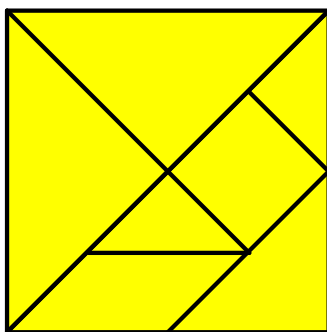# Tangrams

What are Tangrams?
One tangram set consists of seven shapes that can be arranged to form a square. The square tangram puzzle was invented in China and is still being used to challenge individuals to create different shapes using the seven pieces.

How do Tangrams help students?
Tangrams are particularly useful in problem-solving activities. Frequently, tangrams are also used for exploring geometry, proportional reasoning, area, and algebra.

How many are recommended?
Tangram activities are often done with pairs of students so, one tangram set per pair of students is sufficient. Students can make their own set from a template. When tangrams are introduced give students time to experiment and explore. Reassemble the tangram square before storing in a small zip-lock bag.

Sample Activities
1. Assume that each tangram has a value of one whole. Find the value of each piece (based on surface area of one face) stated as a fraction. (Repeat the activity but state the value as a decimal or percent.)
2. Assume a whole tangram set costs $1.60. Determine a value for each piece of the set.
3. If the largest triangle represents $\frac{5}{8}$ then what fraction does the smallest triangle represent?

   (As an alternative to $\frac{5}{8}$ use an integer, decimal or percent.)
4. Use four tangram pieces to make a parallelogram.
5. How many ways can right isosceles triangles be formed with the tangram pieces? (As an alternative, form squares, rectangles, or parallelograms.)
6. Find the perimeter/area of each piece. (This is an opportunity to use the Pythagorean theorem).
7. Use the smallest triangle and the largest triangle to explore what happens to the area of a triangle when the lengths of both height and base are doubled.
8. Choose one of the triangles to represent a loading ramp. Calculate the slope of ramp.
9. Stack the right triangles so that the right angles are aligned. Make an observation about the hypotenuses.
10. Let *a* represent the area of the smallest triangle. What algebraic expression would represent the area of each other piece?
11. Create a tangram design using two or more pieces. Then create an algebraic expression to represent the area of the design.
12. Create convex polygons using tangram pieces. Investigate the sum of the interior angles.
13. Sort and classify the tangram pieces.
14. Create a shape using tangram pieces. Give instruction so your partner can build the same shape (sight unseen).
15. Create a "spinner" using the names of the tangram pieces that meet at one vertex. Determine the probability that the spinner will land on each piece.

Recommended Websites
http://standards.nctm.org/document/eexamples/chap4/4.4/part2.htm   Interactive Tangram Puzzles

http://mathforum.org/trscavo/tangrams/construct.html   Construct a Tangram Set