Composing and Decomposing to Determine Area

Lesson 1

1. Identify the names of the following shapes and explain how you know.











2. How many small rectangles fit inside the large square? Explain how you determined that amount using words and/or drawings.

3. Matt is replacing the carpet in his bedroom. His bedroom is 13 feet wide and 18 feet long. How many square feet of carpet will Matt need? Draw a diagram indicating the base and the height used to determine the area.

4. The area of a rectangle is 104 centimeters. The height of the rectangle is 13 centimeters. What is the base of the rectangle?

5. Use the following floor plan to determine the area of the living room in square feet.



Base: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Height: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Area: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Create five parallelograms by tracing the flexible parallelogram on a sheet of paper. Measure and label the side lengths in inches. Complete the table. Remember to show all your work.

|  |  |  |
| --- | --- | --- |
| Parallelogram | Height of the Parallelogram | Length of the Slanted Side Length |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |

7. What stayed the same for the different shapes, and what changed?

8. As the parallelogram changed, what happened to the side lengths?

9. As the parallelogram changed, what happened to the height length?

10. Glue and measure the pieces of the parallelogram as a rectangle. Calculate the area of the rectangle in square inches. Remember to show all your work.

11. Determine the area of the parallelogram. Remember to show all your work.



12. Determine the area of the parallelogram. Remember to show all your work.



13. Determine the area of the parallelogram. Remember to show all your work.



14. Determine the area of the parallelogram. Remember to show all your work.



15. Measure the base, height, and slanted side length in inches. Determine the area of the parallelogram. Remember to show all your work.



16. Determine the area of the parallelogram. Remember to show all your work.



17. Determine the area of the parallelogram. Remember to show all your work.



18. Determine the area of the parallelogram. Remember to show all your work.



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INSTRUCTIONAL ACTIVITY SUPPLEMENT

Lesson 1

Composing and Decomposing to Determine Area

Lesson 2

1. Describe what you know about the following shapes.

2. Determine the area of the triangle. Show all your work.



3. Glue both of the triangles together as a rectangle, then measure and label the base and the height of the rectangle. Calculate the area of a single triangle in square inches. Show all your work.

4. Compose the triangle into a rectangle in order to calculate the area of the triangle.

2 feet

6 feet

5. Decompose the rectangle into two triangles and determine the area of one triangle.

height = 5 centimeters

base = 2 centimeters

6. Dawn is making a cake for her football party. She is going to ice the cake using two colors, one for each team. If she divides the cake into two equal triangles, what is the area she will need to frost for each team in square inches?



7. Determine the area of the triangle by creating one or two rectangles. Show all your work.



8. Determine the area of the triangle by creating one or two rectangles. Show all your work.



9. Determine the area of the triangle by creating one or two rectangles. Show all your work.



10. Determine the area of the triangle by creating one or two rectangles. Show all your work.



11. Glue and measure the triangles as a rectangle. Calculate the area in square inches. Show all your work.

12. Explain why you do not need to multiply by (or divide by 2) when you bisect an isosceles or equilateral triangle and rearrange the pieces to compose a rectangle.

13. Divide the triangle and compose a rectangle to determine the area. Show all your work.



14. Can you divide the following triangle and create a single rectangle that has the same area as the original area? Explain why or why not.



15. Glue and label the bases and heights for each obtuse triangle.

16. Determine the area of the triangle by using the formula. Show all your work.



17. Determine the area of the triangle by using the formula. Show all your work.



18. The formula to calculate the area of a triangle is *base* · *height* or . Explain why this is so, and be sure to support your explanation with a drawing.

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INSTRUCTIONAL ACTIVITY SUPPLEMENT

Lesson 2

Rectangle



Right triangle



Right triangle



Isosceles triangle



Obtuse triangles



Obtuse triangles



Composing and Decomposing to Determine Area

Lesson 3

1. Decompose the trapezoid into parallelograms, rectangles, and/or triangles.



2. Decompose and calculate the area of the trapezoid. Show all your work.



3. Sam decomposed the following trapezoid to determine the area. Did Sam use a correct strategy? Explain why or why not, and provide the total area for the trapezoid. Show all your work.



4. Mona is going to spread new soil on top of her garden. She needs to know the area in order to determine how much soil to purchase. Her garden is in the shape of a trapezoid to avoid her two fruit trees. What is the area of Mona’s garden? Show all your work.



5. Pablo and Lauren decomposed the following trapezoid in order to calculate the area. Do you agree with Pablo’s work, Lauren’s work, both, or neither? Explain.



6. Glue two trapezoids together as a parallelogram. Label the lengths for the height and both bases. Determine the area of one trapezoid. Show all your work.

7. Adam made a bookcase to fit in the corner of his living room. From the top, the bookcase looks like a trapezoid. How much space in square feet will Adam need for his bookcase? Show all your work.



8. Suzanne is redecorating her bedroom. She is going to paint two diagonal stripes of blue across one wall. What is the total area of the wall that will be covered in blue paint? Show all your work.



