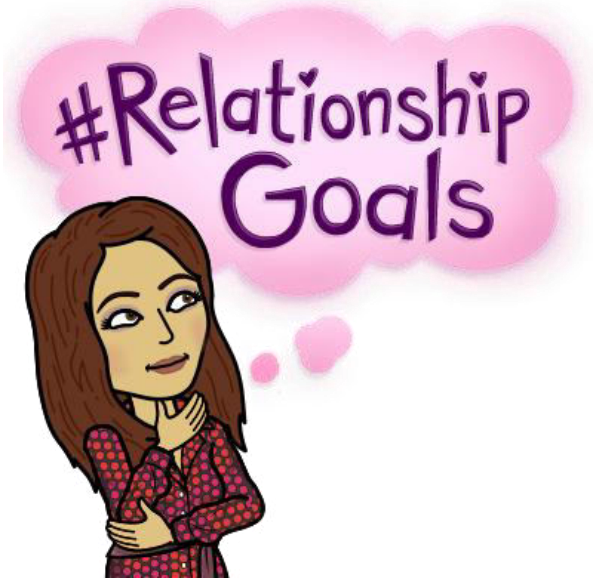
From Parallelograms to Triangles

Lesson # 7

Let’s compare parallelograms and triangles.

Today's Goals

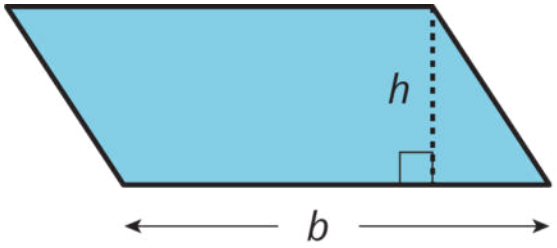
- ❏ I can explain the special relationship between a pair of identical triangles and a parallelogram.

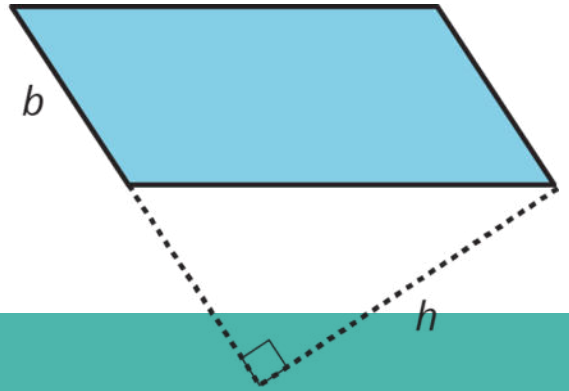


Same Parallelograms, Different Bases

Warm Up 7.1

Here are two copies of a parallelogram. Each copy has one side labeled as the base B and a segment drawn for its corresponding height and labeled h.



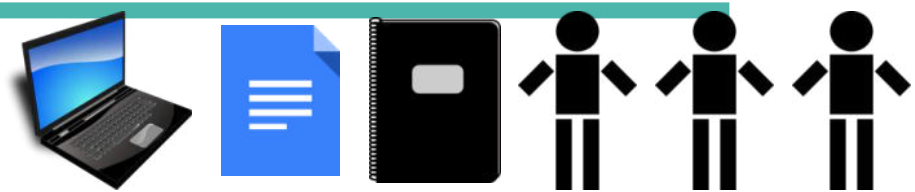


1. The base of the parallelogram on the left is 2.4 centimeters; its corresponding height is 1 centimeter. Find its area in square centimeters.
2. The height of the parallelogram on the right is 2 centimeters. How long is the base of that parallelogram? Explain your reasoning.

How can we verify that the height we found is correct, or that the two pairs of bases and heights produce the same area?

