Hellenistic cities became centers of learning and culture. Philosophy and the arts flourished, and new discoveries that were made are still important to us today.

Hellenistic Arts

How did Greek culture spread during the Hellenistic Era?

During the Hellenistic Era, philosophers, scientists, poets, and writers moved to the new Greek cities of Southwest Asia and Egypt. Alexandria, for example, served as the Greek capital of Egypt and was a major center of learning. Many scholars were attracted to Alexandria's library. It contained more than 500,000 scrolls. Alexandria also had a museum that attracted scholars to do research. The city's reputation as a place of learning and its location on the Mediterranean Sea contributed to Alexandria's economic growth. Today, Alexandria remains a vital city in Egypt where nearly 4 million people live and work.

Buildings and Statues

Greek architects served an important role in expanding Alexander's empire. They planned public building projects for new cities that were being founded and for old cities that were being rebuilt. Hellenistic kings wanted to make these cities like Athens and other cultural centers in Greece. They were willing to spend huge amounts of money to do so. These kings wanted to line the streets with Greek temples, theaters, and baths.

Hellenistic kings and other wealthy citizens hired Greek sculptors, who created thousands of statues for towns and cities. Hellenistic sculptors proved as talented as the sculptors of Greece's Golden Age. These sculptors, however, developed new styles. They did not carve ideal figures to reflect beauty and harmony. Instead, they showed people in a more realistic style. They even created statues that looked angry or sad.

Hellenistic Writers

Hellenistic rulers also supported talented writers. As a result, poets and writers produced a large amount of literature during the Hellenistic Era. Very little of this writing has survived today.

One work that we do know about is an epic poem called *Argonautica*. Written by Appolonius (a • puh • LOH • nee • uhs) of Rhodes (ROHDZ), the poem tells the story of Jason and his band of heroes. You may have read or seen a modern version of this poem, often called *Jason and the Argonauts*. Jason and his band sail the seas seeking a ram with a golden fleece. Along the way, they have many adventures. Another poet, Theocritus (the • AH • kruh • tuhs), wrote short poems about the beauty of nature.

Athens remained the center for Greek theater. There, writers of plays produced comedies, not tragedies. These comedies are known as Greek New Comedy. However, the comedies of the Hellenistic Era were not like the comedies of Greece's Golden Age. Those of the Hellenistic Era did not poke fun at political leaders. Instead, the plays told stories about love and relationships of ordinary people. One of the best known of the new playwrights was Menander (muh • NAN • duhr). He lived from 343 B.C. to 291 B.C. and is considered the most important poet of Greek New Comedy. The temple of Apollo at Delphi had an inscription that read "Know thyself." Making a humorous comment on that inscription, Menander said "This 'Know Yourself' is a silly proverb in some ways; To know the man next door is a much more useful rule." His works were later adapted by Roman writers. Through his works, Menander influenced the development of European comedy during the Renaissance (reh • nuh • ZAHNTS) and even comedy today.

Explaining How did Greek sculpture and drama change during the Hellenistic Era?

Thinkers and Scientists

What ideas and discoveries emerged during the Hellenistic Era?

During the Hellenistic Era, Athens continued to support Greek philosophers. These philosophers tried to answer questions such as, "What is a good life?" and "How can people find peace of mind in a troubled world?" The two most important Hellenistic philosophers were Epicurus and Zeno.
Who Was Epicurus?

Epicurus founded a philosophy known as Epicureanism (eh • pih • kyu • REE • uh • nih • zuhm). He taught his students that finding happiness was the goal of life. He believed that the way to be happy was to avoid pain.

Today the word epicurean means the love of physical pleasure, such as good food or comfortable surroundings. For Epicurus, however, pleasure meant spending time with friends. It meant learning not to be upset about problems in life. Epicureans avoided worry. They limited their wants and lived simply.

The Stoics

A Phoenician thinker named Zeno developed a philosophy called Stoicism (STOH • uh • sih • zuhm). Zeno did not have the money to rent a lecture hall in which to teach. Instead, he taught at a building called the "painted porch". The Greek word for porch was stoa. The term "Stoicism" thus comes from the Greek word stoa.

The Stoics claimed that people who were guided by their emotions lived unhappy lives. They believed that happiness resulted from using reason. Sound thinking, they thought, should guide decisions. Today, the word stoic is used to describe someone who seems not affected by joy or sadness. Unlike Epicureans, Stoics thought people had a duty to serve their community. The ideas of the Stoics would later influence Roman thinkers.

Science and Mathematics

Science also flourished during the Hellenistic Era. Even though Hellenistic scientists used simple instruments, they performed many experiments and developed new theories. Aristarchus (ar • uh • STAHR • kuhs) claimed that the sun was at the center of the universe. He said that Earth circled the sun. At the time, other astronomers rejected his ideas. They thought that Earth was the center of the universe. Euclid taught others his theories about geometry. If you study geometry today, you will be learning about the same topics studied by ancient Greeks.

