TEXAS A&M UNIVERSITY

PHYSICS LECTURE DEMONSTRATIONS

Colleagues,

The Physics Demonstration Program has been reorganized and updated for implementation in the new George P. and Cynthia Woods Mitchell Institute for Fundamental Physics and Astronomy and the George P. Mitchell '40 Physics Building. Click here to view Fluid Mechanics Demonstrations.

The labeling system of the demonstrations has also been changed. The new labeling will incorporate the Demonstration Classification System (DCS) suggested by PIRA, the Physics Instructional Resource Association. The goal of the PIRA Demonstration Classification Scheme is to create a logically organized and universally inclusive taxonomy giving a unique number to every lecture demonstration.

External website references have been added to the demonstration notes when possible. These references have information (historical and practical) to supplement the notes listed in the demo page.

If you are interested in using one of these demonstrations in your classroom, you may send me an email with your class information and the demonstration number and name. Please allow at least two class days notice for the demonstration requests.

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Fluid Mechanics

[Surface Tension]

[Fluid Statics]

[Fluid Dynamics]

2A20.10 CAPILLARY TUBES

Apparatus: Constant level tubes with colored water

Notes: The level of the water in the tubes is the same regardless of the shape of the tubes.

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2B20.40 PASCAL'S VASES (STATIC PRESSURE)

Apparatus: Pascal's apparatus
Extra vases

Notes: BE SURE TO UNSCREW THE GLASS VASES BY THE METAL BASES (to prevent breaking of the glass). The pointer on the apparatus will be used to show that when the different vases are attached to the apparatus and the water level is raised to the pointer mark, the meter will indicate the same pressure for all vases (regardless of the shape of the vases). Before changing the vases, be sure to lower the plastic water container such that the water drains into it.

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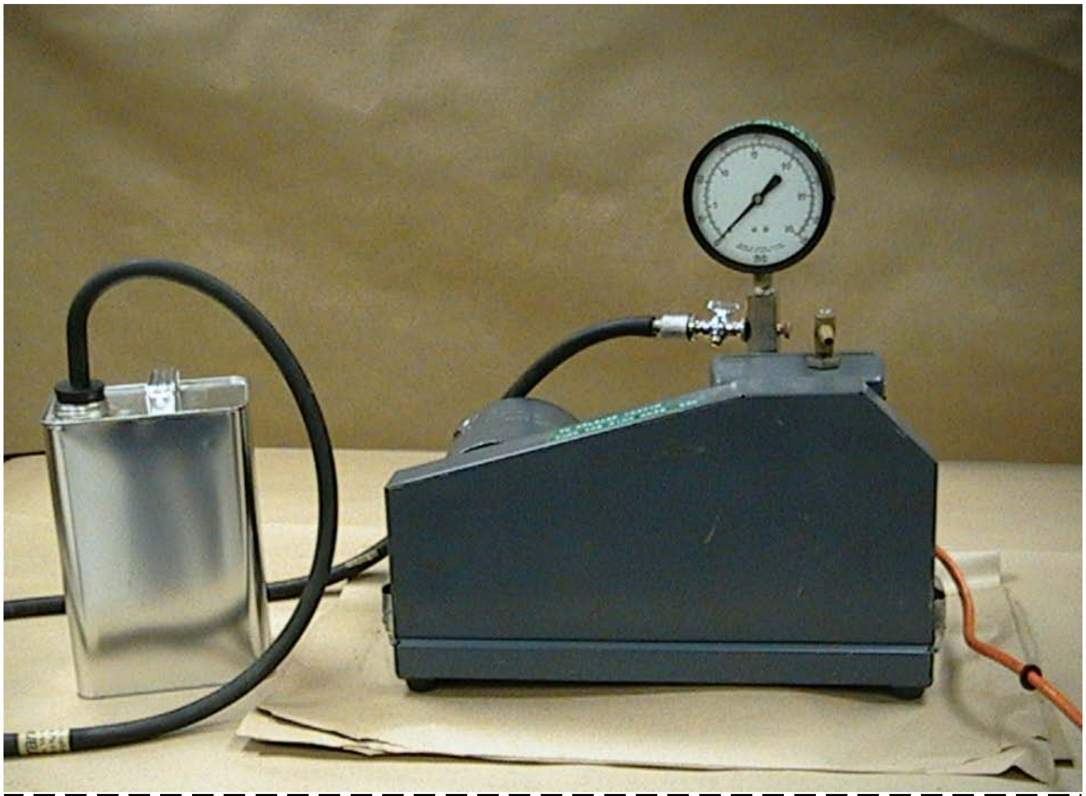
2B30.25 EVACUATED CAN



Apparatus: Vacuum pump
Metal can

Notes: Connect the metal can to the vacuum pump and turn on the pump. Atmospheric pressure will cause the can to be crushed.

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2B30.30 MAGDEBURG HEMISPHERES

Apparatus: Vacuum pump and the hemispheres

Notes: To demonstrate forces arising from atmospheric air pressure.

