The Spread of Hellenistic Culture

**MAIN IDEA**
Hellenistic culture, a blend of Greek and other influences, flourished throughout Greece, Egypt, and Asia.

**WHY IT MATTERS NOW**
Western civilization today continues to be influenced by diverse cultures.

**TERMS & NAMES**
- Hellenistic culture
- Alexandria
- Euclid
- Archimedes
- Colossus of Rhodes

**SETTING THE STAGE**
Alexander’s ambitions were cultural as well as military and political. During his wars of conquest, he actively sought to meld the conquered culture with that of the Greeks. He started new cities as administrative centers and outposts of Greek culture. These cities, from Egyptian Alexandria in the south to the Asian Alexandrias in the east, adopted many Greek patterns and customs. After Alexander’s death, trade, a shared Greek culture, and a common language continued to link the cities together. But each region had its own traditional ways of life, religion, and government that no ruler could afford to overlook.

**Hellenistic Culture in Alexandria**
As a result of Alexander’s policies, a vibrant new culture emerged. Greek (also known as Hellenic) culture blended with Egyptian, Persian, and Indian influences. This blending became known as Hellenistic culture. Koine (koy-NA-Y), the popular spoken language used in Hellenistic cities, was the direct result of cultural blending. The word koine came from the Greek word for “common.” The language was a dialect of Greek. This language enabled educated people and traders from diverse backgrounds to communicate in cities throughout the Hellenistic world.

**Trade and Cultural Diversity**
Among the many cities of the Hellenistic world, the Egyptian city of Alexandria became the foremost center of commerce and Hellenistic civilization. Alexandria occupied a strategic site on the western edge of the Nile delta. Trade ships from all around the Mediterranean docked in its spacious harbor. Alexandria’s thriving commerce enabled it to grow and prosper. By the third century B.C.E., Alexandria had become an international community, with a rich mixture of customs and traditions from Egypt and from the Aegean. Its diverse population exceeded half a million people.

**Alexandria’s Attractions**
Both residents and visitors admired Alexandria’s great beauty. Broad avenues lined with statues of Greek gods divided the city into blocks. Rulers built magnificent royal palaces overlooking the harbor. A much visited tomb contained Alexander’s elaborate glass coffin. Soaring more than 350 feet over the harbor stood an enormous stone lighthouse called the Pharos. This lighthouse contained a polished bronze mirror that, at night, reflected the stars on the sea.

**Critical Thinking**

- **Why might Koine have been named for the word “common”?** (Possible Answer: It was a language people had in common.)
- **Why might Alexander have founded a library in Alexandria?** (Possible Answer: Aristotle had given him a love of learning.)

**In-Depth Resources: Unit 2**
- Guided Reading, p. 5 (also in Spanish)
- Critical Thinking Transparencies
- CT5 Elements of Greek Culture

**ALL STUDENTS**
**In-Depth Resources: Unit 2**
- Guided Reading, p. 5
- History Makers: Archimedes, p. 19

**Formal Assessment**
- Section Quiz, p. 75

**ENGLISH LEARNERS**
**In-Depth Resources in Spanish**
- Guided Reading, p. 42
- Spanish/English Guided Reading Workbook
- Section 5

**INTEGRATED TECHNOLOGY**
**Power Presentations**
- Critical Thinking Transparencies
- CT41 Chapter 5 Visual Summary

**TEKS 25B, 26C**
summarize the fundamental ideas and institutions of Western civilizations that originated in Greece. . . . 26C identify examples of art . . . and literature that transcended the cultures in which they were created and convey universal themes.
light from a blazing fire. Alexandria’s greatest attractions were its famous museum and library. The museum was a temple dedicated to the Muses, the Greek goddesses of arts and sciences. It contained art galleries, a zoo, botanical gardens, and even a dining hall. The museum was an institute of advanced study.

The Alexandrian Library stood nearby. Its collection of half a million papyrus scrolls included many of the masterpieces of ancient literature. As the first true research library in the world, it helped promote the work of a gifted group of scholars. These scholars greatly respected the earlier works of classical literature and learning. They produced commentaries that explained these works.

Science and Technology

Hellenistic scholars, particularly those in Alexandria, built on achievements of earlier Greek thinkers who had themselves been influenced by the nearby Babylonian and Egyptian cultures.

