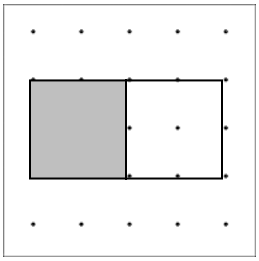


CONSTRUCTING TASK: Geoboard Fractions

Approximately 1 day

STANDARDS FOR MATHEMATICAL CONTENT

MCC1.G.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

If students have not had prior experience using geo boards, you will need to show them how to use the geo boards safely and properly.

ESSENTIAL QUESTIONS

- How can you divide shapes into halves and fourths?

MATERIALS

- Geoboards and rubber bands
- Small Geoboards Recording sheet, one per student
- Crayons/pencils

GROUPING

Large group, individual

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I

Distribute a piece of construction paper to all students. Demonstrate for them how to correctly fold their paper in half and have them do the same. Have them open up their paper to discover that halves were created by folding the paper equally. Next, demonstrate for them how to fold the paper again to create fourths. Discuss why these are considered fractional parts. Repeat the same procedure with various other shapes that can be divided equally in to halves and fourths. Then, give students other shapes that cannot be divided equally in to fourths, such as a triangle.

Part II

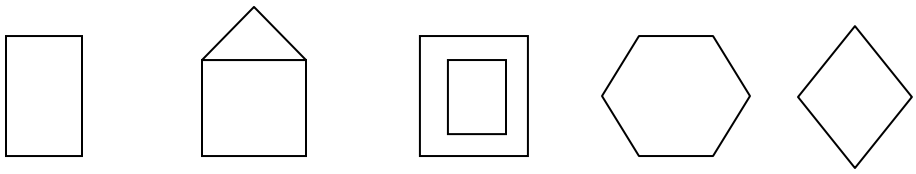
Gather students to a common area to discuss the use geoboards and making shapes. Start off the conversation by explaining to students the importance of safety when using rubber bands and how to properly place them on the boards. Model for students how to place the rubber bands on the geoboard and invite a few volunteers to model this procedure for their classmates. Once students seem to have an understanding of safety procedures, move the discussion to review various shapes the students have worked with in kindergarten and throughout this unit. As students recall the shapes they are familiar with, make a list on the board. Ask, *What clues could you give another student so that they could build a shape on the geoboard? What information would you and your partner need to know about specific shapes in order to build them correctly?*

Explain to students that they will work with a partner to create shapes on the geoboard. Tell them that they will take turns naming details about a shape's attributes as the other partner builds the shape on the geoboard. Once the shape is complete, the other partner will check their work and then switch roles. Model this procedure by inviting a student to come to the front of the group. Give them a geoboard and begin calling out details of a shape for them to build. As the student is building the shape, make comments about the student's technique and point out the safety measures being practiced. Once the student is finished, model how to check their work aloud (For example, "I called out the details of a trapezoid to Heather. I see that there are four sides, four vertices, and it is shaped like a trapezoid. She built the shape correctly!"). Before giving each pair of students a geoboard and materials, review safety procedures once again and what the dialogue between students should sound like while working (only one partner giving clear clues at a time, while the other builds).

Part III

Gather students back to a common area for a discussion of fractions and shapes. Invite students to share what they know about fractions and how shapes can be divided in to fractional parts. Lead students to discuss the various shapes that can be grouped to form another shape (ex: two triangles to form a square, two trapezoids to form a hexagon, two squares to form a rectangle, etc.).

Part IV
Model a shape or design on the geo board (see examples below) and students will independently recreate it on their geo board.



They will then record the shape in the first column on their recording page with a crayon and pencil. Then have the students divide the shape in half and record what they see in the second column. Finally, students will divide the original shape into four equal parts and record. Repeat with different shapes. Have students partner share their fractions describing their shapes and how they divided them.

FORMATIVE ASSESSMENT QUESTIONS

- Could you split the shape another way and still have equal parts?
- How many equal parts do you have?
- What strategies did you use to determine that you have equal parts?
- How we record the name of the fractional part?