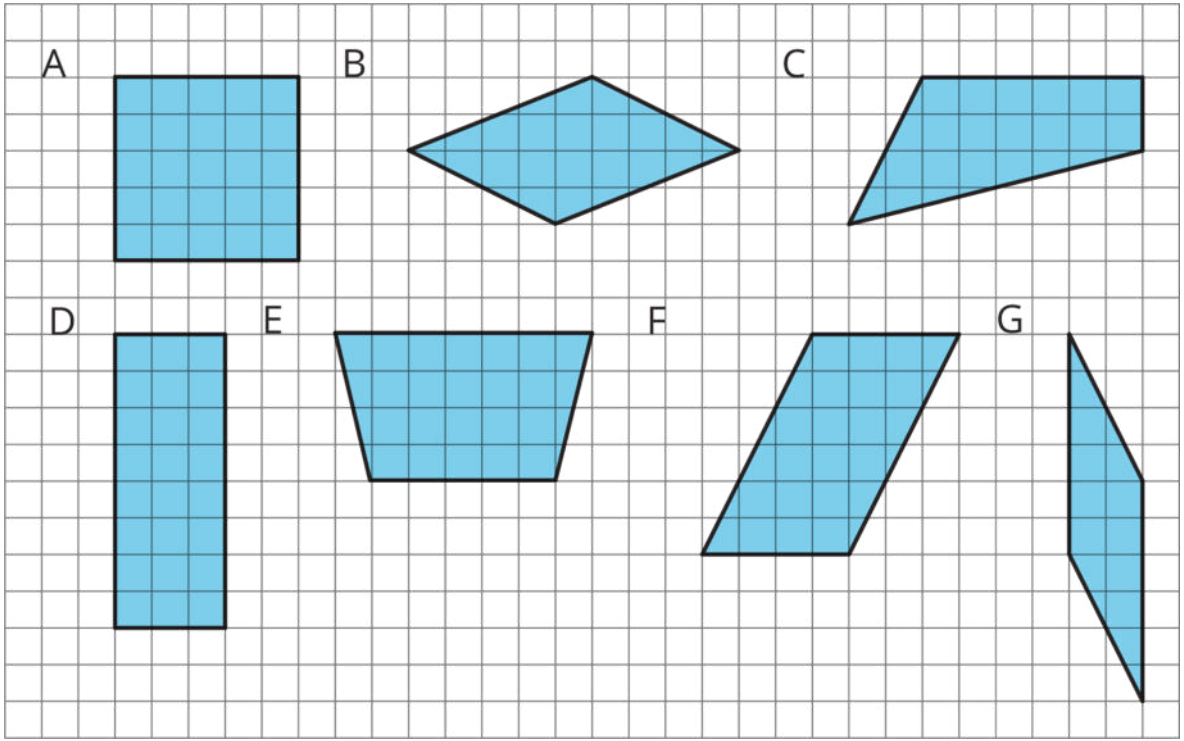
A Tale of Two Triangles (Part 1)

Activity 7.2



Two polygons are identical if they match up exactly when placed one on top of the other.

1) Draw *one* line to decompose each of the following polygons into two identical triangles, if possible. Use a straightedge to draw your line.

