72 sq ft
       ______ × ______ = ______
       ______ ÷ ______ = ______

   b. 3 ft
       Area = 15 sq ft
       ______ × ______ = ______
       ______ ÷ ______ = ______

   c. 4 ft
       Area = 28 sq ft
       ______ × ______ = ______
       ______ ÷ ______ = ______

3. On the grid below, draw a rectangle that has an area of 42 square inches. Label the side lengths.
4. Ursa draws a rectangle that has side lengths of 9 centimeters and 6 centimeters. What is the area of the rectangle? Explain how you found your answer.

5. Eliza’s bedroom measures 6 feet by 7 feet. Her brother’s bedroom measures 5 feet by 8 feet. Eliza says their rooms have the same exact floor area. Is she right? Why or why not?

6. Cliff draws a rectangle with a side length of 6 inches and an area of 24 square inches. What is the other side length? How do you know?
Lesson 8 Homework

Name ____________________________ Date ______________________

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

   a. 
   
   
   
   
   Area: _____ sq cm

   _____ × _____ = _______

   b. 
   
   
   
   
   Area: _____ sq cm

   _____ × _____ = _______

   c. 
   
   
   
   
   Area: _____ sq ft

   _____ × _____ = _______

   d. 
   
   
   
   
   Area: _____ sq ft

   _____ × _____ = _______

2. Write a multiplication equation and a division equation to find the unknown side length for each rectangle.

   a. 
   
   
   
   
   Area: 24 sq ft

   _____ × _____ = _______

   _____ ÷ _____ = _______

   b. 
   
   
   
   
   Area: 36 sq ft

   _____ × _____ = _______

   _____ ÷ _____ = _______
3. On the grid below, draw a rectangle that has an area of 32 square centimeters. Label the side lengths.

4. 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.

5. 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?
Lesson 8: Find the area of a rectangle through multiplication of the side lengths.
1. Cut the grid into 2 equal rectangles.
   a. Draw and label the side lengths of the 2 rectangles.
   b. Write an equation to find the area of 1 of the rectangles.
   c. Write an equation to show the total area of the 2 rectangles.

2. Place your 2 equal rectangles side by side to create a new, longer rectangle.
   a. Draw an area model to show the new rectangle. Label the side lengths.
   b. Find the total area of the longer rectangle.
3. Furaha and Rahema use square tiles to make the rectangles shown below.

![Furaha’s Rectangle](image1)

![Rahema’s Rectangle](image2)

a. Label the side lengths on the rectangles above, and find the area of each rectangle.

b. Furaha pushes his rectangle next to Rahema’s rectangle to form a new, longer rectangle. Draw an area model to show the new rectangle. Label the side lengths.

c. Rahema says the area of the new, longer rectangle is 52 square units. Is she right? Explain your answer.

4. Kiera says she can find the area of the long rectangle below by adding the areas of Rectangles A and B. Is she right? Why or why not?
Lesson 9 Homework

Name ___________________________________________  Date __________________

1. Use the grid to answer the questions below.

 a. Draw a line to divide the grid into 2 equal rectangles. Shade in 1 of the rectangles that you created.

 b. Label the side lengths of each rectangle.

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

   c. Is the area of the new, longer rectangle equal to the total area in Problem 1(c)? Explain why or why not.
Lesson 9: Analyze different rectangles and reason about their area.

small centimeter grid
Lesson 10 Problem Set

Name __________________________________________ Date ________________

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

   a. 
   \[
   \begin{array}{c}
   \text{7} \\
   \text{5} \\
   \text{3} \\
   \end{array}
   \]
   
   \[
   8 \times 7 = (5 + 3) \times 7
   
   = (5 \times 7) + (3 \times 7)
   
   = _____ + _____
   
   = _____ square units
   \]

   b. 
   \[
   \begin{array}{c}
   \text{4} \\
   \text{2} \\
   \end{array}
   \]
   
   \[
   12 \times 4 = (_____ + 2) \times 4
   
   = (______ \times 4) + (2 \times 4)
   
   = _____ + 8
   
   = _____ square units
   \]

   c. 
   \[
   \begin{array}{c}
   \text{6} \\
   \end{array}
   \]
   
   \[
   6 \times 13 = 6 \times (_____ + 3)
   
   = (6 \times _____) + (6 \times 3)
   
   = _____ + _____
   
   = _____ square units
   \]

   d. 
   \[
   \begin{array}{c}
   \end{array}
   \]
   
   \[
   8 \times 12 = 8 \times (_____ + _____)
   
   = (8 \times _____) + (8 \times _____)
   
   = _____ + _____
   
   = _____ square units
   \]
2. Vince imagines 1 more row of eight to find the total area of a $9 \times 8$ rectangle. Explain how this could help him solve $9 \times 8$.

