PHYS 201 Archimedes’ Principle Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

$F\_{b}=ρ\_{f}v\_{f}g$ Density of water = 1 g/cm3 = 1000 kg/m3.

<https://www.youtube.com/watch?v=eQsmq3Hu9HA>

1. State Archimedes’ principle.

2. Uses for Archimedes’ principle:

1. Volume measurement for density: A solid metal alloy has a mass of 335-g in air and 295-g in water. What is the density of the metal alloy?
2. Cavity detection: A metal ornament (gold) has a mass of 155-g in air and 142-g in water. Does it have a cavity inside? If so what is the volume of the cavity? [Density of gold = 19.3 g/cm3]
3. Loading capacity for floating objects: A cylindrical container of mass 24 kg, height 15 cm, and diameter 94 cm is floating in a fresh water lake. What is the maximum load in Kg it can support without sinking.
4. Density of a liquid: A chunk of metal with a mass of 390 g in air and volume 49 cm3 is found to have an apparent mass of 337 g when completely submerged in an unknown liquid. Calculate the density of the unknown liquid.

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