

# Seahorse - Sink or Swim!

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Seahorses are beautiful fish but have some unusual characteristics! They have a shape unlike most other fish. On the diagram at the right, fin that seahorses use to push themselves through the water. They do not have a tail fin. This makes seahorses slow swimmers.

If you watch a seahorse, you might see the dorsal fin moving. But you may also see them float up or sink down – or even hover in one spot! They look like they do not have to work to float or sink.



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Link – You can watch a <u>video of a seahorse swimming</u> at this link!

Driving Question: Just how does a seahorse control whether it sinks, floats or hovers?

### **Objectives:**

- I can explain how seahorses control their ability to float or sink.
- I can build a model of a seahorse to demonstrate buoyancy.
- I can observe changes in my buoyancy model when I change the pressure.

**Prediction:** In this box, write your Prediction: *How do you think seahorses control whether they float, sink or hover?* 

**Hypothesis:** In this box, write a Hypothesis: Why do you think your prediction above is true?

# **Building a Seahorse Model**

In this activity, you will build a model of one of the internal organs of a seahorse – the swim bladder. Most bony fish have this organ, and it is a simple sac that holds air. The diagram at the right shows the internal organs of a seahorse. Find the swim bladder.

Materials: For this model, you will need...

- 2-liter plastic soda bottle with a lid (clear)
- Eyedropper
- Marker or wax pencil



# Internal Anatomy gall bladder Kidney

# Build a Model

- 1. Remove the label from the 2-liter bottle. Make sure you keep the lid with the bottle.
- 2. Fill the bottle with water all the way to the top.
- Put the tip of the eyedropper into the water in the bottle. Squeeze the bulb and release it to partially fill it with water. There should be an air bubble visible below the bottom of the bulb.
- 4. Put the dropper into the jar. It should float with the bulb at or just below the surface of the water.
- 5. Put the lid on the bottle and tighten it.
- 6. To test the model, squeeze the bottle with both hands. When you squeeze the bottle, the dropper should sink! If it does not, remove the dropper, and refill it with more water than the first attempt. Repeat steps 4-6 until you can make the dropper sink by squeezing the bottle.



# Investigation

- 1. Before doing the experiment, partially fill the dropper so you can sink it when you squeeze the bottle. Hold the dropper upright, and mark the bottom of the air bubble with a marker or wax pencil.
- 2. Put the dropper in the bottle, and screw the cap on tight. Make sure the bottle is completely full of water. WRITE YOUR OBSERVATIONS in the table below.
- 3. As you squeeze the bottle, watch the air bubble in the dropper.
  - a. Squeeze the bottle hard enough to make the dropper sink to the bottom of the bottle. WRITE YOUR OBSERVATIONS in the table below.
  - b. Release the bottle VERY slightly. See if you can make the dropper hover between the top and bottom of the bottle. WRITE YOUR OBSERVATIONS in the table below.
  - c. Repeat the experiment two more times, and record your observations again.

Trial	Dropper at top	Dropper at bottom	Dropper "hovering"
1			
2			
3			

### **Observations of Air Bubble in the Seahorse Model**

# **Noticing Patterns and Making Inferences**

a. What patterns do you notice in the air bubble?

b. How do you think seahorses control whether they float, sink, or hover?

# **Thinking Deeper**

• Seahorses have an organ called a "swim bladder" that is filled with air. In order to squeeze the air bubble in the swim bladder, what do you think the outer covering of the swim bladder is made of?

• Sometimes fish, including seahorses, get an infection that causes the swim bladder to fill up with more air. How do you think this illness would affect a fish? Explain your ideas.