Lesson 2.1

GRIDDING A SITE

Fabric-impressed pottery fragment from Halifax County, North Carolina, 1000 BC–AD 500.

Subjects: science, mathematics, language arts.
Skills: knowledge, comprehension, application, analysis, evaluation.
Strategies: brainstorming, mapping, using scale, scientific inquiry.
Duration: 45 to 60 minutes.
Class Size: any; groups of 2 to 4.

Objectives

In their study of how to grid a site, students will use a map and the Cartesian coordinate system to:

- establish a grid system over an archaeological site, labeling each grid unit;
- determine the location of artifacts within each grid unit;
- construct a scientific inquiry concerning the location of artifacts on the site.

Materials

For the teacher, transparencies of "The Piedmont Site" map and "The Grid Sheet." For each team of students, "The Piedmont Site" map, "Artifact Location Record" activity sheet, and a ruler.

Vocabulary

Cartesian coordinate system: two- or three-dimensional grid based on intersecting, perpendicular incremented lines or planes.

Datum: something to use as a basis for measuring; a reference point for a grid or a map.

Flake: a thin piece of stone removed by striking a larger piece with a hammer (usually made of antler or stone). Flakes have sharp edges and were sometimes used as cutting implements. Flakes also were further shaped into tools or were left as waste by-products of flintknapping.

Grid unit: a specific square or rectangular area on the Cartesian coordinate system, designated by the coordinate in one corner (often the southwest corner).

Projectile point: a pointed implement (usually made from chipped stone) that was attached to the end of a spear or an arrow. This is a general term that includes both spear points and arrowheads.

Sherd: a broken piece of pottery; a shard.

Site datum: a stable or permanent feature established as an arbitrary reference point from which the entire site is measured and recorded.

Background

Once a site has been dug (or in the case of sites with no depth, the surface artifacts have been collected), it is gone forever and can never be replaced with another just like it. Because sites are destroyed during collection or excavation processes, archaeologists record them in detail to

preserve the context of all the artifacts and structures. Archaeologists in the future can study an excavated site only if good notes and maps are made.

One way archaeologists preserve context on paper is through the use of the rectangular grid, or *Cartesian coordinate system.* The first step in the excavation process is to establish a grid. A *site datum* is set at an arbitrarily chosen location and is designated as (0,0). Two perpendicular axes or lines intersecting at the site datum are then established and a rectangular grid is superimposed over the entire site. Each square on the ground is marked with numbered stakes in the corners, so that each square or *grid unit* has a unique "name" referred to by its coordinates. The coordinates indicate the distance of a given point north, south, east, or west from the site datum.

Once the grid is established, all artifacts and structures are measured and recorded using the system. Before excavation actually begins, all artifacts visible on the surface are collected and their locations on the grid are recorded. As the excavation proceeds, materials found under the surface are similarly recorded and collected. When the archaeologist returns to the laboratory, the maps and the data recorded in the field can be used to make inferences about past events and the lifeways of the site's inhabitants. If the exact location of each artifact transported back to the laboratory is known, then the object can be tied to its context within the site.

Setting the Stage

Have the students imagine they are a team of archaeologists who have found an archaeological site. Artifacts—including *projectile points*, pottery *sherds*, and stone *flakes*—are scattered on the surface of the ground. They want to make a map of the site. How might they accurately record the location of the artifacts? Have the students brainstorm ideas.

Procedure

1. Project the map of "The Piedmont Site" and explain this is a site they have found in central North Carolina. Overlay a transparency of "The Grid Sheet" and align it to the site by matching the site datum points. Explain that they, as archaeologists, will establish the grid over the site prior to excavating it. Share background information about the importance of gridding a site for current and future study.

2. Distribute "The Piedmont Site" map to each team. Point out the site datum in the lower left hand corner and explain that this is the point from which the grid is established. The name of the site datum is (0,0).

