

PENNY BRIDGE ACTIVITY

Can you build a bridge that holds 100 pennies, using 1 sheet of paper and up to 5 paper clips?

A bridge must support its own weight (the dead load) as well as the weight of anything placed on it, like the pennies (the live load). Your paper bridge must span 20 centimeters (about 8 in.). The sides of your bridge will rest on two books and cannot be taped or attached to the books or the table.

What You Will Need

- plain paper
- 5 paper clips
- ruler
- 2 books or blocks
- at least 100 pennies or other small weights
- scissors



Make a Prediction

Describe how you think the bridge should be constructed in order to support its dead load plus the live load of the pennies.

Try It Out

1. Discuss possible ideas with your partner before you start building. What can you do to the paper to make it stronger? When you have decided on a design, construct your bridge.
2. Place the bridge across two supports that are 20 cm apart. Remember that the space below the bridge must be clear to allow boats to pass!
3. To test your bridge, load it with pennies one at a time, until it collapses. Record how many pennies your bridge supported.

Explain It

Describe how well your bridge supported its dead load and the live load you placed on it. Was the bridge as strong as you thought it would be? Where did it fail?

Build on It

- Redesign your bridge and test it again, using a new sheet of paper. How does your second attempt compare? How can engineers test their plans for building a full-size bridge?
- Is there a difference in the load your bridge can hold if you put the load in the center of the bridge compared to spreading it out along the bridge? Make a prediction and test it.