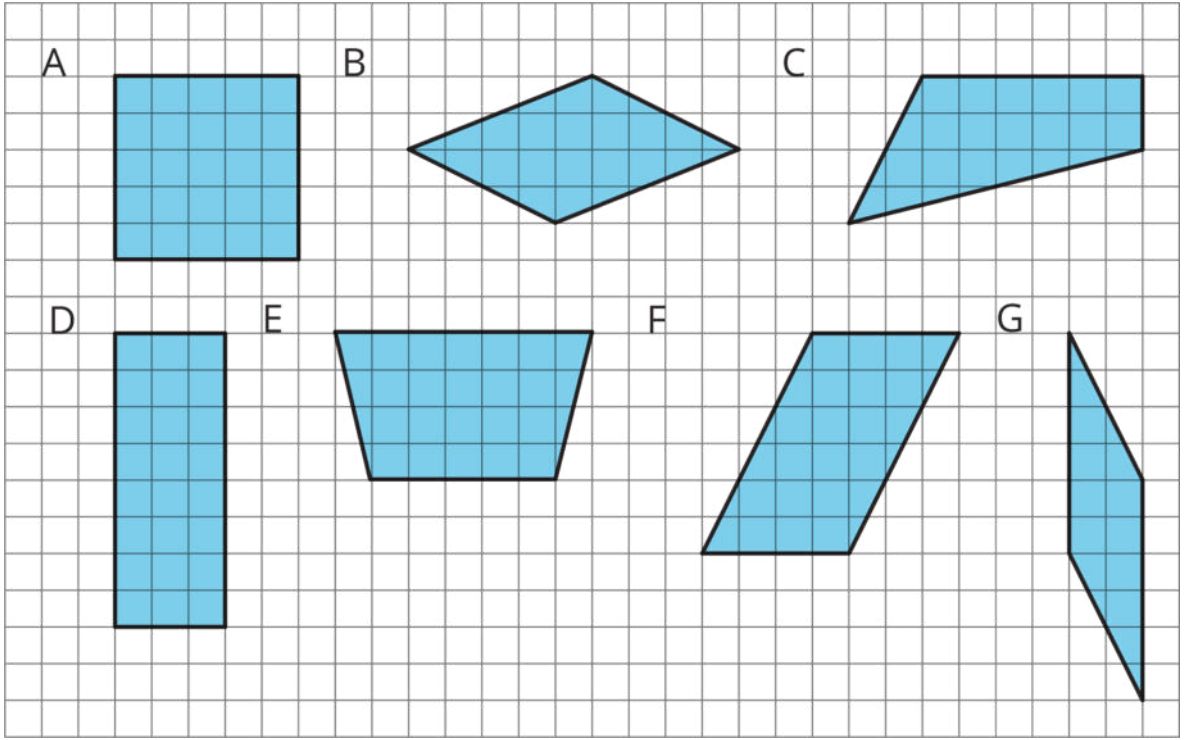


1) Which quadrilaterals can be decomposed into two identical triangles?

Two polygons are identical if they match up exactly when placed one on top of the other.

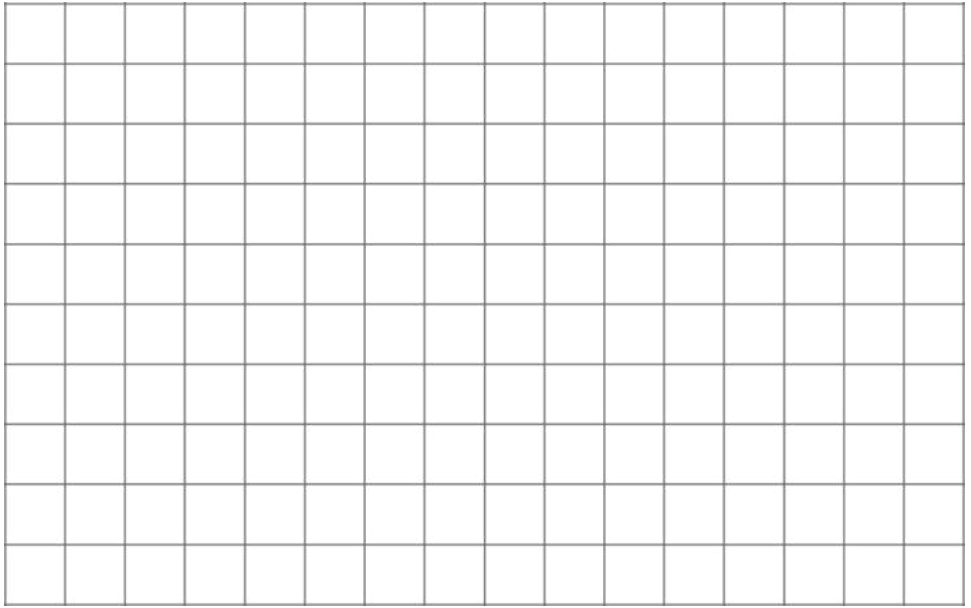
3) Study the quadrilaterals that can, in fact, be decomposed into two identical triangles.

