

Station A: Architecture

Part 1: Read the information about architecture and list the major achievements.

Directions: Carefully read and discuss the information below about the ancient Greeks' achievements in the field of architecture. Then answer the questions for Station A in your packet.

The ancient Greeks created some of the world's most beautiful structures- from religious temples and statues to large outdoor arenas and government buildings. Greek Builders used a variety of construction materials, including wood, sun-dried bricks, and limestone. However, the Greeks built their most sacred buildings out of a hardened type of limestone called marble. Ancient Greek architects developed three styles of architecture called *orders*, each order has a different type of stone columns, which were used to support the building's solid upper structure. The three different bases and tops, or *capitals*, distinguish one from another.

The earliest architectural style, developed by the mainland Greeks, was the *Doric* (pronounced DOR-ik) order, named after the Dorians. The Doric column has no base and rises straight from a platform. A rectangular stone decorated the capital of this type of column.

The next style developed was the Ionic (pronounced eye-ON-ik) order, which was named after its place of origin- Ionia, the Greek territories in the eastern Aegean Sea. An Ionic column rises from a circular, stacked base. Carved scrolls that look like two rolls of paper decorate its capital.

The last style developed was the Corinthian order, named for the city-state of Corinth. The Corinthian column also rises from a circular, stacked base, and has a capital adorned with carvings of spiky leaves from the Mediterranean her *acanthus* (pronounced ah-CAN-thuss).

Part 2: Complete the following task and record your findings.

Directions: Carefully examine the drawings of the three Greek columns and determine the order- Doric, Ionic, and Corinthian- to which each belongs based on the written information. Record the information in your packet.

Part 3: Check your answers.

Unfold the bottom section of this page and compare the answer there with your answers in your packet.

Part 4: Learn about how Greek achievements in this field have been applied in the modern world.

Carefully examine the image and read the caption. Then discuss how the achievements the ancient Greeks made in the field of architecture affects our modern life with your partner and record your answers in your packet.



Caption: Above is a picture of the White House located in Washington D.C.

Station B: Geography

Part 1: Read the information about architecture and list the major achievements.

Directions: Directions: Carefully read and discuss the information below about the ancient Greeks' achievements in the field of architecture. Then answer the questions for Station B in your packet.

The Greeks studied and wrote about the earth's surface, developing a science that they called *geography*. Geography comes from the Greek word for earth (*geo*) and the Greek term for "process of recording" (*graphy*). However, as Greek trade increased, military campaigns (conquering new lands) began, and settlers sailed to distant colonies, a need arose for more accurate maps.

Several important theories in the field of *astronomy*, or the study of planets and stars, helped geographers. First, the astronomers correctly believed that the earth is a sphere. Second, they identified the location of the *equator*, an imaginary line that divides the earth in two halves, the Northern and Southern Hemispheres. Finally, they identified two imaginary lines- the Tropic of Cancer and the Tropic of Capricorn- that marked the tropic regions north and south of the equator, where it stays hot all year.

One of the greatest Greek geographers was Eratosthenes (pronounced eh-rah-TOSS-then-eez). He calculated the length of the equator to be 25,200 miles, remarkably close to today's measurement of 24,805 miles. Eratosthenes constructed maps of Europe, Asia, and Africa including in it latitude lines north and south of the equator, and longitude lines east and west of the prime meridian. Any place on the earth can be located on a map by noting where its line of latitude and its line of longitude cross, or intersect. Maps have become much more specialized since the time of ancient Greece.

Part 2: Complete the following task and record your findings.

Directions: Carefully examine the map of the United States and identify the city located nearest each intersection of the latitude parallels and longitude meridians listed below. Record the information in your packet.

- (1) 40° North latitude, 120° West longitude
- (2) 35° North latitude, 85° West longitude
- (3) 45° North latitude, 100° West longitude

- (4) 30° North latitude, 90° West longitude
- (5) 45° North latitude, 75° West longitude

Part 3: Check your answers.

Unfold the bottom section of this page and compare the answer there with your answers in your packet.

Part 4: Learn about how Greek achievements have been applied in the modern world.

Carefully examine the image and read the caption. Then discuss how the achievements the ancient Greeks made in the field of geography affects our modern life with your partner and record your answers in your packet.



