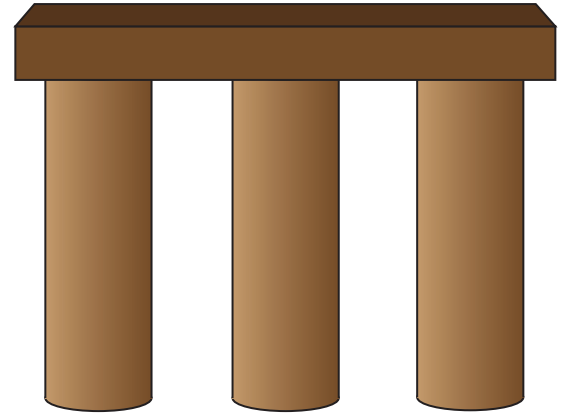


Cardboard Columns

Columns are a basic structural element in most buildings, but they are often hidden from sight. The Greek Revival architectural movement in the United States (1825-1860) revived the style of ancient Greek architecture that made columns a prominent and visible part of the building. Construct and test your own cardboard columns to see why they continue to be used in buildings today.

What you will need:

- 6 toilet paper tubes (or paper cups)
- Large container (ex: baking tray, plastic tub, or cardboard box)
- Horizontal object (ex: piece of cardboard, book, or cookie sheet)
- Filling material: sand, gravel, or rice
- Heavy objects that are easy to stack (ex: books or bricks)



Build and Test

1. Place a baking tray, tub, or cardboard box on the floor.
2. Stand three toilet paper tubes or paper cups inside of the tray or box. Space them approximately one inch away from each other.
3. Place a large, flat object on top. A wide piece of cardboard, large book, or cookie sheet works well. This help distribute the weight during the next step.
4. Carefully stack heavy objects on top. Add each object one at a time, trying to keep the weight in the center. How much weight can the columns hold before collapsing? Record your result.
5. Replace the crushed columns with three new paper tubes or cups. Fill each with sand, gravel, or rice.
6. Repeat steps 2-4 again. How much weight can the columns hold now?

What's Happening?

Most buildings are supported by a combination of vertical columns and horizontal beams. These structural elements support the weight of the building and everything inside of it. Columns are incredibly strong under compression, the downward force exerted by a load and the counteracting force upward from the ground. Hollow columns are relatively strong under the weight of a heavy load, but a solid column, such as the one filled with sand or similar material, can withstand even more weight.

Take it further!

American interest in Greek architecture began with the 1762 publication of *Antiquities of Athens*, James Stuart and Nicholas Revett's study based on archaeological discoveries. British architect Benjamin Henry Latrobe brought the new Greek Revival style to America in the late 18th century. The style was associated with liberty and democracy, making it ideal for the new republic. It quickly spread and was so widely used it was known as the "national style" during the height of its popularity from 1825 to 1860. Defining Greek Revival characteristics include symmetrical and austere porticos with Greek Doric, Ionic, or Corinthian columns, classical cornices and entablatures, and low-pitched roofs.

In Alexandria, The Lyceum (1839) and the Athenaeum (1851) are examples of Greek Revival style. Other Alexandria buildings include elements of the style, such as rowhomes with classical Grecian cornices, the Ionic columns of Alfred Street Baptist Church, and the Doric columns of the George Washington Masonic National Memorial.



The Lyceum, 201 South Washington Street.