

<p>Unit 6</p>  <p>Week 1</p>	<p>Small Group: Tangram Gardens</p> <p>Low to Medium Support</p>	<p>Math SG 2</p>	<p>Standards: MELDS.M.MP.PS.5 MELDS.M.G.PS.6 MELDS.M.G.PS.8</p>
---	--	----------------------	--



Image downloaded from Amazon.com

Guiding Math Ideas:

- Empowering Mathematical Thinking: Habits of Mind for School Success
- Manipulating Shapes

Math Concepts from Unit Learning Progressions:

- Applying problem solving skills to solve math and practical problems
- Orientation: Shapes retain their shapes despite their orientation
- Manipulating 2-D shapes- Slides flips and turns as foundational skills- Geometry and Algebra
- Integrating and utilizing shape and space concepts in class projects and problem solving

Materials:

- *Zinnia's Flower Garden*, Wellington
- For reference: *Shape Capers*, Falwell (Unit 2); *Perfect Square*, Hall (Unit 4), *Mouse Shapes*, Walsh (Unit 4); *More, Fewer Less*, Hoban (Unit 4)
- Tangram Patterns resource
- Crayons or markers
- Scissors (for Teacher Use; Optional child-sized scissors)
- Zipper- top bags
- Masking tape
- Commercial Tangram puzzles (Optional if available)

Math Vocabulary:

- Square, rectangle- 4 sided shapes we can see in many garden plans
- Tangram- a special puzzle with 7 different shapes
- Plot- an area within in a garden that has a certain kind of plant
- Parallelogram- special slanting rectangle with opposite sides parallel.
- Positional words: Between, on top of, beside

Preparation:

This Small Group takes place AFTER the read-aloud *Zinnia's Flower Garden* and builds on Small Group 1. Download and print the pangram patterns (on cardstock if possible). Have some colored tangrams AND some black/white tangram. Leave some Tangrams whole, both colored and black/white for use as references. Cut apart one set of colored tangrams per child and place each set in an individual zipper bag. Leave the black/white ones whole and cut apart after children have colored them. If your program has plastic or wooden tangram puzzles, place those in the math area for free play/reinforcement during the Unit. Place materials on Small Group Table.

Procedure:

Zinnia planned her garden and then she planted it. In Large Group, we made a People Flower Garden. In Small Group earlier this week, we made our own big flower garden mural on the wall. Show Zinnia's Flower Garden book.

What shape do you think Zinnia's Garden was?

Leaf through the book, which doesn't really give an overall picture of the garden. Children may name several types of shapes including rectangle and/or square. Reinforce their identification of these common shapes or other ideas they offer.

Place the large uncut tangrams on the table,

*This puzzle has a special shape and is called a **Tangram**. What do you notice about it?*

Children may identify the overall shape of a square. They may name the different shapes within the tangram. They may count and comment on the number of pieces.

*A **tangram** is a special 7 piece puzzle made up of several shapes.*

Let's play with our Tangrams for a while.

Give each child a bag of colored tangram puzzle pieces. Children work on their individual tangram sets.

*We are going to pretend that this **tangram** is Zinnia's Garden. There are lots of colors and shapes in Zinnia's Garden. We can call these different areas of the garden **plots**. That means a certain area where a person has planted the same kind of flowers. Some plots are big and some smaller.*

First let's look at the Colored Tangrams. What colors of flowers does Zinnia have in her garden?

Guide a discussion about the colors, size, relationships, and orientation, such as:

- *What color flower do you think Zinnia has the most of?*
- *What does she have the fewest of?*
- *Find 2 plots of flowers that are the same color.*
- *What shapes are in the corners?*
- *What shape is between two of the same color shapes?*
- *What shapes do you see in Zinnia's Tangram Garden?*

Children name shapes. Two shapes may be misnamed, so define them accurately.

*The green square is not a diamond. It is a square that is rotated onto one corner. The purple shape is a **parallelogram**. This is a special shape that looks like a slanted rectangle.*

Encourage the use of descriptive words about relative position (**corner, between, beside, on top of**, etc.)

Let's put our flower gardens together like Zinnia's.

Children continue to play with colored tangrams, copying the garden shape or making other shapes.

You might like to create your own special flower garden with colors you like. Here are some "gardens" that haven't been planted yet.

Distribute black/white tangrams and crayons/markers.

Invite children to color or draw flowers on the different "plots". If time permits, cut the black/white (now colored) sets apart during small group. If not, gather them and cut them for the children to use during free-play the rest of the Unit. Label a Zipper-bag and place a set of pieces inside, e.g. *Johnny's Tangram Garden*.

Some children may want to cut apart their own puzzles. Even though they likely will not be perfectly straight or accurate, they will be experimenting with cutting apart wholes and re-assembling them.

Wrap up activity. Save the pre-cut colored tangrams for use again in the math center. Individual colored puzzles can be saved for use during center time, before sharing or sending home.

Strategies to Provoke Math Thinking:

- Tangrams: Tangrams are tools that present, through tactile play, 2 important geometric and algebraic concepts: Visualizing mathematical relationships and manipulating shapes (mentally and physically). This activity connects with U5 Slide, Flip & Turn Activities.
- Links to Previous Units: *Shape Capers* (U2), *Mouse Shapes* (U4), *Perfect Square* (U4), *I Spy Shapes in Art* (U4) all encourage making, finding, building shapes or shape structures. Tangrams increase the challenge while building on previous skills. Display these books in the Book or Math Center.
- Accuracy: Use accurate mathematical terms such as *rhombus* and *parallelogram*. Point out the differences between rotated squares, such as found in the Tangram, and diamonds (another type of rhombus). Continue to add to children’s math vocabularies.
- Free Play and Observation: Free play with math manipulatives continues to be very important. Encourage lots of experimentation and combinations using tangrams-- inside of a frame, outside of a frame, matching patterns and making patterns. By using a finite set of 7 specific shapes,, children have freedom within limits, as they combine the shapes in many different ways Tangrams reinforce part-part-whole relationships. Tangrams are a precursor to ensuing geometry concepts: calculating area, mental manipulation of shapes, perspective & orientation.

Adaptations for Additional Challenge:

- Tangram Creative Puzzles: For additional fun with tangrams, download any of the 100s of online resources or consult classroom activity books of tangram puzzles, in which children use the 7 tangram shapes to create other shapes. There are also free tangram APPs on Google Play. Levels of difficulty can be easily adjusted. Experiment alongside the children. Some tangram shapes are quite challenging even for adults!

Documentation:

- These individual puzzle sets are great artifacts for children to bring to the Story/Telling/Sharing time. As children demonstrate their puzzle and talk about what colors of flowers they chose for their garden they will be using shape and color descriptors and words that describe mathematical relationships. Puzzle sets can also be sent home with children at the end of the unit with a brief note to parents about the puzzle.

Provocation:

- Remove the frames from wooden or cardboard puzzles and challenge children to fit the pieces together. Or create “frames, such as old picture frames, and have children make shape pictures inside the frames.