Learning Resources®

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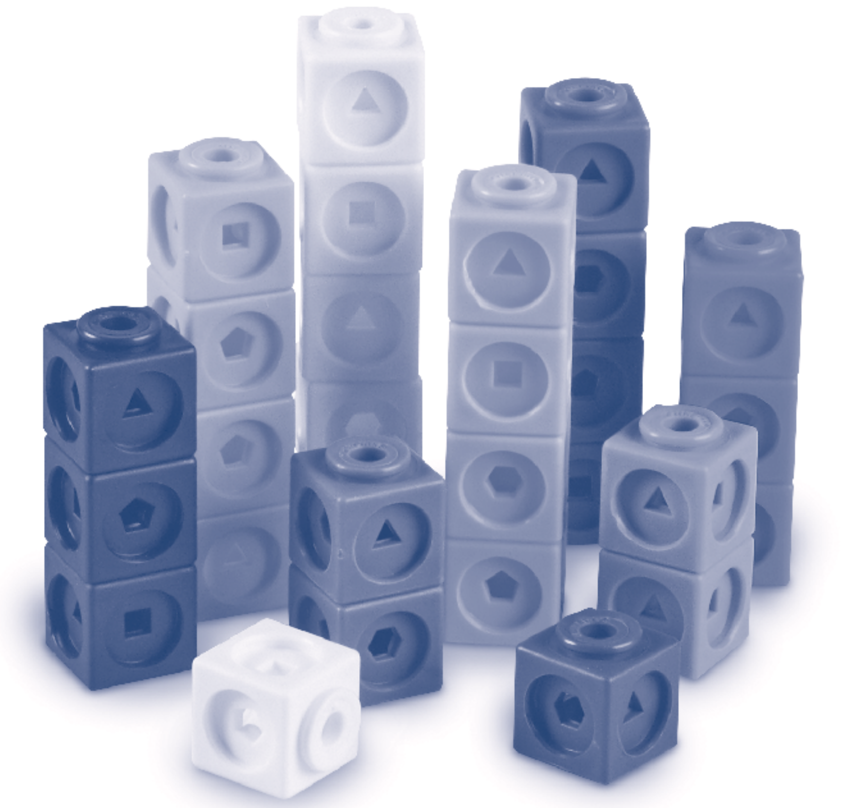
grades K+

MathLink® Cubes

Cubos MathLink® • Cubes MathLink® • MathLink® Steckwürfel



Activity Guide

Guía de actividades • Guide d'activités • Spielvorschläge

⚠ WARNING:
CHOKING HAZARD - Small parts.
Not for children under 3 years.

MathLink® Cubes link together on all sides and come in ten bright colors: blue, green, yellow, red, orange, black, purple, brown, pink, and white. This hands-on manipulative can be used to teach a variety of mathematical concepts, including counting, sorting, patterning, addition, subtraction, multiplication, division, measurement, fractions, area, and perimeter.

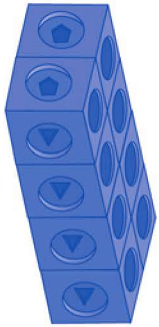
MathLink Cube activities can be used for whole group, individual, or small group instruction. The following teacher-tested activities are for grades K–8.

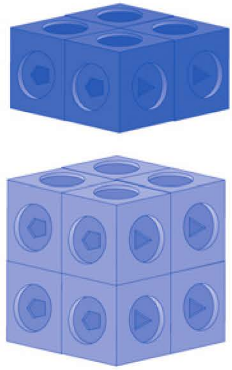
Grades K–2

Concept: Comparing four-sided figures

Grouping: Pairs

Materials (per pair):
20 MathLink Cubes





Procedure:
Have students use four of their cubes to build a closed figure. Compare and contrast the resulting four-sided figures by discussing the following:

Does everyone's figure look the same? Explain.

