Tangrams Math Kit

Activity #1

1. Make a small square using only 2 tangram pieces. (Trace the tangrams to show your work).

Students will need to use the two small triangles. These two triangles are right triangle because they each have a right angle. They are also isosceles triangles because only two sides of the triangle are the same length.

2. Make a larger square using only 2 pieces. (Trace the tangrams to show your work).

Students will need to use the two large triangles. These two triangles are right triangles because they each have a right angle. They are also isosceles triangles because only two sides of the triangle are the same length.

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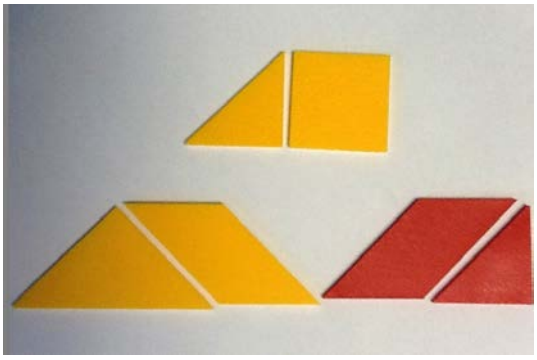
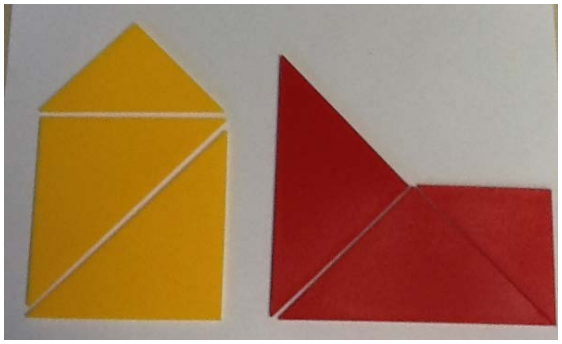
3. Make a trapezoid (4-sided shape/polygon with one set of parallel lines) using only 2 pieces. (Trace the tangrams to show your work).



Here are some possible solutions.

4. Make a pentagon (5-sided shape/polygon) using only 3 pieces. (Trace the tangrams to show your work).



Here are some possible solutions.

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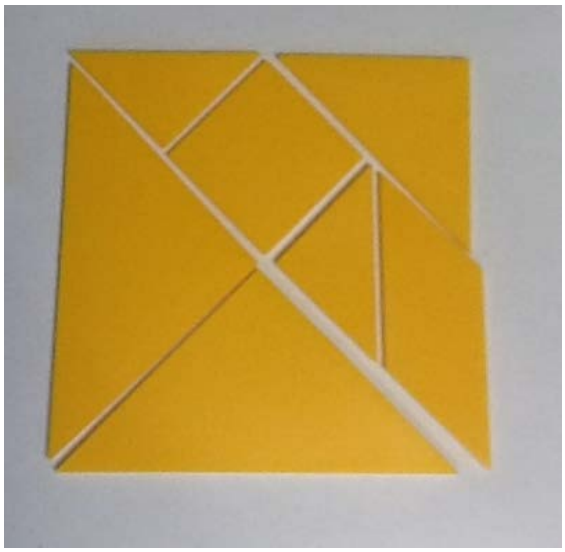
5. Make a 4inch by 4 inch square using the all 7 pieces. (Trace the tangrams to show your work).



Here is a possible solution.

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Activity #2

Part 1

The Rose Family is changing the look of their front yard/lawn. They have divided their square front lawn into 7 different sections (2 small triangles, 1 medium triangle, 2 large triangles, 1 square, and 1 parallelogram). Each section is a part of the whole square lawn. Determine the fractional value of each section. Record your finding in the table. Be sure to explain/justify your solution in the space below the table and/or on your drawing for question 5 in Task #1.

