

A Seat at the Table

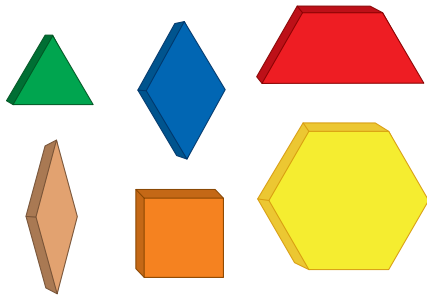
OBJECTIVE

Children will investigate the perimeter of polygons and of composite shapes in order to solve problems. They will also determine the perimeter of those shapes.

WHAT YOU WILL NEED

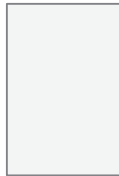
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Pattern Blocks



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Paper



OVERVIEW

In this activity, children explore perimeter by using one set of 6 Pattern Blocks to create shapes with different perimeters. Using the side length to indicate how many people can be seated at the table, they will use Pattern Blocks to create tables that can seat many people or just a few.

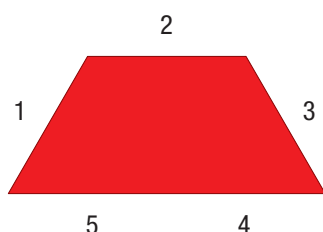
THE BIG IDEA

This activity provides an opportunity for children to build composite shapes and explore the idea of perimeter using nonconventional units.

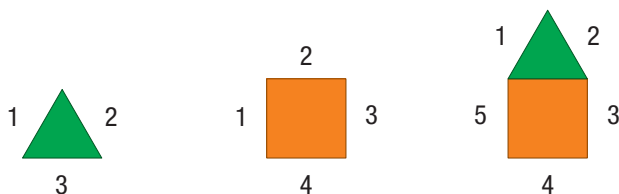
The context of finding a way to create tables that seat different numbers of people provides a reason for children to experiment with perimeter and is a way to apply nonstandard units within a meaningful context. Children equate 1 unit with the amount of space needed for one person to sit. They discover that more units along the outside of the shape equates with a larger perimeter and fewer spaces for people to sit along the outside with a smaller perimeter.



All of the shapes have side lengths that are equivalent to the side length of the orange square except for the trapezoid that has one side that is 2 units long. Make sure that children understand that this piece adds 2 units to the perimeter of the shape and can seat two people. Therefore, a single trapezoid can seat five people.



As children experiment with different ways to put the pieces together, they may initially think that combining a triangle with a perimeter of 3 with a square that has a perimeter of 4 will result in seven seats at the table. As they combine the pieces and find the number of seats, they will begin to understand that as they place two edges together, they lose two seats at the table.



Children may initially combine the pieces in a random fashion. Encourage them to begin to look for patterns and think about how the way in which they combine the pieces can either increase or decrease the amount of space that is available around the outside of the shape. Eventually, children will recognize that when the pieces are placed end to end, they maximize the number of seats at the table because they only lose one seat each time they add a new piece. Conversely, when they combine the pieces into a more compact figure, the number of seats decreases because many of the edges are trapped on the inside of the table.

By establishing the length of one side of the orange block as the length needed to seat one person, it helps children to differentiate the idea of *perimeter* (distance around the outside of the table) from *area* (the surface of the table). As children are working, encourage them to use the terms *perimeter* and *units* to clarify the language that they are using as they describe their tables. For example, when children say that a table can seat 12 people, say that the table has a perimeter of 12 units.

Because all children are using the same 6 blocks for every table, this activity helps them to understand that figures can have the same area but a different perimeter. It lays the groundwork for children's further work with solving problems involving area and perimeter.

1 INTRODUCTION

- ▶ Show children an orange square. Tell them to imagine that the square is a table. Tell them that each side of the square is enough space for one person to sit.
- ▶ Ask children to predict whether the other pieces would be able to seat more people, fewer people, or the same number of people as the orange square.
- ▶ Have children use the orange square to explore the perimeter of each of the Pattern Blocks by finding the number of people who can sit at each “table.”
- ▶ Tell children that they will be investigating how Pattern Block tables fit together in order to create a certain number of seats.

3 MATH TALK

Divide the board at the front of the room into two columns, labeled “Largest Perimeter” and “Smallest Perimeter.” Have children post their images next to each and write the number of people who can sit at the table. Provide children with an opportunity to look at and compare the images of the largest and smallest tables.

Use prompts such as these to promote class discussion:

- ▶ What do you notice about the tables that can seat the most people?
- ▶ What do you notice about the tables that can seat the fewest number of people?
- ▶ How do you know that you can’t make a table that would seat more people?
- ▶ How do you know that you can’t make a table that would seat fewer people?
- ▶ Why are we able to make tables that use the same pieces but have different perimeters?

2 ON THEIR OWN

Children will complete the On Their Own. During this time, the teacher’s role is to:

- ▶ ask probing questions to guide and extend
- ▶ record student thinking
- ▶ record student conversation that promotes collaboration

Use the information gathered to inform the Math Talk.

4 EXTENSION

- ▶ Have each child choose six identical Pattern Blocks. Challenge them to make a table that can seat either more than or fewer than the ones they created in the activity.
- ▶ Use this experience to have them think about how the shapes of the pieces affect the ways that they can be combined and the perimeters of the shapes that are created.

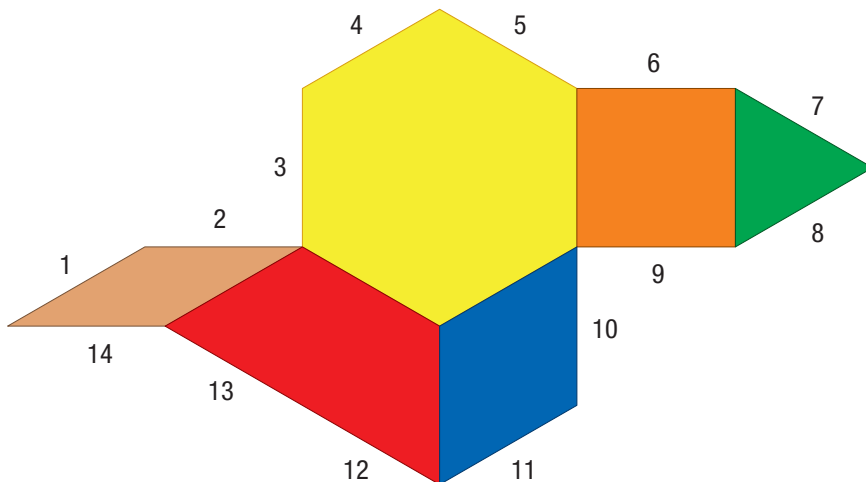
A Seat at the Table

ON THEIR OWN

Design a new table using each Pattern Block exactly one time in your design.

How can you arrange the pieces so that the most people can have a seat at the table? How can you arrange the pieces so that the fewest number of people can have a seat at the table?

- 1 Use all 6 Pattern Blocks exactly one time to create a design for a table.
- 2 For a person to sit at the table, he or she will need 1 unit of space along the outside. Find out how many people can sit at your table.



- 3 Rearrange the pieces to create a table that can seat a different number of people.
- 4 Continue to create tables until you have found the design that can seat the greatest and least numbers of people. Make a sketch of each design.
- 5 When you are finished, choose the table that seats the greatest number of people and the table you created that seats the fewest number of people.

Be prepared to share your table designs to discuss any patterns you notice.

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A SEAT AT THE TABLE

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A

A SEAT AT THE TABLE

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