3. Using a ruler, each team will draw the grid system on "The Piedmont Site" handout using a scale of 1 inch equals 10 feet. Tell them to start from the tip of the datum point in the lower left-hand corner. (The squares in the other three corners of the site are there to help the student draw perpendicular lines. Remind students archaeologists don't have this convenience in the field. They rely on transits, tape measures, and strings.) It is helpful to model this procedure on the overhead projector.

4. Label each point on the grid. The southwest corner of each unit becomes the designation for that unit. Examples of such designations are: (1,2), (2,2), and (2,3). Each coordinate indicates the distance east and north of the site datum, respectively.

5. Distribute to each team the "Artifact Location Record." On it, students will record the grid unit designation and count and name the artifacts in each grid unit. If no artifacts are found in the unit, students should put "0." If an artifact is on a grid line, the student must choose which grid square to record it in. An artifact cannot be recorded in more than one square.

6. Following the procedure of scientific inquiry ask:

- What do you notice about the distribution of the pot sherds? (Note your observations.)
- Why is there a concentration of pot sherds in part of the site? (List some inferences.)
- Choose one inference and formulate an hypothesis from it. Describe how the hypothesis might be tested. Here is an example: There are a lot of pot sherds in one location. We might infer a pottery vessel broke here. If all of the sherds have similar attributes and fit together, then we could accept the hypothesis that a vessel broke in this location. What other reason could explain the concentration of sherds? The students will not be able to actually test the hypothesis without access to the artifacts. This exercise is designed to have them think like archaeologists.
- Conduct a similar inquiry using the stone flakes or other artifacts.

Note: A simplified alternative to the above procedure is to have students overlay "The Grid Sheet" to "The Piedmont Site" and hold them up to the light. "The Grid Sheet" already has named squares. After the students record the artifacts found in each one (Step 5), pick up with the above procedure at number 6.

Evaluation

Students turn in their completed "Artifact Location Record" for evaluation.

Closure

Summarize the importance of why archaeologists grid archaeological sites to assist with accurate recording and making inferences from data, now and in the future.

Extensions

1. With older students, precisely map artifacts within each grid unit. Measure the distance north and east of the grid unit's southwest corner to find the exact location of each artifact with respect to the site datum (0, 0). For example, an artifact might have coordinates like (2.1, 4.6) or (3.3, 8.8).

2. Create a site on the playground by depositing "artifacts," and then establish a grid on the playground. Map the "artifacts" using the grid.

Links

Lesson 1.4: "Archaeological Context."
Lesson 1.7: "Scientific Inquiry."

Sources

Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. 1993. *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades.* Washington, D.C.: Bureau of Land Management, U.S. Department of the Interior. [This lesson is adapted from "Gridding a Site" on pp. 44–48, courtesy of the Bureau of Land Management.]

Ward, H. Trawick, and R. P. Stephen Davis, Jr. 1999. *Time Before History: The Archaeology of North Carolina*. Chapel Hill: University of North Carolina Press. [The image in this lesson's main heading is taken from Figure 4.7.]

