



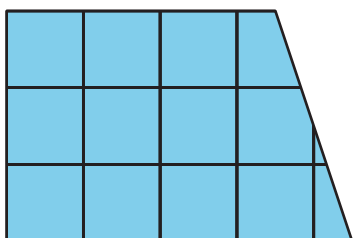
# Finding Area by Decomposing and Rearranging

Let's create shapes and find their areas.

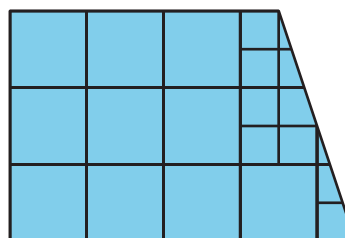
## 2.1 Notice and Wonder: Squares in Shapes

What do you notice? What do you wonder?

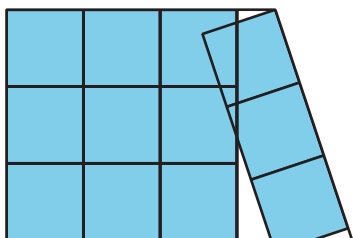
A



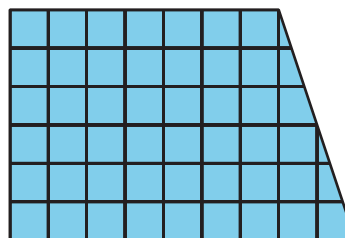
B



C



D

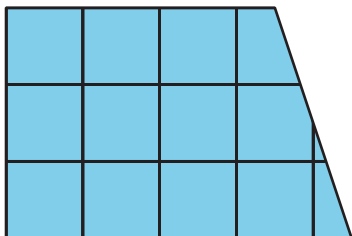


## 2.2 What Is Area?

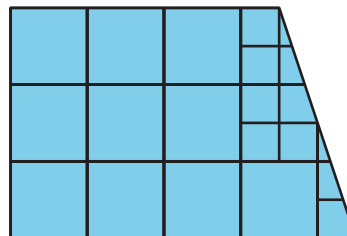
You may recall that the term **area** tells us something about the number of squares inside a two-dimensional shape.

- Here are four drawings that each show squares inside a shape. Select **all** drawings whose squares could be used to find the area of the shape. Be prepared to explain your reasoning.

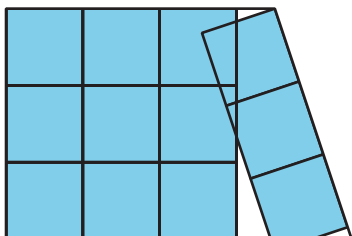
**A**



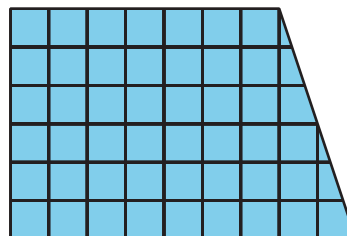
**B**



**C**



**D**



- Write a definition of “area” that includes all the information that you think is important.

## 2.3

## Composing Shapes

Your teacher will give you 1 square and some small, medium, and large right triangles. The area of the square is 1 square unit.

1. Notice that you can put together 2 small triangles to make a square. What is the area of the square composed of 2 small triangles? Be prepared to explain your reasoning.
2. Use your shapes to create a new shape with an area of 1 square unit that is *not* a square. Trace your shape.
3. Use your shapes to create a new shape with an area of 2 square units. Trace your shape.



4. Use your shapes to create a *different* shape with an area of 2 square units. Trace your shape.

5. Use your shapes to create a new shape with an area of 4 square units. Trace your shape.



### Are you ready for more?

Find a way to use all of your pieces to compose a single large square. What is the area of this large square?



## 2.4

## Tangram Triangles

Recall that the area of the square you saw earlier is 1 square unit. Complete each statement and explain your reasoning.

1. The area of the small triangle is \_\_\_\_\_ square units. I know this because . . .
2. The area of the medium triangle is \_\_\_\_\_ square units. I know this because . . .
3. The area of the large triangle is \_\_\_\_\_ square units. I know this because . . .