3. Break the $15 \times 5$ rectangle into 2 rectangles by shading one smaller rectangle within it. Then, find the sum of the areas of the 2 smaller rectangles and show how it relates to the total area. Explain your thinking.
Lesson 10 Homework

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.

\[ 9 \times 8 = (5 + 4) \times 8 \]
\[ = (5 \times 8) + (4 \times 8) \]
\[ = \_ + \_ \]
\[ = \_ \text{ square units} \]

b.

\[ 12 \times 5 = (\_ + 2) \times 5 \]
\[ = (\_ \times 5) + (2 \times 5) \]
\[ = \_ + 10 \]
\[ = \_ \text{ square units} \]

c.

\[ 7 \times 13 = 7 \times (\_ + 3) \]
\[ = (7 \times \_ ) + (7 \times 3) \]
\[ = \_ + \_ \]
\[ = \_ \text{ square units} \]

d.

\[ 9 \times 12 = 9 \times (\_ + \_ ) \]
\[ = (9 \times \_ ) + (9 \times \_ ) \]
\[ = \_ + \_ \]
\[ = \_ \text{ square units} \]
2. Finn imagines 1 more row of nine to find the total area of $9 \times 9$ rectangle. Explain how this could help him solve $9 \times 9$.

3. Shade an area to break the $16 \times 4$ 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.
Lesson 10: Apply the distributive property as a strategy to find the total area of a large rectangle by adding two products.
Lesson 11 Problem Set

Name ____________________________________________ Date ______________

1. The rectangles below have the same area. Move the parentheses to find the missing side lengths. Then, solve.
   a. 6 cm
      \[8 \times \underline{\hspace{1cm}} = \underline{\hspace{2cm}} \text{sq cm}\]
   b. \[\underline{\hspace{2cm}} \text{cm}\]
      \[1 \times 48 = \underline{\hspace{2cm}} \text{sq cm}\]
   c. \[\underline{\hspace{1cm}} \text{cm}\]
      \[2 \times 8 = (2 \times 4) \times 6\]
      \[= 2 \times 4 \times 6\]
      \[= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}\]
      \[= \underline{\hspace{3cm}} \text{sq cm}\]
   d. \[\underline{\hspace{2cm}} \text{cm}\]
      \[4 \times 8 = (4 \times 2) \times 6\]
      \[= 4 \times 2 \times 6\]
      \[= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}\]
      \[= \underline{\hspace{2cm}} \text{sq cm}\]
   e. \[\underline{\hspace{2cm}} \text{cm}\]
      \[8 \times 6 = 8 \times (2 \times 3)\]
      \[= 8 \times 2 \times 3\]
      \[= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}\]
      \[= \underline{\hspace{2cm}} \text{sq cm}\]

2. Does Problem 1 show all the possible whole number side lengths for a rectangle with an area of 48 square centimeters? How do you know?
3. In Problem 1, what happens to the shape of the rectangle as the difference between the side lengths gets smaller?

4. a. Find the area of the rectangle below.

```
8 cm

9 cm
```

b. Julius says a 4 cm by 18 cm rectangle has the same area as the rectangle in Part (a). Place parentheses in the equation to find the related fact and solve. Is Julius correct? Why or why not?

\[
4 \times 18 = 4 \times 2 \times 9
\]

\[
= 4 \times 2 \times 9
\]

\[
= \underline{\phantom{0}} \times \underline{\phantom{0}}
\]

\[
= \underline{\phantom{0}} \text{ sq cm}
\]

c. Use the expression 8 \times 9 to find different side lengths for a rectangle that has the same area as the rectangle in Part (a). Show your equations using parentheses. Then, estimate to draw the rectangle and label the side lengths.
1. The rectangles below have the same area. Move the parentheses to find the missing side lengths. Then, solve.