- What do you notice about them?
- Write a couple of observations about what these quadrilaterals have in common.

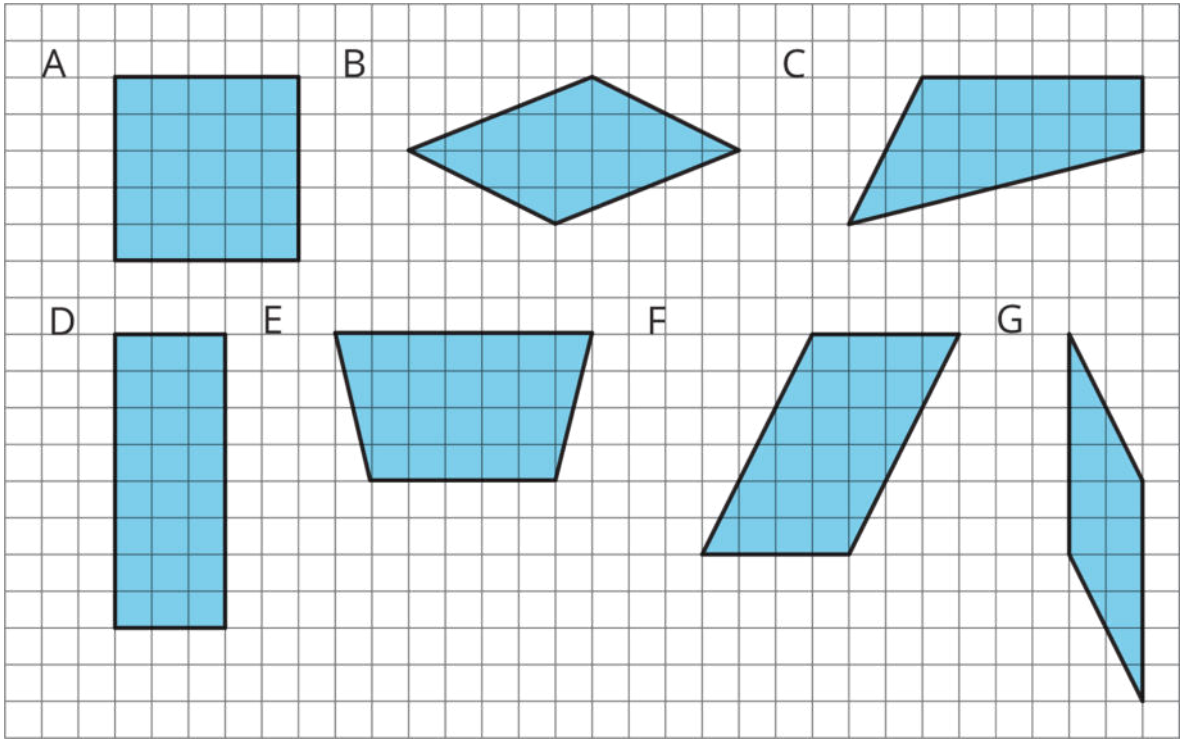


Are you ready for more?

- On the grid, draw some other types of quadrilaterals that are not already shown. Try to decompose them into two identical triangles. Can you do it?
- Come up with a rule about what must be true about a quadrilateral for it to be decomposed into two identical triangles.

