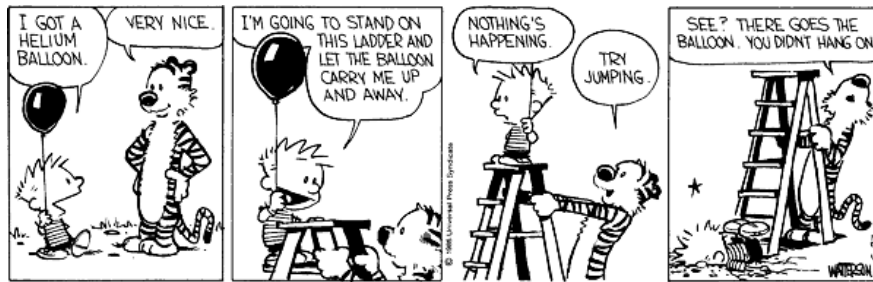


October 26, 2011

Physics 131

Prof. E. F. Redish

■ Theme Music: Queen***Under Pressure*****■ Cartoon: Bill Watterson*****Calvin & Hobbes***

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Outline

■ Go over Quiz 6**■ Fluids**

- Buoyancy
- Surface tension

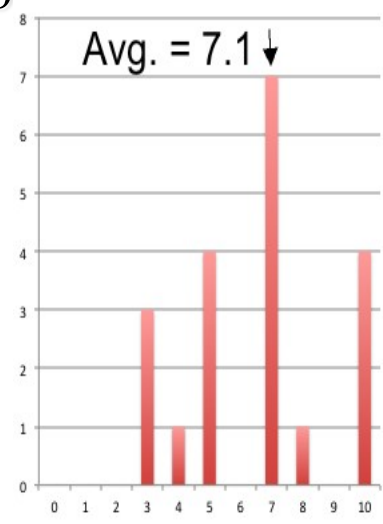
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Quiz 6

	6.1	6.2	6.3
A	30%	5%	50%
B	5%	5%	45%
C	5%	10%	0%
D	65%	10%	5%
E	0%	70%	0%



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Foothold ideas: Buoyancy



- **Archimedes' principle:** When an object is immersed in a fluid (in gravity), the result of the fluid's pressure variation with depth is an upward force on the object equal to the weight of the water that would have been there if the object were not.
- As a result, an object whose density is less than that of the fluid will float, one whose density is greater than that of the fluid will sink.
- An object less dense than the fluid will float with a fraction of its volume under the fluid equal to the ratio of its density to the fluid's density.

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Foothold ideas: Surface tension



- Due to the intermolecular interactions holding a liquid together, the surface of a liquid experiences a tension.
- The pull across any line in the surface of the liquid is proportional to the length of the line.

$$F_{\text{surface tension}} = \gamma L$$

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Reading question

- We were told that surface tension is basically pressure in two dimensions, however, we were then told that pressure is repulsive and acts on 2D surfaces and surface tension is attractive and acts on 1D lines. I do not understand the second aspect of this. Why is one repulsive and the other attractive and how does that occur?

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