- How many sides are on each shape? (4)
- How many corners or vertices? (4)
- What angle are the corners? (90°)

Have students use eight cubes to build another four-sided figure. Compare and contrast the new four-sided figures as above. Have students discuss the differences between squares and rectangles. (All are four-sided figures with two pairs of parallel sides and four 90° angles. All four sides of a square are the same length.)

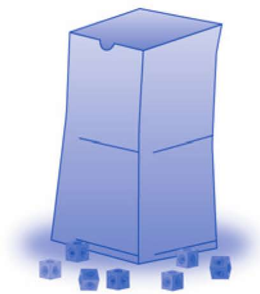
Students can repeat the activity with different numbers of cubes, then explain to their partners whether they have created a square or rectangle.

Grades 3–5

Concept: Exploring fractional parts of a group

Grouping: Small groups of 2–4 students

Materials (per group):
20 MathLink Cubes in 2 colors • Paper • Pencil • Paper Lunch bag



Procedure:
Place all the cubes in the paper bag. Have one student take a handful of cubes from the bag without looking. Have students decide what fractional part of the group each color represents by following this format:

- Count the total number of cubes taken out of the bag (i.e., 7 cubes were taken from the bag, 3 red and 4 blue).
- Count the number of red cubes (3). The fractional part of the red group is 3/7, because 3 out of 7 cubes are red.
- Count the number of blue cubes (4). The fractional part of the blue group is 4/7, because 4 out of 7 cubes are blue.

Have students record their findings on paper. Then have them take turns repeating the process several more times.

Extension:
For an extra challenge, add a third and fourth color to the bag and have students repeat the activity several more times.

Grades 6–8

Concept: Perimeter, area, volume

Grouping: Small groups of 2–4 students

Materials (per group):
40 MathLink Cubes • Isometric Dot Paper • Paper • Pencil

Procedure:
This activity will help students better understand the relationship between area, perimeter, and volume.

Take one MathLink Cube and discuss with students the length (1 unit), width (1 unit), and height (1 unit) of the cube.

Draw the cube on a sheet of isometric dot paper, then trace the base of the cube on a sheet of plain paper.

As students explore the cube dimensions, ask the following questions:

- What is the shape of the base? (square)
- How can you determine the area of the base? (length x width or A = lw)
- What is the area of the base of one MathLink Cube? (1 square unit or 1^2)
- What is the perimeter of the base of one MathLink Cube? (4 units)
- How do you think that you could find the volume of one MathLink Cube? Remind students that volume is the amount of “stuff” that it takes to fill a cube. (length x width x height)

Explain that another way to look at volume is V = Bh, where B equals the area of the base and h is the height of the figure. Discuss how area, perimeter, and volume are related. Repeat using two, three, and four or more cubes until students are comfortable with the concepts. Discuss their findings as you did above.

Divide a sheet of plain paper into six columns. Label the columns *length*, *width*, *height*, *area of base*, *perimeter of base*, and *volume*. Choose 12 MathLink Cubes and build as many different rectangular prisms as possible. Record the length, width, and height of each prism in the appropriate column. Use the recorded information to determine the area and perimeter of each base and the volume of each rectangular prism created.

Discuss:
As students explore the characteristics of rectangular prisms, ask the following questions:

- Did you notice anything unexpected? Explain. (All volumes are the same.)
- Why are all volumes the same? (Each prism was created from 12 cubes.)
- How do the area of the base and perimeter compare? (Although the same number of cubes are used to build the prism, the area and perimeter are determined by which face is identified as the base.)

Using 10 MathLink Cubes, create as many figures that are one unit in height as possible. Copy the figures on a sheet of paper and label each side.

- What is the area of each figure? Explain.
- What is the perimeter of each figure?
- Explain why the area is the same for each figure, but the perimeter differs.
- Which figure has the smallest perimeter? Which has the largest? Explain.

Using 12 MathLink Cubes, create a figure that will have the greatest perimeter, and a figure that will have the smallest perimeter. Explain.

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