9. Calculate the area of the following trapezoid in square centimeters. Show all your work.



10. During art class, Mandie cut two triangles from her rectangular piece of paper. How much of her original piece of paper will Mandie have left? Show all your work.



11. Decompose the kite into parallelograms, rectangles, and/or triangles.



12. Glue the pieces of the kite together as a rectangle.

13. Rearrange the kite as a rectangle in order to determine the area of the kite.



14. Liam is making a kite for his Chinese history project. He wants to cover his kite with fabric. If one of the sticks for his kite is 14 inches and the second stick for his kite is 8 inches, how much fabric in square inches will Liam need for his kite? Decompose and/or rearrange the kite in order to determine the area. Show all your work.



15. Decompose and/or rearrange the kite in order to determine the area. Show all your work.



16. Julia thinks that she can determine the area of the following kite with the information given. Zoe does not think there is enough information provided to determine the area of the kite. Who do you think is correct? Why? If you think Julia is correct, calculate the area of the kite. If you think Zoe is correct, what information is still needed to calculate the area of the kite?



17. Use a ruler to draw a kite that has one diagonal that is 11 inches long and a second diagonal that is 5 inches long. Decompose and/or rearrange the kite in order to determine the area. Show all your work.

Composing and Decomposing to Determine Area

INSTRUCTIONAL ACTIVITY SUPPLEMENT

Lesson 3

Trapezoids (1)



Trapezoids (2)



 





Kite







Composing and Decomposing to Determine Area

Lesson 4

Use the following floor plan to answer Questions 1 – 3.



1. What is the area of the living room and the office in square feet? Show all your work.

2. What is the area of the pool and the bathroom in square feet? Show all your work.

3. What is the total area of the floor plan, including the pool, in square feet? Show all your work.

4. The city is clearing land for a new park. How much area in square kilometers will they need to clear to build the park? Identify whether you used composition or decomposition. Show all your work.



5. The school is planning to repave the parking lot during the school break. The construction workers need to know the area of the parking lot in order to ensure they have enough supplies. What is the area of the parking lot in square feet? Identify whether you used composition or decomposition. Show all your work.



6. Maggie wants to change the carpet in her living room and hallways. How much carpet will Maggie need in square feet? Identify whether you used composition or decomposition. Show all your work.



7. Mark wants to put a pool in his backyard. His backyard is 1,000 square feet. Is the size of the swimming pool less than, equal to, or greater than the size of his backyard? What is the area of the pool in square feet? Identify whether you used composition or decomposition. Show all your work.



8. If Mark’s backyard is 20 feet long and 50 feet wide, will the pool fit in his backyard? Why or why not?

9. Which strategy – composition or decomposition – do you find easier to use to determine the area of an irregular figure? Why?

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INSTRUCTIONAL ACTIVITY SUPPLEMENT

Lesson 4

Floor plan



Table plan



Obstacle course



Decomposition

Composition

Composing and Decomposing to Determine Area

Lessons 1 – 4

1. Answer the following questions using the floor plan. Show all your work.



* 1. What is the area of the bathroom in square feet?
  2. What is the perimeter of the bathroom in feet?

* 1. What is the combined area of the kitchen and dining room in square feet?
  2. Sophia says that the area of the porch is 36 square feet. What mistake did Sophia make, and what is the correct area of the porch in square feet?
  3. Is the combined area of the bathroom and bedroom greater than, less than, or equal to the combined area of the kitchen and dining room? How do you know?

1. Answer the following questions using the park map. Show all your work.



* 1. What is the area of the flower gardens in square kilometers?

* 1. The park has designed a new play structure for the kids’ play area. If the amount of area needed for the new play structure is 0.5 square kilometers, will the kids’ play area be large enough for the new structure? Why or why not?

* 1. The park is replacing the fence around the bird sanctuary. How many kilometers of fencing will they need? How do you know?
  2. Tyler says that he can calculate the area of the picnic tables and outdoor seating area. Jayden says that there is not enough information to calculate the area of the picnic tables and outdoor seating area. Who is correct? How do you know?

1. Decompose or compose the following figures to determine the area.
   1. Trapezoid

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square centimeters

centimeters



centimeters

cm

centimeters

centimeters

centimeters

* 1. Triangle

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square feet  
  


* 1. Parallelogram

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square inches



1. Brenna wants to replace the material on her kite. She measures the perpendicular poles to determine the amount of fabric she will need to purchase. If one pole is 2.25 feet and the second pole is 1.8 feet, what is the area of fabric Brenna will need? Show all your work.
2. The perimeter of the following triangle is 30 centimeters. Determine the value of *x* and calculate the area of the triangle. Show all your work.



1. Matthew is working on his math homework. One question asks him to calculate the area of the following parallelogram. Matthew thinks the answer is 20 square miles. Is Matthew correct? If so, explain how you know he is correct. If not, determine the correct area and explain what Matthew did incorrectly. Show all your work.  
     
   