



Building Strong

Overview:

Build a paper structure that will support a book.

Materials:

- Sheets of 8 1/2" x 11" paper (several per group)
- Books (1 per group)
- [Affordable Structures](#)

Objective/Questions:

Learn that materials' strength varies with shape and arrangement.

Questions:

- Can you support the weight of a book on a flimsy piece of paper?
- Can some shapes and structures support more weight than others?
- What are some basic shapes often seen in building structures? Give examples.
- Challenge extension: [Affordable Structures](#)
- What factors could you consider in building a cost-effective living structure for a family? What about a business building?
- What types of industries could benefit from alternative, affordable building design?

Explorations:

Have students work in teams like civil engineers to build a portable paper structure that will support the weight of a book.

Communication:

Have students research or discuss:

- Affordable living space
- Green design
- Shape and arrangement
- Structures that are

- Cost-effective
- Structurally sound

Test and Record Results:

Direct students to build the requested structure. Encourage them to use their imaginations and to keep in mind the information they learned in the background section. Remind them they should feel free to ask you for help to get started in the right direction.

Test their structures for weight by placing a book on each structure in front of the class. Can their structure support the book?

Analyze Results, Final Product:

Have students look at the basic design of objects in and outside the classroom. Ask them:

- Are there similarities in design?
- What kinds of materials are used to construct these structures?
- Is that material necessary, or can another (cheaper) material be used with the same results?

If using the Challenge Extension evaluation ([Affordable Structures](#)), have students:

- Determine the cost of their structures.
- Redesign the structures at less cost to make them more affordable.