

# Math 5 - Act. 18: Try An Angle

## Summary

After discovering how many different ways they can arrange 2, 3, 4 ...7 tangram pieces to create triangles, students will classify the different triangles by sides and angles.

## Group Size

Individual

## Materials

*Each student or team needs:*

1 Copy of triangle patterns

Tape

Protractor

Additional Resources

*The Greedy Triangle* by Marilyn Burns

Architects and building contractors

## Background for Teachers

Triangles are defined as three-sided polygons which have straight, rather than curved, sides. The sum of the three angles of a triangle equals  $180^\circ$ . Triangles are classified by similarities (or differences) in lengths of the sides and measurements of the angles. An *equilateral triangle* has all three sides of the same length. An *isosceles triangle* has two sides that are the same length. A *scalene triangle* has no sides that are the same length. A *right triangle* has one right angle, an *acute triangle* has all acute angles (less than  $90^\circ$ ), and an *obtuse triangle* has one angle that is greater than  $90^\circ$ .

## Instructional Procedures

Invitation to Learn

Give each student a set of die-cut tangrams. See how many different ways they can arrange 2,3,4...7 pieces to create triangles. Classify the different triangles by sides and angles.

Once a triangle is constructed, recreate the pattern on paper.

Instructional Procedures

Using the above classifications, the students should classify and label the six triangles on their pattern sheet.

Tear or cut the corners of one of the triangles.

Arrange the angles so they touch, then tape them together.

Use a protractor to measure each angle. What is the sum for all three angles?

Do the same for the other 5 triangles.

List your results in a table.

Is there a pattern?

Triangle Type	Right Scalene	Acute Isosceles	Obtuse Isosceles	Obtuse Scalene	Right Isosceles	Equilateral Acute
Sum of Angles						

Curriculum Integration

Math—Standard IV Objective 2c: Measuring with a protractor.

## Extensions

### Possible Extensions/Adaptations

Cut several strips of centimeter graph paper into strips that are 1 cm X 18 cm. Try folding them into triangles with the following side lengths:

A. 6 cm, 6 cm, 6 cm    B. 6 cm, 4 cm, 7 cm    C. 7 cm, 4 cm, 2 cm

D. 4 cm, 4 cm, 8 cm    E. 5 cm, 5 cm, 8 cm    F. 7 cm, 4 cm, 7 cm

D. 4 cm, 4 cm, 8 cm    E. 5 cm, 5 cm, 8 cm    F. 7 cm, 4 cm, 7 cm

D. 4 cm, 4 cm, 8 cm    E. 5 cm, 5 cm, 8 cm    F. 7 cm, 4 cm, 7 cm

Measure, fold, and tape each triangle. Be sure to label the size. What did you learn from this experiment?

### Home & Family Connections

Have students take their set of die cut tangrams home and, with their family members, try to recreate a variety of different triangles, then trace the pieces used in the triangular pattern on a piece of paper. Once the triangles are drawn, label each triangle as equilateral, isosceles, scalene, right, or obtuse.

### Assessment Plan

Have students complete a Frayer Model using a term such as isosceles. Adapt the model to include a drawing in one of the quadrants.

### Authors

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