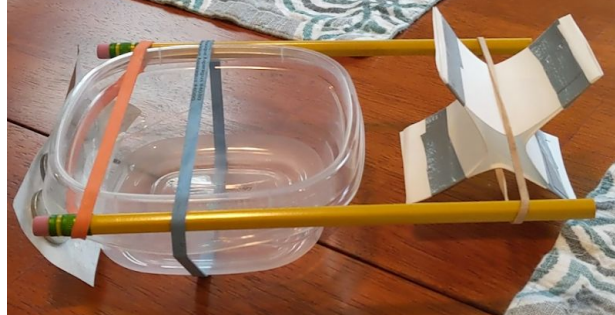


## Build a Paddle Boat



### Materials:

- Shallow plastic container
- 3 rubber bands
- 2 pencils or wooden skewers
- Plastic milk jug or waxy cardboard milk carton
- Duct tape
- A weight for the front of the boat (I used 4 nickles)
- Ruler
- Scissors
- Water (filled bathtub or large container, pool, pond, etc.)

### Directions:

1. Using a rubber band, wrap the two pencils onto the plastic container, one on each side.
2. Put one more rubber band binding the two pencils behind the boat.
3. Cut the milk jug or carton open and flatten it out.
4. Then cut out four rectangular pieces from the milk jug/carton. The pieces need to be 2 inches wide by 3 inches long. Measure with a ruler and then use a pencil to draw your rectangles onto the milk jug. Each of the rectangles will then be folded in half.

5. Now duct tape one side a rectangle to the side of another rectangle to create a cross shape. You could create the cross shape and then tape the sides together.
6. Finally you slide two blades of the paddle through the rubber band one the end of the boat.
7. Attach the weight to the front of the boat for balance.
8. Now twist the paddle on the rubber band to wind it up.
9. Without releasing the twists, place the boat on the water and then let go.

### Things to Observe

- What happens if you twist the paddle toward the boat?
- What happens if you twist the paddle away from the boat?
- Does it make a difference if you move the rubber band and paddle closer to the boat? Further away?
- What makes the water move away from the paddle as it turns?
- What happens if you twist the paddle more? Less?

### The Science Behind It: Storing and Releasing Energy

In this experiment, we used a rubber-band-powered paddle to drive the boat across water. The paddles were driven by the unwinding rubber band, which you manually wound before putting it into the water.

- Where was the energy stored that made the paddle spin? (in the rubber band). The term for stored energy is “potential energy.”
- How can you tell when potential energy stored in the rubber band is being used? (something moves). The term for movement or motion energy is “kinetic energy.”
- What are some examples potential and kinetic energy that occur when a paddleboat moves through the water? (Potential energy: the

wound rubber band. Kinetic energy: the rubber band unwinds; the paddle spins; the boat moves; waves spread out).

- How can you increase the rubber band's potential energy? (wind it up more).

Your boat moves by changing stored energy (potential energy) into motion energy (kinetic energy). The more you wind the rubber band, the more potential energy you store. When you let go, this potential energy turns into kinetic energy, and the boat moves through the water.

