



Super-Cube Shuffle

The Big Idea:

Special blocks called Super-Cubes are colored half red and half white. You'll use these special blocks to create your own designs. Then you'll try to copy different designs one after the other – soon, you'll be a Super-Cube pro!

You Will Need:

- ★ Red and white cubes: 16 per kid
- ★ 1 set of Super-Cube Designs

Purchase the cubes here:

<http://bedtimemath.org/make-a-purchase/>.

We charge only the cost of making the cubes and shipping them to you.



The Math Behind the Scenes:

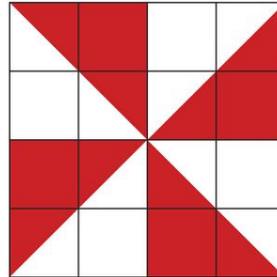
Super-cubes use geometry, a subject where many kids have natural abilities they hardly get to show off in school. In this game, kids use symmetry, rotational and spatial skills to see how shapes fit together.

- ★ Pattern recognition
- ★ Spatial relations: orientation of triangles and slopes
- ★ Reflective and rotational symmetry

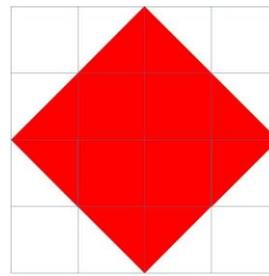
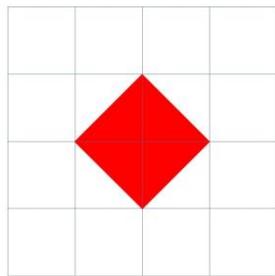
Tricks of the Trade

Start by exploring with the cubes and seeing what shapes can be made. See if you can create these:

- ★ sideways (horizontal) stripes
- ★ a big red triangle
- ★ a diamond
- ★ a diagonal stripe or stripes
- ★ a pinwheel, like this one →



How many sizes of diamonds can you make using some or all of your cubes? See if they catch these 2 sizes, and any others!



For older kids:

- ★ What's the fastest way to change your design from red to white (or white to red)?
- ★ Is your design symmetrical in any way? What does that mean?
 - Mirror image symmetry: either the right side looks like the left side flipped over, or the top half looks like the bottom flipped.
 - Rotational symmetry: if you turn the whole design 90 degrees (to the next corner), you see the same design.

Bonus: How many lines of symmetry does a square have? In other words, on how many lines can you fold a square so the 2 halves line up? (Answer: 4 lines - top edge to bottom edge; left edge to right edge; top left corner to bottom right corner; and bottom left corner to top right corner.)

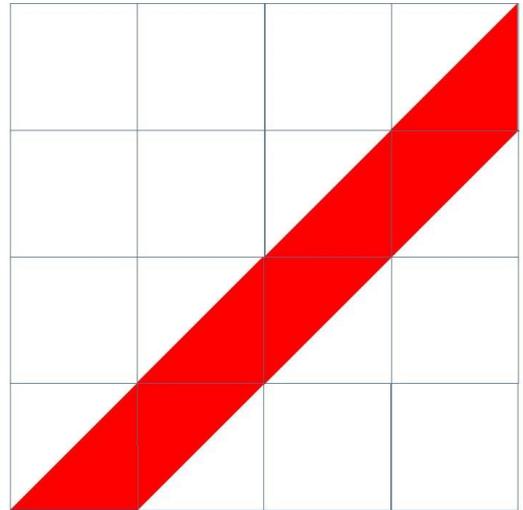
Match the Map

Now you're going to use your cubes to make a cool new design. See if you can copy this map!

1. Kids use their cubes to make the stripe design shown below.

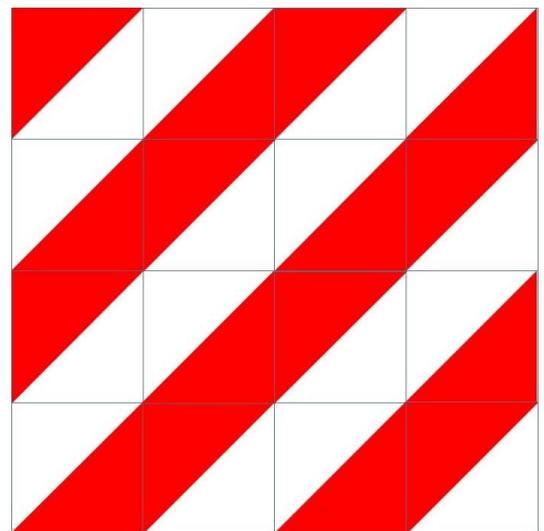
For younger kids: 

- ★ Without counting, how many red triangles do you guess are in that stripe?
- ★ Now count to check!
- ★ How many plain white squares did you leave showing?



For older kids: 

- ★ How many triangles are there in total? (Let the kids try to figure out how to do this without counting each one, i.e. there are 2 triangles per square, how many squares, etc.)
- ★ How many of those triangles do you think are red – without counting? (See if they figure out that's it's 1/2 of them.)
- ★ What do you think will happen if you move the column of blocks all the way on the left to the right side?



Take the Triangle Tour

Now see how many designs you can master!

1. Print off the designs on the following pages (marked grades K-2 or 3-5 as appropriate)
2. Use your cubes to copy the first design. Then move onto the next design.
3. Challenge a sibling to a race – see who can complete more designs in 1 minute, 2 minutes, etc.
4. Make a grid on a piece of paper and make up your own designs. The fun can go on and on!