Foundations

Read the following two stories to your students. Or if you like, ask two students to read the stories.

THE LEANING TOWER OF PISA

Have you ever heard of the Leaning Tower of Pisa? It started out as the bell tower of a beautiful cathedral. Builders planned for the tower to be unique because unlike most other church bell towers, it would stand separated from the cathedral as a lone monument. It was designed to stand over 191 feet high and nearly 65 feet around. At completion the tower would weigh nearly 14 1/2 tons. Construction started August 9, 1173. However, in 1198, after completing only four of the eight levels, workers encountered a problem. For nearly 200 years, they would halt and resume construction time and again. The problem would only get worse. No one could figure out how to fix it. What was the problem?

The tower was leaning. It had a poor foundation that was only 10 feet deep and sat on unstable ground. In fact, the name for the town, *Pisa*, literally means “marshy ground.” Although the building is now famous because of its lean, this beautiful cathedral has a terrible foundation. Because of this, the building never realized its intended potential.

THE EMPIRE STATE BUILDING

No doubt you have all seen pictures of the Empire State Building. Many of you may have actually stood at the top. Located in New York City, the Empire State Building was the tallest building in the world until 1972. Standing 1,454 feet tall, it contains more than 10,000,000 bricks. It houses over 1,000 businesses and even has its own ZIP Code.

But one of the most interesting facts about the building is that it moves! The Empire State Building doesn’t sway so much as it “gives.” In a strong wind, the building will literally “give” up to 1.48 inches! A building so tall that it actually moves in the wind depends on a very strong foundation. In fact, the concrete and steel foundation of the Empire State Building extends 55 feet below the ground into the solid Manhattan bedrock. Think about it. If you were to divide the Empire State Building into 26 parts, only one of those parts would be below ground. This huge building rests on a foundation that is only 1/26th the size of the entire aboveground structure. Yet it has kept the building standing for over 75 years.