Discussion on the rug:

The teacher asks the class, “Where do the animals in the zoo live?” The teacher invites students to tell the whole class about cages or pens at the zoo. The teacher says, “Suppose we want to make a cage or pen where an animal can live. We want to make our pen out of these cubes.” The teacher shows the multi-link cubes to the class. “We want to make the pen as big as possible so the animal can roam around, but we have only 20 cubes we can use. What shape can we make?” The teacher asks the class. Students share their ideas. Then the teacher shows two different pens—one with interior dimensions 1 by 7 and a second with interior dimensions 3 by 5—to illustrate what is meant by different. The teacher says, “I would like you to go back to your desk and work with your partner and make all the different possible shapes using 20 cubes.”

In pairs: Students have cubes and grid paper available.

Teacher says, “Look at all the animal-pen shapes you made. Which shape has the most room for the animal?” Students work together to find a solution. After the students are done, the teacher asks students to share their answers and how they know.

At the end of the investigation: Students either discuss or dictate a response to this summary question: “Show all the shapes you can make with 20 cubes. Explain which shape has the most room for the animal. How do you know?”