

## ACTIVITY 6

# Classifying Triangles by Sides and Angles: The Seven Types of Triangles in the World

## Purpose

To learn about and construct the seven types of triangles that exist in the world: equilateral, right isosceles, obtuse isosceles, acute isosceles, right scalene, obtuse scalene, and acute scalene.

## Material

Geometry Sticks.

Geometric Cabinet — triangles drawer.

Montessori Protractor.

Math journals and pencils.

## Presentation

- Most Montessori teachers present this concept in Year 2 and review it in Year 3.
- This activity should be presented over several days.
- Invite a student to learn about the seven types of triangles at a table or mat set up with the material.

### PART 1: REVIEWING TRIANGLES' SIDES AND ANGLES

- As a review, ask the student to point to one of each of the following in the triangles drawer: equilateral, isosceles, scalene, right, obtuse, and acute triangles. The student may notice that a triangle can have more than one name.

For example, the same triangle may be both obtuse and scalene.

### MAKING AN EQUILATERAL TRIANGLE

- Invite the student to choose three sticks all the same length.
- Ask the student to make a triangle on the tack board using the three sticks.



*An equilateral triangle*

- Say, “What kind of triangle did you form when you used three sticks the same length?” (An equilateral triangle.)
- Ask, “Is there any other kind of triangle you can make with three sticks all the same? (No.)”

- Invite the student to take the equilateral triangle from the triangles drawer and use the Montessori Protractor to measure all three angles. Ask the student what he/she notices about the angles. (They are all the same. In equilateral triangles, all sides and all angles are the same.)
- Ask the student to draw and label an equilateral triangle in his/her journal.

## PART 2: MAKING THREE KINDS OF ISOSCELES TRIANGLES



*A right isosceles triangle*

- Invite the student to put away one of the sticks, leaving two sticks the same length.
- Ask the student what kind of triangle can be made from two sticks the same length. (An isosceles triangle.)
- Encourage the student to make an isosceles triangle by adding a third stick of a different length and closing the figure.



*An obtuse isosceles triangle*

- Ask the student to look at the angles of her/his isosceles triangle and say what type of isosceles triangle it is. Is it a right isosceles triangle, an obtuse isosceles triangle, or an acute isosceles triangle? (The answer will depend on what length of third stick the student chose.)
- Encourage the student to exchange the third stick for a longer or shorter one and again say what type of isosceles triangle it is.
- Encourage the student to continue with different third sticks until he/she has made all three types of isosceles triangles: right, obtuse, and acute.
- Conduct a three-period lesson for the following types of triangles: right isosceles, obtuse isosceles, acute isosceles.



*An acute isosceles triangle*

- Ask the student to draw and label a right isosceles, obtuse isosceles, and acute isosceles triangle in her/his journal.

### **MAKING THREE KINDS OF SCALENE TRIANGLES**

- Invite the student to put away one of the two similar sticks and replace it with a stick different from both sides of the triangle. The student should now have three different sticks on the tack board.
- Ask the student what kind of triangle can be made from three different sticks. (A scalene triangle.)
- Encourage the student to form a triangle from the three sticks.
- Ask the student to look at the angles of his/her scalene triangle and say what type of scalene triangle it is. Is it a right scalene triangle, an obtuse scalene triangle, or an acute scalene triangle?



*A right scalene triangle*



*An obtuse scalene triangle*

(The answer will depend on what length of third stick the student chose.)

- Encourage the student to exchange the third stick for a longer or shorter one, again choosing a stick different from the two on the tack board.



*An acute scalene triangle*

- Invite the student to say what type of scalene triangle it is now.
  - Encourage the student to continue with different third sticks until she/he has made all three types of scalene triangles: right, obtuse, and acute.
  - Conduct a three-period lesson for right scalene, obtuse scalene, and acute scalene triangles.
- Ask the student to draw and label a right scalene, obtuse scalene, and acute scalene triangle in his/her journal.

### Extensions

- Working independently or with a classmate, practice matching the nomenclature cards for the seven different types of triangles in the world. Check work for accuracy using the control set.
- Invite a student to use three Geometry Sticks all the same length to try to make a right equilateral triangle. What happens?
- Invite a student to use three Geometry Sticks all the same length to try to make a right obtuse triangle. What happens?
- Invite a student to choose a triangle from the triangles drawer. Trace around it in the math journal and label it as one of the seven types of triangles. Continue with all the triangles in the triangles drawer, tracing and labeling each in turn.