



Geometric Artistry of Mesa Verde Pottery

In-the-Classroom

OBJECTIVES

Students will be able to:

- Demonstrate their understanding of symmetry, geometric designs, and parallel lines by defining these terms in their own words.
- Use their understanding of symmetry, geometric designs, and parallel lines to finish a layout given a shard of pottery
- Write a paragraph summarizing what they have learned.

CO ACADEMIC STANDARDS (Common Core Math Standards)

CO 7th Math: 4.1
Common Core 7th Math: CCSS:7.G

CO HS Math: 4.5
Common Core HS Math:
CCSS: G-MG, CCSS: G-MG.1, and
CCSS: G-MG.2

MATERIALS

- Pencils
- The Geometric Artistry of Mesa Verde Pottery *Worksheet*
- Photocopies or slideshow of examples of pottery, the three types of structures, and pottery shards
- PowerPoint
Full lesson is available on the [optional Powerpoint presentation](#) (7.6 mb).

INTENDED GRADE/RANGE

- Middle to High School

TIME INVOLVED

- One to two class periods

LOCATION

- In the Classroom

OVERVIEW

In this geometry lesson, students will learn about the Ancestral Pueblo people and the pottery they created. Students will use their knowledge of geometric designs, symmetry, and parallel lines to recreate a pot's design based on actual pottery shards from the Mesa Verde Collection.

BACKGROUND INFORMATION

Find the background information at the following links:

- www.nps.gov/meve/forteachers/upload/ancestral_puebloans.pdf
- www.nps.gov/meve/forteachers/upload/ep_activity3_chronology.pdf

PREPARATION

Read background information and create a handout or slide show (or download and use PowerPoint) to introduce the Ancestral Puebloan culture to students.

PROCEDURE

1. Hand out the Mesa Verde Pottery worksheet
2. Have the following written on the board/overhead so all students can read and refer back to important information.

Read the following passage out loud (from *Mesa Verde the Living Park*, page 19.)

“Mesa Verde ceramic artists ... had a vast and fascinating repertoire of abstract geometric designs. There were bands of parallel rings, spirals, scrolls, interlocking curlicues, triangular mazes, elbows that folded in on themselves, stairstep-like ziggurats, lightning-like slashes, and checkerboards. Some of the same figures appear on rock walls as petroglyphs. Designers today see an obsession with symmetry and the tension of tight, parallel lines.”

3. Discuss key words or math phrases from the paragraph. Give definitions and have students write in their own words their definitions of geometric designs, parallel lines, and symmetry.
4. Have students do a quick sketch of a pot design on their handout based on the information from the *Mesa Verde the Living Park* passage.
5. Show examples of pottery (Appendix A) and ask students to compare their sketch to the Ancestral Puebloan pots by writing some similarities or differences on their worksheet.
6. Have students brainstorm why Ancestral Puebloans used geometric designs. Ask students if they have any geometric designs that are important to them.
7. Using the background information, explain about the Ancestral Puebloans' 700 year history at Mesa Verde. Or use the following (also on optional powerpoint):

Pithouses

- Around A.D. 550 the first Ancestral Pueblo people settled in the Mesa Verde area. They are known as Basketmakers for their skill in crafting baskets.
- Instead of being nomadic, the Basketmakers started farming and building permanent structures called pithouses.
- They began making pottery and acquired the bow and arrow.
- Their food included corn, beans, squash, nuts, fruits, rabbit, deer and turkey.

Pueblos

- Around A.D. 750 the buildings started to evolve with population expansion.
 - Along with pithouses, the Ancestral Pueblo people created structures above ground using poles and mud. These new structures were placed side by side in curving rows to create villages.
 - Masonry structures, using sandstone blocks, were developed by A.D. 1000. This skill allowed multi-story housing units.
 - Pithouses began evolving into kivas. These new underground rooms became a ceremonial site, meeting space, and occasional winter residence.
- The use of pottery increased as they created many different types such as ladles, mugs, bowls, lidded jars, and canteens. Many were painted with organic or mineral based paint using brushes made from yucca.

Cliff Dwellings

- Around A.D. 1150 many people began moving from their homes on the mesa into the cliff alcoves.
 - They started building larger, more complex, densely packed, multistory stone and mortar pueblos.
 - Rooms usually housed two or three people. There were also rooms used for storage.
- The flat-roofed kivas were built in front of rooms. This created a courtyard, an area for daily routines.
- Pottery also changed from simple designs to complicated black geometric designs painted on white backgrounds. Their pottery had progressed to a point where some researchers consider it to be the "highest artistic expression" of the culture.

