Name:_____Score:_____

Archimedes Principle

Formulas

Density = mass/volume Weight = mass*gravity Weight of a fluid = density*volume*gravity

Useful Values

Density of water = 1.0 kg/L

Start on the Intro screen on the Buoyancy Sim on the PhET Sims site.

1) What is Archimedes Principle?

2) What is the mass of each block?

3) How much does each block weigh? (Use the formula and 9.8 m/s^2 for *g* and show your work below. Then check the weight on the scale).

4) Click box to "Show Forces" for "Gravity" and "Contact Forces" and click box to "Readout" for "Force Values". What are the values of each force, for each block?

   Wood Block: Brick:

   Gravity:_____ Contact Force: _____Gravity:_____ Contact Force: _____

5) What is the net force on each block?

6) They are in a state of _____.

7) What is the volume of water in the pool?

8) Place the wood block in the water. What volume of water does the wood displace?

9) What is the weight of the water displaced? (Use the formula for the weight of a fluid above, show your work below)

10) Click on the box to "Show Forces" for "Buoyant Force". What is the value of the buoyant force?

11) Compare the weight of the fluid displaced and the buoyant force.

12) What is Archimedes Principle?

13) How much does the brick weigh?

14) Place the brick in the pool, and let it sink. What volume of water does it displace?

15) What is the weight of this water? (Use the formula and show your work below)

16) What is the value of the buoyant force on the brick?

17) What is Archimedes Principle?

18) Consider the weight of the wood and the buoyant force on the wood. Why doesn't it sink?

19) Consider the weight of the brick and the buoyant force on the brick. Why does it sink?

20) What is the density of the brick? of the wood? (Hint: Find the volume of the wood by holding it under water with the cursor)

density of brick:_____ Density of wood:_____

21) What does density have to do with buoyant force?

22) Remove the brick from the water and leave the wood in. Predict how much more water will be displaced when the brick is placed on the wood.

Prediction:_____

23) Place the brick on the wood and record how much more water is displaced.

24) Why must this much water be displaced in order for the system to float?

25) What is Archimedes Principle? (Yes, I'm using repetition as a memorization tool! Got it yet?!)