Caption: On the left is a picture of a sailor using nautical maps to plan a course for his ship. On the right, is a picture of a sailor using a sextant. A sextant is a tool that calculates the angle between two objects and is used by sailors when they navigate.

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- (1) Carson City, Nevada
 - (2) Atlanta, Georgia
 - (3) Pierre, South Dakota

- (4) Baton Rouge, Louisiana
- (5) Montpelier, Vermont

Station C: Medicine

Part 1: Read the information about architecture and list the major achievements.

Directions: Directions: Carefully read and discuss the information below about the ancient Greeks' achievements in the field of architecture. Then answer the questions for Station C in your packet.

Initially, the Greeks had little knowledge of medicine. They believed that the Gods caused diseases. To cure patients, doctors chanted versus to the Gods, and used charms and magical ointments. Sometimes they advised a sick person to make sacrifices to the gods.

In the fifth century, B.C.E., a physician named Hippocrates (pronounced hih-PAH krah-teez) began a medical school. He and his followers introduced new teachings and practices that changed the entire field of medicine. Hippocrates and his associates argues that physician should examine the effects of water, food, and climate upon a person's health. He believed that after repeatedly observing a disease, a doctor could make an accurate prediction about the course that the disease would take.

The most famous contribution of the Greeks made to modern medicine is the *Hippocratic* (pronunciation hih-poh-KRA-tic) *Oath*. Doctors taking this oath promise to honor their teacher, so their best for the sick, never give anyone poison, and keep the secrets of their patients. The Greeks though an ethical code for doctors was necessary because the practice of medicine was not regulated by the government- making it easy for dishonest individuals to take advantage of the sick. Over time, the medical profession has changed the original Hippocratic Oath to fit the modern practice of medicine. Nevertheless, the oath doctors take today still emphasizes patients' dignity and confidentiality, and the doctor's responsibility to use knowledge appropriately.

Part 2: Complete the following task and record your findings.

Carefully read and examine the symbols in the excerpt from the Hippocratic Oath. Then, decide which word from the list below corresponds to each symbol. Sketch the symbols labeling each with the corresponding word in your packet.

swear
judgment
houses
see

physician
poison
love
abroad

carry
holy
women

Part 3: Check your answer.

Unfold the bottom section of this page and compare the answer there with your answers in your packet.

Part 4: Learn about how Greek achievements in this field have been applied in the modern world.

Carefully examine the image and read the caption. Then discuss how the achievements the ancient Greeks made in the field of medicine affects our modern life with your partner and record your answers in your packet.



Caption: Above is a picture of a doctor allowing a young boy to listen to his own heartbeat as she gently examines him.

Station D: Astronomy

Part 1: Read the information about astronomy and list major achievements.

Directions: Directions: Carefully read and discuss the information below about the ancient Greeks' achievements in the field of architecture. Then answer the questions for Station D in your packet.

The ancient Greeks contributed much knowledge of the field of *astronomy*, the study of the planets, stars, and other objects in the universe. They proposed that the Earth turned, or *rotated*, on its *axis*, and imaginary line through the Earth between the North Pole and the South Pole. Some astronomers tried to calculate the sizes of the Sun and the Moon and their distances from Earth. The Greeks also predicted solar *eclipses*, when the Moon, moving between the Earth and the Sun, blocks out the sun's light. Greek astronomers were able to identify the spring and fall *equinoxes*, when the Sun is directly over the equator and the lengths of the day and night are almost equal. It was also a Greek who proposed that the pull of the Moon's gravity causes ocean tides to rise and fall.

One of the most important Greek Astronomers was Aristarchus (pronounced air-ih-STAR-kiss). He proposed that the Sun was the center of the solar system, and that the planets revolved around it. Scholars do not know the techniques he used to reach his conclusions, because most of his original work was lost. Most Greeks refused to accept Aristarchus's ideas. They believed the Earth was the center of the solar system. Religious people felt that the gods certainly would place that the Earth at the center of its creation. It was not until the 1500s C.E. that astronomers accepted Aristarchus' theory.

Part 2: Complete the following task and record your findings.

After reading the passage about the ancient Greeks achievements in astronomy answer the questions below in your packet.

1. What was Aristarchus's theory about our solar system?
2. Many ancient Greeks did not agree with Aristarchus's theory. Make an inference regarding why people did not believe in his theory.

Part 3: Check your answer.

Unfold the bottom section of this page and compare the answer there with your answers in your packet.

