

# SHOPPING FOR RODS

NUMBER

- Counting
- Ratio and proportion
- Dealing with money

## Getting Ready

### What You'll Need

Cuisenaire Rods, at least 2 sets per group

*Shopping for Rods Spinner 1, 1 per group, page 97*

*Shopping for Rods Spinner 2, 1 per group, page 98 (optional)*

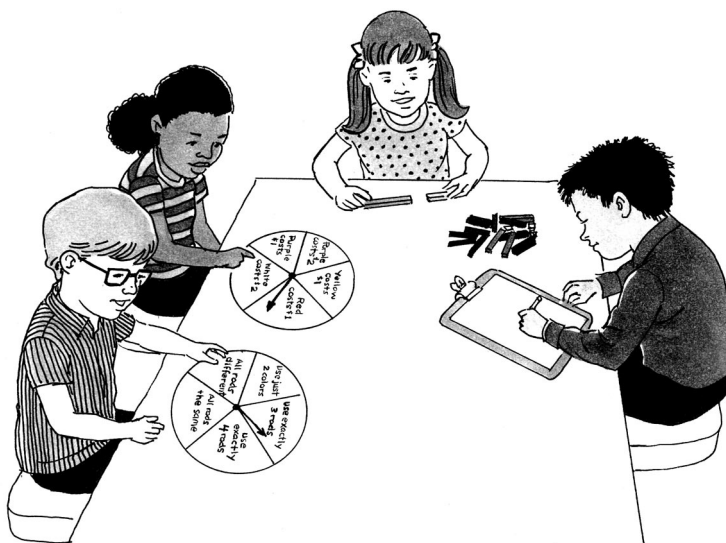
Play money (optional)

Overhead Cuisenaire Rods and/or *Shopping for Rods Spinner* transparencies (optional)

## Overview

Children use a spinner to find the cost of one Cuisenaire Rod. They use this value to figure out the cost of other rods and then determine a combination of rods that they could buy with \$10.00. In this activity, children have the opportunity to:

- ♦ compute mentally
- ♦ work with money concepts
- ♦ use ratio and proportion
- ♦ discover relationships among Cuisenaire Rods



## The Activity

### Introducing

- ♦ Tell children to imagine that the Cuisenaire Rods are for sale and that the white rod costs \$1.00.
- ♦ Invite volunteers to explain why the red rod should cost \$2.00.
- ♦ Once it is established that the red should cost twice as much as the white because it is twice as long, have children figure out the cost of a rod of each of the other colors.
- ♦ Show children that the cost of some rods can be determined in more than one way. To illustrate this, display the following:

w	w	w	w	w	w	w	w
n							

r	r	r	r
n			

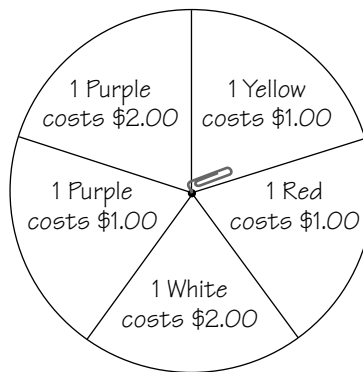
p	p
n	

- ♦ Point out that the cost of the brown rod, \$8.00, can be found by counting by ones, by twos, or by fours.

## On Their Own

### *How many Cuisenaire Rods could you “buy” with \$10.00?*

- Work with a group. Pretend that your group has \$10.00. You must spend it all to “buy” Cuisenaire Rods.
- To find the price of a particular rod, one of you spins a spinner that looks like this.
- Use the results of the spin to find the prices of other rods. For example, if you spin “1 white rod costs \$2.00,” a light green rod will cost \$6.00 because it is 3 times longer than the white rod.
- Use the prices of the rods for your spin to answer these questions:
  - ♦ What is the least number of rods you could buy for \$10.00?
  - ♦ What is the greatest number of rods you could buy for \$10.00?
  - ♦ What number of rods between the least and greatest numbers could you buy for \$10.00?
- Take turns spinning until each member of the group has had a turn with a different starting price. For each turn, find the price of the rods and answer the questions above.
- Record your answers and any patterns you notice.



## The Bigger Picture

### *Thinking and Sharing*

Invite a group to describe how they spent their \$10.00 based on the results of a spin. Invite other groups that had an identical spin to share how their \$10.00 purchases were the same or different from the first group's. Continue to invite groups to share their results until every group has reported.