Another scientist, Eratosthenes (ehr • uh • TAHS • thuh • neez), was the chief librarian at the library at Alexandria. After study and research, Eratosthenes concluded that Earth was round. He then used his knowledge to measure Earth's circumference (suhr • KUHM • fuhr • ens)—the distance around Earth.

In order to measure the Earth's circumference, Eratosthenes put two sticks in the ground far apart from each other. When the sun was directly over one stick, he measured its shadow. By measuring the shadows, he was able to calculate the curve of Earth's surface.

Using his measurements, Eratosthenes tried to figure the distance around Earth. Remarkably, his estimate was within 185 miles (298 km) of the actual distance. Using similar methods, he tried to determine how far it was to the sun and to the moon. Although his measurements were not accurate, he concluded that the sun was much larger than Earth and the moon.

Euclid (YOO • kluhd) of Alexandria advanced the field of mathematics. His best-known book Elements describes plane geometry. Plane geometry is one branch of mathematics. It shows how points, lines, angles, and surfaces relate to one another. Around 300 B.C., Egypt's King Ptolemy I (TAH • luh • mee) asked Euclid if he knew a faster way to learn geometry. Euclid answered that "there is no royal way" to learn geometry. In other words, if the king wanted to understand Euclid's ideas, he would have to study. Euclid's theories still influence mathematicians today.

The most famous scientist of the Hellenistic Era was Archimedes (ahr • kuh • MEE • deez). Archimedes worked on solid geometry. He studied ball-like shapes, called spheres, and tubelike shapes, called cylinders. He also figured out the value of pi. This number is used to measure the area of circles. It is represented by the Greek symbol π.

Archimedes was also an inventor. He developed machinery and weapons of war. Archimedes was known as a modest man. According to one story, however, he boasted, "Give me a lever and a place to stand on . . . and I will move the earth."

The king of Syracuse heard of Archimedes' boast. He asked Archimedes to build a machine to defend the city, so Archimedes designed catapults. These machines could throw rocks, arrows, and spears over long distances.

When the Romans attacked Syracuse in 212 B.C., the catapults drove them back. It took the Romans three years to capture the city. During the massacre that followed, Archimedes was killed.

Hellenistic thought and culture had long-lasting effects. The mathematician Hypatia (hy • PAY • shuh) lived in Alexandria in Egypt around A.D. 400, more than 700 years after the Hellenistic Era. She kept up the Greek tradition of studying philosophy and mathematics. Like the great Greek thinkers of the past, Hypatia also championed the use of reason over superstition:
"To teach superstitions as truth is a most terrible thing."

"Reserve your right to think, for even to think wrongly is better than not to think at all."

— from Hypatia, Encyclopaedia Britannica Profiles, 300 Women Who Changed the World

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Comparing and Contrasting How were Epicureanism and Stoicism similar? How were they different?

Connections to TODAY

Constant \(\pi\)

Astronomers in the Hellenistic Era made amazing discoveries. Many of the measurements they made were very accurate. Even though scientists today can measure more accurately, no one has ever been able to improve on Archimedes' calculation of \(\pi\). The number \(\pi\) (\(\pi\)) is a ratio. When the circumference of a circle is divided by its diameter, you get \(\pi\). \(\pi\) is always the same for every circle—about 3.1416.

Greece and Rome

How did Greece fall under Roman rule?

The four kingdoms that formed from Alexander's empire shared Hellenistic culture. Despite their common culture, the kingdoms were unable to work together. They often fought wars with one another.

Macedonia held power over Greece for a time. It could not keep the Greek city-states permanently under control, though. Sparta and some other city-states regained their independence. These city-states had Hellenistic cultures, but they did not have strong armies. They remained free for only a short time.

Rome was a city-state in central Italy. In the late 200s B.C., Rome conquered the entire Italian Peninsula. Greece lost its lands in southern Italy. The Greeks now feared that Rome would take control of Greece.

The Greeks tried to stop Rome's growing power, but failed. They began supporting Rome's enemies in various wars. The Romans won these conflicts, however. Gradually, Rome gained control of the Greek mainland.

Explaining How did the Greek city-states react to Rome's growing power?

LESSON 4 REVIEW

Review Vocabulary

1. Why did Greek scientists study the circumference of Earth?

Answer the Guiding Questions

2. Explaining Why did Alexandria become a major center of learning?
3. **Describing** What contributions did Archimedes make to science?

4. **Explaining** How did the Greeks attempt to stop Rome's invasion of Greece?

5. **Drawing Conclusions** What beliefs about Earth and the heavens were proved by the discoveries of Aristarchus and Erastosthenes?

6. **ARGUMENT** Compare the Stoic and Epicurean views about life. Which of these views appeals to you? Write a paragraph that explains the reasons for your choice.