# Buoyant Force

## Chapter 7.2

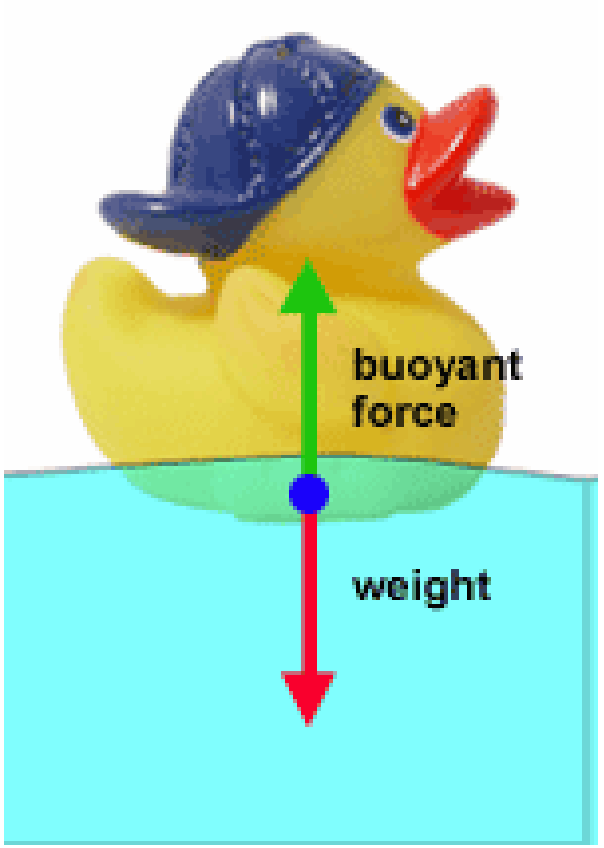
# I. Buoyant Force and Fluid Pressure

**Buoyant Force:** the upward force exerted on an object by a fluid (liquid/air).

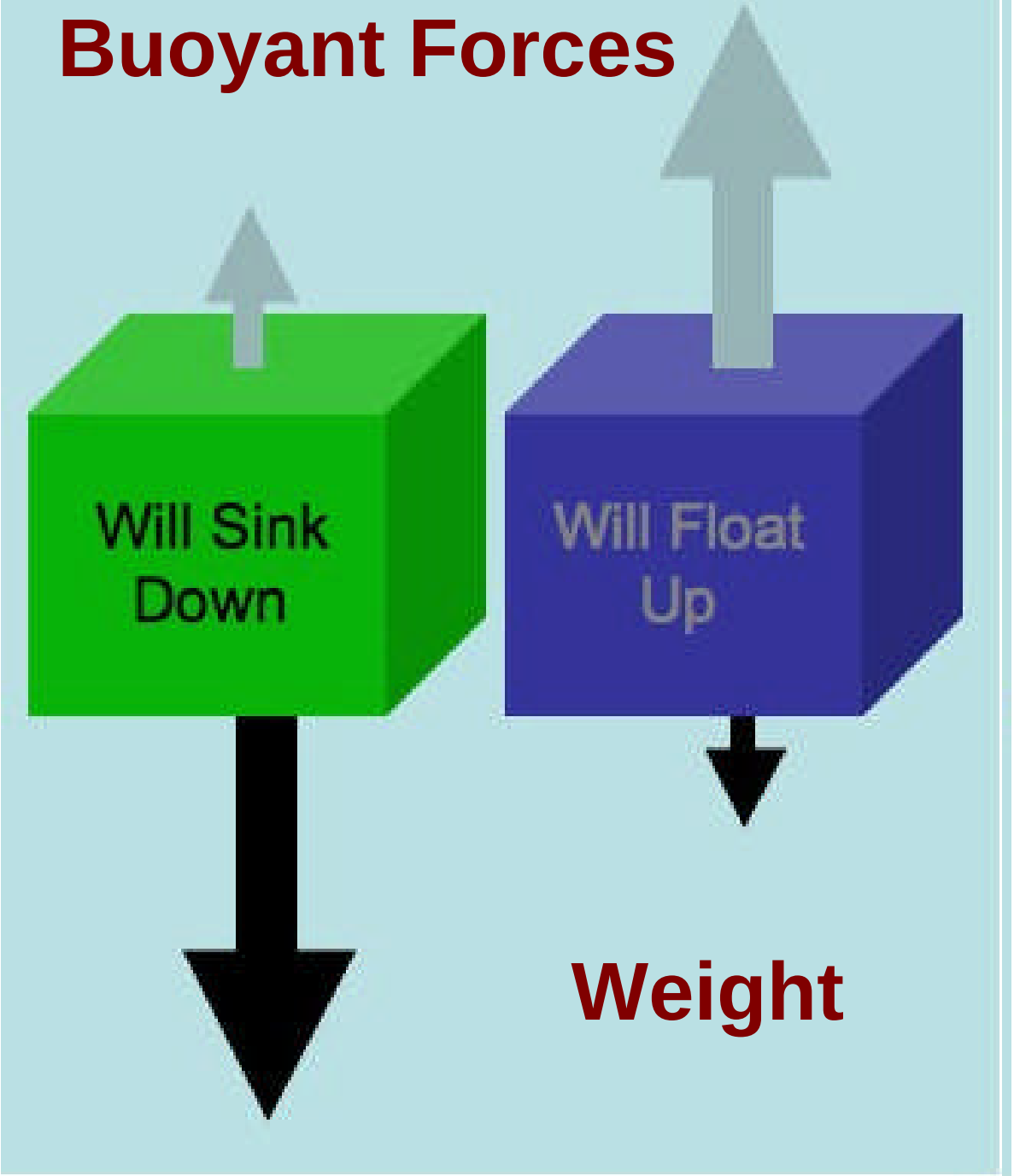
Buoyant force is created by fluid pressure.

