

COVER THE GIRAFFE

GEOMETRY • MEASUREMENT • LOGIC

- Counting
- Area
- Spatial visualization

Getting Ready

What You'll Need

Cuisenaire Rods, 1 rod of each color per child

Cover the Giraffe worksheet, several per child, page 92

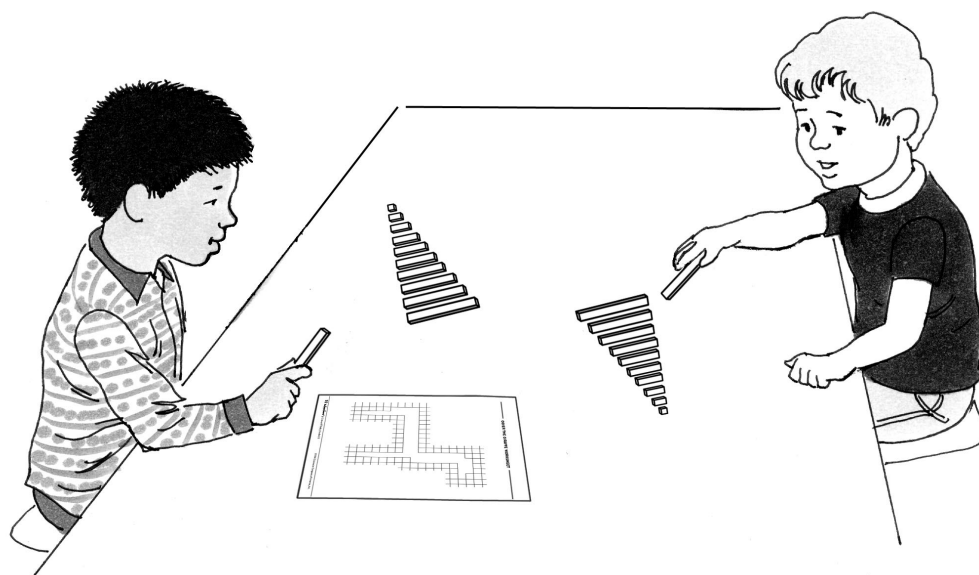
Crayons

Overhead Cuisenaire Rods and/or *Cover the Giraffe* transparency (optional)

Overview

Children cover the outline of a giraffe using a specified set of Cuisenaire Rods. They compare their work and try to identify as many different solutions as possible. In this activity, children have the opportunity to:

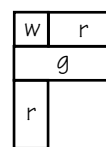
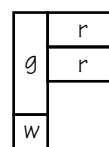
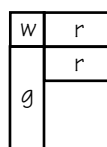
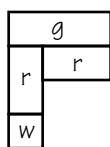
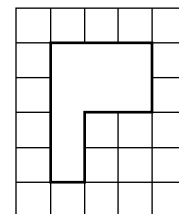
- ♦ develop spatial reasoning
- ♦ visualize a region as the sum of component parts
- ♦ find multiple solutions



The Activity

Introducing

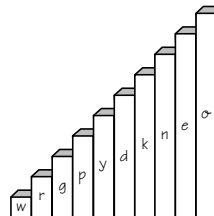
- ♦ Outline the shape shown on 1-centimeter grid paper. Then copy and distribute it.
- ♦ Challenge children to cover the outline using only 1 white rod, 2 red rods, and 1 light green rod.
- ♦ Establish that several different ways of covering the shape are possible.



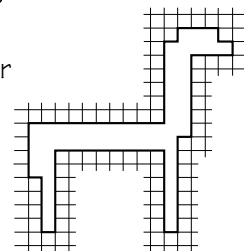
On Their Own

How can you cover the giraffe using just 1 Cuisenaire Rod of each color?

- Work with a partner. Each of you make your own Cuisenaire Rod staircase.



- Now use the rods from your staircase to completely cover a giraffe that looks like this.
- Compare your work.
- Record both solutions if they are different. Record just 1 of them if they are the same.
- On other worksheets, find more ways to cover the giraffe. Record each way.
- Be ready to talk about how you covered the giraffe.



The Bigger Picture

Thinking and Sharing

Invite children to post their solutions. Lead a discussion about the similarities and differences in the position of the rods

Use prompts such as these to promote class discussion.

