Some Favourite Demos

1. "Who wants to hit a teacher with a hammer?"

materials: piece of wood, hammer, large "weight" from phys-ed

This simulates a person having cinder blocks broken on their chest by a sledge hammer.

Lie on the floor, place the large "weight" on your chest. Place a piece of wood on the "weight" (this protects the "weight" from damage). Have the student hit the block of wood with a hammer (have them start slowly and build up, mostly so they feel confident). The "weight" has so much inertia that it basically keeps on doing what it is already doing (nothing)

2. "Why is your physics teacher trying to break his/her hand"

Place a large piece of metal (I use a block of iron) on your hand (remove any jewellery first). Hit it quite violently with a hammer. Again no real effect due to Newton's first (see figure 1)

3. " A physics teacher can break a board with his/her hand?"

Attach a piece of 3/4" thick (10 " by 10 " works well) pine to the edge of something very solid like the teachers desk. Ensure that you are going to break the wood with the grain rather than against it (it still works it just hurts a lot!). Make sure that your hand wants to keep on doing what its doing!

Figure 1

4. " Blast your students and have them smile"

The Airzooka can be purchased for about $20.00. It produces very large amplitude sound waves that you can aim at your students. It shows them both what a sound wave is and how fast it moves.

5. " Please take your Ipods out"

The ipod touch and iphone have many applications which can be used in the classroom

I use the dog whistle to demonstrate the range of human hearing
I use the decibel meter to well measure you guessed it
coastermate allows you to measure accelerations on a roller coaster and email yourself the data

6. "Launching with Lenz"

A simple device can be made to dramatically demonstration both electromagnetic induction and Lenz's law. The launcher consists of an iron cylinder wrapped with magnet wire (the wire was coiled on an cardboard tube). The coil is attached to a wall outlet using a power bar with a switch. The aluminum discs are placed on top of the cardboard. When the alternating current is turned on a rapid changing strong magnetic field induces eddy currents in the discs. According to Lenz's law the fields due to the eddy currents oppose the inducing field and the discs are fired into the air. The split ring prevents sufficiently strong fields from building up and it is not launched. Safety note: This is a dangerous piece of equipment (due to large current) and needs to be handled with care. (see figure 2)

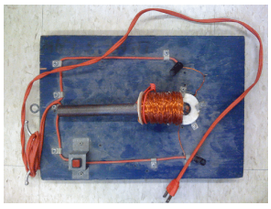

Figure 2

7. "Magnetic Braking and Lenz"

The drop zone and other similar rides use magnetic braking based on Lenz's law. This demo shows how it works. An aluminum pendulum (figure 3) is swung between the poles of a very strong magnet. The induced field opposes the inducing action bringing the pendulum to a stop. The pendulum with the slits cut in it (figure 4) (like the split ring in 6) doesn't work nearly as well)

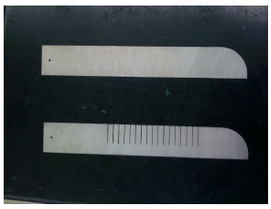

Figure 4

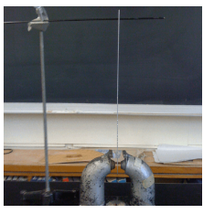

Figure 3

8. "Fisher Price and Thin Film Interference"

Students love bubbles and the bigger the better. Fisher price makes a wonderful bubble maker for about $20.00. Students will notice the bubbles becoming "bluer" as the bubbles thin. Eventually they become thin enough that construction interference is no longer visible and the bubbles become almost invisible.