Properties of Polygons

This activity is designed to reinforce the properties of polygons using a string tied to form a loop.

Work in groups of three. The first person should read the description of the polygon aloud. The other two people in the group will work together to manipulate the string to form the matching polygon and decided on the correct name. Each person should name the polygon and make a drawing of it to the right of the statement on his or her own paper. Switch roles so that each person has an opportunity to form polygons with the string. Note: Be sure to list all polygons for which the criteria hold.

1. An equilateral quadrilateral
   - rhombus
   - square

2. An equilateral quadrilateral with at least one right angle
   - square

3. An equilateral quadrilateral with exactly one right angle
   - None or DNE

4. A four-sided polygon with exactly two right angles
   - Examples: trapezoid
   - kite

5. A polygon with at least two pairs of parallel sides
   - Numerous possible answers: Full credit for ALL four quadrilaterals and at least 1 with 5 or more sides.
   - parallelogram
   - rectangle
   - rhombus
   - square
   - hexagon
   - any regular n-gon, n ≥ 4, n is even. Possible with a polygon with 5 or more sides and purposefully constructed

6. A quadrilateral with congruent diagonals
   - isosceles trapezoid
   - rectangle
   - square
KEY

7. A polygon with exactly one pair of parallel sides and at least two right angles
   
   At least 2 means 3 or more

   Half credit for trapezoid with exactly 2 right angles

   Full credit for a purposefully constructed n-gon, \( n \geq 5 \)

8. A polygon with at least one pair of parallel sides and at least two right angles
   
   For full credit, include at least one non-quadrilateral

   rectangle square any purposefully constructed n-gon, \( n \geq 5 \) (see #7)

9. A quadrilateral with two pairs of congruent sides
   
   kite parallelogram rectangle rhombus square

10. A quadrilateral with two pairs of congruent angles

   parallelogram rectangle rhombus

   square isos. trap.

11. Choose a polygon and write a statement that describes the polygon. Read the description aloud.
    The rest of the group members should form the polygon with the string and name it correctly.

    **Answers may vary.**