Use prompts such as these to promote class discussion:

- ♦ How did you use the cost of one rod to find the cost of the other rods?
- ♦ If the spinner showed ———, then how much would a ——— (name a color) rod cost? Explain.
- ♦ What did you do to find out which rods and how many of each would cost you \$10.00?
- ♦ Can different combinations of rods cost the same? Explain.
- ♦ What patterns did you notice?

## Writing and Drawing

Ask children to pretend that they work for the company that makes Cuisenaire Rods. Have them design an advertisement that includes a price list for the rods based on the fact that one yellow rod costs \$0.75.

## Teacher Talk

### Where's the Mathematics?

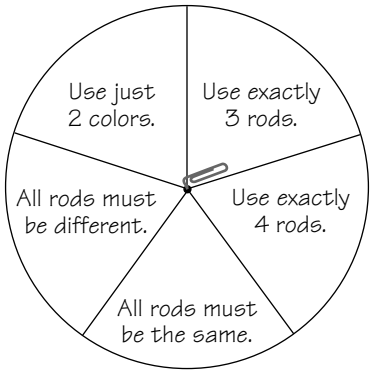
By starting with an assigned value for one Cuisenaire Rod and using that value to find the cost of other rods, children use proportional reasoning based on their understanding of the relative lengths of the rods. In four of the spinner outcomes, this proportional reasoning will lead to work with fractions of a dollar. For example, if the spinner stops on *1 Purple costs \$2.00* or *1 Red costs \$1.00*, then the rods have values in multiples of \$0.50. If the spinner lands on *1 Purple costs \$1.00*, then the rods have values in multiples of \$0.25. The greatest challenge may arise when the *1 Yellow costs \$1.00* is spun because then the rod values occur in multiples of \$0.20. If any of these amounts seem too challenging for your class, you can adapt the entries on the spinner accordingly. Some groups may find it helpful to use play money to enact parts of this activity.

Children employ a variety of strategies for spending their allotted \$10.00. Some will concentrate on the monetary values by figuring out how much a white rod costs based on the value given on the spinner and then making up a chart listing the cost of each rod. For example, when they spin *1 Yellow costs \$1.00*, their chart might look like this:

white	\$.20
red	\$.40
light green	\$.60
purple	\$.80
yellow	\$1.00
dark green	\$1.20
black	\$1.40
brown	\$1.60
blue	\$1.80
orange	\$2.00

Extending the Activity

- 1. Have children create a picture or a design with Cuisenaire Rods and then spin the spinner to figure out the “cost” of their picture/design.
- 2. Add a second spinner (page 98) to the activity. The group spins the spinner given in *On Their Own* to find the cost of each rod and then spins this spinner to find an additional condition for spending their allotted \$10.00, or an amount as close to \$10.00 as possible.



Children then use the values on the chart to buy the rods, stopping occasionally to find out the total amount of money they have spent and using trial-and-error at the end to make sure the amount comes out to \$10.00 exactly.

