

# Zoom It!

Sometimes taking a closer look means looking at the world in miniature. As students look at smaller representations of larger things, they begin to understand, intuitively, the concept of scale. Miniature models of houses, airplanes, or cars help students to think about scale models, where a smaller unit of measure is used to designate a larger unit of measure. This activity will encourage students to think about scale as they draw two different pictures of the same plant, one as if taken through a normal camera lens and one as if taken through a zoom lens.

## What You Need:

### for each student:

- 2 pieces of plain white paper
- pastels or colored pencils
- One Square Inch tool from “One Square Inch” activity on p. 5

### for groups of 3-5 students:

- a vase full of flowers  
(a clear vase is nice because students can see the stems in water)
- or a plant

### for the class:

- for demonstration purposes, a three-dimensional model of a house, train or car to begin to explain the concept of scale

## To Get Ready:

Gather flowers from your yard or a nearby field and put them in vases. The type of flower does not matter; we just want to give students the opportunity to look more closely at the plant.

If you can not find any flowers, use potted plants.

Invite students to move their desks to form tables of four or five students.



## To Start, Ask:

*Have you ever looked through binoculars, a zoom lens on a camera, or a telescope? What happens to the image you're viewing as you look through these tools? Have you ever made or played with a doll house or a model airplane?*

## Now, Try It:

- Pass out the flower vases to the groups of students who have gathered.
- Pass out the paper and pastels, and ask students to draw the vase and flowers on their paper. Encourage them to draw the vase and flowers as large as possible, so that they fill the entire page of paper.
- As they draw, students should look carefully at the flowers and vase, noticing particulars, and making detailed observations.

- When they've completed their first drawings, pass out more paper and the One Square Inch tool.
- Ask students to draw a second drawing, a 'zoomed-in' drawing, of the flowers in the vase. As a way to zoom in, place the One Square Inch tool somewhere on the drawing.
- Now draw only what is seen inside the square inch, but fill the whole second piece of paper with that image. Encourage the students to look again carefully at the small area of the plant and vase which they have isolated with their One Square Inch tool. Do they notice small hair-like features on the stem, differences in color, or structures which they did not notice before?
- Students may need help adapting the size from one square inch to an entire sheet of paper. Encourage them to think about the difference in size from a model train to a real train. On a model train, one wheel is one inch in diameter, whereas on a real train, one wheel is one foot in diameter. The same concept applies to this 'zoomed-in' drawing. In the first drawing, one petal may have been one inch long, while a petal in the zoomed-in drawing may be almost one foot long.



### Ask Students Again:

*When they've finished drawing, find out what students have noticed about scale. What did you do in this activity that was similar to or different from building a doll house or a model train? Did you use any measurements as you did this activity? In what ways?*

### Scientist Spotlight:

**Botanists** are scientists who study all forms of plant life. Scientific drawings help botanists to notice and catalogue the differences between various types of plant species.

**Scientific illustrators** use careful observation and a deep understanding of their subject to create detailed pictures of different plants and animals. In their work, scientific illustrators combine their artistic and scientific skills.



### Assess What Happened

Include the two drawings in the field journals which students are keeping.

Also, using the Field Journal Entry sheet (on p. i), invite students to respond to the following question. Be sure to add this one to the scientific field journals.

***What was the hardest part about drawing the 'zoomed-in' picture of one part of the plant? What new things did you notice by observing the plant so closely?***

