31.5 Mathematics

The Greeks loved reasoning, or looking for logical answers to nature's mysteries. Greek scientists often found those answers in the field of mathematics.

One such scientist, Pythagoras (pih-THAG-er-uhs), believed that numbers were the key to understanding nature. He started a school where students developed mathematical **theories**.

Like many Greeks, Pythagoras was especially fascinated by geometry. *Geometry* comes from a Greek word that means "to measure land." Geometry began as a system for measuring areas of land. The Egyptians could also measure shapes and spaces, but the Greeks created new and improved methods. Using geometry, they could figure out problems such as how much seed to buy for planting a field or how to lay out a city.

Another famous Greek mathematician was Euclid (YOO-klid). His geometry textbook has been used as the basis for the teaching of geometry for more than 2,000 years.

Greek culture produced the first woman to earn fame as a mathematician, Hypatia (hie-PAY-shuh). Born in Egypt in about 370 C.E., she taught Greek philosophy and mathematics in the city of Alexandria.
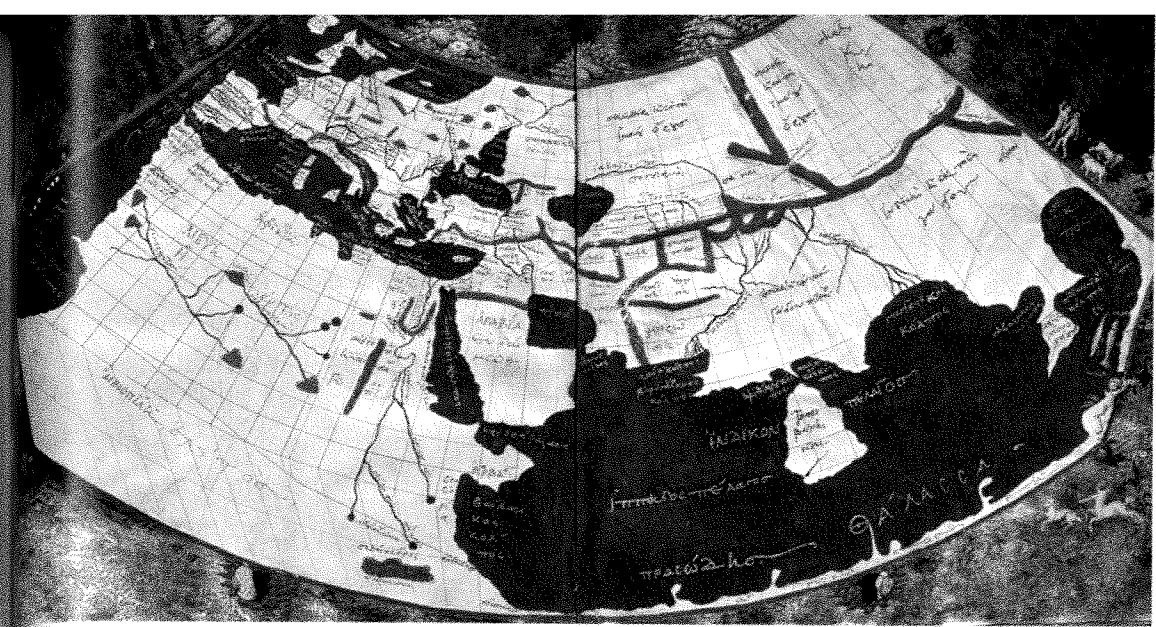
geometry the branch of mathematics involving points, lines, planes, and figures

31.6 Astronomy

Astronomy comes from the Greek word for "star." Astronomy is the scientific study of outer space. Ancient Greeks were pioneers in this field.

People in all civilizations observed the sun, moon, and stars. But a Greek scientist named Aristarchus (ayr-uh-STAHR-kuhs) was the first person to suggest that Earth moves around the sun. This idea upset many Greeks who believed that Earth was the center of the universe.

Another Greek, Hipparchus (hih-PAHR-kuhs), is often called one of the greatest scientists of the ancient world. He studied and named more than 850 stars. He also figured out how to estimate the distances from Earth to both the sun and the moon. His theories allowed later scientists to **accurately** predict eclipses of the moon.

Hypatia was a highly respected philosopher and mathematician in Alexandria, Egypt.

A 15th-century mapmaker created this replica of Ptolemy's map of the world. Compare it with a modern world map. Can you find Africa?

31.7 Geography

The study of geography has roots in ancient Greece. The word *geography* comes from Greek words that mean "writing about the earth." The Greek historian Herodotus created the first map of the known world, in about 450 B.C.E. To gather the information for his map, Herodotus asked geographic questions. He found some answers to his questions by traveling and talking with other travelers. He organized the information by displaying it on a map.

Another great geographer of ancient times was Ptolemy (TAH-luh-mee), a Greek scientist who lived in Alexandria, Egypt. He wrote a book called *Geographia* that listed about 8,000 places around the world. His book contained maps that showed how to represent the curve of Earth on a flat surface.

Ptolemy also designed a system of lines drawn on a map called **latitude** and **longitude**. With this system, he recorded the specific locations for the thousands of places he listed in his book. Centuries later, Arab scholars would further develop the study of geography, especially in the field of mapmaking.

31.8 Biology

Ancient Greeks developed the science of **biology**. About 600 B.C.E., Greek thinkers believed each event has a cause and an effect. They used this idea to study the natural world.

Curiosity led Greeks to study plants and animals. Scientists learned about the anatomy, or body structure, of animals and humans. This knowledge helped doctors in their medical studies.

The Greeks identified plants and also named their parts. The Greeks learned that plants reproduce by spreading seeds. Greek doctors used plants, such as herbs, as medicines and for pain.

latitude a measure of how far north or south a place on Earth is measured from the equator

longitude a measure of how far east or west a place on Earth is from an imaginary line that runs between the North and South Poles

biology the study of living things; their structure, growth, and function