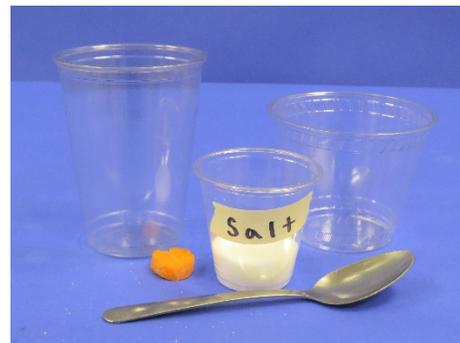


Rooting for Sink and Float!

Some objects float in water and other sink. But did you know that you can change whether something floats or sinks by adding a substance to the water? Let's try it and see!

What you'll need

- Water
- 2 clear plastic cups
- Salt
- Spoon
- 1 carrot slice (about $\frac{1}{4}$ inch thick)



Be safe

The materials in this activity are not hazardous. Always work with an adult to supervise and guide you. Do not taste or eat any food items you are testing.

Here's what to do

1. Pour water into a cup until it is about 1/2-full.
Predict whether a carrot slice will sink or float in the water.
2. Place the carrot slice in the water.
Did the carrot float or sink?
3. Take a teaspoon of salt and put it in the water with the carrot. Stir the water to dissolve the salt.

As you dissolve the salt, what happens to the carrot? If nothing happens, dissolve another teaspoon of salt in the water.

What to expect

As the water gets saltier, the carrot slice rises toward the surface and eventually floats.

What's happening in there?

The carrot is more dense than fresh water so the carrot sinks in fresh water. When salt is dissolved in the water, the density of the water increases until the salt water becomes more dense than the carrot which makes the carrot float in the salt water.



What else could you try?

See if you can make the carrot sink from the surface but not sink all the way to the bottom. In other words, see if you can make the carrot “hover” somewhere in between.

You can try this by doing the opposite of what you did before. Instead of adding salt to fresh water, try adding fresh water to salty water. Instead of the carrot moving up from the bottom like it did before, it should move down from the top. Let’s try it!

Be safe

Be sure to review the safety instructions on page 1 before proceeding.

Here’s what to do

1. Place the cup with salt water and the carrot in front of you.
2. Pour water into another cup until it is about 3/4-full.
3. Carefully pour some fresh water into the salt water until the carrot begins to drop from the surface.

If the carrot falls all the way to the bottom, stir up some undissolved salt from the bottom or add a little more salt to make the carrot move up again.

4. Continue to add fresh water to make the carrot fall or salt to make the carrot rise until it is “hovering” somewhere in the water not on the bottom and not on the top.



What to expect

As fresh water is added, the carrot should begin to sink.

What’s happening in there?

Adding fresh water causes the water in the cup to become less dense near the surface. The water eventually becomes less dense than the carrot so the carrot begins to sink. The carrot sinks until it reaches saltier water that is more dense. The fresh and salty water mix and the carrot slice can “hover” in the water when the density of the water is very similar to the density of the carrot.