

### KEY IDEAS

- Alexander the Great created the largest empire in history at the time.
- After Alexander's death, his generals and friends fought for power.
- The Hellenistic Period is when Greek culture spread all over the world.

## LESSON PREVIEW

### LESSON OBJECTIVE

Student will write at least 6 clear, reasonable connections between concepts in the lesson text and broader world events, issues, or cultures..

## Introduce the Key Terms



Please introduce the Key Terms using examples, artwork, charades, analogies, or whatever strategies best suit you and your class. After reading and discussing the lesson, students will complete a Key Terms Activity in the Student Guide to reinforce their understanding.

**architecture** (noun): the art of designing buildings and other structures

**assassinate** (verb): to kill by surprise or in secret, usually for political reasons

**Hellenistic** (adjective): having to do with Greek culture after the death of Alexander the Great

**logic** (noun): a reasonable way of thinking about something

**mortal** (adjective): sure to die someday

**philosophy** (noun): the study of knowledge, truth, and the meaning of life

**province** (noun): one of many large areas a country is divided into

## Introduce the Lesson



Give students time to look through the new lesson in the Student Edition. They should read the Key Ideas, Key Terms, and headings for the lesson and take a look at the images. Then they will be ready to read the lesson as part of the following Reading Strategy assignment.

## READING THE TEXT

### Reading Strategy



#### Make Text-to-World Connections

SEE STUDENT GUIDE PAGE 74.

Explain that today students will be learning a third way to make connections as they read. In this lesson, they will connect text from the lesson to events or issues in the world. This may include a current event from the news, a social concern that has been around for a while, an aspect of a specific culture, or anything else having to do with the world at large. Many examples might be found on television and in the news. For example, if students were reading a book about cars, they could connect what they read to the issue of pollution caused by automobiles. If they are reading a book about tigers, they might hear on the news that tigers are in danger of becoming extinct. Point out that text can be connected to the arts, science, history, or even pop culture. Text-to-world connections can be serious or funny, but they give readers more to think about.

Practice searching for text-to-world connections as a class by reading the first two sections of Lesson 3 together: "Alexander the Great" and the portrait of Aristotle. What can we connect when it comes to Alexander's education and the way students are educated in our day? What's the difference between having a tutor and a public school system like our country has? What great thinkers remind students of Aristotle?

Another connection between the world of Alexander the Great and the modern world is war. What wars are being fought in our day? How are they similar to Alexander's wars and conquests? How are they different? Tell students that they will be searching for 10 more text-to-world



They will also need to write down notes about what the interview subjects say. Have students compile the responses and select some of their favorites to share with the class.

### Key Terms Activity



#### Two Connections

SEE STUDENT GUIDE PAGES 75–76.

Begin by modeling the Student Guide task on the board using terms from the previous lesson. Students will connect each Key Term with two other terms on the list as they fill out the “Two Connections” page in the Student Guide. You can use the following example from Lesson 2 to get them started. Ask students to explain what connection is being made. (*Two types of people are being compared for the amount of political power they can exercise—and potential abuse of that power.*)

A group of *aristocrats* may take advantage of their wealth and political connections in a country, but a *tyrant* is even worse because he has so much power.

Let students know that if they run out of connections based on the lesson material, they can make up connections of their own as long as the meanings of the Key Terms are supported. Here’s an example:

The people got so sick of the cruel *tyrant* that they threw him in the *bay*.

When students are finished, give them time to share their best connections with the class.

NAME \_\_\_\_\_ DATE \_\_\_\_\_

**CHAPTER 4, LESSON 3** KEY TERMS ACTIVITY (1 of 2)

**Two Connections**  
For each term, use connections with two other terms. Do not repeat any of the connections. If you need to use the same two words together, come up with a different connection. Although you should start off with connections that relate to the lesson, you can use any other connections, including outside ones. List the connections clearly, supporting the meanings of the key terms.

