

**Review last weeks lesson**


*-Sample Questions-*

- What are strong shapes?
- Is a pyramid strong?
- What is sadwitching a joint?

**Fun Facts**

- The Coliseum still stands today and can be seen.
- The Coliseum doesn't only have damage from earthquakes but also by stone robbers!

**AMAZING ANCIENT STRUCTURES**
Engineering with LEGO Bricks  
Brain Builders Educational Programs

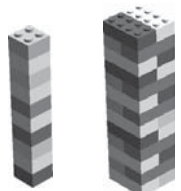


**The Coliseum in Rome**

This was the largest coliseum built in the Roman Empire and was considered one of the best engineered and architected structure from Rome. The Coliseum was used for Gladiatorial events and seated up to 50,000 spectators. It is made from many columns and arches but also suffered much damage from earthquakes.

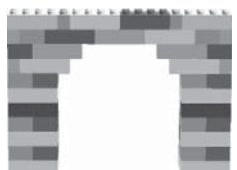
**Columns**

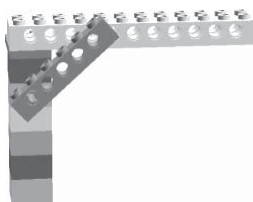
Columns were used as far back as ancient Egypt to 2600bc and are still used today. They are often used to support the roof of a building or in a multi-story building. They do a great job of resisting lateral forces. In other words, they can resist a force that is pushing downward on the column. Columns are also used together with arches or supporting beams. Here are some examples of a basic column.



**Arches**

Have you ever seen a bridge and noticed how the bottom has a symetrical curve on the bottom? That is an arch. The bottom of your feet also have an "arch" to them which is also curved. Arches do a great job of transferring downward force on the weak areas of a structure across to the columns. They enable structures to be long and strong at the same time, just like a long bridge! Here is an example of a simple arch with columns on the side.





Here is another way that you can support a structure. This is similar to an arch but uses a support beam, which creates the shape of a triangle, between the beam and column. This is also a good design to use if you are finding it difficult to build an arch.

*Try building different designs and see if you can make a super tall structure that is strong!*

*Have students build on a platform. This will help the stability of their structures.*

*You may also pass out extra 2x2 bricks for the teams to use.*

**Challenge 1 - Team Build**

- Engineer a structure at least 15 bricks tall that can support the weight of a heavy book.
- Must have columns

**Challenge 2 - Team Build**

- See which team can build the tallest structure that can support the weight of the book.
- Award that team with builder bucks!