

WORLD OF WATER

Water is necessary for all life on earth, and it has some interesting and pretty unique properties we can study!

KEYWORDS:

Buoyancy

A force that pushes opposite of gravity

Hydrophilic

When something really likes water

Hydrophobic

When something does not like water

ASK YOUR CLASS:

Q: Can you think of objects you are familiar with that might be hydrophilic? What about any that are hydrophobic? **A:** There are many options here. Some examples include: Hydrophilic - paper towel, dirt/soil, sugar, salt; Hydrophobic: oil, counter tops, plastic.

Q: What is buoyancy? **A:** Buoyancy is a force that pushes on objects in the opposite direction of gravity. It is based on density, or how much matter is inside a material. Air is less dense than water which is why bubbles float to the surface. (K-PS2-1)

Q: How can you test the buoyancy of objects? If you push down on something that floats, how does that affect buoyancy? **A:** One option would be to take a cup and add different substances to it to see if they float or sink. A plastic bead will float in water. By adding additional force by pushing down on it, you can overcome that buoyancy and make it sink. However, once you let go the buoyant force takes over and it will float! (3-PS2-1)

Q: Why does the condiment packet sink when you push on the sides of the water bottle? **A:** Adding pressure to the sides of the bottle also adds pressure to the packet within. The little pocket of air in the packet gets compressed, or more dense. It gets so dense that it is no longer buoyant enough to counteract the denser condiment inside, so the packet sinks.

Q: Try to apply different amounts of pressure to the bottle. Can you make the Cartesian Diver float somewhere in the middle? **A:** By testing how much pressure to add to make the diver sink many times, the students will be able to estimate how much pressure to add to make the diver move to a specific area within the bottle. (3-PS2-2)

K-3RD NGS STANDARDS COVERED:

- K-PS2-1:** Plan and conduct an investigation to compare the effects of different strengths or directions of pushes and pulls on the motion of an object.
- 3-PS2-1:** Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- 3-PS2-2:** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.