

CONCEPTUAL PHYSICS ALIVE! VIDEO QUESTION SET

Liquids I

In this lecture, Paul Hewitt describes and demonstrates density, pressure, and buoyant force. Read the following questions before the presentation begins. Answer them while the presentation is in progress. [39 minutes]

1. Answer using a “word equation.” (Mass) Density =

2. Which has the greater density?

- A. a teaspoon of water**
- B. a “lakeful” of water**
- C. same for both**
- D. not really enough information to say**

3. Which applies more FORCE to the floor?

- A. an elephant’s foot**
- B. woman’s high heel shoe**
- C. about the same for both**
- D. not really enough information to say**

4. Answer using a “word equation.” Pressure =

HEWITT says:

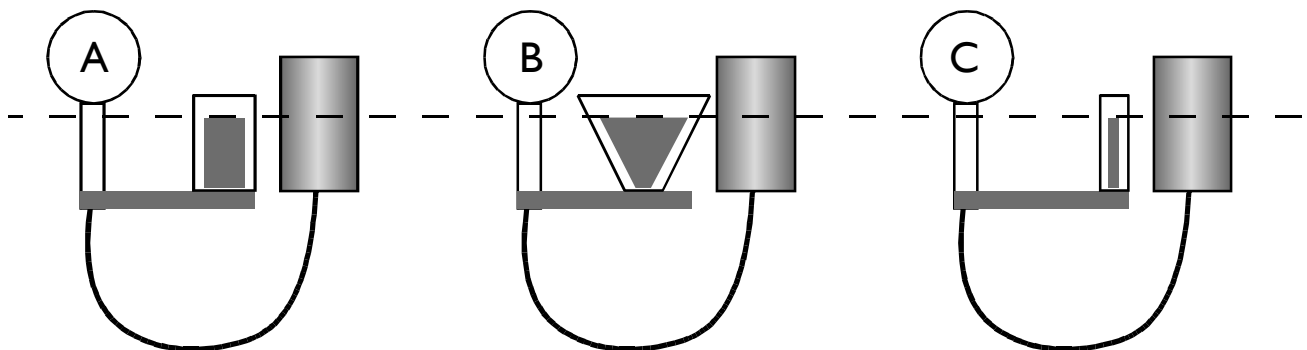
$$\text{Pressure} = F/A = Wt/A = \text{DEN} \times \text{VOL} / A = \text{DEN} \times A \times \text{DEPTH} / A = \text{DEN} \times \text{DEPTH}$$

SOME FOLKS say:

$$\text{Pressure} = F/A = mg/A^* = \rho g V/A^{**} = \rho A d g / A = \rho g d$$

5. Which Pascal vase has the highest pressure reading?

- A. A**
- B. B**
- C. C**
- D. Same for all**



*Hewitt uses “Wt”, some folks use “mg”.

**Hewitt’s “DEN” is weight density which is simply mass density times g. So “DEN x VOL / A” = “ρgV/A.”

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1. Answer using a “word equation.” (Mass) Density =

2. Which is heavier?

- A. the lead ball**
- B. Styrofoam ball**
- C. they have approximately the same weight**
- D. Hewitt never tells us**

3. Which applies more FORCE on the floor?

- A. an elephant’s foot**
- B. woman’s high heel shoe**
- C. about the same for both**
- D. not really enough information to say**

4. Which applies more PRESSURE on the floor?

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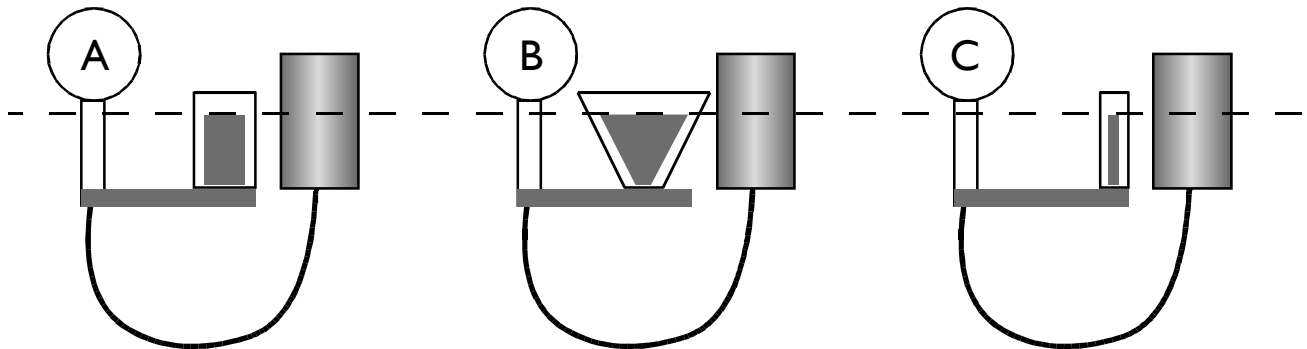
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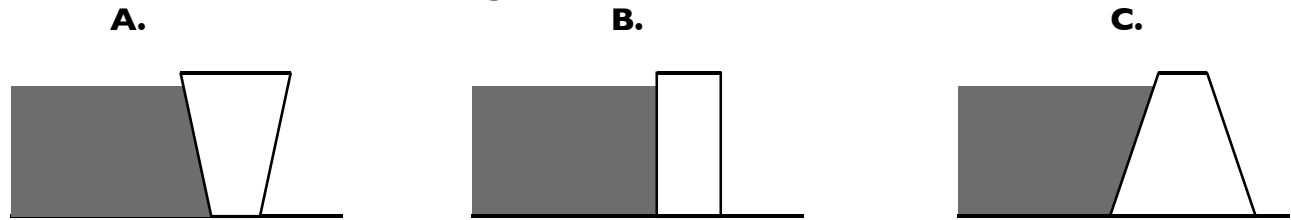
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6. Which is the best dam design?



7. Which dam—if either—is less likely to fail due to too much pressure: the dam that holds back a shallow lake or the one that holds back a deep pond?



8. If only these forces are considered, there is a net force in which direction due to water pressure?

9. The difference between the measured weight when the body is in air and the measured weight when the body is immersed in the liquid is called the

_____ force.

10. At which position is the pressure on the baseball greatest?

A. top B. middle C. bottom D. same for each

11. Which has the greater buoyant force acting on it at the bottom of the pool?

A. a cube of lead
B. a cube of aluminum with the same volume
C. same buoyant force on both

12. Answer Hewitt's final question: Which ship floats higher?