Part 4: Learn about how Greek achievements in this field have been applied in the modern world.

Carefully examine the image and read the caption. Then discuss how the achievements the ancient Greeks made in the field of astronomy affects our modern life with your partner and record your answers in your packet.



Caption: Above is a picture of flight controllers in Houston celebrating the safe return of the Apollo 13 mission to the moon in 1970. A large drawing of a Greek sailing ship and the words “Odyssey” and “Apollo” are visible at the front of the control room.

(1) Aristarchus proposed that the Sun was the center of the solar system, and that the planets revolved around it.

(2) Other ancient Greeks did not want to anger the gods and did not believe that the gods would have placed anything other than the Earth at the center of the solar system.

Station E: Zoology

Part 1: Read the information about zoology and list major achievements.

Directions: Directions: Carefully read and discuss the information below about the ancient Greeks' achievements in the field of architecture. Then answer the questions for Station E in your packet.

The study of zoology, a scientific field that describes, classifies, and explains the development of animal life, fascinated the ancient Greeks. One of the first ancient Greeks to propose a theory about the development of animals was Anaximander (pronounced an-AX-ih-MAN-dur). He believed that animals developed, or *evolved*, from an earlier life-form. According to Anaximander, all living things came from water. He said that over time, the sun evaporated the water and land appeared. The sea animals then came ashore and adapted a new way of life. Anaximander thought that humans came from these early sea creatures. Today scientists accept the basic idea of evolution, but have made several important changes to Anaximander's theories.

A second ancient Greek scientist and philosopher, Aristotle (pronounced AR-uh-STAH-tull), greatly advanced the field of zoology. Aristotle developed a basic system for classifying all living things into groups, and gave names to the groups. He divided all plants and animals into a descending order of categories – kingdom, genus, and species – that were increasingly more limited, or *exclusive*. For example, dogs, tigers, and monkeys are all members of the animal *kingdom*. However, each of these animals is a member of a separate *genus* because of distinguishing features such as size, shape and number of teeth. Finally, each genus has numerous *species*, a more exclusive category based on other factors or features. For example, hounds and terriers are both species of the genus of dogs. Modern scientists have refined Aristotle's system into nine categories, but the terms he introduced are still used today.

Part 2: Complete the following task and record your findings.

Directions: Carefully examine the four pictures of animals and arrange them in the order in which you think they evolved – from the earliest –existing form to the present form. Record the names and the evolutionary order of the species in your packet.

Part 3: Check your answers.

Unfold the bottom section of this page and compare the answer there with your answers in your packet.

Part 4: Learn about how Greek achievements in this field have been applied in the modern world.

Carefully examine the image and read the caption. Then discuss how the achievements the ancient Greeks made in the field of zoology affects our modern life with your partner and record your answers in your packet.



Caption: Above is a picture of zoologists comparing the skeletons of different vertebrates.

Station F: Engineering

Part 1: Read the information about engineering and list major achievements.

Directions: Directions: Carefully read and discuss the information below about the ancient Greeks' achievements in the field of architecture. Then answer the questions for Station F in your packet.

In an effort to better understand the world around them, the Greeks developed scientific theories and applied them in various ways. Today, many ancient Greek discoveries and theories are put to practical use in the field of engineering. Engineers apply scientific and mathematical knowledge to operate machines and build structures.

One Greek scientist, Archimedes (pronounced ark-ih-MEE-deez), made important contributions to the engineering field. For example, he explained the principle of the *lever*. Archimedes explained that a lever is a bar that rests on a point, called a fulcrum. The weight that rests on the lever is called the *load*. A person or machine's pushing and pulling on the lever is called the *force*. In the most common type of lever, the force is at one end, the load is at the other, and the fulcrum is between the two. The amount the load can be raised, or the *leverage* depends on the length of the lever, the position of the fulcrum, the location of the load, and where the force is applied. When the force and the load are balanced, the lever will be horizontal. If the fulcrum is moved closer to the load, then less force will be needed to raise the load. That means that the leverage increases, making it easier for a person to lift the load. A crowbar and a seesaw are examples of levers.

Part 2: Complete the following task and record your findings.

Directions: Place the weight on the X on Book 1. Place your forefinger on the opposite end of Book 1 and gently push down. Repeat this process with Book 2 and Book 3. Record your answers to this prompt in your packet.

Part 3: Check your answers.

