

Lesson 4 Newspaper Bridges II: Making an even stronger bridge

Objectives: Students will have an opportunity to build on what they learned by building their initial newspaper bridges. They will be able to use materials that they asked for in the final discussion of the previous lesson.

Students will develop a respect for limited resources and will experience the need to budget their resources.

Materials: For each student:

- ∞ Journal
- ∞ Pencil
- ∞ Pre-packaged materials for home connection

For each group:

- ∞ 5 Bridge material tickets (see handouts)
- ∞ 1 Bridge materials price list (see handouts)

For the entire class:

- ∞ Approximately 20 sheets of newspaper per group
- ∞ Masking tape
- ∞ Rubber bands
- ∞ String
- ∞ Weights to test strength of bridges (Have plenty of weights – bridges can support over 7.5 kg!)

Sponge: Ask students to write in their journals how they would make a stronger bridge using more newspaper, tape, rubber bands, and string.

Initial

Discussion: Brainstorm ideas for making stronger bridges.

Define problem: Design and build a bridge as long and as strong as possible between two chairs or tables using only newspaper, masking tape, and rubber bands. You can choose not to use all types of materials.

Students must purchase their materials. Each group gets 5 tickets. One ticket buys: 5 sheets of newspaper, or 1 meter of masking tape (stick tape to group's table), or 5 rubber bands. Before purchasing materials, discuss with group.

Define Constraints: Bridges will not be anchored to the chairs or tables and will have no supports that touch the ground.

Project: Working in groups of three or four, students will build a bridge between two tables or chairs at least 40 cm apart. Bridges will not be anchored to the tables or chairs. Students are given 5 tickets, which they must use to “purchase” materials. Students should discuss in groups what materials they want to purchase before buying materials.



Vocabulary: Anchor – to attach firmly
Support – (verb) to bear the weight, especially from below, (noun) one that supports

Final

Discussion: Allow students to look at other groups’ bridges. Have groups share their process. Ask the following questions:

- ∞ Which bridge looks strongest?
- ∞ Why do you think that one bridge is stronger than another?
- ∞ How did you make the bridge strong?
- ∞ What worked, what didn’t work?
- ∞ How much weight does your bridge hold? (Take picture of bridge before testing weight.)
- ∞ Compare weight this bridge holds with weight that bridge from previous class held.
- ∞ What materials would you like to have to make a stronger bridge from newspaper?

Students write in their journals what worked and what didn’t work. Encourage them to draw pictures of the process. Students should record the amount of weight their bridges held.

Home

Connection: Bundle a copy of the instructions for File Card Bridges with 10-3x5 index cards and hold together with paper clip. Note that any type of weight will do – you don't need to measure the strength of bridges with pennies.

Home Connection project instructions are from:

http://www.exploratorium.edu/science_explorer/card_bridge.html (Print at 77% from Safari for good page breaking and for all important material to fit on 2 pages.)