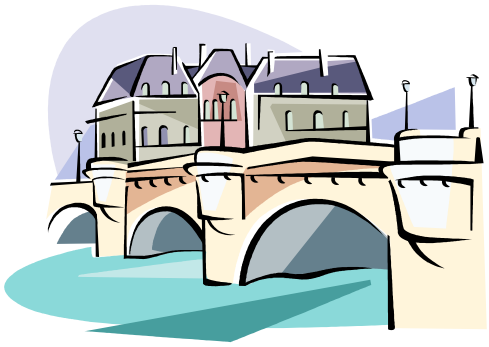


MINOU
by
Cindy Bingham

Minou teaches students an important lesson; each one of us must learn to be self-reliant, and grow up to be adults of independent means. We all must be prepared to be problem-solvers and risk takers. Both boys and girls need to be capable of care-giving.

As Minou learns her way around Paris, we see its beautiful sites and learn that the Seine River divides the city into the Right and Left Banks. Bridges are a necessity for getting across the river, especially since cats don't like to swim. Students will learn how to build an arched bridge like Pont Alexandre III and four other kinds of bridges; then they will test them with pennies to see which one is the strongest. Then they are challenged to come up with a bridge design of their own.

MATERIALS: 8 X 11 paper, two stacks of books @ 10 cm high, scissors, metric rule, pennies

ACTIVITY: see attached activity page from WONDERSCIENCE, February, 1991.

SOURCE: American Chemical Society/American Institute of Physics

STANDARDS:
BSL: 1.1, 1.3, 1.5, 1.9, 1.13, 3.3, 3.4, 11.2, 12.2, 12.3
NCTM: 1a, 1c, 3b, 5a, 5d, 6a, 10a
SCS: A1, B2, E2, H2, H3, H5

Bingham, Cindy. Minou. Advocacy Press, 1987. ISBN#0-911655-36-0.

TEACHER NOTES: Minou is a cat, and the story takes place in Paris. This activity could be used with any book in which a bridge is necessary to the plot. Activities using physics principles are so important at the elementary level. See The Three Billy Goats Gruff document for additional bridge-building activities.

WonderScience Construction Challenge *

If you wanted to build a structure such as a bridge, a house, or even a baseball stadium, there are always two important questions you first need to answer:

1) What kind of building materials am I able to get?
and
2) How can I *design* the structure so that it will work using those materials?

Try to find the best way to use a material to build a strong structure in the ***WonderScience Construction Challenge*** below!

You will need

sheets of typing paper, cut in half lengthwise
two stacks of books of equal height (about 10 cm)
blunt-end scissors
metric ruler
pennies

THE CHALLENGE!

Your *WonderScience* Construction Challenge is to build the strongest bridge you can, using only 1/2 sheet of paper!

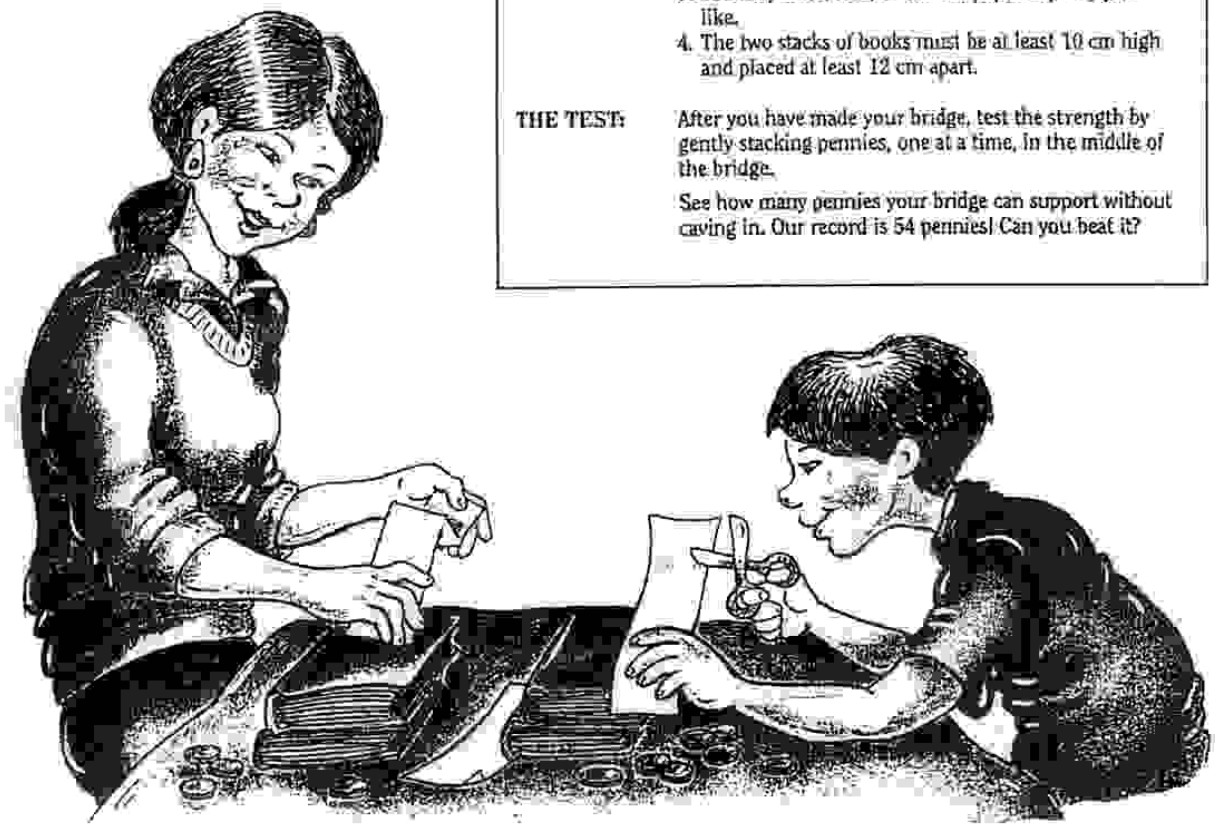
THE RULES:

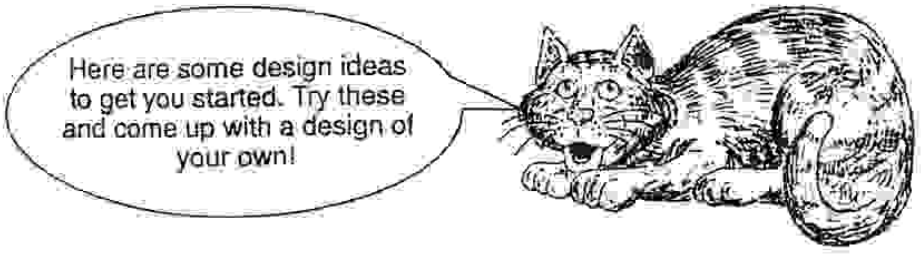
1. The bridge can be made only from 1/2 sheet of plain white paper. You can use less paper, but not more.
2. You may not use glue, tape, or any other materials.
3. You may bend, fold, or cut the paper any way you like.
4. The two stacks of books must be at least 10 cm high and placed at least 12 cm apart.

THE TEST:

After you have made your bridge, test the strength by gently stacking pennies, one at a time, in the middle of the bridge.

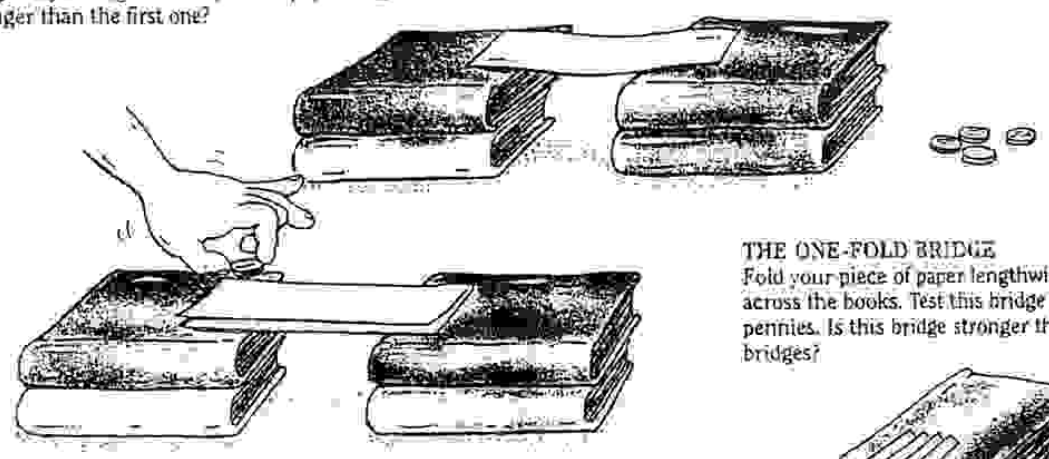
See how many pennies your bridge can support without caving in. Our record is 54 pennies! Can you beat it?





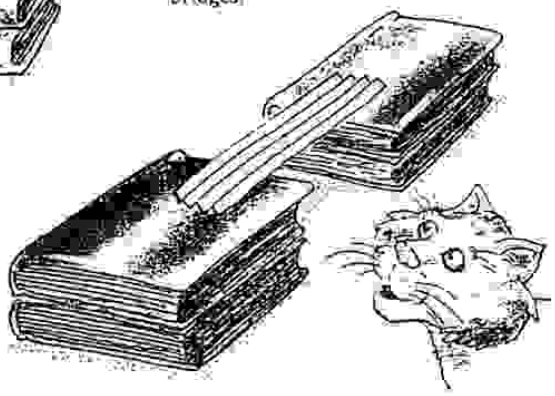
THE FLAT BRIDGE

Lay your piece of paper between the books. Test the bridge by placing pennies, one at a time, on the middle of the bridge. Is this bridge very strong? Cut the piece of paper lengthwise to make two long strips. Lay one strip on top of the other. Is this bridge stronger than the first one?



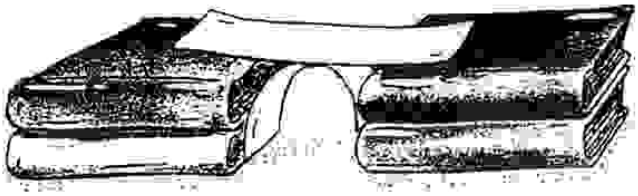
THE ONE-FOLD BRIDGE

Fold your piece of paper lengthwise and lay it across the books. Test this bridge with the pennies. Is this bridge stronger than the flat bridges?



THE ACCORDION BRIDGE

Fold the long side of the paper back and forth to make small pleats like an accordion. Test this bridge's strength with the pennies. Does the number and size of the folds affect the strength of the bridge? Experiment and find out! It sure would be hard to drive across this bridge! Can you think of a way to design an accordion bridge with a smooth roadway?



THE ARCHED BRIDGE

Cut the paper in half lengthwise. Place one strip between the two stacks of books to make an arch. (You may need to cut the strip so that the arch is the same height as the books.) Place the second strip across the books and the arch and test with the pennies. Does the arch make the bridge stronger?

THE WALLED BRIDGE

Fold each long side of the paper up so that your bridge has walls on both long sides. Test the bridge with the pennies. Does the size of the walls make a difference in the strength of the bridge? Experiment to find out. Can you design a bridge with both walls and an arch?