

**River Quest 2019*****It floats, you don't. Wear your life jacket.*****Synopsis, Resource Links, and Vocabulary List**

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**Synopsis:**

Ten people drown every day in the United States. 88% of these were not wearing life jackets. Life jackets are now much different than the orange vests commonly envisioned and they are collectively known as Personal Flotation Devices or PFD's. Life jackets save lives because they are more buoyant in water than people are – *they float, you don't*. Buoyancy is the force that counteracts the force of gravity that wants to make you sink. The buoyant force is due to the difference in density between the water and the life jacket.

There are different types of life jackets and they make use of different materials such as foam or air but they all have the same characteristic of having a lower density than water. The different life jackets also are designed for different uses and different weather or survival conditions. For example, a life jacket designed to help a person survive in the open ocean has a greater buoyant force than a life jacket which will be used primarily in small inland lakes. The reason for this is that the person may be in the water for a longer period of time before rescue and the waves will likely be higher and the greater buoyancy will hold the person higher in the water. Life jackets are also designed different for different activities. For activities that require a large degree of motion such as windsurfing, jet skiing, or fishing, a bulky life jacket will not work as well so specialty life jackets are available for these sports but each person must be aware of the tradeoffs between convenience and safety if they choose to use these life jackets.

**Reference Material Links:**

PFDMA: <http://www.pfdma.org/local/downloads/documents/pfdmabrochure.pdf>

US CDC: <http://www.cdc.gov/homeandrecreationalafety/water-safety/waterinjuries-factsheet.html>

MN DNR: [http://www.dnr.state.mn.us/safety/boatwater/pfd\\_selecting.html](http://www.dnr.state.mn.us/safety/boatwater/pfd_selecting.html)

WI DNR: <http://dnr.wi.gov/topic/boat/pfd.html>

**Vocabulary List:**

**Personal Flotation Device:** A personal flotation device (abbreviated as PFD; also referred to as a lifejacket, life preserver, Mae West, life vest, life saver, cork jacket, buoyancy aid or flotation suit) is piece of equipment designed to assist a wearer, who may be either conscious or unconscious, to keep afloat.

**Buoyancy:** the ability or tendency to float in water or air or some other fluid.

**Gravity:** the force that attracts a body toward the center of the earth, or toward any other physical body having mass

**Density:** the state or quality of being dense; compactness; closely set or crowded condition.

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### CLASSROOM PROJECT

Enjoy fun science experiments for kids that feature awesome hands-on projects and activities that help bring the exciting world of science to life.

What Will Float? An array of vegetables will be tested to see what floats and what don't, your students will have to guess which ones will and which ones won't? The results are very interesting and can teach you some fun facts about density.

#### What you'll need

- One pepper
- One orange
- One apple
- One potato
- One baby carrot
- One banana
- Water
- Small vessel to hold water

#### Instructions

1. Fill your vessel with water about half full.
2. Line your experiments up and have your student's guess which will float or not float.
3. One by one place each ingredient into the vessel and mark down what happens.

#### What's happening?

An item's density will dictate its buoyancy, not its weight. If something is heavier than another, does this mean that the heavier item will sink? Not necessarily, because a really heavy boat floats yet a light penny sinks. But a boat has to be careful not to overload itself as it could reach a point where it becomes too heavy and could sink.

Does the shape of an object determine whether an object sinks or floats? Sometimes it does. If you make a tin foil ball that sinks, you can then stretch out the tin foil and make it float. It is the same weight, but the weight is spread out across a larger space (change in density).

The peel on the orange is spongy and full of air pockets, thus allowing the orange to float. Once the peel is removed, the 'naked' orange sinks. The orange peel acts like a life jacket which helps humans to float when in water.

MN Standard 6.2.2.2.2

WI Standard 5-PS2-1

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