

Station F: Engineering

1. **Read the information about engineering and list major achievements.** Carefully read and discuss the information below about the ancient Greeks' achievements in the field of engineering. Then, list three major ancient Greek achievements in the field of engineering in the Station F section of **Student Handout 4.1A**.

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. He used science and math to invent several war machines that enabled his city-state, Syracuse, to withstand an attack by a powerful Roman army. Among his weapons were carefully positioned reflective types of metals that could act like mirrors and lenses. These metals used the sun's heat to raise the temperature of the Roman ships and cause them to burn up. He also designed *catapults* that threw arrows and stones with amazing accuracy.

Archimedes also explained the principle of the *lever*. He 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 a 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.