1. **architecture**  
Connection #1 \_\_\_\_\_  
Connection #2 \_\_\_\_\_

2. **assassinate**  
Connection #1 \_\_\_\_\_  
Connection #2 \_\_\_\_\_

3. **Hellenistic**  
Connection #1 \_\_\_\_\_  
Connection #2 \_\_\_\_\_

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NAME \_\_\_\_\_ DATE \_\_\_\_\_

**CHAPTER 4, LESSON 3** KEY TERMS ACTIVITY (2 of 2)

4. **logic**  
Connection #1 \_\_\_\_\_  
Connection #2 \_\_\_\_\_

5. **mortal**  
Connection #1 \_\_\_\_\_  
Connection #2 \_\_\_\_\_

6. **philosophy**  
Connection #1 \_\_\_\_\_  
Connection #2 \_\_\_\_\_

7. **province**  
Connection #1 \_\_\_\_\_  
Connection #2 \_\_\_\_\_

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## OPTIONAL ACTIVITIES

### Art Activity



#### Greek Architecture

Show your students a picture of the Lincoln Memorial and ask them what it has in common with ancient Greece. The answer is architecture! The architecture of ancient Greece was so striking and well proportioned that it has been imitated by more than one later generation, starting with the Romans. The architectural movements it inspired are broadly referred to as “classical.” Among them are the Renaissance and later Neoclassical and Greek Revival styles. People in those later eras became fascinated by what the ancient Greeks had done, studying their writing and imitating their art and architecture. (Mention that the art of ancient Greece had an especially strong influence in the area of sculpture, which became more rounded and realistic looking.) Show and discuss a picture of the Parthenon next to the one of the Lincoln Memorial. How are these buildings alike? How are they different?

In this activity, your students will be detectives trying to solve the mystery of this influence: “Why has the architecture of ancient Greece been so influential?” Or to put it another way, “What is it about ancient Greece architecture that has made people at different times in history want to copy its style?” Students will consider important examples of both the ancient architecture and of later imitators. (Explain that by “imitators,” we do not mean people who copied these works precisely, but rather those who used similar components—most notably columns—and principles of design.)

Explain that some have argued that Greek architecture, for example the Parthenon, incorporates a pleasing mathematical ratio called the Golden Mean or Golden Ratio. Others disagree. While this precise ratio may not have been incorporated, ancient Greek architecture is well proportioned and aesthetically successful. (Define *aesthetics* for your students.)

Students should learn the characteristics of ancient Greek architecture. The two articles below are a good starting place. The most famous examples of ancient Greek architecture are temples at the Acropolis in Athens, but other examples of temples are found throughout Greece and in Sicily. Have students study the structures from the list below and connect them to what they have learned about the architectural style in the articles.

### Architecture in Ancient Greece (Metropolitan Museum of Art)

[http://www.metmuseum.org/toah/hd/grarc/hd\\_grarc.htm](http://www.metmuseum.org/toah/hd/grarc/hd_grarc.htm)

### Greek Architecture (Ancient History Encyclopedia)

[http://www.ancient.eu/Greek\\_Architecture/](http://www.ancient.eu/Greek_Architecture/)

- Parthenon (Athens, Italy)
- Erechtheum (Athens)
- Temple of Athena Nike (Athens)
- Temple of Aphaia (Aegina, Italy)
- Temple of Apollo Epicurius (Bassae, Italy)
- Temple of Poseidon (Sounion, Italy)
- The Temple of Hera I (Paestum, Italy)
- The Temple of Concord (Agrigento, Sicily)

Next, why did people who lived hundreds of years later become so interested in ancient Greek architecture? Student should find out what these three styles and time periods of architecture are, relating them back to the ancient Greek architecture on which they are based:

- Renaissance architecture
- Neoclassical architecture
- Greek Revival architecture

Historically, what made architects of each style interested in ancient Greek architecture? What models did they use? The Neoclassical and Greek Revival styles are closely associated. In what ways are they similar and different? Who are the famous architects of each movement?

Students should pay careful attention to columns, which are a key component of ancient Greek architecture and of later classical styles. As mentioned in the Student Edition, there are three main types of columns. Your students should try to figure out what kinds of columns are used on the examples they study from each of the three later periods. They can also look for examples in their own towns since these columns are still used on buildings in our day.

Have students examine key structures from each of the three architectural movements above, comparing them to ancient Greek architecture.

#### 1. Renaissance Architecture

There are examples of Renaissance architecture throughout Europe, but some of the most famous ones are in Italy:

- Pazzi Chapel, Florence
- Old Sacristy, Florence
- Bramante's Tiempetto, Rome

- Capitoline Museums, Rome
- Palazzo Farnese, Rome
- St. Peter's Basilica, Rome
- Ducal Palace, Urbino
- Basilica Palladiana, Vicenza

#### 2. Neoclassical Architecture

Many of the well-known buildings in the Neoclassical style in the United States are in the nation's capital, though a few others are included in this list:

