



Technology-Connected Lesson Plan

Title:	Grandfather Tang's Story: A Tale with Tangrams
Grade Levels:	4 th - 6 th
Curriculum Areas:	Math (Geometry)
Measurable Objectives:	<ul style="list-style-type: none"> ☞ Students will demonstrate geometric and spatial knowledge by describing and identifying shapes and using geometric representations in problem solutions through the use of tangrams, an ancient Chinese puzzle made from a square.
LA Content Standards:	<ul style="list-style-type: none"> ☞ G-2-M - identifying, describing, comparing, constructing, and classifying geometric figures and concepts ☞ G-3-M - making predictions regarding transformations of geometric figures (e.g., make predictions regarding translations, reflections, and rotations of common figures)
Grade Level Expectations (GLE)	<ul style="list-style-type: none"> ☞ Use mathematical terms to classify and describe the properties of 2-dimensional shapes, including circles, triangles, and polygons (G-2-M) ☞ Identify and use appropriate terminology for transformations (e.g., <i>translation as slide, reflection as flip, and rotation as turn</i>) (G-3-M)
K12 Educational Technology Standards:	<ul style="list-style-type: none"> ☞ Students use technology tools to enhance learning, increase productivity, and promote creativity. ☞ Students use productivity tools to work collaboratively in developing technology-rich, authentic, student-centered products.
Technology Connection:	<ul style="list-style-type: none"> ☞ Overhead Projector ☞ Computers with Internet access ☞ Download the free software, <i>Tangrams</i>, from <i>Free Software by Mark Overmars</i> (http://www.cs.uu.nl/people/markov/kids/tangram.html).

Procedures:

☞ Tangrams continue to entertain and frustrate now days. The puzzle attracts people on a number of levels. Its simplicity makes it accessible to a broad spectrum of people. The figures spark visually inclined people though their form, liveliness and striking simplicity. Many of the designs are adaptable to quilting, appliqué and many other artistic or craft projects. Storytellers can weave a tale with many characters and objects using only the seven tans.

Follow the steps below with the students. Have the students record their observations on their paper for each step. Allow students to share their observations with the class.

- ☞ Fold the square sheet in half along a diagonal, unfold and cut along the crease. What observations can you make about the two pieces you have? How can you "prove" that your observations are correct?
 - ☞ Take one of the halves, fold it in half and cut along the crease. Make more observations and be able to support your statements.
 - ☞ Take the remaining half and lightly crease to find the midpoint of the longest side. Fold so that the vertex of the right angle touches that midpoint and cut along the crease. Continue with observations. Congruent and similar triangle may be discussed, as well as trapezoid.
 - ☞ Take the trapezoid, fold it in half and cut. What shapes are formed? Students may not realize that these shapes are trapezoids as well. What relationships do the pieces cut have? Can you determine the measure of any the angles?
 - ☞ Fold the acute base angle of one of the trapezoids to the adjacent right base angle and cut on the crease. What shapes are formed? How are these pieces related to the other pieces?
 - ☞ Fold the right base angle of the other trapezoid to the opposite obtuse angle. Cut on the crease. You now should have the seven-tangram pieces. Are there any more observations you can make?
 - ☞ Have the students mix up the pieces and try to put the pieces together to form the square, which was the shape of the paper they originally started with.
- (Give students a Ziploc bag to store their seven-piece puzzle in.)*
- ☞ Read *Grandfather Tang's Story: A Tale with Tangrams*; make the tangram on the overhead. The students can then make

	<p>the tangram of the character by following your pattern.</p> <ul style="list-style-type: none"> 🖥️ Download the free software, Tangrams, from Free Software by Mark Overmars (http://www.cs.uu.nl/people/markov/kids/tangram.html) <p>Introduce and discuss the directions with the students.</p> <p><i>Tangram is a well-known Chinese puzzle. The goal is to form various shapes from 7 pieces. This program challenges you to solve a large number of these puzzles. Puzzles range from very simple ones for small children to difficult ones for adults. Also an editor is provided that allows you to create your own collections of puzzles. You can even use different sets of pieces. The program is very easy to use and help is provided within the program.</i></p> <ul style="list-style-type: none"> 🖥️ Allow the students to rotate in and out of the computer station to create different shapes using the online manipulative.
Materials:	<ul style="list-style-type: none"> 🖥️ Grandfather Tang's Story: A Tale with Tangrams by Ann Tompert 🖥️ Square sheet of paper (students can fold from 8.5" x 11" plain paper) 🖥️ Scissors 🖥️ Paper and pencil to record observations 🖥️ Ziplock bags
Assessment:	<ul style="list-style-type: none"> 🖥️ Observation and participation 🖥️ Collect the students' observations that were recorded during the step by step of making the seven-piece tangram puzzle.
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