

Newspaper Bridges!

Objective:

- To differentiate different structure shapes and compare their effectiveness
- To understand the property of bending stiffness
- To observe the effects of different loads on structures

Opening Lesson:

- This week we will be making bridges out of newspaper! Bridges are important for getting stuff across rivers, hills, and other things in nature.
- Some examples of famous bridges are the Golden Gate Bridge in San Francisco and the Brooklyn Bridge in New York City which are both suspension bridges. Can you think of any other famous bridges?
- These bridges have to withstand a lot of weight due to the cars, buses, trucks, and people that travel across them. What do we think makes these bridges strong? Think about the materials as well as the shapes seen.
 - Bending stiffness refers to how hard it is to bend a certain material. For our experiment with newspaper, think about how bending stiffness relates to the bridge's effectiveness and how we can adjust this quality for our bridge
 - Notice how many pieces of the bridge are connected, especially in square and triangle shapes? These shapes and connections are super important for the bridge to be stable and hold weight.
- We will be making our own bridges out of newspaper and using these shapes to make them as strong as possible.



Materials:

- Newspaper
- Masking Tape
- Plastic Bag
- Rulers
- Weights (Washers and/or marbles)



Activity:

1. Start off with 10 sheets of newspaper and one roll of masking tape.
2. Brainstorm some possible ideas for the construction of your bridge. You can think about some bridges you've seen in real life, and what we talked about earlier in the lesson, as inspiration. Keep in mind that it should be around a foot long and a couple inches wide.
3. When you think your design is ready, you can build your bridge using the newspaper and the tape.

4. To test your bridge, set two chairs a little less than a foot apart. Place your bridge across the two chairs. Then lay the ruler on top and hang the bag off the edges of the ruler.
5. You can then slowly start to add weights into the bag to see how much your bridge can withstand!
6. Keep adding weights until your bridge falls.

Closing Lesson Questions:

- Did your bridge support as much weight as you initially thought?
- What ideas worked really well?
- How does bending stiffness affect the effectiveness of the bridge?
 - Having good bending stiffness is essential to the effectiveness of the bridge.
- What improvements would you make to your bridge to help it withstand more weight?