Buoyant force > Weight → Floats

Buoyant force < Weight → Sinks

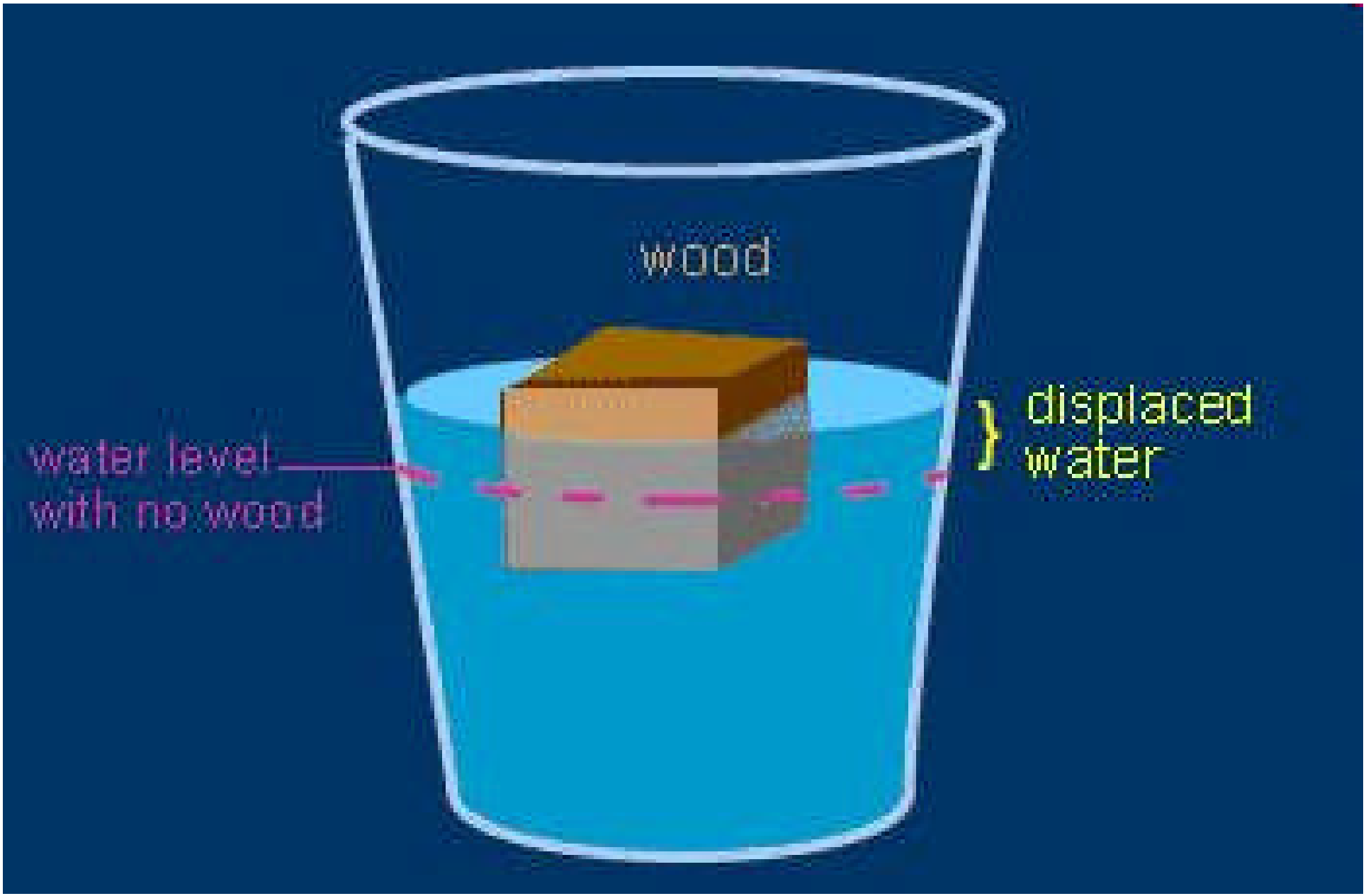


# Buoyant Forces

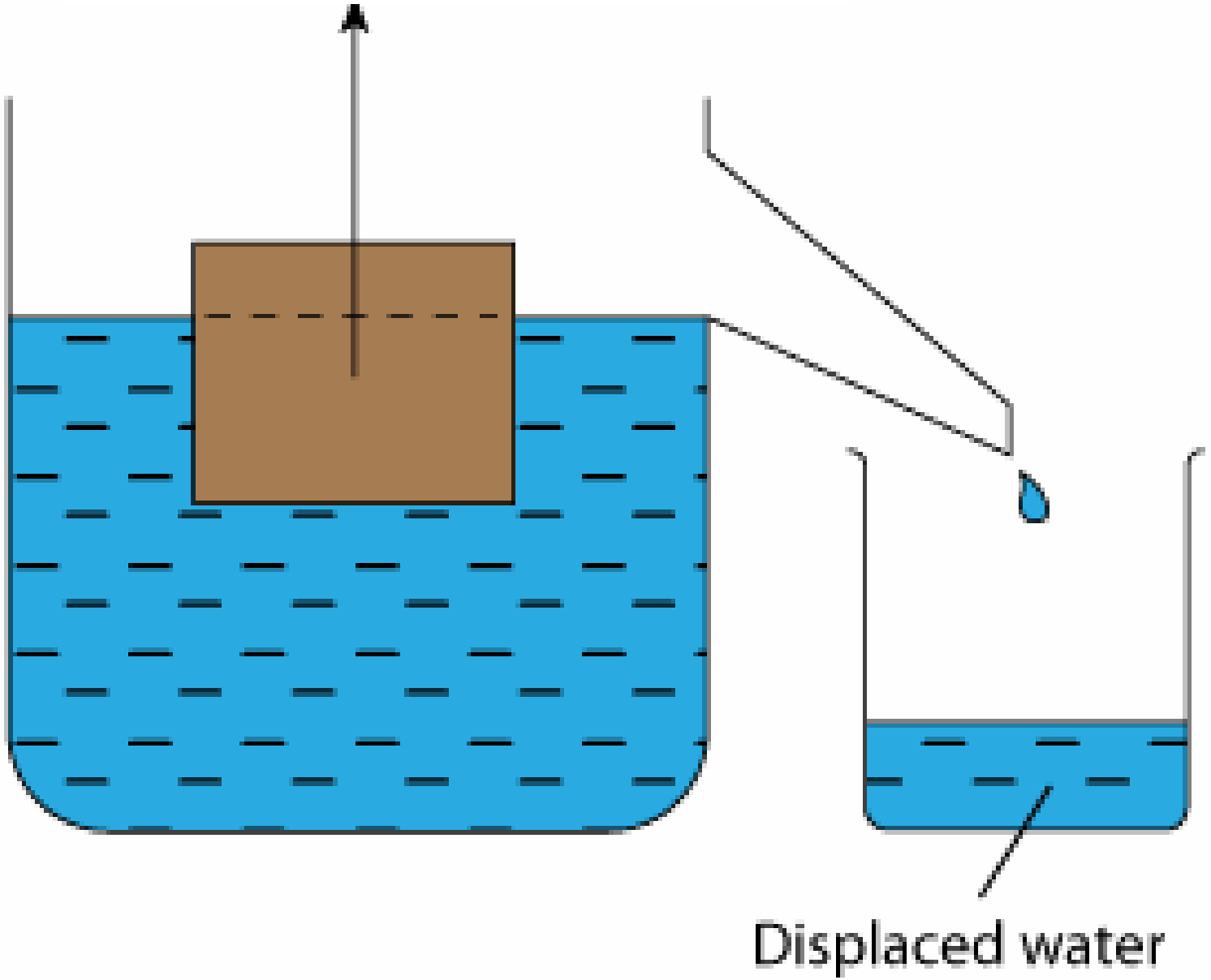


# How can we measure the buoyant force?

**Archimedes Principle:** Buoyant force is equal to the weight of the liquid displaced by an object.


wood
water level
with no wood
displaced
water

# Buoyant Force



# Calculating Weight

- Weight is a force.

$$\text{Force} = \text{mass} \bullet \text{acceleration}$$

$$\boxed{F = ma}$$

$$1\,\text{N} = \frac{1\,\text{kg} \bullet \text{m}}{\text{s}^2}$$

**Important:** Mass must be in kg.

What is the weight of a cube of aluminum if the mass is 44.2 grams?

$$\text{Weight} = \text{Force}_{(\text{gravity})} = \text{mass} \cdot \text{acceleration}_{(\text{gravity})}$$

$$F_{(gravity)} = (22.4g)(\frac{kg}{1000g})(9.8\frac{m}{s^2})$$

$$\text{F}_{(\text{gravity})} = 0.2\frac{\text{kg} \cdot \text{m}}{\text{s}^2} = \mathbf{0.2N}$$