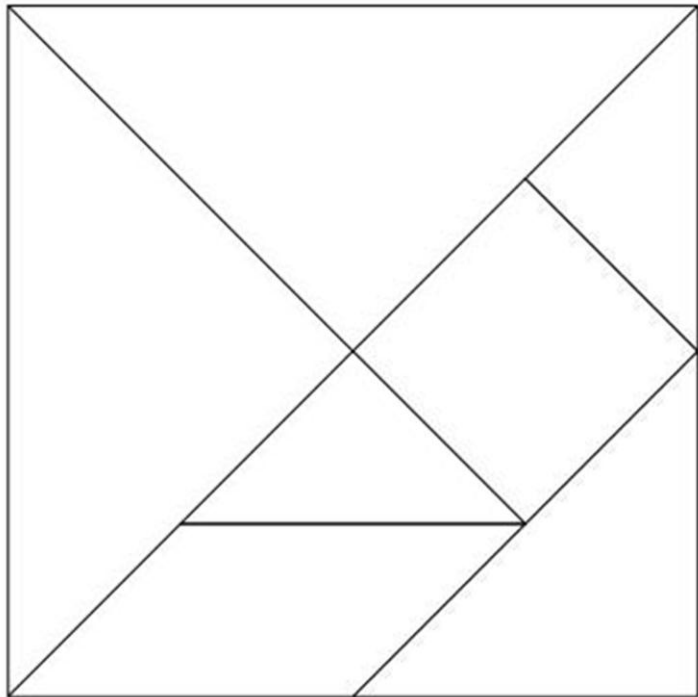


Tangrams *ANSWERS*

Lesson 1 of 4, work in pairs

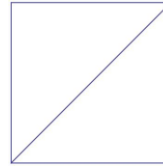
Tangrams are an ancient puzzle made of simple geometric shapes. Work with tangrams that are in your classroom, or use the classroom master that your teacher can photocopy to make your own tangram pieces. All 7 of the pieces can be arranged to form a square.



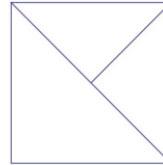
*Materials Needed: Pencil
Math Journal or Notebook
Tangram Master or Tangram Pieces*

1. Create a square using the Tangram pieces. See how many different ways this can be done, and draw all of them in your math journal. Compare your results with a classmate.

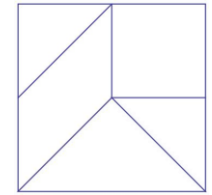
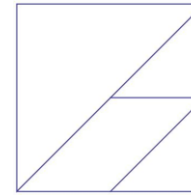
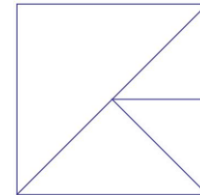
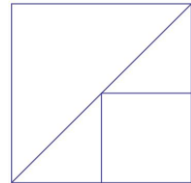
2. Can you make a square with just two of the pieces?



3. Can you make a square with only 3 pieces?



4. Can you make a square using exactly 4 or exactly 5 pieces? In how many different ways?



5. Is there a different way to make a square with all 7 pieces than the arrangement you started with? Draw it in your math notebook.

Standards: Geometry

Tangrams *ANSWERS*

Lesson 2 of 4, work individually or in pairs

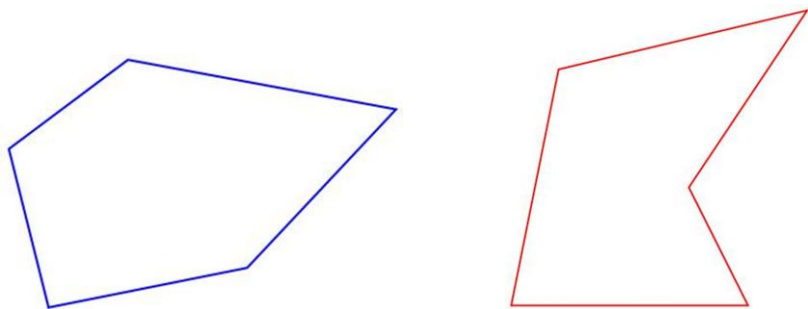
*Materials Needed: Pencil
Math Journal or Notebook
Tangram Pieces*

Continue to work with the 7 tangram pieces.