   36 cm
   1 cm
   9 cm
   4 cm

   a. Area: \(4 \times ______ = ______ \text{ sq cm}\)

   2 cm
   9 cm

   b. Area: \(1 \times 36 = ______ \text{ sq cm}\)

   ______ cm
   ______ cm

   c. Area: \(4 \times 9 = (2 \times 2) \times 9\)

      \(= 2 \times 2 \times 9\)

      \(= ______ \times ______\)

      \(= ______ \text{ sq cm}\)

   ______ cm
   ______ cm

   d. Area: \(4 \times 9 = 4 \times (3 \times 3)\)

      \(= 4 \times 3 \times 3\)

      \(= ______ \times ______\)

      \(= ______ \text{ sq cm}\)

   ______ cm
   ______ cm

   e. Area: \(12 \times 3 = (6 \times 2) \times 3\)

      \(= 6 \times 2 \times 3\)

      \(= ______ \times ______\)

      \(= ______ \text{ sq cm}\)

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?
3. a. Find the area of the rectangle below.

![Rectangle Diagram]

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

\[ 4 \times 12 = 4 \times 2 \times 6 \]
\[ = 4 \times 2 \times 6 \]
\[ = \_\times \_\times \_ \]
\[ = \_\text{sq cm} \]

c. Use the expression 8 \times 6 to find different side lengths for a rectangle that has the same area as the rectangle in Part (a). Show your equations using parentheses. Then, estimate to draw the rectangle and label the side lengths.
1. Each side on a sticky note measures 9 centimeters. What is the area of the sticky note?

2. Stacy tiles the rectangle below using her square pattern blocks.

![Rectangle](image)

a. Find the area of Stacy’s rectangle in square units. Then, draw and label a different rectangle with whole number side lengths that has the same area.

b. Can you draw another rectangle with different whole number side lengths and have the same area? Explain how you know.
Lesson 12 Problem Set

3. An artist paints a $4 \times 16$ foot mural on a wall. What is the total area of the mural? Use the break apart and distribute strategy.

4. Alana tiles the 3 figures below. She says, “I’m making a pattern!”

   a. Find the area of Alana’s 3 figures and explain her pattern.

   b. Draw the next 2 figures in Alana’s pattern and find their areas.

5. Jermaine glues 3 identical pieces of paper as shown below and makes a square. Find the unknown side length of 1 piece of paper. Then, find the total area of 2 pieces of paper.

   [Diagram of 3 pieces of paper]
Lesson 12 Homework

Name _______________________________ Date ________________

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

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

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

5. Lila makes the pattern below. Find and explain her pattern. Then, draw the fifth figure in her pattern.
Lesson 13: Find areas by decomposing into rectangles or completing composite figures to form rectangles.

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

   Figure 1: Area of A + Area of B: ______ + ______ = ______ sq units

   Figure 2: Area of C + Area of D: ______ + ______ = ______ sq units

   Figure 3: Area of E + Area of F: ______ + ______ = ______ sq units

   Figure 4: Area of G + Area of H: ______ + ______ = ______ sq units
2. The figure shows a small rectangle cut out of a bigger rectangle. Find the area of the shaded figure.

![Diagram of a large rectangle with a smaller rectangle cut out of it.]

Area of the shaded figure: \[ \text{Area of large rectangle} - \text{Area of small rectangle} = \text{Area of shaded figure} \]

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

![Diagram of a large rectangle with a smaller rectangle cut out of it.]

a. Label the missing measurements.

b. Area of the big rectangle: \( \text{length} \times \text{width} = \text{Area} \) sq cm

c. Area of the small rectangle: \( \text{length} \times \text{width} = \text{Area} \) sq cm

d. Find the area of the shaded figure. 

---

Lesson 13: Find areas by decomposing into rectangles or completing composite figures to form rectangles.
1. Each of the following figures is made up of 2 rectangles. Find the total area of each figure.

**Figure 1:** Area of A + Area of B: _______ + _______ = _______ sq units

**Figure 2:** Area of C + Area of D: _______ + _______ = _______ sq units

**Figure 3:** Area of E + Area of F: _______ + _______ = _______ sq units

**Figure 4:** Area of G + Area of H: _______ + _______ = _______ sq units
2. The figure shows a small rectangle cut out of a big rectangle. Find the area of the shaded figure.

Area of the shaded figure:
\[ \underline{\text{\text{---}}} - \underline{\text{\text{---}}} = \underline{\text{\text{---}}} \text{ sq cm} \]

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

a. Label the missing measurements.

b. Area of the big rectangle:
\[ \underline{\text{\text{---}}} \times \underline{\text{\text{---}}} = \underline{\text{\text{---}}} \text{ sq cm} \]

c. Area of the small rectangle:
\[ \underline{\text{\text{---}}} \times \underline{\text{\text{---}}} = \underline{\text{\text{---}}} \text{ sq cm} \]

d. Find the area of the shaded figure.
Lesson 13: Find areas by decomposing into rectangles or completing composite figures to form rectangles.
Lesson 14: Find areas by decomposing into rectangles or completing composite figures to form rectangles.

