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Please enjoy this complimentary excerpt from *Mastering Math Manipulatives, Grades 4-8*, by Sara Delano Moore and Kimberly Rimbey.

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Materials

- Geometric strips with protractors

Organization (physical)

- **Getting Started:** Distribute one set of materials to each pair or trio of students.
- **Winding Down:** Rebag the strips and return the materials to home base.

Mathematical Purpose

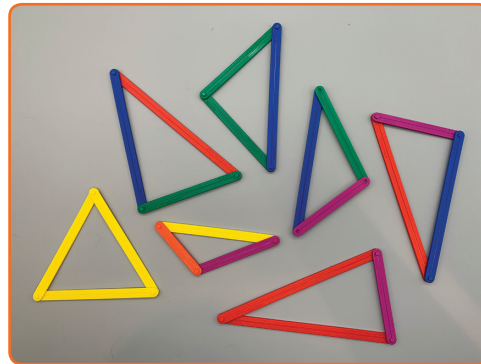
In this activity, students explore the attributes of triangles and quadrilaterals with a focus on the angles.

Manipulative Illustrated

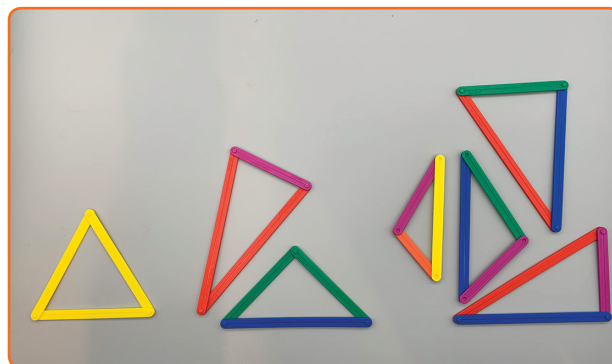
- AngLegs® (hand2mind)