Unfold the bottom section of this page and compare the answer there with your answers in your packet.

Part 4: Learn about how Greek achievements in this field have been applied in the modern world.

Carefully examine the image and read the caption. Then discuss how the achievements the ancient Greeks made in the field of engineering affects our modern life with your partner and record your answers in your packet.



Caption: The picture above shows members of Cirque du Soleil using leverage to launch each other into the air in one of their performances.

It is easiest to raise the weight with Book 3, because the pencil (the fulcrum) is closest to the load, which means it takes less force from one's finger to raise the load.

Station G: Mathematics

Part 1: Read the information about mathematics and list major achievements.

Directions: Directions: Carefully read and discuss the information below about the ancient Greeks' achievements in the field of architecture. Then answer the questions for Station G in your packet.

Ancient Greeks made many discoveries in the field of mathematics, especially in geometry, a branch of mathematics that deals with the measurements and properties of points, lines, angles, surfaces, and shapes. Although other civilizations used this field of mathematics long before the Greeks, it was the Greek mathematicians who most clearly explained the rules of geometry.

Euclid (pronounced YOO-klid), whom some call the “father of geometry,” was one of the most famous mathematicians in ancient Greece. He collected and organized most of the existing knowledge of geometry into several books called *Euclid's Elements*. Euclid began his book with true statements that required no proof and then used logic to prove assumptions that he believed to be true, called theorems.

Another very influential ancient Greek was the mathematician and philosopher Pythagoras (pronounced puh-THA-guh-russ). Pythagoras is best remembered today for the *Pythagorean Theorem*, a mathematical theorem that is used to describe the relationship between the three sides of a right triangle. He proved that the square of the length of the *hypotenuse* (longest side of a right triangle) is equal to the sum of the squares of the lengths of the *legs* (the two sides that form a right angle) of the right triangle.

Part 2: Complete the following task and record your findings.

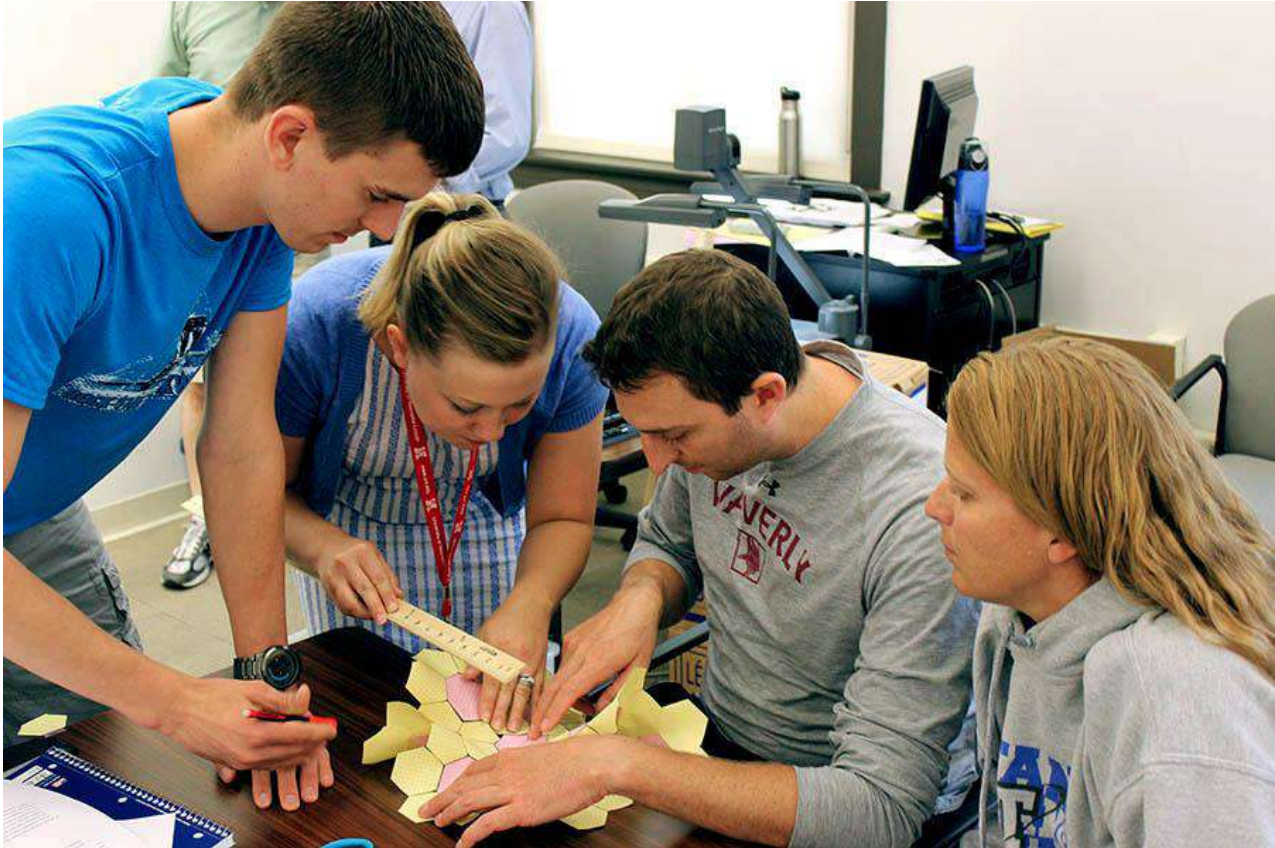
Directions: Use the Pythagorean theorem [the relationship described by the formal $a^2 + b^2 = c^2$] to find the length of the string that is taped to the floor and the wall. The distance from the end of the strong on the floor to the wall is 3 feet, designated by a . The string is taped to the wall at a height of 6 feet, designated by b . Use a calculator and the formula to find c , the length of the string. Record your answer, including the steps you followed in your student packet.