1. Make several different polygons with all 7 of the tangram pieces. Draw the polygon, as well as how the individual pieces fit into the polygon, in your math journal.

There are many correct answers.

A convex polygon is one that if you try to connect two points inside the polygon, you can always do so with a straight line that stays in the polygon. The blue figure below is convex, and the red one is not.



2. How many different convex polygons can you make, using all 7 tangrams? Draw pictures in your math journals showing all of the convex polygons that you made.

There are many correct answers.

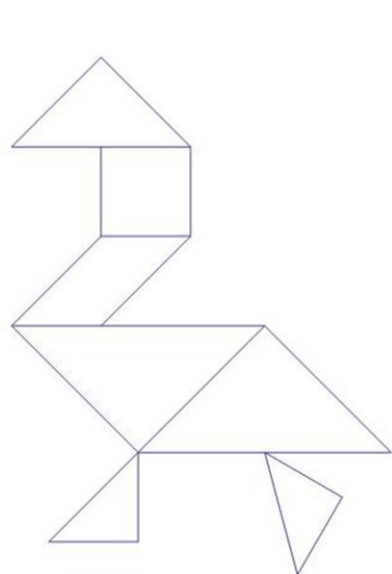
3. Compare with your classmates to find as many as you can. Add ones you didn't find yourself to your math journal.

Standards: Geometry, representation

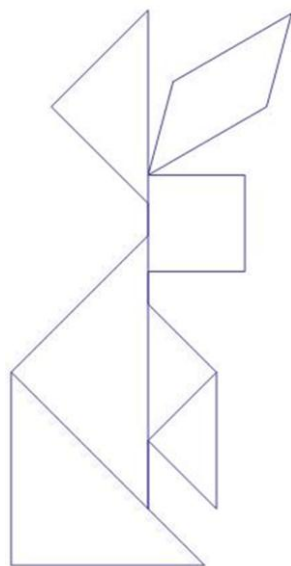
Tangrams *ANSWERS*

Lesson 3 of 4, work individually or in pairs

Try to make the pictures on this card using all 7 tangram pieces. Once you have succeeded, draw the picture in your notebook, showing how the tangram pieces make up the pictures.

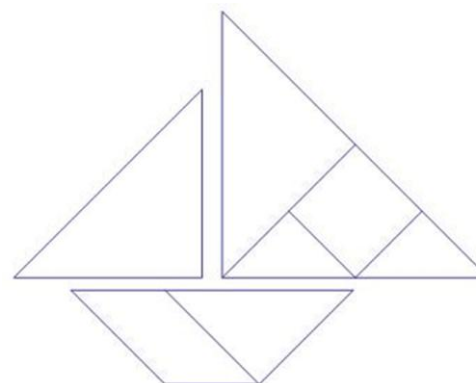


Duck

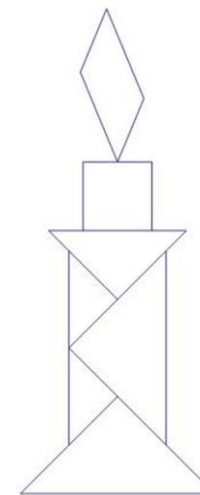


Rabbit

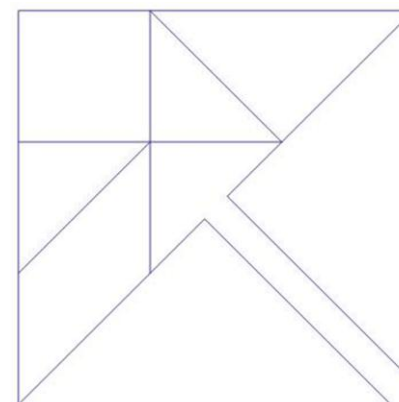
*Materials Needed: Pencil
Math Journal or Notebook
Tangram Pieces*



