

**From:** Paul Beale <Paul.Beale@colorado.edu>  
**Subject:** Re: Mechanics demos  
**Date:** April 3, 2006 10:43:49 AM MDT  
**To:** Charles Rogers <Charles.Rogers@colorado.edu>  
**Cc:** Steven Pollock <steven.pollock@colorado.edu>

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Chuck

I use the bowling ball pendulum to death to discuss oscillations. KE->PE->KE etc. Also the oscillation period is easy to calculate for small circular oscillations. You also use shorter ones attached the bench. We could use a really long spring that would attach to the catwalk but the largest ones on the bench are OK. Vary k (one and two springs) and m (one and two masses) to see effect on frequency.

This is where I first really use some calculus. This is a good spot for them to see their first differential equation.

I always have a student try to drink a coke that is sitting on the floor by sucking it up surgical tubing while they are standing on the catwalk. Lots of cheering on occurs. Their face usually turns red by the time the coke gets close. Coke is good because it is easily visible as it goes up the tube.

The leaf blower and beach balls is always a hit to demonstrate Bernoulli.

If you are good balancing things, a chair balanced by one leg using one finger is good for center of mass. We could use a couch with four scales, one under each leg. You will see some couch equilibrium problems (using Homer Simpson) in my concept tests. Those were memorable to students years later.

The 55 gallon drum crush is a must!

The coke/diet coke float/sink question is a good one to create a good conversation. Also recreate the boat/anchor problem by using two (one large and one larger) clear buckets and a brick. The water level change is obvious, especially if you add a little food coloring

The gas thermometer with room temp, boiling water, ice water, and liquid N<sub>2</sub> is a must to demonstrate absolute zero. Large balloons put into the liquid nitrogen contract and then re-expand impressively.

A little sound/music is good if that is not going to be covered next semester. Beats, octaves, Chords, are easy with the keyboard and frequency analyzer.

Paul

On Apr 1, 2006, at 10:36 AM, Charles Rogers wrote:

Hi Paul, Mike, and Steve,

We're headed into the last month of classes and I'm looking for advice about demos and associated theater for PHYS 1110. We're just finishing Newtonian gravity, are starting solid body rotation, and will cover oscillations, fluids and pressure, and thermal physics by the end.

I'd love to hear about your favorite demos for this material (or other favorites). We will not cover waves (I've talked to Murray Holland about 1120 in the Fall and he is using Knight's text, where mechanical waves are treated

in the E&M section), so that material will not be covered. Still, it's tempting to do the beat frequency demo...

Anyway, I'm looking for inspiration, so any info would be great.

Thanks,

-Chuck

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