



Shrink the Axe: Drawing to Scale

Overview

Archaeologists often need to be artists as well as scientists. This lesson introduces students to the concept of drawing to scale. Using a grid, the students will transfer a picture of an 18th century axe from a one-inch scale to a half-inch scale.

Objectives

Students will:

- learn about the importance of scale drawings
- use a grid to help reduce an artifact drawing
- understand that archaeologists can also be artists

Core Standards of Kit

2.2 Problem Solving Process

6.4 Historical Connections

6.6 Being a Historian

Standards

1.17 Notation and Representation

5.29 Visual Arts

7.7 Geometric and Measurement Concepts

Age level

Grades 4-12/ Age 9-18

Time

45 minutes

Materials

- copies of "Shrink the Axe" worksheet
- copies of the full-size axe drawing with grid



Background

Archaeologists sketch pictures of artifacts as they map excavation sites in the field. In the lab, archaeologists draw pictures to record and study the artifacts. As scientists, the archaeologists need to make the drawings as exact as possible. But the artifacts can range in size from huge, like a shipwreck, to very small, like a flake. So archaeologists use scale-drawings to make the pictures of artifacts more manageable.

Students may find it challenging to draw a picture of an artifact on a smaller scale. This lesson uses a grid to help the students transfer the picture of an axe to a smaller scale.

Procedure

1. Introduce the concept of drawing to scale. Have the students imagine books that contain pictures of full-size houses, desks, animals, or amoebas. Scientists and artists use the concept of scale to maintain exact proportions while making the whole picture smaller or larger.
2. Pass out copies of the worksheet and copies of the full-size axe. The axe picture needs to be turned on its side so the top of the picture matches the top of the grid on the worksheet.
3. Demonstrate how to transfer the drawing in a full-size block to the half-size block on the worksheet. Encourage the students to start with the outline of the artifact.
4. Some students may find this a challenging activity in spatial relations. Make sure the students have a good start before proceeding on their own.
5. When the students are finished, measure the two artifact drawings. The full-scale artifact should be exactly twice the size of their new half-scale drawing.

Evaluation

Have students reduce or enlarge another picture. Allow them to construct their own grid over the image.



What Next?

Continue with other Principles of Archaeology lessons or proceed to the artifact activities.

If your school library has a copy of Chuck Close, Up Close by Jan Greenberg, show students paintings by an artist who uses a grid to enlarge images of people on a massive scale.

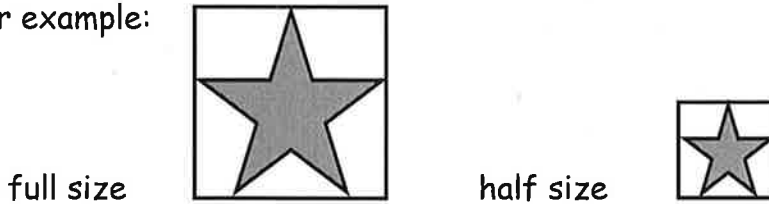


Shrink the Axe

The full-size picture of the axe head is covered with squares, each equal to one inch. Follow the directions to draw a half-size picture of the axe.

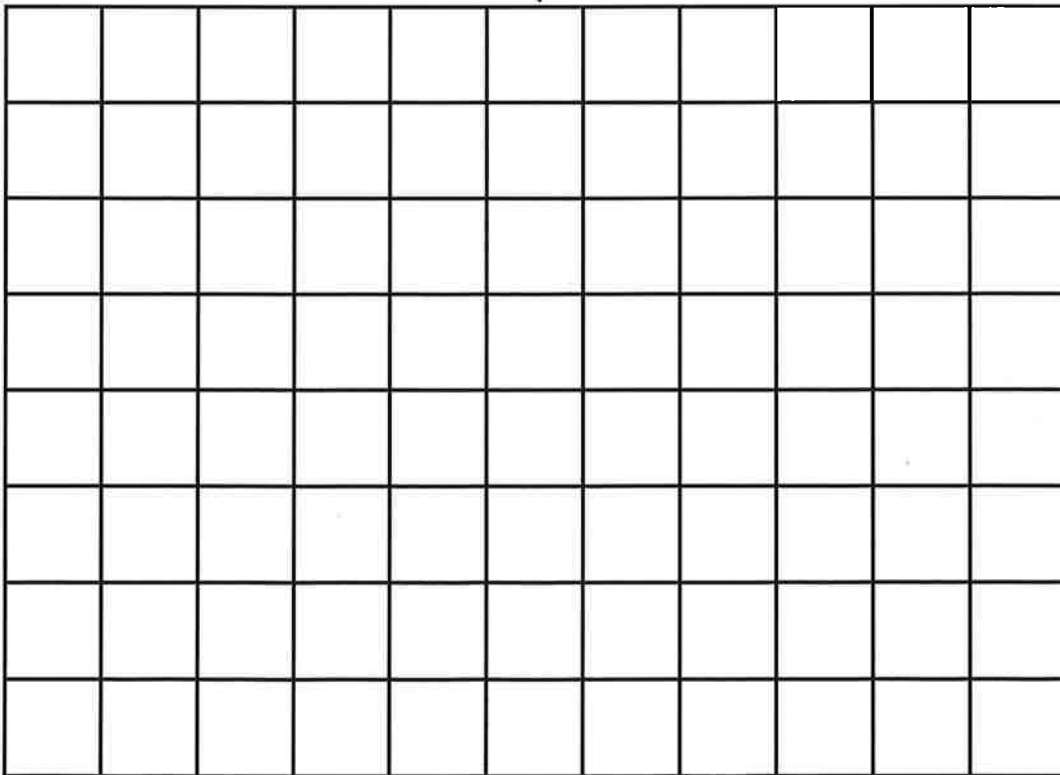
1. On the large drawing, pick one square as a starting point. It helps to pick a square with part of the artifact outline.
2. Find the matching starting point on the sheet with the small squares.
3. Recreate the same shape from the large square to the small square. Use the lines to help you shrink the drawing.

