

Pressure & Buoyant Force (p. 89 – 91)

I. Pressure

1. Define the term pressure.

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Pressure – amount of force exerted on a given area of surface

2. Fluids exert pressure evenly in all directions.

Circle One : True False

3. The same force is exerted on each of the following. Which exerts the most pressure?

- a. a foot
- b. a large book
- c. a fingertip
- d. the tip of a ball-point pen

Snowshoes?

Bed of Nails?

4. Write out the equation for determining pressure.

$$P = \frac{\text{Force}}{\text{Area}} = \frac{F}{A}$$

5. What is the SI Unit used to measure pressure?

Pascal = (1 N/m²)

II. Buoyant Force

1. Define the term buoyant force.

Buoyant Force – upward buoyant force on matter exerted by fluids

- Pop Goes
- Sink on bottom of pool

2. Pressure increases with depth.

Circle One : True False

3. Define Archimedes' Principle.

Archimedes' Principle – the buoyant force on an object in a fluid is an upward force equal to the weight of the fluid that the object displaces

4. With regards to weight and buoyant force, how do the following scenarios occur? (Circle one for each scenario.)

	<u>Weight</u>			<u>Buoyant Force</u>		
<u>Object Floats</u>	Greater	Equal	Lesser	Greater	Equal	Lesser
<u>Object Suspended</u>	Greater	Equal	Lesser	Greater	Equal	Lesser
<u>Object Sinks</u>	Greater	Equal	Lesser	Greater	Equal	Lesser

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Helium vs. Air Balloons

Myth Busters
 - Ping Pong balls + boat
 - Child with balloons

5. What is the density of water?

1.00 g/cm³

6. What situation occurs to cause an object to float or sink in water? (Circle one.)

Object Floats : Density > 1.00 g/cm³

Density < 1.00 g/cm³

Object Sinks : Density > 1.00 g/cm³

Density < 1.00 g/cm³

7. How can a huge, steel ship float in ocean water (despite steel being 8X denser than water)?

- The shape of the hull (hollowed)
 produces less density than surrounding water
 (Hull Shape = ↑ Volume Occupied, Same Mass)
 = ↓ Density

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Saltwater
 (Dense fluid)

↓
 (Easier to float
 than freshwater)