Name ________________________________ Date _________________

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

   a. 
   
   b. 

2. The figure below shows a small rectangle in a big rectangle. Find the area of the shaded part of the figure.
3. A paper rectangle has a length of 6 inches and a width of 8 inches. A square with a side length of 3 inches was cut out of it. What is the area of the remaining paper?

4. Tila and Evan both have paper rectangles measuring 6 cm by 9 cm. Tila cuts a 3 cm by 4 cm rectangle out of hers, and Evan cuts a 2 cm by 6 cm rectangle out of his. Tila says she has more paper left over. Evan says they have the same amount. Who is correct? Show your work below.
1. Find the area of each of the following figures. All figures are made up of rectangles.

a. 

b. 

Lesson 14: Find areas by decomposing into rectangles or completing composite figures to form rectangles.
2. The figure below shows a small rectangle cut out of a big rectangle.

![Diagram of a rectangle with a smaller rectangle cut out of it.]

a. Label the side lengths of the unshaded region.

b. Find the area of the shaded region.
Lesson 15: Apply knowledge of area to determine areas of rooms in a given floor plan.

Name ________________________________ Date ____________________

1. Make a prediction: Which room looks like it has the biggest area?

2. Record the areas and show the strategy you used to find each area.

<table>
<thead>
<tr>
<th>Room</th>
<th>Area</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedroom 1</td>
<td>_____ sq cm</td>
<td></td>
</tr>
<tr>
<td>Bedroom 2</td>
<td>_____ sq cm</td>
<td></td>
</tr>
<tr>
<td>Kitchen</td>
<td>_____ sq cm</td>
<td></td>
</tr>
<tr>
<td>Hallway</td>
<td>_____ sq cm</td>
<td></td>
</tr>
<tr>
<td>Bathroom</td>
<td>_____ sq cm</td>
<td></td>
</tr>
<tr>
<td>Dining Room</td>
<td>_____ sq cm</td>
<td></td>
</tr>
<tr>
<td>Living Room</td>
<td>_____ sq cm</td>
<td></td>
</tr>
</tbody>
</table>
3. Which room has the biggest area? Was your prediction right? Why or why not?

4. Find the side lengths of the house without using your ruler to measure them, and explain the process you used.

   Side lengths: _________ centimeters and _________ centimeters

5. What is the area of the whole floor plan? How do you know?

   Area = _________ square centimeters
The rooms in the floor plan below are rectangles or made up of rectangles.
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: 45 square centimeters  Living Room: 63 square centimeters
Porch: 34 square centimeters  Bedroom: 56 square centimeters
Bathroom: 24 square centimeters  Hallway: 12 square centimeters
Lesson 16 Problem Set

Name _____________________________ Date ________________

Record the new side lengths you have chosen for each of the rooms and show that these side lengths equal the required area. For non-rectangular rooms, record the side lengths and areas of the small rectangles. Then, show how the areas of the small rectangles equal the required area.

<table>
<thead>
<tr>
<th>Room</th>
<th>New Side Lengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedroom 1: 60 sq cm</td>
<td></td>
</tr>
<tr>
<td>Bedroom 2: 56 sq cm</td>
<td></td>
</tr>
<tr>
<td>Kitchen: 42 sq cm</td>
<td></td>
</tr>
</tbody>
</table>
Lesson 16 Problem Set

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

<table>
<thead>
<tr>
<th>Room</th>
<th>New Side Lengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hallway:</td>
<td></td>
</tr>
<tr>
<td>24 sq cm</td>
<td></td>
</tr>
<tr>
<td>Bathroom:</td>
<td></td>
</tr>
<tr>
<td>25 sq cm</td>
<td></td>
</tr>
<tr>
<td>Dining Room:</td>
<td></td>
</tr>
<tr>
<td>28 sq cm</td>
<td></td>
</tr>
<tr>
<td>Living Room:</td>
<td></td>
</tr>
<tr>
<td>88 sq cm</td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Area (square units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball court</td>
<td>10</td>
</tr>
<tr>
<td>Jungle gym</td>
<td>9</td>
</tr>
<tr>
<td>Slide</td>
<td>6</td>
</tr>
<tr>
<td>Soccer area</td>
<td>24</td>
</tr>
</tbody>
</table>

Name __________________________________________ Date ________________

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