- Lincoln Memorial (Washington, DC)
- White House (Washington, DC)
- US Capitol (Washington, DC)
- US Supreme Court (Washington, DC)
- National Gallery of Art (West Building; Washington, DC)
- Philadelphia Museum of Art
- Virginia State Capitol
- Field Museum of Natural History (Chicago)

#### 3. Greek Revival Architecture

The following are examples of the Greek Revival style in three different countries:

- Thomas Jefferson Memorial (Washington, DC)
- British Museum (London, England)
- Brandenburg Gate (Berlin, Germany)
- Glyptothek Museum (Munich, Germany)
- Bank of the United States (Philadelphia)
- US Capitol (Washington, DC)
- River Road plantation homes (Louisiana)

Now that your students are becoming experts in ancient Greek and classical architecture, it's time for them to design their own buildings in an all-new style influenced by the Greeks and the later styles that used their ideas. Students can work individually or in pairs or small groups to design a contemporary house or government building such as a city hall or library using elements from the styles they have studied. One requirement is that the building has to have some kind of columns. Students should draw or paint a picture of the building and then share their concepts with the class. How will their buildings incorporate principles from Greek architecture? What unique elements will keep their designs from simply looking like the Parthenon? How will they make the ancient and newer elements work together in an aesthetically pleasing way?

Finally, discuss the question posed early in the activity: "Why has ancient Greek architecture influenced other architectural styles for hundreds of years?" Having studied the four architectural styles, how would your students answer the question?

### Kinesthetic Activity



#### Class Olympics

Ask your students if they know about the Olympic Games and how they started. Today's Olympics are part of our heritage from Ancient Greece. Give students a little history about the ancient Greek Games: they started out as a few races as part of a religious festival honoring Zeus in 776 BCE and eventually grew into a larger set of events with competitors from city-states throughout the region. Winning events in the games added to the prestige of the city-states, and when the city-states were at war they declared peace just for the 5-day Olympics. Only men were allowed to compete, and they competed naked. Events added to the races included wrestling, boxing, chariot races, long jump, the javelin throw, and the discus throw. The winner of each event was given an olive branch curved into a crown and became famous throughout the region. His hometown often gave him large sums of money and other prizes in celebration.

The games weren't just for athletes. Artists, sculptors, and poets came to the games to sell their work, which usually honored the victors, athletics, and the human body. The site of the games was Olympia, which became a religious center with a temple. Its gold-and-ivory statue of Zeus was one of the Seven Wonders of the Ancient World.

Now your class will put on their own Olympics! Brainstorm as a class to come up with a list of 6–8 events, including at least two from Ancient Greece, or variations of them. In addition to long and short footraces, you can add Frisbee as a discus throw and a sack race in place of a chariot race. What other events can your students come up with?

Have students make “olive leaf crowns” (actually a partial circle) from paper and pipe cleaners or bobby pins and hold the competition. You might want to divide the class in half and hold playoff events. You can also hold an arts competition in which students write poems, paint pictures, or sculpt in clay to celebrate athletic events and victories.

In addition, students can conduct online research about today's Olympic Games and events. For example, have each student pick a different event to study and present to the class. One or more students can also investigate how the modern games came to be, and how they are similar and different from the ancient games. Be sure to discuss why sports and exercise are important. What is their connection to human health and wellbeing?

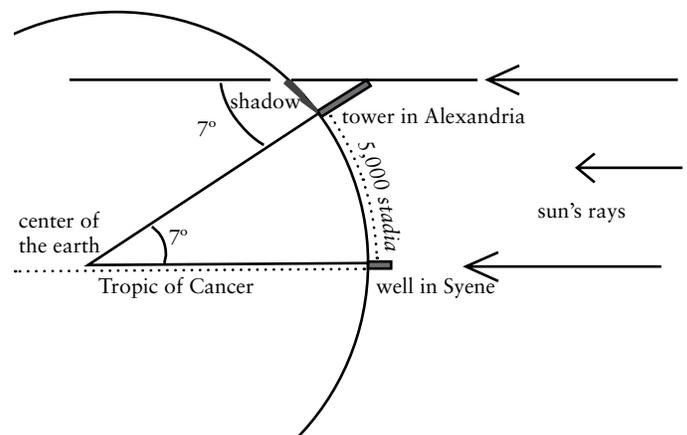
### Math Activity



#### Eratosthenes Measures the Earth

The ancient Greek mathematician Eratosthenes used geometry to measure the earth's circumference and came up with a remarkably accurate number. Ask students how they think he could have done it using geometry. If they're stuck, put this hint on the board: “the sun's rays.” You can then add “= parallel lines.” Read your class Kathryn Lasky's picture book about Eratosthenes and his calculation, *The Librarian Who Measured the Earth*. What science information did Eratosthenes use to solve the problem? Why would it only work on June 21? What geometric tools did Eratosthenes use? (Point out that contrary to one history rumor, people have known the earth was spherical, not flat, for as far back as the ancient Greeks—and yes, Columbus knew it too.)

