Week 3. **BUILDING ON HISTORIC SUCCESS**

LEAD-IN:

1. An American teenager addressed the "***Ask a Scientist***" website with the following question:

I was wondering, ***who is/are considered the founder/s of physics?*** *I am doing a presentation in class and have been researching, and I have not come up with a specific answer.*

How would ***you*** answer this question?

2. Work in groups. Discuss what you know about the history of physics and its founders. Share your ideas with the rest of the class.

READING

Task1. Read the text to learn more about the early history of physics. Complete the chart about the founders of physics and their accomplishments.

Scientists	Accomplishments
Archimedes	measured the density of solid bodies by submerging them in a liquid, etc.
.....	.....
.....	.....

Historically, science is rooted in people's efforts to understand and explain the world and the universe around them. They wanted to feel some degree of control of their lives or at least be able to explain what was going on and why. Their interest was born of concern and fear, as well as curiosity. The early history of man involves very little ability to investigate more than could be observed with senses. Many people attributed phenomena they couldn't understand to the presence or actions of gods. Others didn't accept the myths on faith but chose to investigate further.

The study of mathematics and the sciences, particularly astronomy and physics, began in the important centers of ancient civilizations. Alexandria was one of such centers where the mathematician and inventor Archimedes designed various practical mechanical devices, such as levers and screws, and measured the density of solid bodies by submerging them in a liquid. Some famous Greek philosophers such as Socrates, Plato, and Aristotle had a significant impact on the development of western civilization as a whole and on science in particular. Aristotle viewed the learning process as one of observation and thinking, but he would not conduct experimentation. Experimentation was something other than what he supported in his ideas about how to find the answers to questions.

It wasn't until the beginning of the Renaissance that humankind realized that experimentation and observation were equally important. The advent of modern science followed the Renaissance and was inspired.

By the highly successful attempt by several outstanding individuals to interpret the behavior of the heavenly bodies during the 16th and 17th centuries.
The Polish natural philosopher Nicolaus Copernicus introduced the heliocentric system claiming that the planets move around the sun. He was convinced, however, that the planetary orbits were circular.
Sometime later, after heroic seven-year efforts to more accurately model the motion of the planet Mars, Johannes Kepler concluded that the planets follow not circular but elliptical orbits with the Sun at one focus of the ellipse. This breakthrough overturned a millennium of dogma based on Ptolemy's idea of 'perfect' circular orbits for the 'perfect' heavenly bodies. Kepler also proposed the first known model of planetary motion in which a force emanating from the Sun deflects the planets from their 'natural' movement, causing them to follow curved orbits.
When Galileo Galilei heard of the invention of the telescope, he constructed one of his own in 1609. By observing the phases of the planet Venus, he confirmed the heliocentric system. He also discovered the surface irregularities of the moon, the four brightest satellites of Jupiter, sunspots, and many stars in the Milky Way. During the early 17th century, Galileo pioneered experimentation to validate physical theories, which is the key idea in the modern scientific method. Galileo's interests were not limited to astronomy; he also demonstrated that bodies of different weight fall at the same rate and that their speed increases uniformly with the time of fall. Galileo's astronomical discoveries and his work in mechanics foreshadowed the work of the 117th-century English mathematician and physicist Sir Isaac Newton, one of the most outstanding scientists ever lived.

Task 2. Mark the statements T for 'true' or F for 'false.' Correct the false ones and expand on the true ones.

Statements	T/F
a) People's fright and desire to have more control of their lives and curiosity led to the birth of science.	
b) Even in the early days, people had quite a good ability to conduct experiments and investigations.	
c) Alexandria was one of the most important scientific centers of the ancient world.	
d) Aristotle considered experimentation an important part of any research process.	
e) Nicolaus Copernicus suggested that the planets move around the Sun.	
f) German astronomer Johannes Kepler concluded that the planets follow circular orbits.	
g) Galileo constructed the first telescope in the world and, with its help, observed the phases of the planet Jupiter	
h) Galileo devoted all his research efforts to astronomy.	

WRITING

Task 3. Based on your previous knowledge and facts from the text, write an answer to the question of an American teenager about the founders of physics. Start like this:

"Physics appeared as a separate science only in the early 19th century. Before that time, a physicist was often a philosopher, mathematician, chemist, biologist, engineer, or political leader. That's why I do not think a particular person can be called the founder of physics. So, we can name several outstanding scientists. I want to start with…."

LISTENING