

# Build & Maneuver a Submarine



**Contact the Albacore Museum for Field Trip and School Visit Opportunities**

Special Thanks to National Museum of the United States Navy for writing content

## Lesson Plan

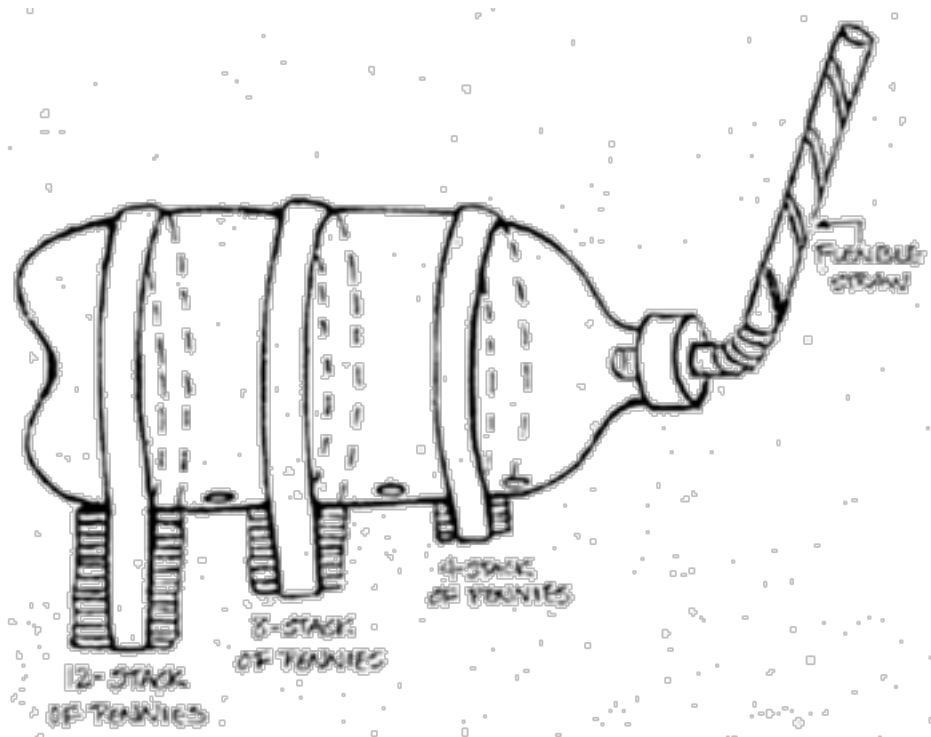
**OBJECTIVE:** Students learn the basic of principle of buoyancy and how submarines use it to dive and ascend in water.



### **MATERIALS:**

- empty 16 or 20 oz. plastic soda bottle with hole in cap (the hole should be big enough to pass a flexible straw through)
- three wide rubber bands
- 24 pennies
- aluminum foil
- adhesive tape
- flexible straw
- large tub of water

# Activity Sheet



## PROCEDURE:

1. Cut three holes inside of the soda bottle.
2. Stack the pennies into three piles containing 4, 8, and 12 pennies.
3. Carefully wrap stacks of pennies with foil.
4. Place a rubber band around the plastic bottle and slide it next to the closest hole. Position the other rubber bands next to the two remaining holes.
5. Place the four-penny stack under the rubber band closest to the bottle's top.
6. Place the eight-penny stack under the middle rubber band, next to the middle hole.
7. Place the 12-penny stack under the last rubber band (NOTE: The weights should be next to the holes NOT over them.)
8. Push the shorter end of the straw (about 1 inch) through the hole in the bottle's cap. Reattach the bottle cap to the bottle. Keep the flex section outside and bent upwards. Tape straw securely into place in bottle cap.
9. Lower the "submarine" into the water. Do not let long end of straw take in water.

10. Observe the action of the "sub" and record your observations.

11. When the sub stops sinking, blow into the straw.

12. Observe the action of the sub and record your observations.

**QUESTIONS:**

1. What makes your submarine sink?

2. What makes it surface?

3. You learned the basic properties that make submersibles dive and surface. What is your model missing that U.S. Navy submarines have to navigate underwater? Think of your sub as an underwater plane.