

Culture and Math

The Greeks

Teacher's Guide



Grade Level: 10–12

Curriculum Focus: Social Studies

Lesson Duration: Two class periods

Program Description

Much of Western culture, from mathematics to philosophy, originated in ancient Greece. In “Greece: One Out of Many,” discover Homer, the Greek philosophers, and the majestic gods and goddesses of ancient Greece. Learn about Greek geometry and the progression of mathematics from estimation to precision in “Math and the Ancient Greeks.” Watch “Early Greek Contributions to Navigation,” and see how in a mathematician used his knowledge to approximate the Earth’s circumference in the third century B.C. Meet “The Pythagoreans,” the group that has had the greatest impact on Western mathematics.

Onscreen Questions

- What aspects of modern civilization have arisen from ancient Greece?
 - What was the greatest contribution the ancient Greeks made to mathematics?
 - How might the ancient Greeks have used information about the circumference of the Earth?
 - What applications of the Pythagorean Theorem do you see in daily life?
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Lesson Plan

Student Objectives

- Identify important sites in ancient Greece.
- Describe aspects of Greek culture, history, and architecture.

Materials

- *Culture and Math: The Greeks* video
- Encyclopedias, geography and social studies texts, and other reference materials with information about ancient Greece
- Examples of travel brochures (can be found at travel agencies)
- White paper
- Computer with publishing program (optional)

- Pencils and erasers
- Crayons, markers, or colored pencils

Procedures

1. Begin the lesson by watching *Culture and Math: The Greeks* with your class. After watching the video, ask students: What was the culture of ancient Greece like? What contributions did the ancient Greeks make to society? Have students describe some of the cultural, economic, and religious aspects of life in ancient Greece.
2. Next, ask students to design a travel brochure for ancient Greece. Ask students what they would expect to find in a travel brochure. Share examples of travel brochures you have collected with the class. Ask: What types of information do you see in these brochures? How do the brochure publishers make the information interesting and enticing for travelers? Make a class list of the information one might find in a brochure (including maps, historical and cultural information, and photographs or images).
3. Explain that each travel brochure must include a description of ancient Greek architecture, cultural life (such as religious beliefs, important cultural events, and social hierarchy), a brief overview of the history of ancient Greece, and at least two significant sites located in ancient Greece. Students should provide information about the history and importance of each site. The brochures should be interesting, factual, and colorful and should include several pictures or images. If computers with a publishing program are available, show them how to use a publishing program to design and print their brochures. If not, give students white paper and have them fold it in thirds to be used as their final brochure paper. They may type their brochure text and paste it into the brochure.
4. Give students time to work on their brochures in class and at home. They may use *Culture and Math: The Greeks*, reference materials, and travel brochures as research tools for their brochures. Encourage students to be creative, using fun colors and designs. Students may choose to include maps and additional information as long as their brochures include the necessary information set out in Step 3.
5. When students have finished their brochures, divide the class into groups of five or six and have them share their brochures with the rest of the group. Give the groups time to read all of the brochures and discuss them. Then discuss the brochures as a class. What did you find interesting or exciting about a particular brochure? What did you learn from your classmates' brochures?
6. Display the finished brochures in the classroom so that students may read through them at their leisure.

Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- **3 points:** Students created creative and interesting travel brochures that addressed all of the necessary criteria with great accuracy; described aspects of Greek culture, history, and architecture in great detail; identified at least two important sites in ancient Greece and accurately described their significance and history.
- **2 points:** Students created somewhat creative and interesting travel brochures that addressed most of the necessary criteria with general accuracy; described aspects of Greek culture, history, and architecture in some detail; identified at least one important site in ancient Greece and accurately described its significance and history.
- **1 point:** Students created incomplete or uninformative travel brochures that addressed little to none of the necessary criteria with any accuracy; did not describe aspects of Greek culture, history, and architecture in any detail; identified one or no important sites in ancient Greece and inaccurately described their significance and history.

Vocabulary

architecture

Definition: A style and method of design and construction

Context: The Parthenon is a famous example of classical Greek architecture.

influential

Definition: Of considerable importance

Context: In ancient times, a complex and influential civilization arose on the mainland and islands of Greece.

inspire

Definition: To stimulate to action; motivate

Context: The lessons of the ancient Greeks continue to inspire modern thought.

mythology

Definition: A body or collection of stories belonging to a people, addressing their origin, history, deities, ancestors, and heroes

Context: Greek mythology gave rise to modern theater.

philosophy

Definition: Investigation of the nature, causes, or principles of reality, knowledge, or values, based on logical reasoning rather than empirical methods

Context: Ancient Greek thought gave rise to the study of philosophy.

wisdom

Definition: The ability to discern or judge what is true, right, or lasting; insight

Context: The ancient Greeks made the pursuit of wisdom a way of life.

Academic Standards

National Center for History in the Schools (NCHS)

The National Center for History in the Schools has developed standards for the teaching of history. To view the standards online, go to <http://nchs.ucla.edu/standards/toc.html>.

This lesson plan addresses the following standards:

- Era 3: Classical Traditions, Major Religions, and Giant Empires, 1000 BCE-300 CE: How major religions and large-scale empires arose in the Mediterranean Basin, China, and India, 500 BCE-300 CE

The National Council for the Social Studies (NCSS)

The National Council for the Social Studies (NCSS) has developed national standards to provide guidelines for teaching social studies. To view the standards online, go to <http://www.socialstudies.org/standards/strands/>.

This lesson plan addresses the following thematic standards:

- Culture
- People, Places, and Environments
- Global Connections

DVD Content

This program is available in an interactive DVD format. The following information and activities are specific to the DVD version.



How to Use the DVD

The DVD starting screen has the following options:

Play Video – This plays the video from start to finish. There are no programmed stops, except by using a remote control. With a computer, depending on the particular software player, a pause button is included with the other video controls.

Video Index – Here the video is divided into four parts (see below), indicated by video thumbnail icons. Watching all parts in sequence is similar to watching the video from start to finish. Brief descriptions and total running times are noted for each part. To play a particular segment, press Enter on the remote for TV playback; on a computer, click once to highlight a thumbnail and read the accompanying text description and click again to start the video.

Curriculum Units – These are specially edited video segments pulled from different sections of the video (see below). These nonlinear segments align with key ideas in the unit of instruction. They include onscreen questions, reproduced in this Teacher's Guide. Total running times for these segments are noted. To play a particular segment, press Enter on the TV remote or click once on the Curriculum Unit title on a computer.

Standards Link – Selecting this option displays a single screen that lists the national academic standards the video addresses.

Teacher Resources – This screen gives the technical support number and Web site address.

Video Index

I. Greece: One Out of Many (4 min.)

The origins of Western civilization lie in ancient Greece. See how Greek mythology, Homer's epic poems, and the thinking of Greek philosophers have shaped modern culture.

II. Math and the Ancient Greeks (7 min.)

The Greeks were the first to make exact, rather than estimated, geometric calculations. Learn more about Thales, the Greek philosopher who laid the foundation for the formal study of geometry.

III. Early Greek Contributions to Navigation (5 min.)

In the 3rd century B.C., Eratosthenes used his knowledge to approximate the Earth's circumference. Discover other ways the Greeks applied mathematics to navigation.

IV. The Pythagoreans (7 min.)

Pythagoras made many advances in mathematics and geometry. He is best known for his proof of the Pythagorean Theorem.