Build It!

Concept Areas

Geometry and spatial reasoning in three dimensions, logic in a geometrical setting. Using vocabulary: cube, face, edge, side, touching, above, below, each, every.

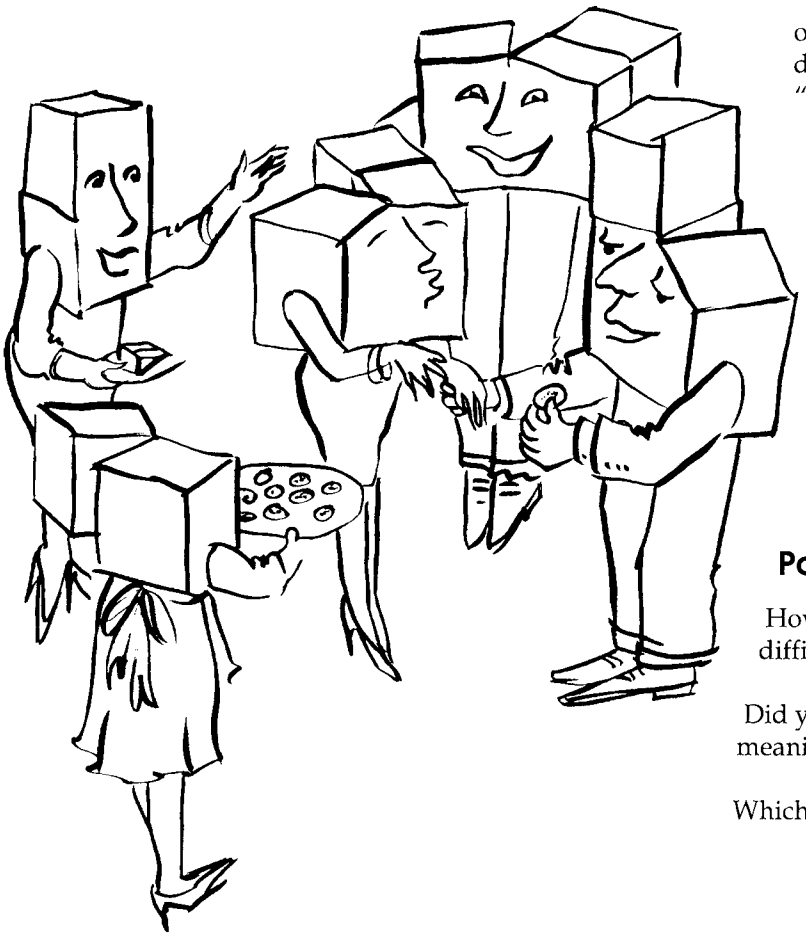
Description

The group needs to build a small structure out of colored cubes. Each clue tells something about the structure, for example, "there is a red block below the green block," or "the two orange blocks share an edge." In some problems, students have to deduce what blocks they need from their clues. In one problem, each clue restricts its holder to touching only one color of block.

These problems are popular starters. They're fun, and the first few are pretty easy without being trivial.

For Each Group:

- Colored cubes. You can solve every problem in this family by using a subset of eleven cubes: two each of red, blue, yellow, green, and orange, and one purple.



Purpose

We could go on for pages about the importance of geometry as part of mathematics learning at all levels. Let's just make three points here:

- First, the clues use mathematical language and force problem-solvers to use words like "face" and "edge" to get their clues across to others. Furthermore, students get into good discussions about whether "below" means "below and next to."
- Second, most geometry instruction is two-dimensional, yet we live in a 3D world. Learning to think in three dimensions is powerful and useful.
- Third, incorporating math language and 3D thinking will help those students who will need it the most—the students who don't often play with toys that enhance spatial visualization

Possible Debriefing Questions

How would you make these problems more difficult?

Did you use any words that had more than one meaning to the group?

Which was your favorite problem? Why?

Build It #1

There are six blocks in all.

One of the blocks is yellow.

Build It #1

The green block shares one face with each of the other five blocks.

Build It #1

The two red blocks do not touch each other.

Build It #1

The two blue blocks do not touch each other.

Build It #1

Each red block shares an edge with the yellow block.

Build It #1

Each blue block shares one edge with each of the red blocks.