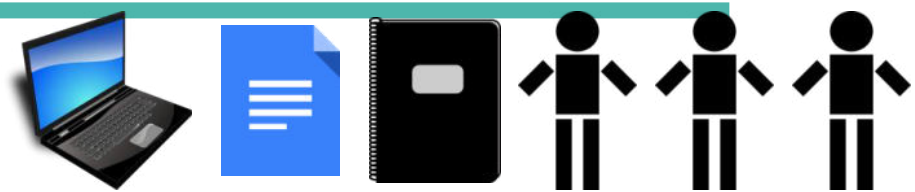


Two polygons are identical if they match up exactly when placed one on top of the other.



A Tale of Two Triangles (Part 2)

Activity 7.3



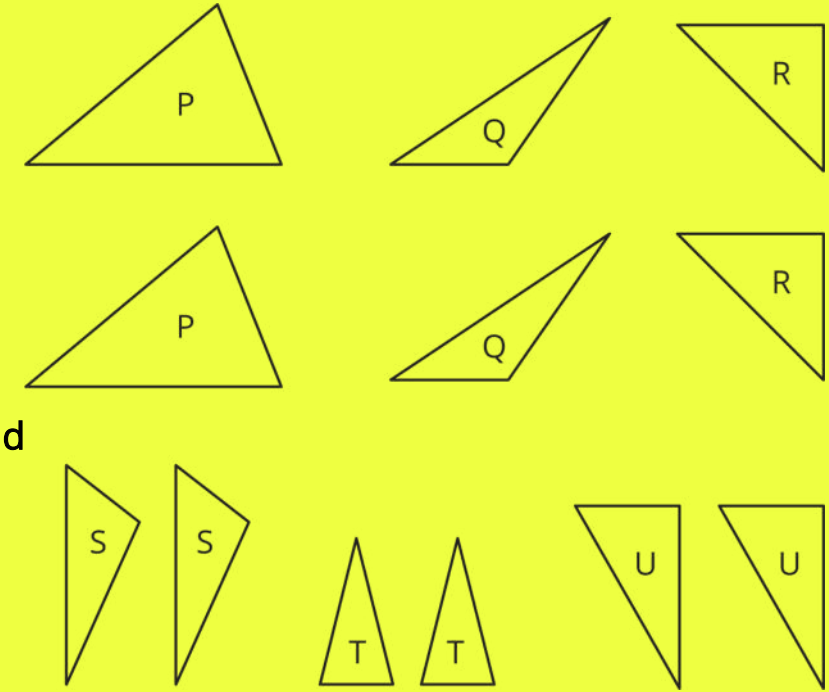
Your teacher will give your group several pairs of triangles. Each group member should take 1–2 pairs.

