Activity 1.1.1 History of Civil Engineering and Architecture

Introduction
Can you name any of the Seven Wonders of the Ancient World? Each was a feat of civil engineering and architecture. What causes structures such as these to fill us with awe even today? What is it that makes them seem more wondrous in our time of modernization? These structures have paved the way for many new advances in the design of the structures you see today.

In this activity you will learn about the history of civil engineering and architecture. You will see differences between the two professions and learn of their beginnings.

Equipment
- History of Civil Engineering and Architecture presentation

Procedure
In this activity you will investigate the history of civil engineering and architecture. You will see differences between the two professions and learn of their beginnings.

1. Define civil engineering.
A civil engineer designs things that are used by the public, such as railroads and bridges.

2. Define architecture.
Architectures design private structures such as houses.

3. Describe the origination of the concept of architecture?
Architecture first appeared when humans turned towards agriculture and required houses when they settled down in one place.

4. In ancient times how were building materials chosen?
Building materials were chosen based on what was available and what would fit the climate of the area.

5. Give two examples of vernacular architecture.
Native Alaskans and others who lived near the Artic regions lived in igloos because ice was a plentiful building material that insulated heat.
6. Name and describe the type of system used to create many early buildings.
Post and lintel type construction was used to create many early buildings. Pillars were used to support a bar on top.

7. What was the purpose of the Egyptian pyramids? Mexican pyramids?
Egyptian pyramids were used as tombs for dead pharaohs. Mexican pyramids were used for sacrifices.

8. What kind of construction method was used to build the Parthenon? Made a simple sketch to illustrate.
Post and lintel was used. Pillars held up the beam to create entrance-like openings.

9. What problem in architecture led to this form of construction?
The desire for bigger heights led to this form of building.

10. Explain how an arch is created.
Stones were placed in a curved structure with a key stone on top.

11. How is the vault used in civil engineering?
Arches were placed next to one another.

12. Give an example of an arch and dome system.
Arches and domes had a keystone on top to support the circular structure.

13. Give an example of a modern material we have that was not available to the ancients. How did this restrict construction in ancient times?
In modern times, steel and reinforced concrete was invented.

14. What was the purpose of the Roman aqueducts?
They were used to transport clean water to cities and other densely populated areas.

15. Compare ancient Greek roads to ancient Roman roads.
Roman roads were layered to make it last longer. They were more durable and vast.

16. Describe an ancient Roman bridge.
Bridges had arches to support the walkway.
17. How did building materials and methods change after the Romans?

Iron and steel were created because it was lighter and stronger.

**Conclusion**

1. Give an example of a modern pyramid not shown in the presentation. How does its function differ from that of the Egyptian pyramids? What do you think accounts for this difference?

Some stores have a pyramid shapes. Modern pyramids are no longer used for religious purposes. Modern societies are more advanced, where religion is not as important.

2. Give an example of a modern structure that uses an arch and dome system.

Football stadiums have domes on top for weather and arches for entrances.

3. What is the main purpose of modern roads? How is the cost of modern roadways defrayed?

Modern roads are used for transportation and are made from cheaper materials.