

Unit 5  Week 4	Small Groups: Mirror Building Low Support	Math SG 2	Standards: MELDS.M.CCC.PS.7 MELDS.M.G.O5.3 MELDS.M.MD.PS.11
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<p>Guiding Math Ideas:</p> <ul style="list-style-type: none"> ● Integrated Projects- STEM- Measuring ● Quantity- Reinforcement of all related concepts ● Combining 3-D Shapes <p>Math Concepts from Unit Learning Progressions:</p> <ul style="list-style-type: none"> ● Numerals communicate and represent math ideas. ● We can identify and utilize shape and space concepts in STEM ● Standard measurement means assigning numbers to things.
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<p>Materials:</p> <ul style="list-style-type: none"> ● Tub of Small 3-D Geometric Shapes ● Mirror Tiles or Old Mirrors- One per child or per 2 children ● Rulers ● Paper or Journal for Findings ● Resource books: <i>When I Build with Blocks</i> by Alling Unit 1 and <i>Changes, Changes</i> by Pat Jenkins (Unit 2) ● 3-D Shape Chart 	<p>Math Vocabulary:</p> <ul style="list-style-type: none"> ● Reflection: Light bouncing off of something smooth
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Preparation:

Collect or borrow old mirrors. Cheap mirrors or mirror tiles can also be purchased at craft or home improvement stores.

Gather materials in Small Group Area. Children can build on the floor or table.

Place the resource books (Building books used earlier in the year) on the table for reference.

Procedure:

This is an open-ended exploratory activity.

What have we been learning about reflection?

Children contribute answers.

A reflection happens when light bounces off of something smooth and shiny, like the water in the Puddle Pail, or windows or mirrors.

Today we are going to do some building and measuring in a special way.

Show mirrors and small blocks.

We are going to build right on top of these mirrors. I wonder what it will look like?

[Assign partners or have children build individually].

Building up these towers reminds me a little bit of the Tall Tree Trees we made or the pile of creatures in the Napping House!

*When you finish building, **observe** the way your mirror reflects the blocks. What does it look like?*

It would be fun to count how many blocks high your structure is and record it on our Small Group paper.

You can also measure your structure before you break it down and build another one.

Here are some rulers and some paper for you to record your work. One idea is to draw a picture of your structure and then write how tall it is. I'll be around to help you if you need me.

Children will use a wide range of skills as they think about how to measure their structures. As children build, some will experiment with measuring, drawing and counting. Some children will focus on stacking blocks. Some may write numerals. Others may identify numerals. Others will experiment with how to measure-- holding the ruler next to their structure, making marks, imitating measurement activities they have seen. All of these skills are foundational to the complex skill of measurement (See Strategies Below)

Be sure to name the different 3-D blocks accurately and observe children's identification skills. Refer to your 3-D shape chart, introduced in Units 1 and 2.

Use the books as resources and ideas for children as they create structures and towers.

Observe and support children's measuring and counting skills.

Take pictures of the structures before cleaning up.

Strategies to Provoke Math Thinking:

- Using Reflection as a Teaching Tool: The visual effects of mirrors enhances learning and piques children's interests. Perspective and iteration (repetition) of objects in the mirror connect to art. Many Montessori activities include building on or beside mirrors and observing the effect. What other surfaces in your classroom are reflective and could be used in creative ways?
- Standard Measurement: Experimenting with measurement tools started in Unit 2 and will continue through Unit 6. Mastery of the processes of standard measurement, takes years to develop beyond surface understandings. Some experts say children are ages 8 or 9 before having genuine understanding. Why? Measurement includes complex ideas about units, which change according to the tools used. Different systems of measurement are used in different contexts. Some measurements are additive (putting 1 cup of water into 1 cup of flour does not give us 2 cups of dough); some are cumulative. Plan regular activities in measurement to give children the chance to feel comfortable with tools, to imitate the steps of measurement and to solidify their understanding that measurement means assigning a number to the thing that is measured.

Adaptations for Additional learning:

- Building "Challenges"- Pair up children and give each child a set of the same geometric shapes. Challenge them to create as many different kinds of structures as they can and compare with their partner using identical sets of blocks.
- Mirror building game: Place a barrier such as a folder or box on the table between two children sitting opposite of each other. Using the color spinner, children take turns spinning and selecting

a block of the same color. They must then describe the shape they are using, without letting the other child know with the goal of building identical towers by using attribute descriptions.

Documentation:

Compare these structures to the ones children were building in Unit 2, when small geometric blocks were introduced. How have children grown in their skills, such as identifying shapes, counting, and using measurement tools? If children are building with a partner, how do they use math terms to communicate their ideas.

Provocation:

SWPL activities for this Unit include copying movements, such as the songs *Do What I'm Doing*, or *Mirror Mirror*. These activities have patterns and directionality embedded in them.