

# Supersize my Supermaze

Grades 9-12: Pre-trip Activity I



## PERFORMANCE GOALS:

Students will learn the methods used to “scale-up” a two-dimensional figure while maintaining its fundamental geometrical form.

## OBJECTIVES:

- Students will now learn how geometrical figures are “scaled-up” (enlarged) with a high degree of accuracy.
- Students will understand how the principles involved in scaling-up a drawing apply to everything from corn mazes to office towers.

## NATIONAL STANDARD:

NS.K-4.3 Life Science

In grades 9-12 all students should use geometric ideas to solve problems in, and gain insights into, other disciplines and other areas of interest such as art and architecture.

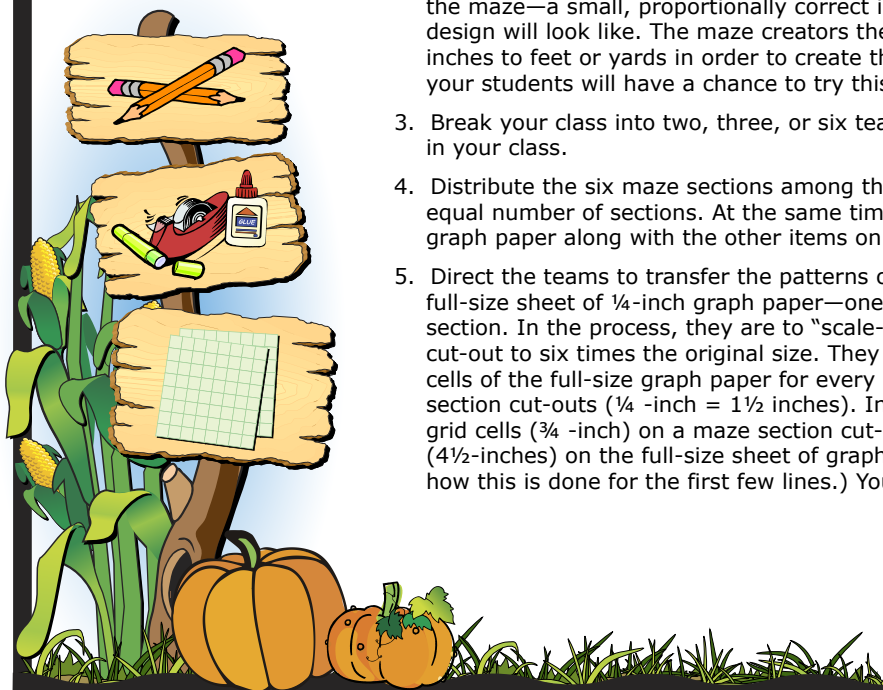
## PREPARATION:

1. Print (from our website) an image of the corn maze that you will be visiting, and show this to your class.
2. Print out the gridded maze on the second page of the “**Supersize my Supermaze**” Teacher Resource Sheet and cut it along the indicated dividing lines into six sections.
3. Acquire the items on the Materials list in sufficient quantities for the number of teams into which you’ll be dividing your class (up to six teams).

## ACTIVITY:

1. Inform your students that they will soon be making a field trip to a farm that features a corn maze. Show them the printed aerial photo of that maze.
2. Ask your students if they are curious about how this elaborate corn maze pattern was created and solicit their best guesses about the methods that might have been used. Then explain that the process begins with the creation of a “scale drawing” of the maze—a small, proportionally correct image representing what the full-size design will look like. The maze creators then “scale up” the drawing, converting inches to feet or yards in order to create the full-scale pattern in the cornfield. Now your students will have a chance to try this technique for themselves.
3. Break your class into two, three, or six teams depending on the number of students in your class.
4. Distribute the six maze sections among the student teams so that each team gets an equal number of sections. At the same time, distribute six full-size sheets of ¼-inch graph paper along with the other items on the “Materials” list to each team.
5. Direct the teams to transfer the patterns on the six maze section cut-outs onto the full-size sheet of ¼-inch graph paper—one sheet of ¼-inch graph paper per maze section. In the process, they are to “scale-up” the pattern on the maze section cut-out to six times the original size. They are to do this by using six ¼-inch grid cells of the full-size graph paper for every individual ¼-inch grid cell on the maze section cut-outs (¼ -inch = 1½ inches). In other words, a line that stretches across 3 grid cells (¾ -inch) on a maze section cut-out will be drawn across 18 cells (4½ -inches) on the full-size sheet of graph paper. (You may need to demonstrate how this is done for the first few lines.) You can advise the teams to divide up the

## MATERIALS REQUIRED



how this is done for the first few lines.) You can advise the teams to divide up the work within their respective groups: one student can count the grid cells on the original maze section pattern...a second student can do the multiplication...a third student can draw the enlarged pattern onto the full-size sheet of graph paper...a fourth student can verify the accuracy of the transfer...and so on.

6. To reduce mistakes, encourage your students to draw the enlarged pattern in pencil first. After they have verified that the enlargement has been done accurately, they can trace over the pencil lines using a felt-tip marker or crayon.
7. When all the maze sections have been scaled-up and accurately transferred to the full-size sheets of graph paper, direct the teams to work together to tape them to a wall, door, or large board in the appropriate positions relative to each other. If all the original small-scale maze sections have been correctly enlarged, the assembled large-scale pattern should be an exact replica of the original—except six times the original size.
8. With the enlarged maze having been assembled, discuss with your students why this enlargement technique works and how it's a process similar to the one used to make mazes like the one your class will be visiting. Then go on to explain how similar techniques are used in architecture and other disciplines.

**MATERIALS:**

- Writing instruments
- ¼-inch Graph paper
- Glue, glue stick, tape