Draw Eratosthenes's solution on the board as follows:



Not drawn to scale

Eratosthenes already knew that the angle of the sun's rays at noon on June 21 in Syene would be 90 degrees—the rays were known to fall directly down a well there on that date without casting a shadow. That's because Syene was right at the Tropic of Cancer, a northern latitude line where the sun's rays hit at a 90-degree angle at noon on the summer solstice, which is June 21 (or 22 some years). Its southern counterpoint, the Tropic of Capricorn, has the same phenomenon once a year on the winter solstice, which is December 21 (or 22 some years).

With this in mind, Eratosthenes took care of the other end of the equation, measuring the shadow of a tower or obelisk in Alexandria to find the angle of 7.2 degrees for the sun's rays there at noon on June 21. This number was different from the angle in Syene because of the earth's

curve—which made the mathematician’s calculation of circumference derived from a full 360 degrees possible.

The other number Eratosthenes needed for his equation was the distance from Alexandria to Syene, which was approximately 5,000 *stadia* (an ancient unit of measure, singular *stade* or *stadion*). This number was known because of the numerous journeys of camel caravans, although men assigned as step counters may also have provided it.

The arc of the angle Eratosthenes measured using the shadow in Alexandria was 7.2 degrees, which happens to equal 1/50 of a circle (360 degrees), so he multiplied the 5,000 stadia by 50 to get the earth’s circumference.

Actually, the mathematician was able to use a ratio equation because he had congruent angles, as shown in the diagram—the sun’s rays were his parallel lines crossing an imaginary line reaching from the top of the tower in Alexandria straight down towards the earth’s center. Which angles are congruent as shown in the diagram? (*Alternate interior angles, each with a measure of 7.2 degrees.*) Here is the ratio he set up:

$$\frac{\text{angle of the sun in Alexandria}}{360^\circ} = \frac{\text{distance to Tropic of Cancer}}{\text{Earth's circumference}}$$

Have your students calculate the answer by filling in the ratio with the right numbers on the board: 7.2 degrees for the angle of the sun’s rays in Alexandria and 5,000 stadia for the distance to the Tropic of Cancer (Syene):

$$\frac{7.2 \text{ degrees}}{360^\circ} = \frac{5,000 \text{ stadia}}{x}$$

Your students should come up with 250,000 stadia for the earth’s circumference. Write “1 stade = .115 miles” on the board and have your class convert Eratosthenes’s answer to miles. They should get 28,750 miles. In our day, using more precise numbers and measuring technology, we have come up with a circumference for the earth of about 24,901 miles, but Eratosthenes was quite close, especially considering his information was slightly off for a couple of reasons: the distance from Alexandria to Syene was not exact, and Alexandria is not quite directly north of Syene. Depending on the definition of one stade, for which we have two different numbers from history, Eratosthenes’s circumference for the earth was off by either 1 percent or

16 percent. (The number above is for the 16 percent.) His results were impressive in any case.

### Eratosthenes Finds Diameter of Earth (Rice University and University of Texas)

<http://outreach.as.utexas.edu/marykay/assignments/eratos1.html>

### Eratosthenes’s Measurement of the Circumference of the Earth (Arizona State University School of Earth and Space Exploration)

<http://keyah.asu.edu/lessons/Eratosthenes/KM4.html>

### Eratosthenes: The Measurement of the Earth’s Circumference (Following the Path of Discovery; ads)

<http://www.juliantrubin.com/bigten/eratosthenes.html>

Note that some of these sites have suggestions for students recreating the experiment or for applying the principles in similar ways that you may want to try with your class.

You can also refer to Mary Gow’s longer book on this topic, *Measuring the Earth: Eratosthenes and His Celestial Geometry*.

## Economics Activity



### Needs and Wants

Let your students know that as civilizations grew, so did economies. How did people buy, sell, and trade? What economic decisions did ordinary people make? They made similar choices to the ones we make today. Consumers, or the people who buy goods at stores or markets, have to decide whether to spend their money on *needs* or *wants*. Put the two terms on the board and ask students to define them. Then make a class chart of needs and wants on the board. You may find that students have put items that should be considered wants in the needs section. Explain that needs are intended for basic survival. For example, groceries such as bread and milk could go in the needs section, but not things like potato chips and ice cream.