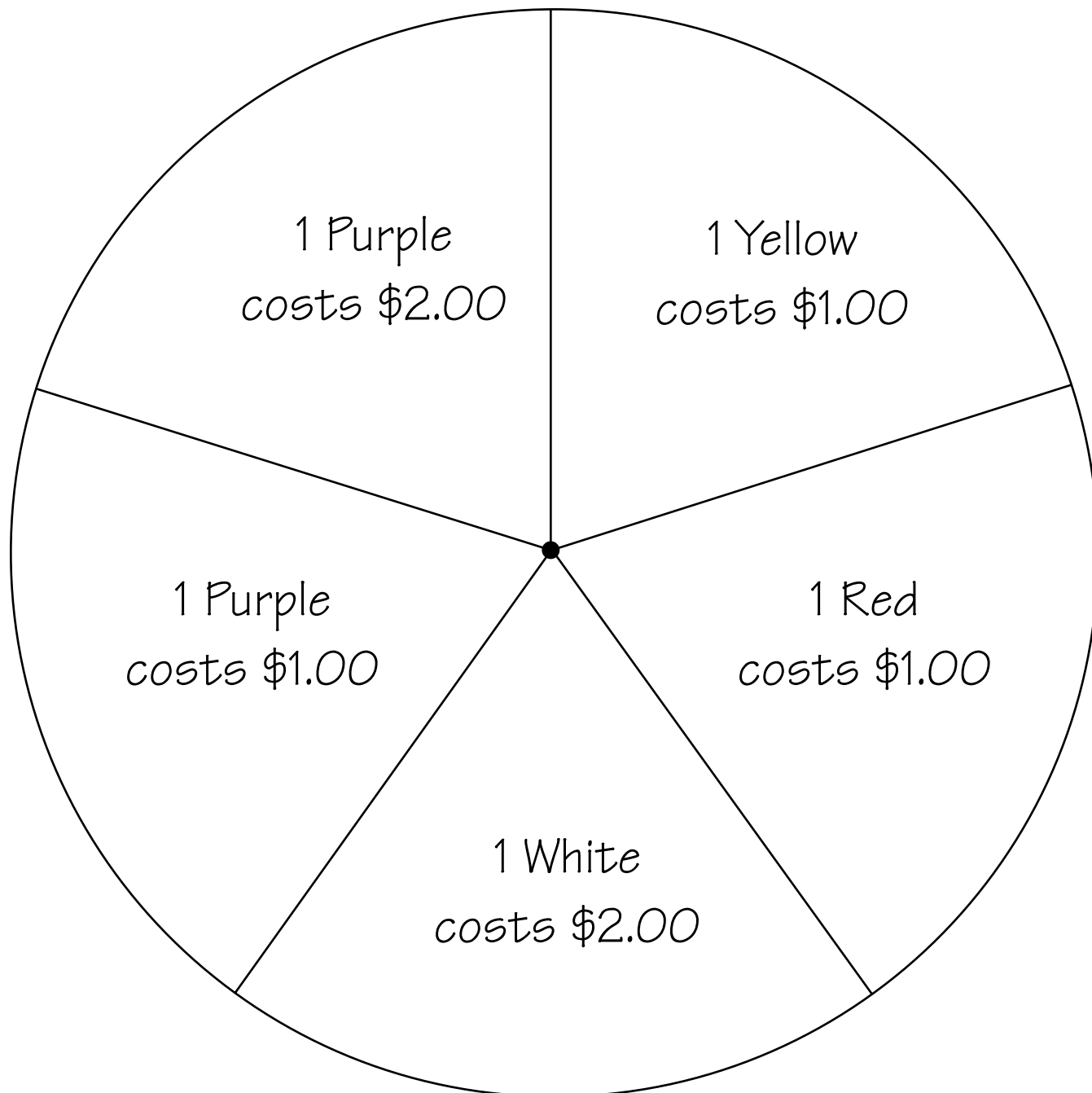
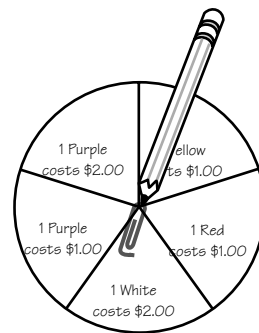
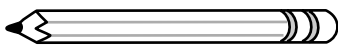
Other children might work directly with the rods instead of concentrating on the monetary value of each rod. For example, they might look at the value on the spinner, such as *1 Purple costs \$2.00*, figure out that they could buy five purple rods for \$10.00, and then trade the one or more purple rods for rods of an equivalent length until they have answered each of the three questions in the activity.

Finding the least number and greatest number of rods gives children some parameters when looking for an in-between number of rods. This chart indicates the minimum and maximum number of rods for each case on the spinner:

Possible spin	Least number of rods	Greatest number of rods
1 Yellow costs \$1.00	5 orange	50 white
1 Red costs \$1.00	2 orange	20 white
1 White costs \$2.00	1 yellow	5 white
1 Purple costs \$1.00	4 orange	40 white
1 Purple costs \$2.00	2 orange	20 white

Children might notice that two of the sections on the spinner—*1 Red costs \$1.00* and *1 Purple costs \$2.00*—have identical outcomes. Children might also make generalizations such as “The less the white rod costs, the more rods you can buy for \$10.00” or “You can always buy ten times more white rods than orange rods” or “When the white rod costs \$2.00, there aren’t very many different solutions.” Statements such as these show that children are developing a firm grasp of proportional thinking.

## SHOPPING FOR RODS - SPINNER 1



## SHOPPING FOR RODS - SPINNER 2

