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 type of engineering based on the design and construction of public works, such as bridges, dams, and other large facilities.

2. Define architecture.

The art and science of designing buildings for human habitation.

3. Describe the origination of the concept of architecture?

The origins of architecture came around when people began to live in constructed dwellings and within communities. Caves were last used as habitats around 8000 BC. The beginnings of architecture were simply how to find a way to separate oneself even further from harms way with shelter.

4. In ancient times how were building materials chosen?

This was based on region on resources available to the settlers of these lands, whether it was wood, stone and mud.

5. Give two examples of vernacular architecture.

1) igloo 2) Apache Wickiup
6. Name and describe the type of system used to create many early buildings.

The type of style was called Imhotep which was a dense structure of bearing walls that provide support for each other and the roof.

7. What was the purpose of the Egyptian pyramids? Mexican pyramids?

The purpose of Egyptian pyramids was to act as a tomb for the Pharaoh when they will die.

The purpose of the Mexican pyramids was ceremonial or astronomical for either ritual or study.

8. What kind of construction method was used to build the Parthenon? Made a simple sketch to illustrate.

Post-and-lintel construction: horizontal beams placed across vertical posts.

9. What problem in architecture led to this form of construction?

It was impossible to create a door and window opening without sacrificing support.

10. Explain how an arch is created.

They are made from smaller and lighter blocks of stone, thus they are easier to stack and build on. Blocks are placed in a curved formation in such a way that they give each other support.

11. How is the vault used in civil engineering?

When two of these vaults intersect, a cross vault is created. Vaults allow for the construction of bridges, walkways, and other passages.

12. Give an example of an arch and dome system.

The Colosseum

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?

Structural steel for it was a lightweight and malleable metal that was also tough and more stable. This meant that many structure could not have been built for they were too heavy or too unstable.
14. What was the purpose of the Roman aqueducts?

This was by constructing canals, tunnels, and such in order to get a sewage system or public bathing for people. As well it was a better way of transporting water.

15. Compare ancient Greek roads to ancient Roman roads.

Greek roads were ceremonial thus less necessary so it was much smaller and less effective than Roman roads who had 50,000 miles of paved roads in order to get around the empire quicker.

16. Describe an ancient Roman bridge.

They were constructed using columns and beams with a pile foundation. They were covered with ash to fill spaces in the platform usually.

17. How did building materials and methods change after the Romans?

There was little change in building materials or methods of construction from those of the Romans. Than during the 18th century resources such as iron became cheaper because of new furnaces.

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?

The Palace of Peace and Reconciliation is a modern pyramid with a design that claims to recognize “all the world’s religious faiths.” This is not a tomb thus different. This is different for there is a social aspect of this pyramid rather than cultural because it was built during the 1900’s

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

United States Capitol

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

Transport from one place to another on land in an easy and efficient way with use of a vehicle. It was defrayed by public costs or private donations.