Astronomy  Alexandria’s museum contained a small observatory in which astronomers could study the planets and stars. One astronomer, Aristarchus (ar ih STAIR uk s) of Samos, reached two significant scientific conclusions. In one, he estimated that the Sun was at least 300 times larger than Earth. Although he greatly underestimated the Sun’s true size, Aristarchus disproved the widely held belief that the Sun was smaller than Greece. In another conclusion, he proposed that Earth and the other planets revolve around the Sun. Unfortunately for science, other astronomers refused to support Aristarchus’ theory. In the second century A.D., Alexandria’s last renowned astronomer, Ptolemy, incorrectly placed Earth at the center of the solar system. Astronomers accepted this view for the next 14 centuries.

Eratosthenes (EH r ih TAHS ih NEEZ), the director of the Alexandrian Library, tried to calculate Earth’s true size. Using geometry, he computed Earth’s circumference between 28,000 and 29,000 miles. Modern measurements put the circumference at 24,860 miles. As well as a highly regarded astronomer and mathematician, Eratosthenes also was a poet and historian.

Mathematics and Physics  In their work, Eratosthenes and Aristarchus used a geometry text compiled by Euclid (YOO klid). Euclid was a highly regarded

Science and Technology

Lesson 5-5

How do astronomers study the universe?

Alexandria

The Solar System

History from Visuals

Interpreting the Chart

Explain that Greek astronomers had little objective knowledge about the universe. Even so, they knew that the earth was round, and that other planets orbited around a fixed point.

SKILLBUILDER Answers

1. Comparing  Ptolemy incorrectly placed the earth at center of solar system; Aristarchus overestimated size of Earth.

2. Clarifying  estimate of Earth’s circumference; Hellenists had some knowledge of geometry.

Estimating the Earth’s Circumference

Class Time  40 minutes

Task  Demonstrating how Eratosthenes estimated the circumference of Earth

Purpose  To gain an appreciation of the challenges faced by Greek astronomers and their ingenuity in overcoming them

Instructions  In the third century b.c., the Greek astronomer Eratosthenes computed Earth’s circumference. He observed that the shadows cast by objects at noon grew shorter the closer one got to the equator. Have a group of students research his computation and explain it in their own words. Then have one or two students present this information to the class, using a basketball or other sphere to help audience members visualize the problem and its solution.

Evaluate student performance using the Standards for Evaluating a Product or Performance chart in the Integrated Assessment book.

Tip for Gifted and Talented Students

The muses were the daughters of Zeus and Mnemosyne, goddess of memory. Calliope was the muse of epic poetry; Erato, love poetry; Euterpe, lyric poetry and music; Melpomene, tragedy; Thalia, comedy; Clio, history; Urania, astronomy; Polyhymnia, sacred song; and Terpsichore, dance.

Vocabulary

Museum means “house of the muses.”

Classical Greece 147

Differentiating Instruction: Gifted and Talented Students

Integrated Assessment
**Global Patterns**

**Pythagorean Theorem**
Long before Pythagoras, the Egyptians discovered a “3–4–5” triangle. When they wanted crop fields with true right angles, they knotted a length of rope into 12 equal sections. They stretched the rope around three stakes to form a triangle that had sides 3, 4, and 5 units. The angle opposite the side with 5 units was always a right angle. Have students try this for themselves.

**Philosophy and Art**

**Critical Thinking**
- Which philosophy, Stoicism or Epicurianism, seems more reasonable to you? (Stoicism—Emphasis on virtue, focus on what individual can control; Epicurianism—Focus on harmony between body and mind.)
- Why do you think Hellenistic artists focused on realism? (Possible Answers: more interesting, more challenging, more accurate reflection of everyday life)

**Vocabulary Note: Word Origins**
Stoic philosophers take their name from the stoas, or covered porches, where they held their conversations.

**Pythagorean Theorem**
Geometry students remember Pythagoras for his theorem on the triangle, but its principles were known earlier. This formula states that the square of a right triangle’s hypotenuse equals the sum of the squared lengths of the two remaining sides. Chinese mathematicians knew this theory perhaps as early as 1100 B.C. Egyptian surveyors put it to practical use even earlier.

However, the work of the school that Pythagoras founded caught the interest of later mathematicians. Shown is Euclid’s proof in Greek along with a Chinese and an Arabic translation. The Arabs who conquered much of Alexander’s empire spread Greek mathematical learning to the West. The formula became known as the Pythagorean theorem throughout the world.


Another important Hellenistic scientist, **Archimedes** (ahr•kuh•deez) of Syracuse, studied at Alexandria. He accurately estimated the value of pi (π)—the ratio of the circumference of a circle to its diameter. In addition, Archimedes explained the law of the lever.