- ◆ How many different solutions did the class find?
- ◆ Did finding the first solution make it easier to find more solutions? If so, how?
- ◆ When you began to cover a new giraffe, which rod did you place first? Why?
- ◆ Which rods were hardest to place? Why? Which were easiest? Why?
- ◆ Do you think that there might be even more ways to cover the giraffe? Why do you think so?

Extending the Activity

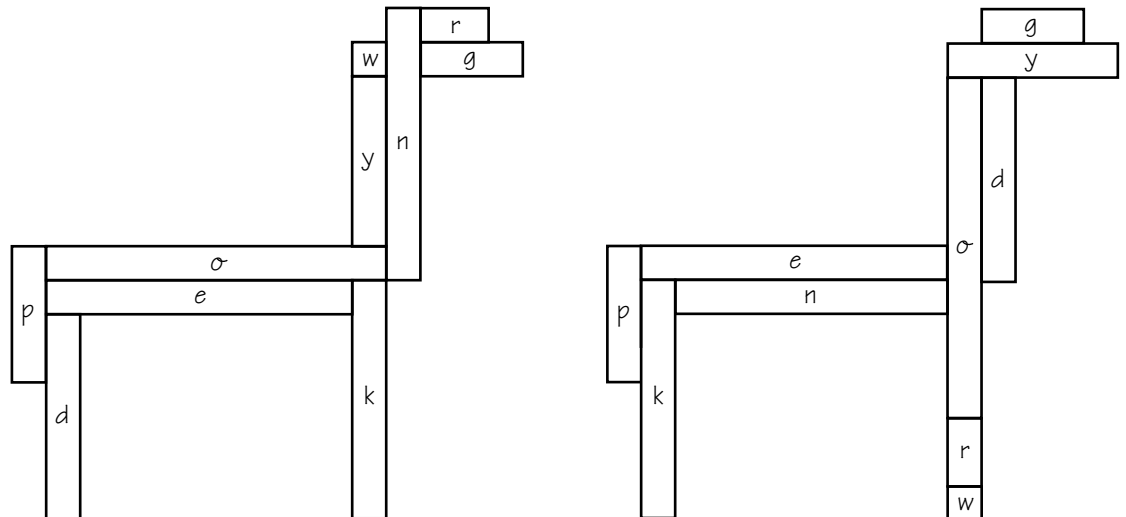
1. Ask children to use the rods from one of their solutions to figure out how many white rods they would need to cover the giraffe.
2. Have children create their own animal picture or design using one rod of each of the ten colors. Have them trace the outline of their work on 1-centimeter grid paper then challenge others to fill in the outline using only the rods from a staircase.

Teacher Talk

Where's the Mathematics?

Many children enjoy solving spatial puzzles, such as *Cover the Giraffe*. Some will do these puzzles with speed and ease while others will require more time and many tries. You are likely to find that children who excel at doing this are not necessarily the same ones who do well at computational tasks. Including activities, such as *Cover the Giraffe*, in your classroom can help you meet children's different learning styles.

The initial goal for this activity should be for children to find just one solution. As partners compare their solutions, additional approaches will emerge. This giraffe design has a great deal of flexibility so it lends itself to many solutions. Here are two solutions with quite different rod arrangements—in one case, the orange rod is placed horizontally; and in the other, it is placed vertically.



As children study their own and one another's solutions, they may see simple ways to find alternative solutions. For instance, in the right-hand arrangement on the previous page, the light green rod (the top of the head) could be easily switched with the red and white rods and a "new" solution would be found. Another easy switch would be to change the order of the rods in the column containing the orange, red, and white rods. The rods could be placed in different orders creating "new" solutions. Finding easy switches such as these helps children see a concrete explanation for how one number may have multiple representations.

Children may find that the grid marks outside the outline help them predict which rods will fit inside. They can count the number of grid squares to find the length of the rod that will fit inside the outline. Children frequently find it easier to place the longer rods into the outline first and then move the shorter rods around to fill in the remaining spaces.

This activity provides a chance for children to work with the concept of area on an informal basis. The giraffe has a constant area of 55 square centimeters but that area may be broken down into smaller areas in scores of different ways. Later, in middle school and in high school, children will use this same idea to break complex areas into smaller shapes that are easier to work with. For example, it is easier to find the area of the complex shape below if it is broken down into a rectangle, a semicircle and a triangle.

