Real physics students demonstrate inelastic collisions!
(recall: inelastic collisions usually involve squishy things so energy is lost by distorting the object!)

* Not a recommended DIY physics demo

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It's still early!

- If you did poorly on Midterm #1...
  - Practice problem solving, a lot!
  - You can drop one midterm.
  - I have two sets of office hours between now and the next test!
    - Tues 10-11am (except this week)
    - Weds 11:30-12:30pm
  - DO THE PRACTICE EXAMS.

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What's good/bad about this class?

- Anonymously (if desired) please let me know if there are adjustments that I can make, for example:
  - What can I do to help you learn more effectively?
  - Use of class tools (webassign, clickers, etc)?
  - Should I prompt for questions more often?
  - Are problem solving days helpful?
  - What kind of things do you like/not like?

  Clicker “A” when you’re done!

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What would you like to do today?

A. Using static vs. kinetic friction.
B. Finish that “length of skid marks” problem from friction lecture.
C. Identifying elastic vs. inelastic collisions.
D. Methods in figuring out which physics concept to use for a problem.
E. Practice a few conceptual problems.

[also: hand up if you’re specifically dreadfully confused about some other topic]
I’m standing with my socks on in the hallway. How much horizontal force will be required to get me to start sliding?

Assume a mass 70kg, a coefficient of kinetic friction of $\mu_k = 0.05$, and a coefficient of static friction of $\mu_s = 0.1$

What horizontal force will be required to keep me sliding after I’ve started moving?

Assume a mass 70kg, a coefficient of kinetic friction of $\mu_k = 0.05$, and a coefficient of static friction of $\mu_s = 0.1$

**Static friction**

An object is held in place by static friction on an inclined surface. The angle of inclination is increased until the object starts moving. If the surface is kept at this angle, the object

A. Slows down.
B. Moves at uniform speed.
C. Speeds up.
D. None of the above.

**Static friction**

At the Amazon packaging factory, a machine dumps boxes onto a conveyor belt by tilting a metal slab. The coefficient of static friction between the box and the slab is 0.5. At what slab angle from horizontal does a 2kg box start to slide down?
Stopping distance: Kinetic Friction.
A 1000 kg car starts at a velocity of 10 m/s and slams on the brakes until it stops. Without an ABS system, how long should the skid marks be? [or: how far will a pushed object go before it stops]
Coefficient of kinetic friction between tires and road is 0.4

Elastic or inelastic?
A very squishy bouncy ball moving forwards at 5.00 m/s strikes a stationary soft bouncy ball of the same mass. After the collision, the first ball continues forward at 1.0 m/s and the other one is moving away faster.
Just think about this first. No numbers.
Is this collision…
A. Elastic
B. Inelastic
C. Perfectly inelastic

Problem solving methods
An 80 kg movie stuntman runs and jumps out a window at 2 m/s, from a building situated 30 m above a catching net. Neglecting air resistance, determine his velocity just before he hits the net.

How should we approach this problem?
Conceptual problems...

Playing catch in space

You and your friend on the ISS want to play a game of space catch. You start at 1m away from one another, and throw the ball back and forth. After the game, you both bump into the walls at opposite ends of the space station. Why is this?

A. Conservation of momentum.
B. There is no friction in space.
C. Your gravity vector is no longer pointing towards Earth.
D. All of the above.
E. None of the above.

What happens to the ball’s speed and acceleration after this point?

A. Both decrease.
B. The speed decreases, but the acceleration increases.
C. Both remain constant.
D. The speed increases, but acceleration decreases.
E. Both increase.

Two sumo wrestlers jump towards one another and grab each other in a mid-air collision. Wrestler one is twice as massive as wrestler two, but wrestler two jumped twice as fast. Whose side of the arena do they end up on?
What would you like to do?

A. Inclines problem.
B. 2D elastic collision.
C. Conceptual problems

Two shuffleboard disks of equal mass, one orange and the other green, are involved in a perfectly elastic collision. The green disk is initially at rest and is struck by the orange disk as shown above. Determine the speed of each disk after the collision.

At the bowling alley, the ball feeder machine must push a ball up a ramp 1.0 m long. The ramp leads to a surface 0.5 m above the base of the ramp. What is the velocity the ball must have at the bottom of the ramp to get it to the top?

Assume a 5kg ball and a frictionless surface.

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WHAT KIND OF PROBLEM IS THIS?
A. 1D Conservation of momentum.
B. 2D Conservation of momentum.
C. Conservation of energy.
D. 1D Kinematics.
E. Friction analysis.
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Assume a 5 kg ball and a frictionless surface.