

# Lab 8 Buoyancy

## Objectives

In this lab, students will study the relationship between the buoyant force acted on an object and the amount of displaced fluid (liquid or gas).

## Supplies

[Does an Orange Float or Sink?](#) video on YouTube.

URL <https://youtu.be/J8ZXDpDh4VY>

## Theory

According to Archimedes' Principle, the buoyant force acted on an object, fully or partially immersed in a fluid, is equal to the weight of the fluid that is displaced by the object.

$$F_b = W_{displaced\ fluid} = m_{displaced\ fluid} g = D_{fluid} V_{displaced\ fluid} g$$

Where m represents mass; g is the gravitational acceleration; D represents density and V is volume.

## Procedure

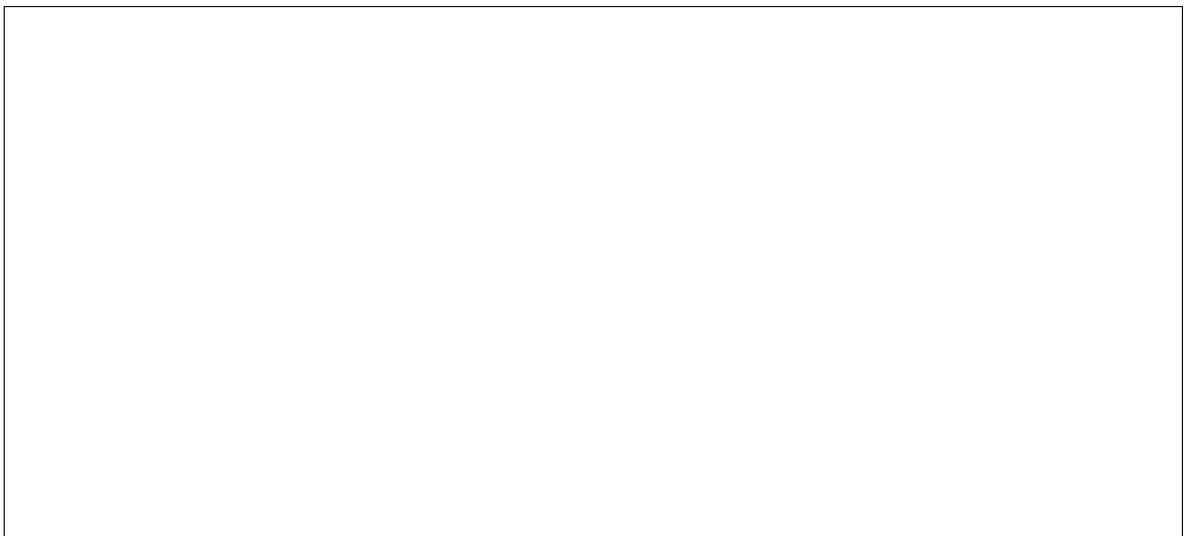
Watch the [Does an Orange Float or Sink?](#) (multiple times if necessary) and answer the questions listed below.

## Questions and Problems

1. After watching the “Does an Orange Float or Sink?” video, what conclusion can you draw about the orange with peels and the orange without peels. (Hint: think about their densities and their relative densities with respect to the density of water).



2. When you throw a beach ball in water, what will happen to the beach ball? Sink or float? Is the ball completely or partially submerged in water? What will happen to the ball if you press it down into the water until it's fully submerged, then release your hand? What does this mean? At the moment you release your hand, how many forces are acting on the ball? What are they? Are they equal in magnitude? If not, which force is bigger?



3. In the above question, does the ball experience the same amount of buoyant force when it is partially submerged or completely submerged? If no, in which case the buoyant force is bigger, when the ball is partially submerged or completely submerged? What conclusion can you draw about the relationship between the displaced liquid and the buoyant force?

**First and last name:**

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