Popcorn

Materials

- Popcorn (popped an un-popped kernels)
- Tall beaker or glass of water

Instructions

1. Test whether popped and un-popped popcorn floats or sinks.
2. Look for some partially-popped kernels and test if they float or sink.

What happens?

Popcorn floats because it has a lower density than water. Density is the amount of mass in a given volume and it is a measure of how tightly matter is packed inside an object. The un-popped kernels sink because they have a higher density than water. This is a good demonstration of the fact that it is density, rather than size, that determines whether or not an object will float in water. The popcorn is very light for its size because it contains a lot of air, whereas the un-popped kernels have a lot of material squeezed inside a small volume.

Partially-popped kernels tend to float even though they are almost the same size as the un-popped kernels. They have a crack in them with some white material visible through the crack. The increase in volume when they partially pop is usually enough to increase the volume slightly so they are less dense than water.

Why does it matter?

This is a fun way of exploring the difficult concept of density. Unlike volume and weight, the density of an object cannot be easily observed. It is easy to see if one object is bigger than another and we can often feel if one object weighs more than another, or measure them on a set of scales. Density depends on both volume and weight so it cannot be directly observed.

Popcorn kernels pop when they are heated to about 180 degrees Celsius. You don't need a popcorn machine or hot oil to make popcorn. Kernels placed in an oven heated to at least 180 degrees Celsius will pop.

Slow motion video of popcorn popping, ABC Splash: http://splash.abc.net.au/media/-/m/1270770/what-makes-popcorn-pop-

Health and safety considerations

- Choking hazard for young children (popcorn)