

# Who Can Build the Strongest Bridge?

## You will need:

- tape
- yarn
- sticky tack
- scissors
- paper clips
- straws
- a small cup full of coins (about 100 coins)



## Directions

1. Review components of a bridge with students.
2. Pass out supplies to each group of students.
3. Ask students to build a bridge that can hold a cup full of coins.

## Exploration

Which type of bridges are students choosing to make? How are the groups problem solving and working together? After 10 minutes, stop the groups and have them discuss the challenges of building the bridge. What is working? What is not working? Let the groups continue working for 20 minutes to update and adjust their bridges based on the class discussion. Allow the children to retest each bridge. Ask the groups who have built successful bridges to explain what type of bridge they built and how they built it.

## Discussion and Explanation

The different types of bridges support different weights across a single span. When building a bridge, we have to ask, "How far away can the ends of the bridge be and still support a certain amount of weight?" Bridges are designed to withstand forces pushing down upon them, like the weight of the coins. The bridge must endure tension and compression. Tension is the result of opposing sides applying pressure. Compression is the force that gravity and weights (like cars or coins!) put on bridges.

**Which of the students' bridges best endured the tension and compression? Can students point to areas of compression and tension on their own bridges?**

Trusses, arches, and cables help ease the forces of tension and compression by spreading them over the bridge more evenly.

**Can students show where they have built trusses, arches, or used suspension cables to support their bridges?**

## Math Extension:

1. Students can draw and label the shapes they used to build their bridges.
2. Students can measure the length and height of their bridges.
3. Students can weigh the coins they used in grams.
4. Students can draw their bridge and label the angles.

## Books to read:

- 'Twenty-One Elephants and Still Standing' by April Jones Prince
- 'Bridges' by Seymour Simon
- 'Cathedral: The Story of Its Construction' by David Macaulay