Gifted in both geometry and physics, Archimedes also put his genius to practical use. He invented the Archimedes screw, a device that raised water from the ground, and the compound pulley to lift heavy objects. The writer Plutarch described how Archimedes demonstrated to an audience of curious onlookers how something heavy can be moved by a small force:

**PRIMARY SOURCE**
Archimedes took a . . . ship . . . which had just been dragged up on land with great labor and many men; in this he placed her usual complement of men and cargo, and then sitting at some distance, without any trouble, by gently pulling with his hand the end of a system of pulleys, he dragged it towards him with as smooth and even a motion as if it were passing over the sea.

**PLUTARCH, Parallel Lives: Marcellus**

Using Archimedes’ ideas, Hellenistic scientists later built a force pump, pneumatic machines, and even a steam engine. A

**Philosophy and Art**
The teachings of Plato and Aristotle continued to be very influential in Hellenistic philosophy. In the third century B.C., however, philosophers became concerned with how people should live their lives. Two major philosophies developed out of this concern.

**Stoicism and Epicureanism** A Greek philosopher named Zeno (335–263 B.C.) founded the school of philosophy called Stoicism (STOH•ih•suh•nism). Stoics proposed that people should live virtuous lives in harmony with the will of god or the natural laws that God established to run the universe. They also preached that

**Differentiating Instruction: Struggling Readers**

**Words with Multiple Meanings**

**Class Time** 15 minutes

**Task** Identifying the different meanings of words

**Purpose** To show students that words can have more than one meaning and that a word’s meaning can change over time

**Instructions** Have students write down the explanations provided for Stoicism and Epicureanism provided under the section “Philosophy and Art,” which begins on this page. Then ask them to use a dictionary to look up the current meanings of the words *stoic* and *epicure*. (*stoic: someone who appears indifferent to pleasure and pain; epicure: someone with sensitive and discriminating tastes*) Have students brainstorm why such changes in the meanings of these words may have taken place. (Possible Answer: Words and their meanings can change over time.)

Students who need additional help with the text may use the Guided Reading Workbook for this section.
human desires, power, and wealth were dangerous distractions that should be checked. Stoicism promoted social unity and encouraged its followers to focus on what they could control.

Epicurus (/e-pi′rəs/) founded the school of thought called Epicureanism. He taught that gods who had no interest in humans ruled the universe. Epicurus believed that the only real objects were those that the five senses perceived. He taught that the greatest good and the highest pleasure came from virtuous conduct and the absence of pain. Epicureans proposed that the main goal of humans was to achieve harmony of body and mind. Today, the word epicurean means a person devoted to pursuing human pleasures, especially the enjoyment of good food. However, during his lifetime, Epicurus advocated moderation in all things.

**Realism in Sculpture**  Like science, sculpture flourished during the Hellenistic age. Rulers, wealthy merchants, and cities all purchased statues to honor gods, commemorate heroes, and portray ordinary people in everyday situations. The largest known Hellenistic statue was created on the island of Rhodes. Known as the **Colossus of Rhodes**, this bronze statue stood more than 100 feet high. One of the seven wonders of the ancient world, this huge sculpture was toppled by an earthquake in about 225 B.C.E. Later, the bronze was sold for scrap. Another magnificent Hellenistic sculpture found on Rhodes was the Nike (or Winged Victory) of Samothrace. It was created around 203 B.C.E. to commemorate a Greek naval victory.

Hellenistic sculpture moved away from the harmonic balance and idealized forms of the classical age. Instead of the serene face and perfect body of an idealized man or woman, Hellenistic sculptors created more natural works. They felt free to explore new subjects, carving ordinary people such as an old, wrinkled peasant woman.

By 150 B.C.E., the Hellenistic world was in decline. A new city, Rome, was growing and gaining strength. Through Rome, Greek-style drama, architecture, sculpture, and philosophy were preserved and eventually became the core of Western civilization.

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**ANSWERS**

1. Sample Answer: astronomy: planets rotate around Sun; geometry: Euclid’s *Elements* (most important—still basis of geometry); philosophy: virtue, moderation; art: realism
2. Traders brought customs and traditions from all over the Mediterranean.
3. earlier Greek thinkers, Babylonian and Egyptian cultures
4. Astronomers such as Eratosthenes and Aristarchus used Euclid’s geometry text.
5. encouraged people to live virtuous lives
6. Greek culture and language traveled with Alexander’s army. Many Greek merchants, artisans, and officials settled in lands Alexander conquered.
7. Possible Answer: the work of Archimedes, because his ideas were used to make many practical tools
8. Both created art to honor gods and goddesses.
9. Rubric Essays should point out that the United States has attracted people from many different cultures and give examples of how these influences were blended into U.S. culture. **Rubric** Collages should provide at least four examples of devices based on Archimedes’ innovations and explain how the devices are used and the principles by which they function.