Sailboat



Candle



Boxed Arrow

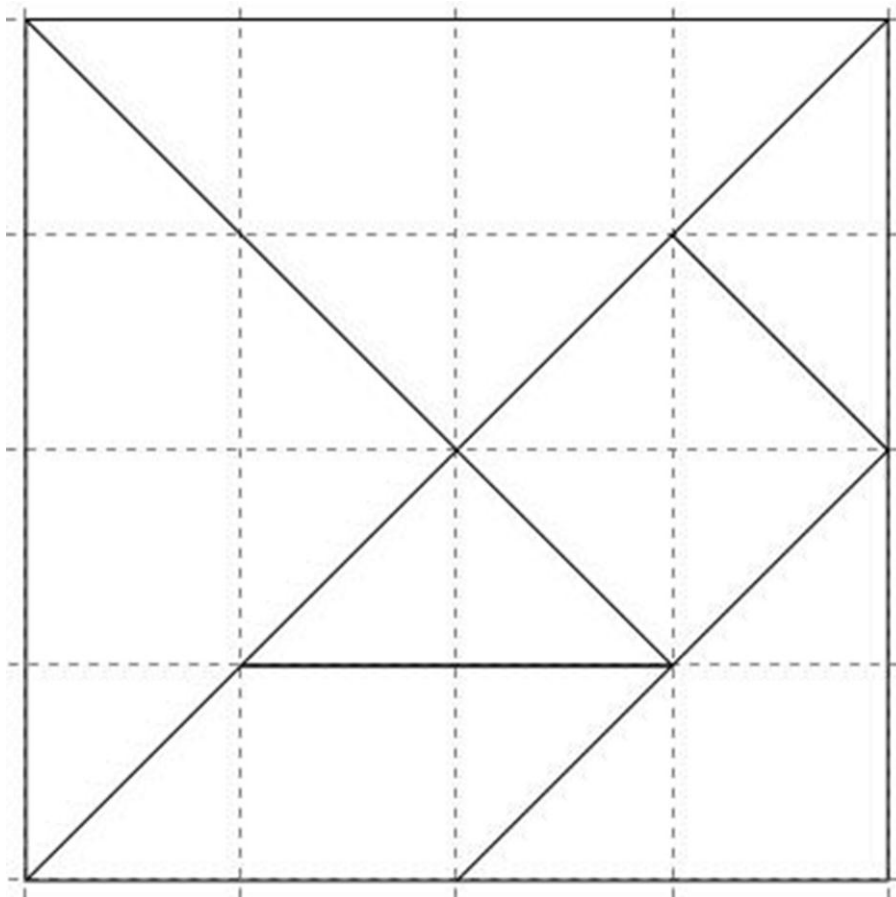
Standards: Geometry, representation

Tangrams *ANSWERS*

Lesson 4 of 4, work in pairs

*Materials Needed: Pencil
Math Journal or Notebook
Tangram Pieces*

Now look at the tangram pieces laid on a grid.



1. Each box in the grid (outlined by the dashed lines) is 1 square unit. Find the area of each piece.

The large triangles have area 4 units², the medium triangle has area 2 units², the small triangles have area 1 unit², the square has area 2 units², and the parallelogram has area 2 units².

2. Look at the different squares you made on Lesson 1. What is the area of each of those squares? (Be careful! Remember that the diagonals of the grid do *not* have length 1. You will have to use your answers to question 1 to figure this out.)

The square with 2 pieces has area 2 units² or 8 units² (depending on whether the small or large triangles were used). The square with 3 pieces has area 4 units². The squares with 4 pieces all have area 8 units², and the square with 5 pieces has area 8 units².

3. What is the total area of each tangram shape you made in Lesson 3? (If you think about this, it should be a very quick answer.)

The all have an area of 16 units².

Standards: Geometry, area, representation