(set up info – be sure to attach the hose to one of the hemispheres before putting demo out for use.)

Resources: http://engineering.wikia.com/wiki/Magdeburg_hemispheres
http://www.physlink.com/estore/cart/Magdeburg-Hemispheres.cfm

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2B40.20 ARCHIMEDES' PRINCIPLE (DENSITY AND BUOYANCY)

Apparatus: 20N spring scale, short rod and two-way clamp
Long rod and base
Metal can with string attached
Cylindrical metal block
Large plastic beaker (with overflow pipe)
Plastic beaker (to catch overflow water)
Small plastic beaker (to help refill large beaker)

Notes: First show that the metal block has the same volume as the hollow metal can by inserting the block into the can. Next, note the reading of the spring scale when the metal can and the block are hanging from it. Fill the large beaker with water up to the overflow stem. Lower the block into the beaker of water and allow the water to overflow into the plastic beaker (be sure the block is completely submerged). Now note the reading of the spring scale. Take the water that has overflowed into the beaker and pour it into the metal can (which is mounted above the block) and again note the spring scale reading.

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2B40.30 CARTESIAN DIVER (DENSITY AND BUOYANCY)

Apparatus Cartesian diver in plastic bottle

Notes: Squeeze the sides of the plastic bottle and watch the diver go up or down.

Also available--- clear 20 oz soda bottles filled with water and a ketchup packet inside. Squeezing the bottle causes the packets to go to the bottom of the bottle. This is something that students can make at home. These bottles may be passed out to the class to try their hand at making the packet go up and down in the bottle.

References: http://www.absoluteastronomy.com/topics/Cartesian_diver

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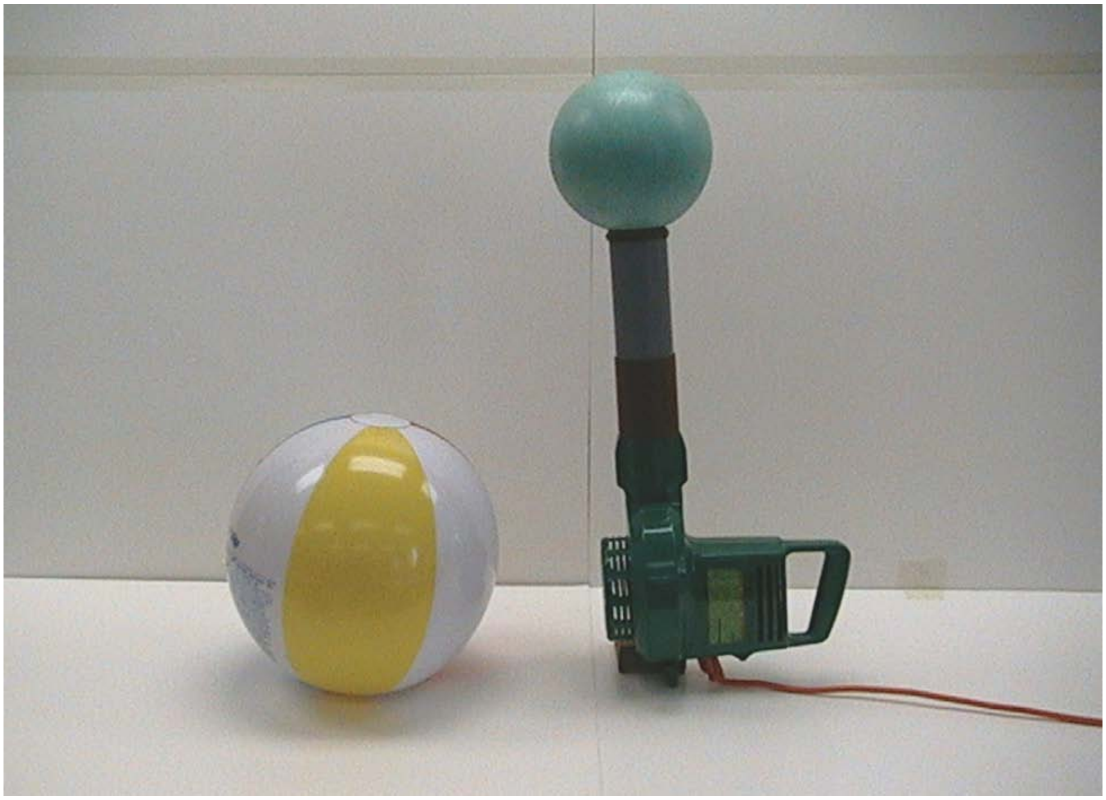
2C20.30 BERNOULLI (WITH LARGE PLASTIC BALLS)



Apparatus: Leaf Blower
Assortment of balls

Notes: A large leaf blower is provided with an assortment of balls. One may rotate the blower at angle and show that the balls will still hover over the end of the blower.

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