

The Dollar Bill Bridge

The Action Have students investigate different ways that a \$5 bill could support and suspend a drinking glass on top of, and in between, two other drinking glasses.

Grade Level Grade 7 – Structure & Design
Grade 10 – Science Challenge

Materials A \$5 dollar bill
Three drinking glasses

Instructions Place two drinking glasses about 4 cm less than the length of the \$5 bill apart from each other. Proceed by folding the bill in half lengthwise, and then fold this in half again, and again. Unfold the bill and fold it now in and the next crease out (as in the pleads of a skirt). Make sure that all the folds are sharply creased (use your nail to press). Spread the pleated bill out and place it over the two glasses, bridging the two, and carefully place the third glass in the center on top of the bill. Voila! The dollar bill bridge!

Safety

Hints

Science Principle Providing the bill with the lengthwise corrugations actually turned the bill into a strong beam across the two drinking glasses. There is an optimum number of corrugations, which gives it optimal strength. The larger the corrugations the less we can make from the width of the dollar bill, and the more corrugations the smaller they are and thus the weaker.

In nature we find similar corrugations in celery stalks and other plant tissues. In our daily life we encounter the zig-zag or corrugated structures in bridges, plastic roofing, & cardboard boxes (cardboard consists of two layers of heavy paper with a corrugated layer in between).