Leaving Mesa Verde

- Sometime after A.D. 1250 the Ancestral Pueblo people started to leave the Mesa Verde area. By A.D. 1300, everyone had moved away, eventually settling along the mesas, rivers, and streams to the south where their descendants live today.
- No one knows exactly why they left, but some hypotheses include: drought, social or political problems, depletion of natural resources, religious reasons, or a desire for a change.

8. Show students the pictures of pottery shards (Appendix C). Have them choose a shard, then try to recreate the rest of the pot's design on their worksheet based on their knowledge of symmetry, geometric designs, and parallel lines.
 - a. There are three levels of difficulty from which to choose: Easy, Hard, and Challenging
 - b. Students can work in groups or individually
9. When students are finished, have them complete questions 6 and 7 on the worksheet and turn in their work.

ASSESSMENT

Collect worksheets when students are finished with the activity. Assess student answers on key words, their interpretation of the pottery shard, their paragraph about what they have learned, and reflection about completing their design.

COLORADO COMMON CORE) ACADEMIC MATH STANDARDS

These are some of the standards that are covered with this activity. You may find additional standards relevant to your grade level and objectives.

STANDARD 4: Shape, Dimension, and Geometric Relationships

Middle School

1. Modeling geometric figures and relationships leads to informal spatial reasoning and proof.
 - a. Draw, construct, and describe geometrical figures and describe the relationships between them. (CCSS: 7.G)

High School

5. Objects in the real world can be modeled using geometric concepts.
 - a. Apply geometric concepts in modeling situations. (CCSS: G-MG)
 - i. Use geometric shapes, their measures and their properties to describe objects. (CCSS: G-MG.1)
 - iii. Apply geometric methods to solve design problems. (CCSS: G-MG.3)



Name _____

Date _____

Period _____

The Geometric Artistry of Mesa Verde Pottery Worksheet

1. Define the following terms in your own words

a. Geometric Designs

b. Parallel Lines

c. Symmetry

2. Draw a quick sketch of a bowl based on the passage from *Mesa Verde a Living Park*.

3. What were some similarities or differences in your sketch to the examples shown?

4. Why do you think they used geometric designs? Do you have any geometric designs that are important to you?

5. Using the pottery shard shown and your understanding of symmetry, parallel lines, and geometric designs, complete (to the best of your ability) what the design on the whole pot might have looked like.

Circle what level your shard is: Easy Hard Challenging

6. Write a paragraph about what you learned about pottery and the people who created it. Describe two things you found interesting about the Ancestral Puebloans.

7. Was it easy or hard to finish the designs started by the Ancestral Puebloans? Explain your answer.

APPENDIX A: Examples of Pottery



APPENDIX B: Types of Structures

Pithouse



Pueblo



Cliff Dwelling

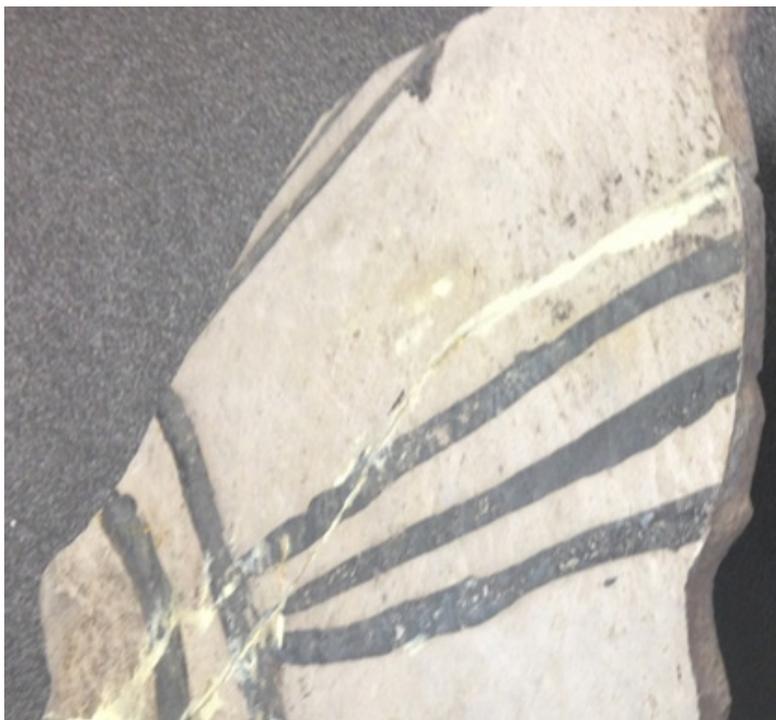


APPENDIX C: Pottery Shards (for worksheet)

Easy Shard 1



Easy Shard 2



Hard Shard 1



Hard Shard 2



Challenging Shard 1



Challenging Shard 2