Part 3: Check your answers.

Unfold the bottom section of this page and compare the answer there with your answers in your packet.

Part 4: Learn about how Greek achievements in this filed have been applied in the modern world.

Carefully examine the image and read the caption. Then discuss how the achievements the ancient Greeks made in the field of mathematics affects our modern life with your partner and record your answers in your packet.



Caption: In the picture above, there is a teacher explaining geometry concepts to her students as she helps them to create three – dimensional model.

$$\begin{aligned}a^2 + b^2 &= c^2 \\3^2 + 6^2 &= c^2 \\9 + 36 &= c^2 \\45 &= c^2\end{aligned}$$

$$\begin{aligned}c &= \sqrt{45} \\c &= 6.7 \\ \text{The string is 6.7 feet long}\end{aligned}$$

Station H: Physics

Part 1: Read the information about physics and list major achievements.

Directions: Directions: Carefully read and discuss the information below about the ancient Greeks' achievements in the field of architecture. Then answer the questions for Station H in your packet.

The ancient Greeks made several important contributions in *physics*, the scientific field that students matter and energy and the way they interact. A Greek philosopher Democritus (pronounced dih-MAH-krah-tuss) came closest to modern-day beliefs with his theory. He suggested that unchanging *atoms* makes up all things. These atoms, from the Greek word *atomos*, which means indivisible – are too small to be seen, even with a microscope. These exist in different sizes and shapes, and when they combine, they form different objects. Today, scientists have identified three primary parts of the atom. *Protons* with positive electrical charges and *neutrons* with no charge make up the center of the atom, called the *nucleus*. *Electrons* with negative charge whirl around the nucleus. An atom is held together by the electrical attraction between the nucleus and the electrons.

Part 2: Complete the following task and record your findings.

Directions: Take one of the balloons and rub all parts of it on your hair for at least 15 seconds. Then hold it near the paper dots that are scattered on the desk. Observe what happens. Record your answers to this prompt in your packet: If the balloon picked up extra electrons when you rubbed it on your hair, what charge – positive or negative – must the paper now have to be attracted to the balloon?

Part 3: Check your answers.

Unfold the bottom section of this page and compare the answer there with your answers in your packet.

Part 4: Learn about how Greek achievements in this field have been applied in the modern world.

Carefully examine the image and read the caption. Then discuss how the achievements the ancient Greeks made in the field of physics affects our modern life with your partner and record your answers in your packet.



Caption: The picture above shows the first phase of a mushroom cloud. This is the cloud generated by the first underwater atom bomb explosion, which occurred at Bikini Atoll on July 25th, 1946. One theory is that Bikini Bottom, the setting for the popular show *SpongeBob SquarePants*, is based on Bikini Atoll.

If the balloon picked up extra electrons, it has a negative charge. The paper must now have a positive charge to be attracted to the balloon.