

STEM CHALLENGE



Index Card Towers Building Structures

OVERVIEW

Can you build a stable structure using index cards? Design and construct a tower that can support the weight of a book or other object. How tall can you make your tower? How much weight can your structure support?

9. What could you do differently to improve your design?

10. How could you adapt your structure to hold more weight or to climb higher?

INDEX CARD TOWER MATERIALS

Stack of Index Cards
A Book or other Weighted Object*
Measuring Tape or Yardstick*

* This item not provided in the kit

LET'S DO IT: INDEX CARD TOWERS

1. Can you build a structure only using index cards that can support the weight of a book or other heavy object?
2. Try to build your structure as tall as possible without using any additional materials (tape, paper clips, staples, etc.).
3. How might you place the cards to make a stable structure?
4. Does changing the shape of an index card make a difference?
5. Draw your designs and describe your ideas. How might you design a sturdy base? What shapes are good for building? How can you give the tower more stability?
6. Try building your structure, testing your designs as you go. What worked? What didn't?
7. Can your structure hold the weighted object?
8. How tall is your tower? Measure its height.

WHAT'S THE SCIENCE?

One of the most important steps in any engineering challenge is to understand the problem you are trying to solve. In this case, you are trying to build a structure that can support the weight of an object. To determine a solution to this problem you will need to explore critical load, or the amount of weight or force that causes a structure to fail or fall apart. You will also test its structural integrity or strength of your structure when the weight is added.

Some shapes can help to add strength to your structure and may allow you to build your tower taller. Triangles can help to add stability and are used to support weight. Cylinders can be used to make columns and have been used in architecture for centuries. Once you learn which designs allow you to build taller and support more weight, you can repeat the pattern and see if your structure can be even taller and stronger.



Index Card Towers Building Structure



CAREER PATHWAYS

If you like designing & building structures, you could be a

- Structural Engineer
- Architect
- Carpenter
- Urban Planner
- Materials Scientist

READING CONNECTIONS



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