Shape	Fractional Value	Explanation
Large Triangle	¼ (one-fourth)	Explanations will vary. If blank, ask students to share with you how they arrived at the fractional value for each tangram piece. *Example: Using the square from problem number 5 above, I noticed that half of the square was made of the two large triangles. I know that it takes 4 large triangles to make a square. So one of the four triangles would be equal to one-fourth.*
Large Triangle	¼ (one-fourth)	
Medium Triangle	1/8 (one-eighth)	*Example: I noticed that the medium triangle fits onto the large triangle and that the medium triangle only covers half of the large triangle. So half of ¼ (one-fourth) is 1/8 (one-eighth).*
Small Triangle	1/16 (one-sixteenth)	*Example: I noticed that the small triangle is half the area of the medium triangle. So half of 1/8 (one-eighth) is 1/16 (one-sixteenth.)*
Small Triangle	1/16 (one-sixteenth)	
Square	1/8 (one-eighth)	*Example: I observed that the small triangle fits into the square twice. So the square has to be twice the size of the small triangle.*
Parallelogram	1/8 (one-eighth)	*Example: I observed that the small triangle fits into the parallelogram twice. I used a similar approach to find the parallelogram as I did to find the fractional value of the square.*

What is the sum of the fractional values? **1**

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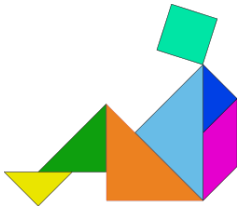
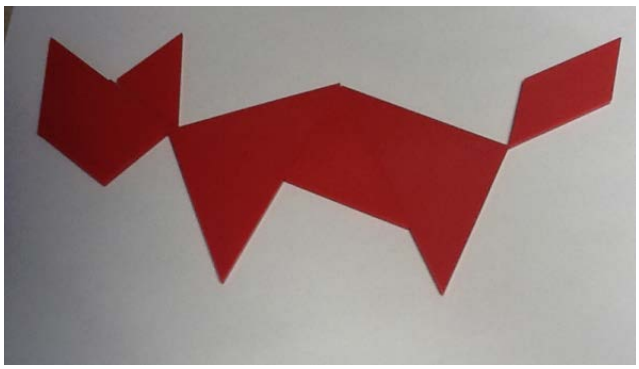


Part 2

Create 2 different designs using all 7 tangram pieces. Each tangram piece must touch at least one vertex (corner) of another tangram. Be sure to only trace the outline of the design. If time permits, have a friend find the fractional value of each piece.

Here are some examples.



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Extension:

Find the decimal and percent equivalent for each tangram piece.

Tangram	Fraction	Decimal	Percent
Small Triangle	1/16	0.0625	6.25%
Small Triangle	1/16	0.0625	6.25%
Medium Triangle	1/8	0.125	12.5%
Large Triangle	1/4	0.25	25%
Large Triangle	1/4	0.25	25%
Square	1/8	0.125	12.5%
Parallelogram	1/8	0.125	12.5%

What is the sum of the fractional values? **1**

What is the sum of the decimal values? **1**

What is the sum of the percentage values? **1**

Extension (continued):

If the small tangram triangle was worth a $1.00, what would the values of the other tangram pieces be? Explain your reasoning using pictures, numbers, and/or words.

Tangram	Fraction	Dollar Value	Possible Explanations
Small Triangle	1/16	$1.00	Given information.
Medium Triangle	1/8	$2.00	The medium triangle is twice the size of the small triangle so the value is doubled too.
Large Triangle	¼	$4.00	The large triangle is twice the size of the medium triangle so the value is doubled too.
Square	1/8	$2.00	The medium triangle, square, and parallelogram each have the same fractional value so they each are worth $2.00.
Parallelogram	1/8	$2.00	

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Activity #3

Reflect and respond to at least two prompts below.

- I learned_____ about _____.
- I created a _____ using all 7 tangram pieces. I chose this design because _____.
- If I were to help someone figure out the fractional value of_____, I would tell them _____.
- I found it easier to go from _____(fractions, decimals, percent) to _____ (fractions, decimals, percent), because _____.

Reflections will vary.

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Activity #4

Technology Connection

Tangram Puzzles

http://www.abcya.com/tangrams.htm

More Tangram Puzzles

http://pbskids.org/sagwa/games/tangrams/index.html

Equivalent Fractions with Monkeys

http://www.fractionmonkeys.co.uk/activity/

Fraction, Decimal, and Percent

http://www.mathplayground.com/Decention/Decention.html

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