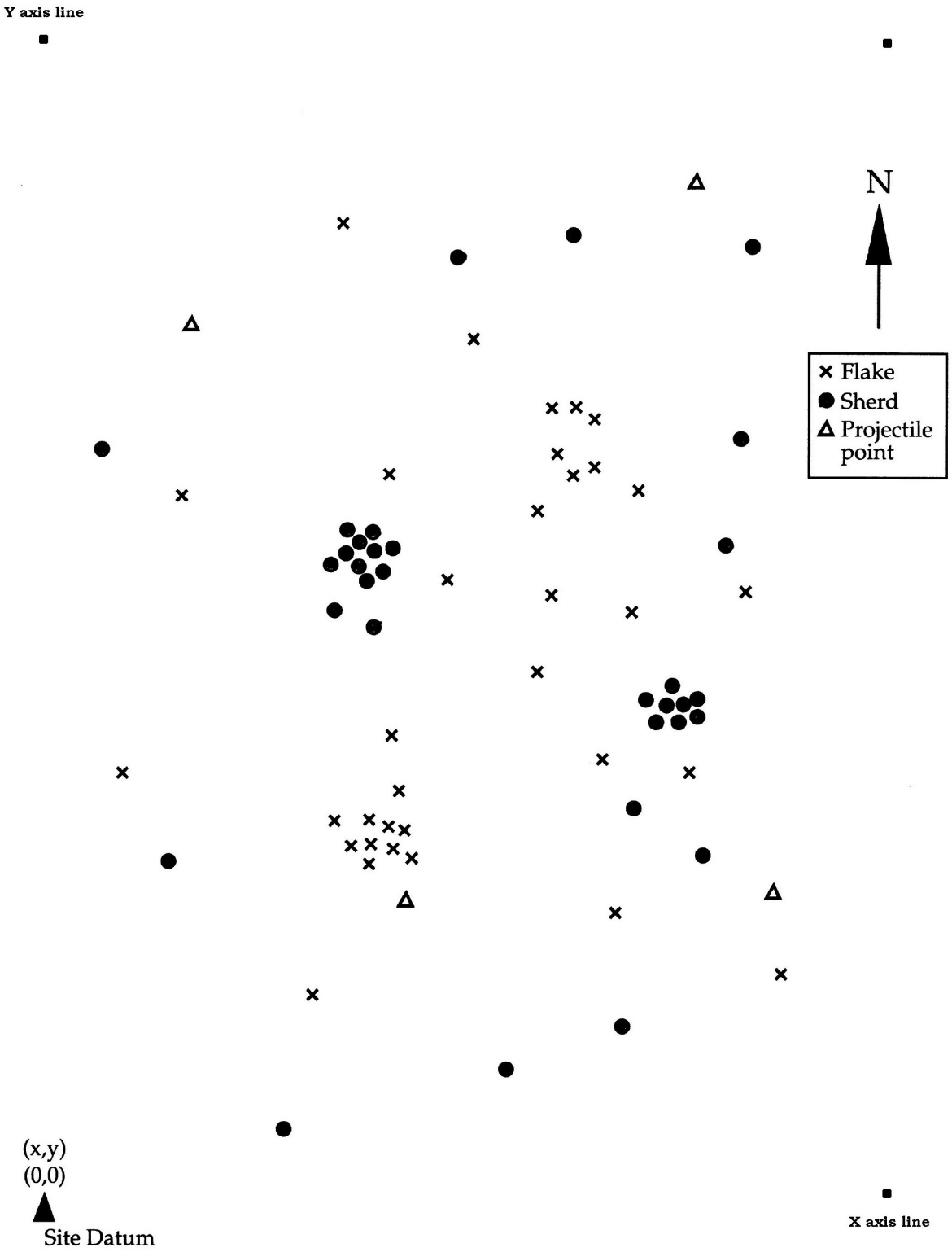
"Artifact Location Record" Activity Sheet Answers:

Note that the answers may vary depending on how the grid is placed and how assignment choices are made when artifacts fall on boundaries. The table below gives an example of how a typical "Artifact Location Record" might appear.

