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A versatile collection of 10 colored rectangular rods, Cuisenaire® Rods are used to develop a variety of math skills. Each rod’s color corresponds to a different length. The shortest rod, the white, is 1 centimeter long; the longest, the orange, is 10 centimeters long. When the rods are arranged in order of length into a pattern commonly called a “staircase,” each rod differs from the next by 1 centimeter. This allows you to assign a value to one rod and then assign values to the other rods based on the relationships between the rods. One set contains 74 rods, distributed in the quantities shown below. The 10 colors are referred to as follows:

- o = orange (4)
- e = blue (4)
- n = brown (4)
- k = black (4)
- d = dark green (4)
- y = yellow (4)
- p = purple (6)
- g = light green (10)
- r = red (12)
- w = white (22)

Using letters to represent the rods exposes students to the kind of symbolic thinking they will use later in algebra.

With Cuisenaire Rods, students can explore spatial relationships by making flat designs on a table or by stacking them to make three-dimensional designs. They soon discover how some combinations of rods are equal in length to other, single rods. This understanding provides a context for investigating symmetry.

Older students may focus on comparing the lengths of the rods and recording the results on grid paper. This helps them visualize the inherent “structure” of a design and gives them practice in using grade-appropriate arithmetic and geometric vocabulary.

Though students need to explore freely, some may appreciate specific challenges, such as being asked to make designs that show fractional equivalence between two groups of rods.

**Working with Cuisenaire Rods**

Cuisenaire Rods provide a basic model for the numbers 1 to 10. The white rod can stand for 1, and the red rod can stand for 2 because the red rod has the same length as a “train” of two white rods. The rods from light green through orange are assigned values from 3 through 10, respectively. The orange and white rods provide a model for place value. A “train” of 4 orange rods (“tens”) and 3 white rods (“ones”) is 43 white rods long.

**Multiplication with Cuisenaire Rods**

You can model multiplication for your students using rods. First, show them the following trains with each corresponding multiplication sentence:
In these equations, the first number is the multiplier, the second number is the multiplicand, and the final number, 6, is the product. In presenting multiplication with Cuisenaire Rods, the multiplicand is always the numerical equivalent of a single rod. For example, in the equation 2 x 3 = 6, the 3 stands for the light green rod, and to solve this equation with rods, students would need 2 light green rods to find the product, 6. Throughout this book’s activities, the multiplicand will always represent a particular Cuisenaire Rod, while the multiplier will tell the student how many of that rod to use.

Building on those concepts, the activities in this book are presented in a sequential order from easiest to most challenging. Live-Action Frogs familiarizes students with the idea of multiples and lays the groundwork for later work with factors. From there, students move to more challenging activities, Rod-ability and Don’t Fall Through the Ice, in which they must make decisions about which rods to pair in order to reach particular quantities. These activities will strengthen their understanding of multiples and of how multiples look in three dimensions. Rod-ability, in particular, will enhance their knowledge of multiplication facts. After completing the activity for Don’t Fall Through the Ice, more advanced students can create multiplication sentences to describe the games they’ve just played. Next, Packing It In gives students an opportunity to use multiplication to find the volume and surface area of several boxes. Finally, in Rod Rulers students use their knowledge of factors and multiples to perform multiplication and division to convert measures.

**Division with Cuisenaire Rods**

You can also model division using rods. First, show students the following trains:

```
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>d</td>
<td>r</td>
<td>r</td>
</tr>
</tbody>
</table>
```

Ask: A dark green train can be divided into how many red rods?

From this simple introduction, you can guide students through several activities in this book. For example, after students have a good grasp of the multiplication involved in Live-Action Frogs and Rod-ability, use the included blacklined masters to give students a chance to practice division with rods in the context of the related activity. After completing the activity for Don’t Fall Through the Ice, more advanced students can create division sentences to describe the games they’ve just played. Lastly, in Rod Rulers students solve multiplication and division problems to convert a measure expressed as one rod color into a measure in terms of another rod color. The combined activities expose students to division with Cuisenaire Rods.

**Where Do We Go from Here?**

Cuisenaire Rods are also effective models for investigating more advanced math operations and concepts, including Fractions and Decimals, Geometry, Measurement, Number Patterns, and Logical Reasoning. Look for these other titles in the Using Cuisenaire® Rods series:

- LER 7527 Using Cuisenaire® Rods: Addition & Subtraction
- LER 7529 Using Cuisenaire® Rods: Fractions & Decimals
- LER 7530 Using Cuisenaire® Rods: Geometry & Measurement

The activities in Using Cuisenaire Rods: Multiplication & Division are consistent with the vision of mathematics teaching described in the Principles and Standards for School Mathematics published by the National Council of Teachers of Mathematics. All of these activities involve the use of the Process Standards: Problem Solving, Reasoning and Proof, Communication, Connections, and Representation. Each activity also focuses on one or more of the following Content Standards: Number and Operations, Algebra, Geometry, Measurement, or Data Analysis and Probability.
Using a copy of the Lily Pad Strips worksheet, answer each question below. Then fill in the number needed in each problem.

1. Which frog can jump 3 times to move 15 spaces? ______

2. Which frog can jump 5 times to move 15 spaces? ______

3. Which frog can jump 9 times to move 18 spaces? ______

4. Which frog can jump 3 times to move 18 spaces? ______

5. Which frog can jump 2 times to move 14 spaces? ______

6. Which frog can jump 4 times to move 16 spaces? ______

7. Which frog can jump 13 times to move 13 spaces? ______

8. How many times must an e frog jump to move 18 spaces? ______

9. How many times must a g frog jump to move 18 spaces? ______

10. How many times must a p frog jump to move 20 spaces? ______
Discover hundreds of classroom applications for the most versatile hands-on math tool! This expansive series provides step-by-step teaching strategies and all the reproducible resources you’ll need to present major math concepts to students in Grades 1 through 6. Developed by educators to conform to the NCTM’s latest content strands and topics, each 48-page book’s six field-tested, comprehensive units include:

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• In-depth hands-on activities
• Blackline masters
• Assessment worksheets
• Math extensions
• Detailed teaching notes

Look for the other fine Cuisenaire® Rods products available from Learning Resources®:

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LER 7529 - Using Cuisenaire® Rods: Fractions & Decimals, Grades 3-6
LER 7530 - Using Cuisenaire® Rods: Geometry & Measurement, Grades 3-6
LER 7500 - Cuisenaire® Rods Introductory Set (Plastic)
LER 7501 - Cuisenaire® Rods Introductory Set (Wood)
LER 7504 - Cuisenaire® Rods Activity Set Gr. PreK-2 (Plastic)
LER 7505 - Cuisenaire® Rods Activity Set Gr. PreK-2 (Wood)
LER 7508 - Overhead Cuisenaire® Rods