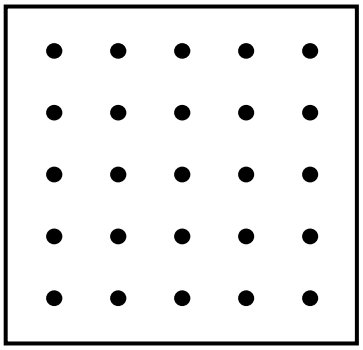
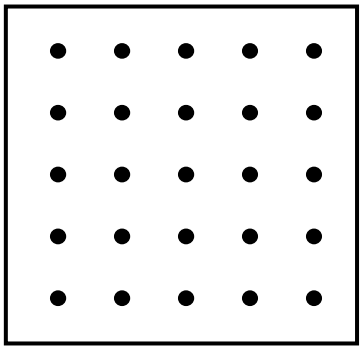
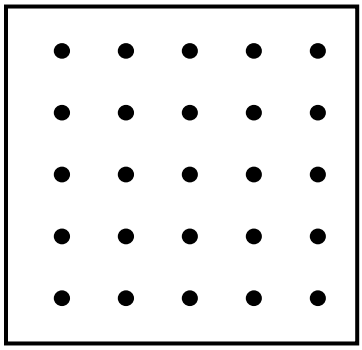
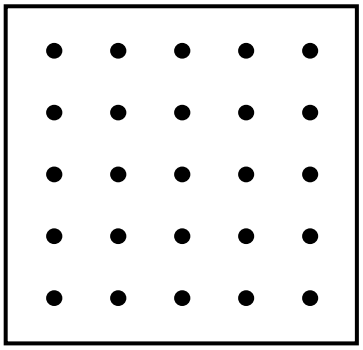
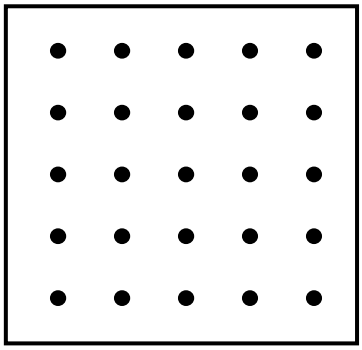
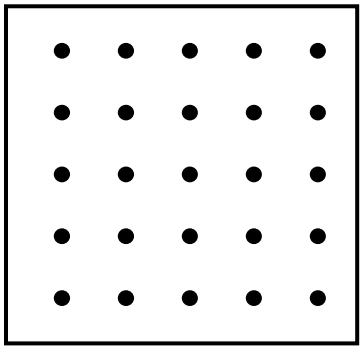
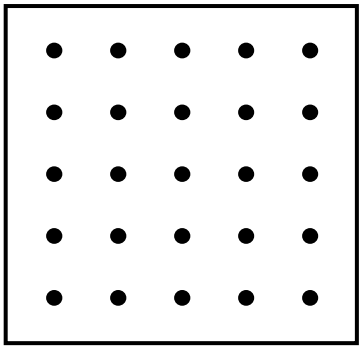
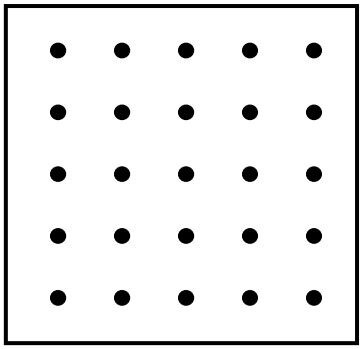
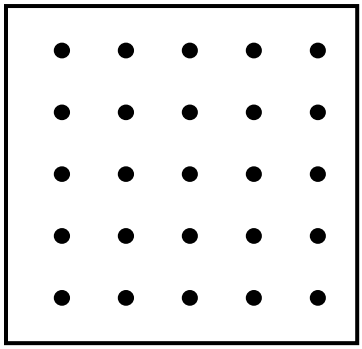
DIFFERENTIATION

Extension
- Have students work with a partner to build shapes on the geoboard. Partner 1 will call out attributes of a shape to partner 2 as he or she creates the shape on the geoboard. Then, once the shape is correctly made to partner 1's satisfaction, partner 2 will hand over the geoboard and give directions to partner 1 of how to divide the shape in to equal parts.

Intervention
- Draw shapes for student and have the student use the geo boards and bands to create the fractional parts.

Name:_____ **Date:**_____

Small Geo Boards

	Shape	Halves (1/2)	Fourths (1/4)
1			
2			
3			
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