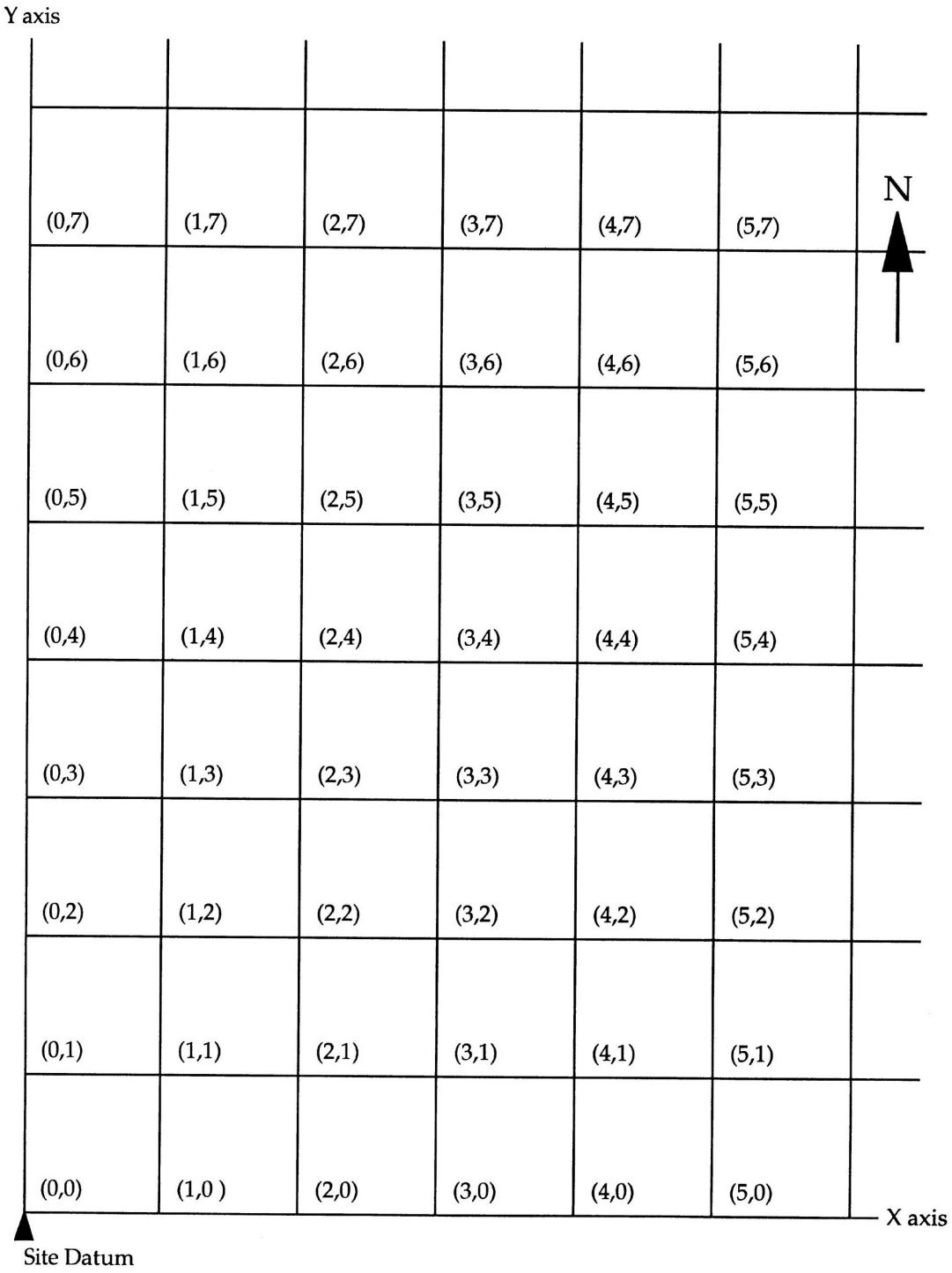
Grid Unit	Flakes	Sherds	Points
1,0	0	1	0
3,0	0	1	0
2,1	1	0	0
4,1	0	1	0
5,1	1	0	0
0,2	0	1	0
2,2	9	0	1
4,2	1	1	0
5,2	0	1	1
0,3	1	0	0
2,3	2	0	0
4,3	1	4	0
5,3	1	4	0
2,4	0	6	0
3,4	3	0	0
4,4	1	0	0
5,4	1	0	0
0,5	0	1	0
1,5	1	0	0
2,5	1	6	0
3,5	1	0	0
4,5	4	0	0
5,5	0	2	0
1,6	0	0	1
3,6	2	0	0
4,6	2	0	0
2,7	1	0	0
3,7	0	1	0
4,7	0	1	0
5,7	0	1	1

The Piedmont Site

Name:



The Grid Sheet



Artifact Location Record

Name:

Grid Unit	**Flakes** (count)	**Sherds** (count)	**Points** (count)