For example:



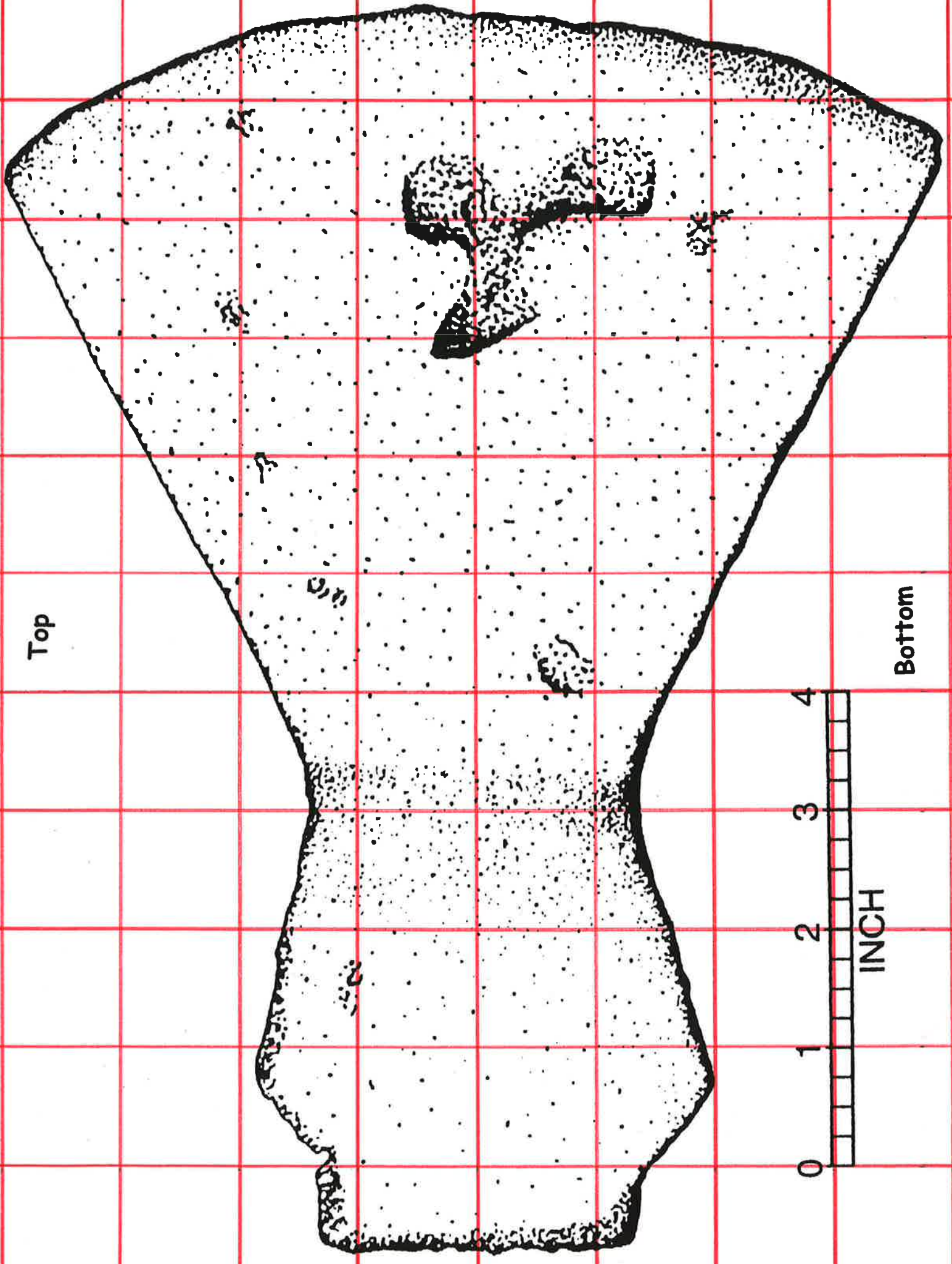
4. Continue to copy the picture square by square. When finished, your drawing should be exactly half the size of the original.

Top



1 square = 1 inch

scale 1:½



Top

Bottom



INCH