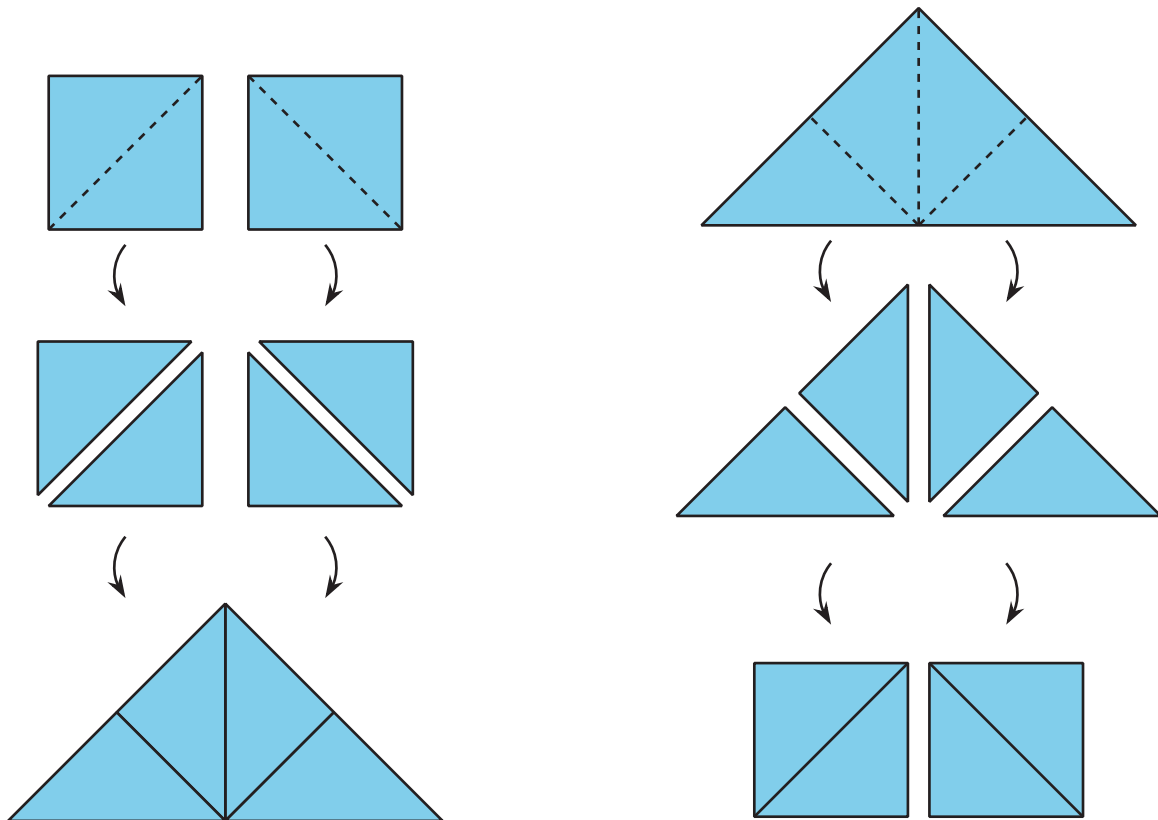


## Lesson 2 Summary

Here are two important principles for finding **area**:

1. If two figures can be placed one on top of the other so that they match up exactly, then they have the *same area*.
2. We can *decompose* a figure (break a figure into pieces) and *rearrange* the pieces (move the pieces around) to find its area.

Here are illustrations of the two principles.



- Each square on the left can be decomposed into 2 triangles. These triangles can be rearranged into a large triangle. So, the large triangle has the *same area* as the 2 squares.
- Similarly, the large triangle on the right can be decomposed into 4 equal triangles. The triangles can be rearranged to form 2 squares. If each square has an area of 1 square unit, then the area of the large triangle is 2 square units. We also can say that each small triangle has an area of  $\frac{1}{2}$  square unit.