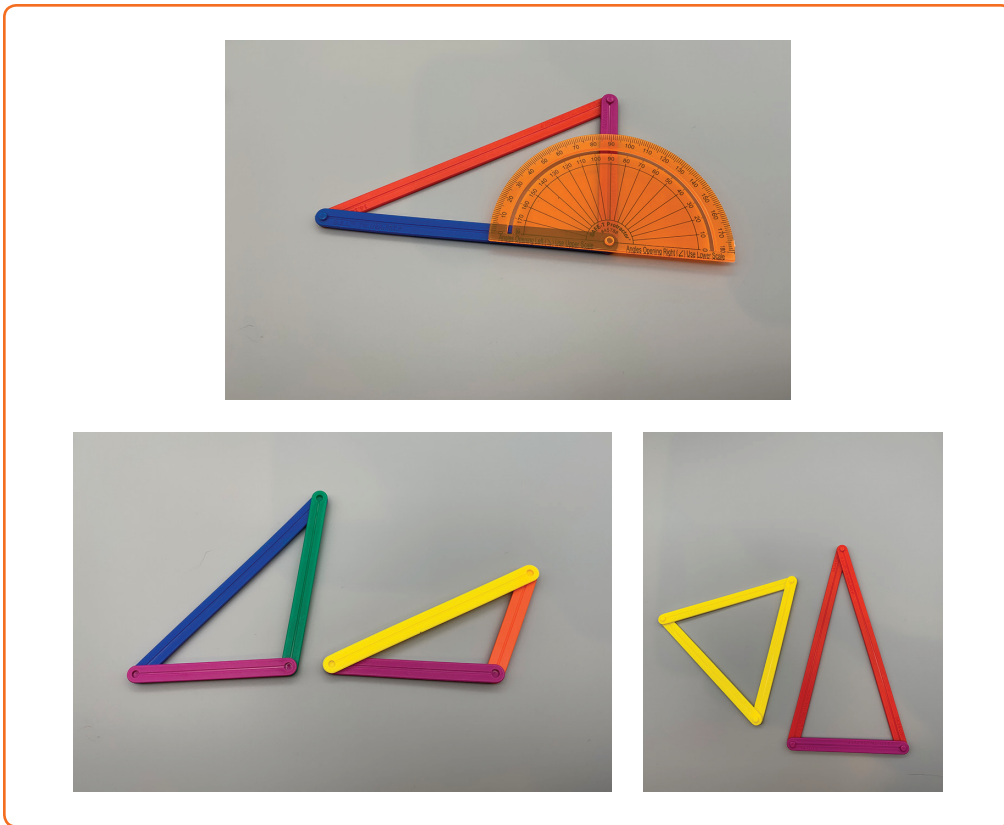
Steps

1. Each pair or trio should build six to eight triangles based on random draws of three strips from the bag. As in Activity 6.1, students can draw a new set if a triangle cannot be made.

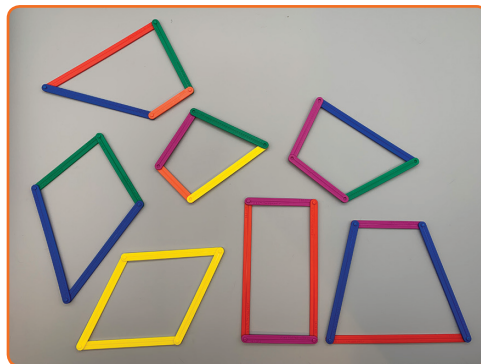


2. Use the following questions to observe and classify the triangles:
 - Are there any triangles where all angles are the same? What else do you notice about these triangles?
 - Are there any triangles where exactly two of the angles are the same? What else do you notice about these triangles?
 - Are there any triangles where each angle is a different size? What else do you notice about these triangles?
 - Are there any triangles with a right angle? What else do you notice about these triangles?
3. As students discuss each category of triangle, provide the appropriate names: equilateral, isosceles, **acute**, **obtuse**, and right. Point out that some names are still associated with side length even though this lesson is about angles.





4. A similar activity can be completed with quadrilaterals. Here are questions to use in observing and classifying the quadrilaterals:



- Are there any quadrilaterals with all four angles the same? What else do you notice about these quadrilaterals?
- Are there any quadrilaterals with two pairs of matching angles? What else do you notice about these quadrilaterals?
- Are there any quadrilaterals with one pair of matching angles? What else do you notice about these quadrilaterals?
- Are there any quadrilaterals with angles the same? What else do you notice about these quadrilaterals?

5. As students discuss each category of quadrilateral, provide the appropriate names and relationships for the shapes in focus for the lesson.

Why This Manipulative?

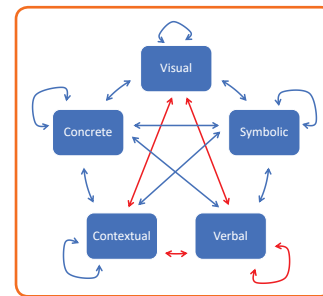
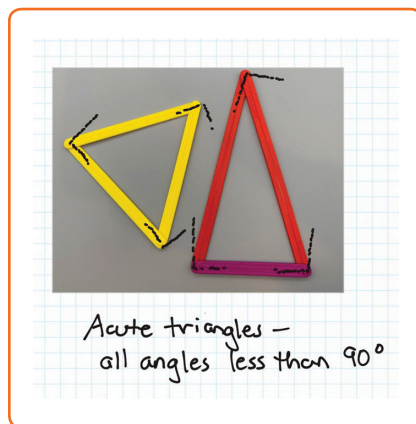
Connecting strips are a flexible tool for creating two-dimensional shapes. The variety of side lengths gives a wide range of possible figures to create. Use the included protractor to measure the angles in a shape (see Activity 6.6 for more information).

Developing Understanding

As with Activity 6.2, this lesson reflects at least two lessons of work, one on triangles and one on quadrilaterals. Classifying quadrilaterals is much more complex as there is more to consider than just angle congruence. It is teacher's choice about when to discuss parallel sides for quadrilateral figures.

Featured Connection

Use the Caption Your Picture strategy to create a glossary of shapes discussed. For each term, students should sketch and label at least two different examples.



Source: Lesh, Post, & Behr (1987).