

FPC Chapter 13 - FORCES IN FLUIDS Study Guide Worksheet. Fill in the blanks using notes!

Vocabulary Terms

1. pressure - _____
2. pascal - the unit of pressure found by dividing the force by the area over which the force acts;
 $P = F/A$
3. fluid - a substance that assumes the shape of its container.
4. Pascal's principle - _____

5. hydraulic system - a device that uses pressurized fluid acting on pistons of different sized to change a force.
6. Bernoulli's principle - as the speed of a fluid increases, the pressure within the fluid decreases.
7. lift - the pressure difference between the top and the bottom of the wing creates this upward force.
8. buoyancy - _____

9. buoyant force - acts in the opposite direction as gravity and exerts an upward force on an object in water
10. Archimedes' principle - _____

13.1 Fluid Pressure

13.1 Section Review Questions

- Force and area are needed to calculate _____.
- Water pressure _____ as depth increases.
- At a given depth, pressure is constant and exerted equally in all directions.
- Atmospheric pressure _____ as altitude above sea level increases.
- You cannot feel atmospheric pressure acting on your body because the pressure inside your body balances the pressure outside.

13.2 Forces & Pressure in Fluids

- What makes something float or sink?

-In our Buoyancy Activity from last Thursday, why did the empty vial float in water while the tap water filled and salt water filled vials sank?

13.2 Section Review Questions

-A change in pressure at any point in a fluid is transmitted equally and unchanged in all directions throughout the fluid.

-As the speed of the fluid increases, the pressure within the fluid _____.

-Lift of a wing is largely explained by _____'s Principle. Air traveling faster over the top of the wing produces an area of reduced pressure. The resulting pressure difference between the top and bottom of the wing produces lift.

-Water pressure _____ with increasing depth in the pool, causing the air-filled balloon to be compressed.

3 Principles

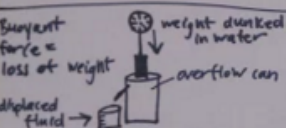
_____ Principle: the buoyant force on an object is equal to the weight of the fluid displaced by the object.

_____ Principle: a change in pressure at any point in a fluid is transmitted equally and unchanged in all directions throughout the fluid.

_____ Principle: as the speed of a fluid increases, the pressure within the fluid decreases.

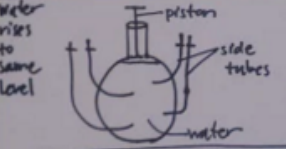
(left)
3/9/16 (right)

Buoyant force = loss of weight



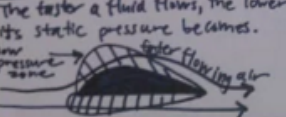
weight dunked in water
overflow can
displaced fluid

Pascal's Principle: A change in pressure at any point in a fluid is transmitted equally and unchanged in all directions throughout the fluid.



piston
side tubes
water
water rises to same level

Bernoulli's Principle: As the speed of the fluid increases, the pressure within the fluid decreases. (applies to airplane flight)



The faster a fluid flows, the lower its static pressure becomes.
low pressure zone
high pressure zone
faster flowing air

3 Principles:

Archimedes' Principle:
The buoyant force on an object is equal to the weight of the fluid displaced by the object.

Pascal's Principle: A change in pressure at any point in a fluid is transmitted equally and unchanged in all directions throughout the fluid.

Bernoulli's Principle:
As the speed of the fluid increases, the pressure within the fluid decreases. (applies to airplane flight)

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