



Cardboard Boats

Recommendations: For students in Grade 4-8. Adult supervision is recommended. Can be done indoors or outside.

Purpose: Students will learn about the design and construction process through this hands-on STEM challenge. Using just cardboard and tape, students are encouraged to get creative and come up with a boat design that will float on water. For an added challenge, students can try and design their boats so they can even hold a load and stay afloat!

Materials:

- Lots of recycled cardboard (*tip: waxed cardboard works the best for the outside of the boat*)
- Lots of tape
- Paper and pencil
- Object(s) that will fit in the boat (*only needed if you are going to do Step 5*)
- Water source (*this can be a pond, puddle or even a bathtub*)

How it Works:

Step 1: Design - Using their paper and pencil, students will design what they hope their boat to look like (*its ok if the final product doesn't completely reflect the original plan*).

Step 2: Construct - Use the tape and cardboard to construct the boat. Make the boat as big or small as you wish (*the size is usually determined by the amount of cardboard you have as well as the water source you are going to test the boat in*).

Step 3: Float Test – Please ensure an adult is present during this step. Bring your boat to the water source. Carefully place the boat on to the water. Watch carefully. If any major leaks or design flaws are detected early the boat can still be saved, fixed and re-tested!

Step 4: Voyage Test – Take the testing to the next level by seeing if the boat can be pushed or pulled and see if it stays together during a little trip.

Step 5: Load Test (optional) - The final test is to see how much weight the boat can take and stay upright. Take an item of a known weight (*Example: 2x4 Lego block = 2.5 grams*) and carefully add it to the boat. Continue adding objects onto the boat (*keep a count*) until the boat capsizes and then add up the total weight it took to sink the craft.

Conclusion: Questions to Ask - How did the boat do? What are some changes you would implement next time in order to make the boat float longer or be able to hold more weight? Do some research into why things float. Can you apply what you find to the design of your boat? Can you use this new information to make your boat (*or your next one*) better?