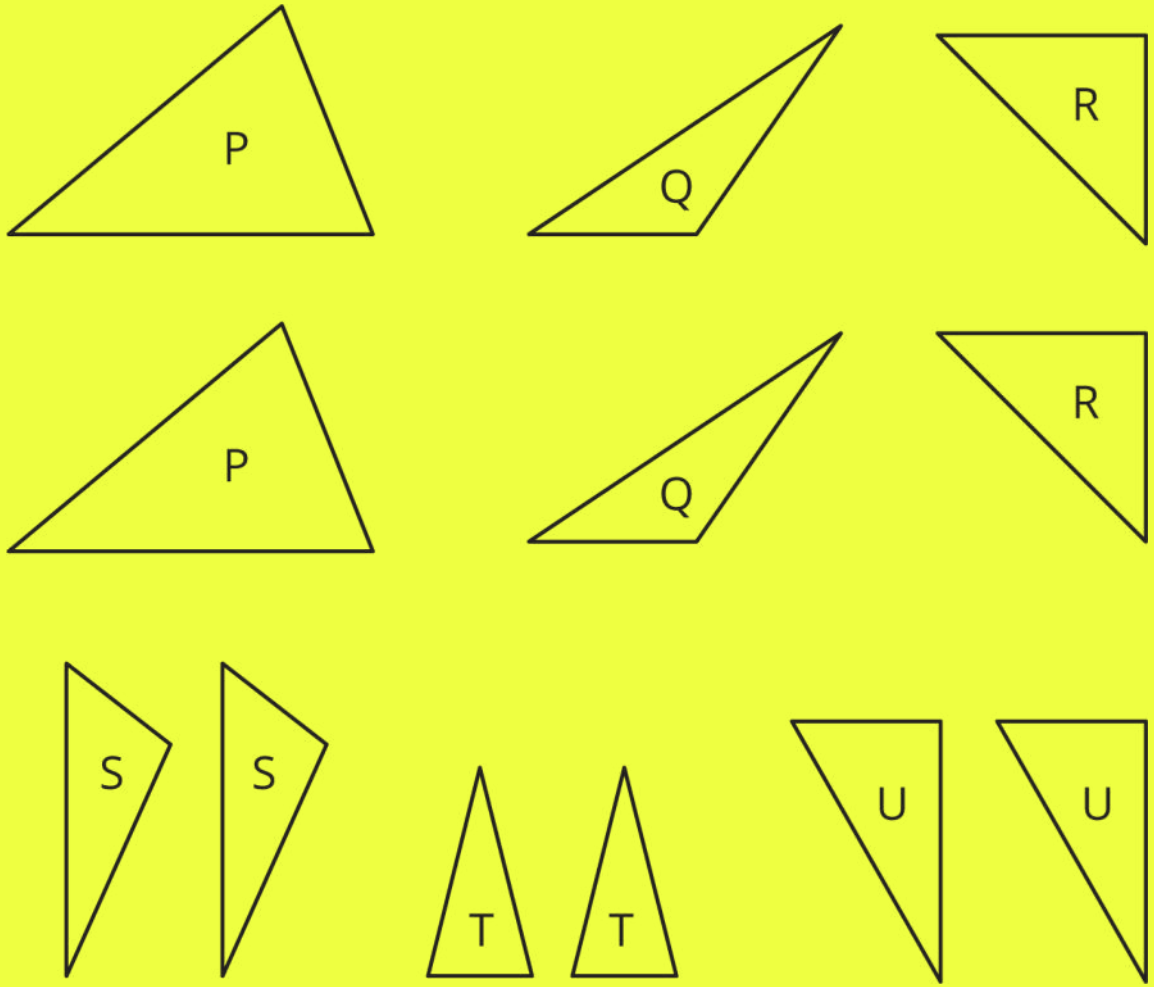
a. Which pair(s) of triangles do you have?
b. Can each pair be composed into a rectangle? A parallelogram?

1. Discuss with your group your responses to the first question. Then, complete each of the following statements with *all*, *some*, or *none*. Sketch 1–2 examples to illustrate each completed statement.