- car
- coat
- washer and dryer
- candy bar
- bicycle
- water

- shoes
- cellphone
- movie tickets
- beans
- refrigerator
- soda pop
- apartment (rent)
- baseball glove
- soup
- TV
- French fries
- blanket

Which of these items are needs? (Coat, water, shoes, beans, apartment, soup, blanket.) Why are the others wants? Explain that even though things like cars and refrigerators make our lives more comfortable, they are not required to keep us alive, healthy, and safe. Other things, such as baseball gloves and TVs, are enjoyable, but are even less necessary for our basic wellbeing. Note also that a community or even a country might be said to have needs and wants. Your students may not be aware that cities, states, and countries have budgets. What are the needs and wants of a community or country?

Next, have students replace items on the list with goods and services that would have been available in the Hellenistic Period. What would they have eaten instead of a candy bar, for example? What entertainment would have been available instead of movies and TV? Talk about how in any society, wants must come before needs.

online research to complete the chart. Then hold a class discussion to go over their answers. Be sure to define unfamiliar terms such as *philosophy*, *rhetoric*, *epistemology*, and *logic*.

Next, have students work in pairs or small groups to write and create biographical reports for the people in the chart and their ideas or accomplishments. Class presentations can be in the form of first person “autobiographies,” dialogues, newscasts, TV interviews, mini-documentaries, or skits. The presentations should include samples of the individuals’ most famous ideas, quotes, accomplishments, inventions, and/or creations—including major beliefs of the schools of philosophy. Here is the list from the chart for your reference. (See also completed chart in the Answer section at the end of the chapter and the optional math activity above, “Eratosthenes Measures the Earth.”)

- Aeschylus
- Alexander the Great
- Anyte of Tegea
- Archimedes
- Aristophanes
- Aristotle
- Democritus
- Eratosthenes
- Euclid
- Euripides
- Gorgo of Sparta
- Herodotus
- Hippocrates
- Leonidas I
- Phidias
- Pericles
- Plato
- Pythagoras
- Socrates
- Thales

# LESSON REVIEW

## Review Activity

### Great Minds of Ancient Greece

SEE STUDENT GUIDE PAGES 77–79.

Ancient Greece is known to this day for its great philosophers, teachers, scientists, writers, leaders, and mathematicians. This group of people came up with important principles in subjects such as geometry, logic, and the arts that have influenced later work for hundreds of years. Who are they, and what did they accomplish that is important to us even now?

Students will fill in the chart in the Student Guide to identify some of these ancient Greek thinkers and their accomplishments. They will need to conduct library or

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**CHAPTER 4, LESSON 3**  
Review Activity (1 of 3)

**Great Minds of Ancient Greece**  
Fill in the chart below to identify some of the influential thinkers and leaders of ancient Greece and their major accomplishments. In the third column you should indicate the person's role or title. Some examples of roles include mathematician, philosopher, writer, leader, scientist, inventor, and artist. (You may use the Internet to help you.)

Name	Approximate Dates Born and Died (BCE)	Role(s)	Major Accomplishments
Aeschylus			
Alexander the Great	356–323	Basic military leader	Created huge empire, unified military leader and politician, spread Greek culture
Anyte of Tegea			
Archimedes			
Aristophanes			
Aristotle			

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

**CHAPTER 4, LESSON 3**  
Review Activity (2 of 3)

Name	Approximate Dates Born and Died (BCE)	Role(s)	Major Accomplishments
Aeschylus			
Alexander the Great			
Anyte of Tegea			
Archimedes			
Aristophanes			
Aristotle			
Democritus			
Eratosthenes			
Euclid			
Euripides			
Gorgo of Sparta			
Herodotus			
Hippocrates			
Leonidas I			
Phidias			
Pericles			
Plato			
Pythagoras			
Socrates			
Thales			

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

**CHAPTER 4, LESSON 3**  
Review Activity (3 of 3)

Name	Approximate Dates Born and Died (BCE)	Role(s)	Major Accomplishments
Aeschylus			
Alexander the Great			
Anyte of Tegea			
Archimedes			
Aristophanes			
Aristotle			
Democritus			
Eratosthenes			
Euclid			
Euripides			
Gorgo of Sparta			
Herodotus			
Hippocrates			
Leonidas I			
Phidias			
Pericles			
Plato			
Pythagoras			
Socrates			
Thales			

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