

NJAAPT DEMO SHARE-A-THON

(Princeton University, February 3, 2017)

Falling Matchbox

From a height of 10 cm, can you drop a full matchbox on the **smallest** face so that it remains upright?

Smashing Steel Spheres

Smash these 1-pound, 2-inch diameter spheres on a sheet of paper suspended vertically. Small holes will burn, which clearly show the conversion of kinetic energy into heat energy.

\$29 from Educational Innovations, Arbor Scientific, etc.

Coffee Joulies

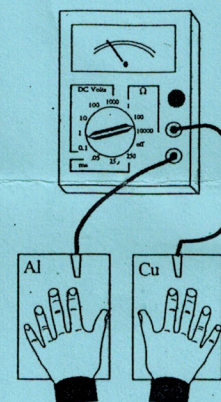
Each stainless steel shell is filled with an "advanced phase change material" that melts at 140 °F. Put them in your coffee and they absorb heat when it is too hot, storing that energy inside. When your coffee reaches the perfect temperature, this stored energy is released to keep it at that temperature longer. Use one Joulie for every 4 oz (120 mL) of hot beverage.

Five for \$48 from www.joulies.com

Hand Battery

Connect small sheets of copper and aluminum (steel is better) to a voltmeter. Place your palms separately on the metals to create a potential difference. This is similar to a lemon battery using a penny and nickel. (Diagram from John Wiley & Sons, 1994)

Application: Lie Detector (Polygraph) -- galvanic skin response (electrodermal activity)



Grate and String

Attach two strings to a metal grate. With your index fingers, press the ends of the strings on the *tragus* of each ear -- the layer of cartilage in front of the ear canal. Press your ears closed to shield any background noise in the room. With the grate hanging freely, knock it against a table to hear some interesting sounds! Also works with hangers, aluminum bats, Slinkys, etc.

Half Lens

Suppose a biconvex lens is used to form a sharp image of a candle flame on a screen. If the **top** half of the lens is covered, then how will the image change?

PHYSICS IS PHUN!

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