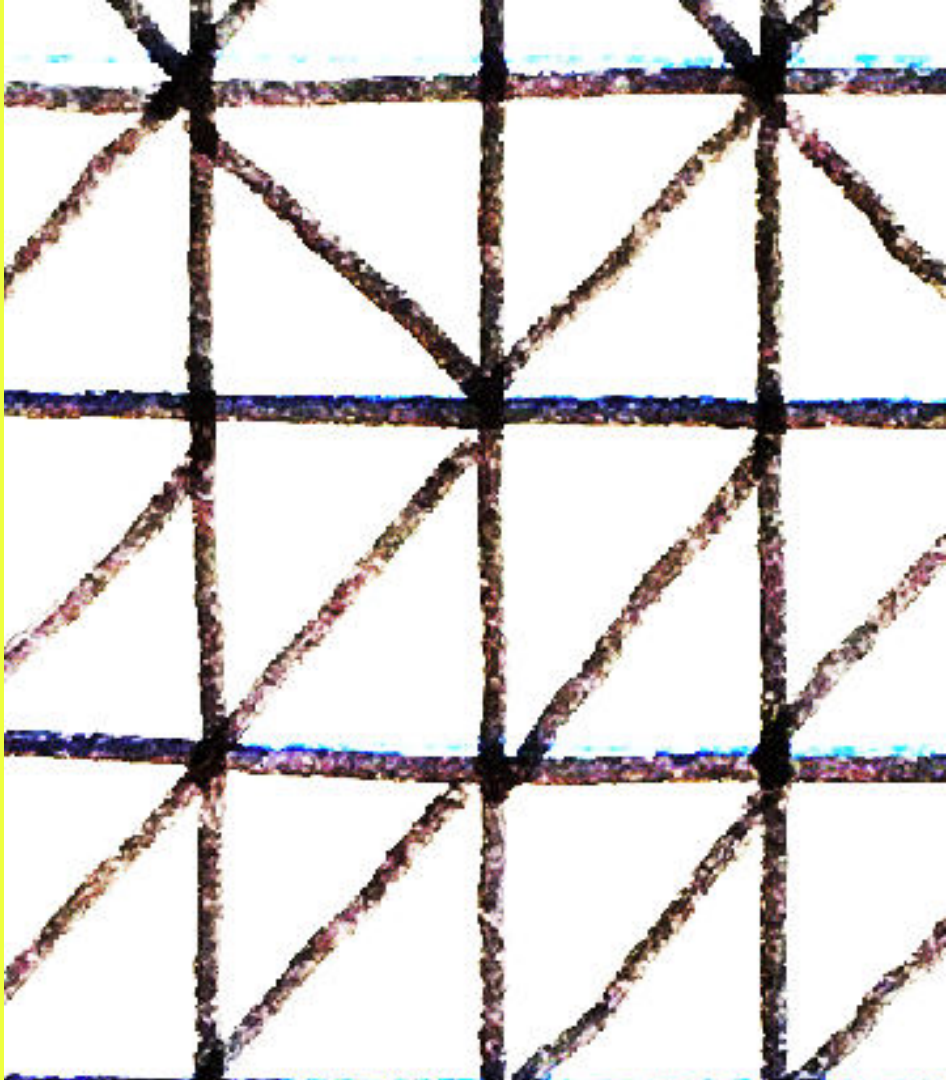
   a. _____ of these pairs of identical triangles can be composed into a *rectangle*.

   b. _____ of these pairs of identical triangles can be composed into a *parallelogram*.




P
Q
R
P
Q
R
S
S
T
T
U
U

Lesson Synthesis

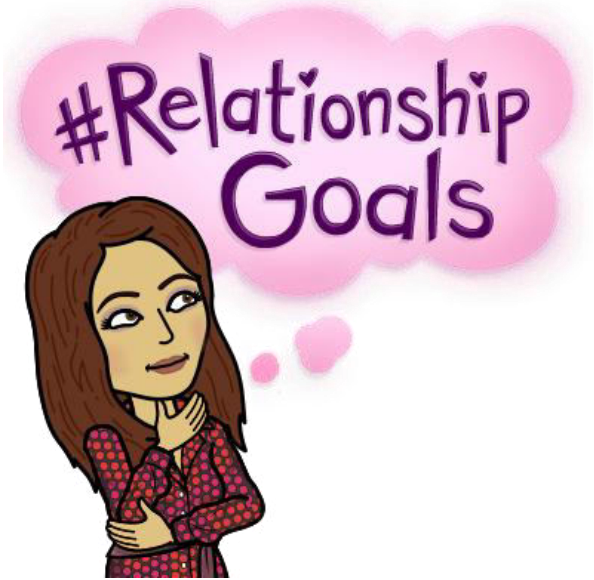


First, we tried to decompose or break apart quadrilaterals into two identical triangles.

Then, we tried to compose or create quadrilaterals from pairs identical triangles.

Today's Goals

- ❏ I can explain the special relationship between a pair of identical triangles and a parallelogram.



A Tale of Two Triangles (Part 3)

Cool Down 7.4