

October 10, 2012

Physics 131

Prof. E. F. Redish

■ Theme Music:

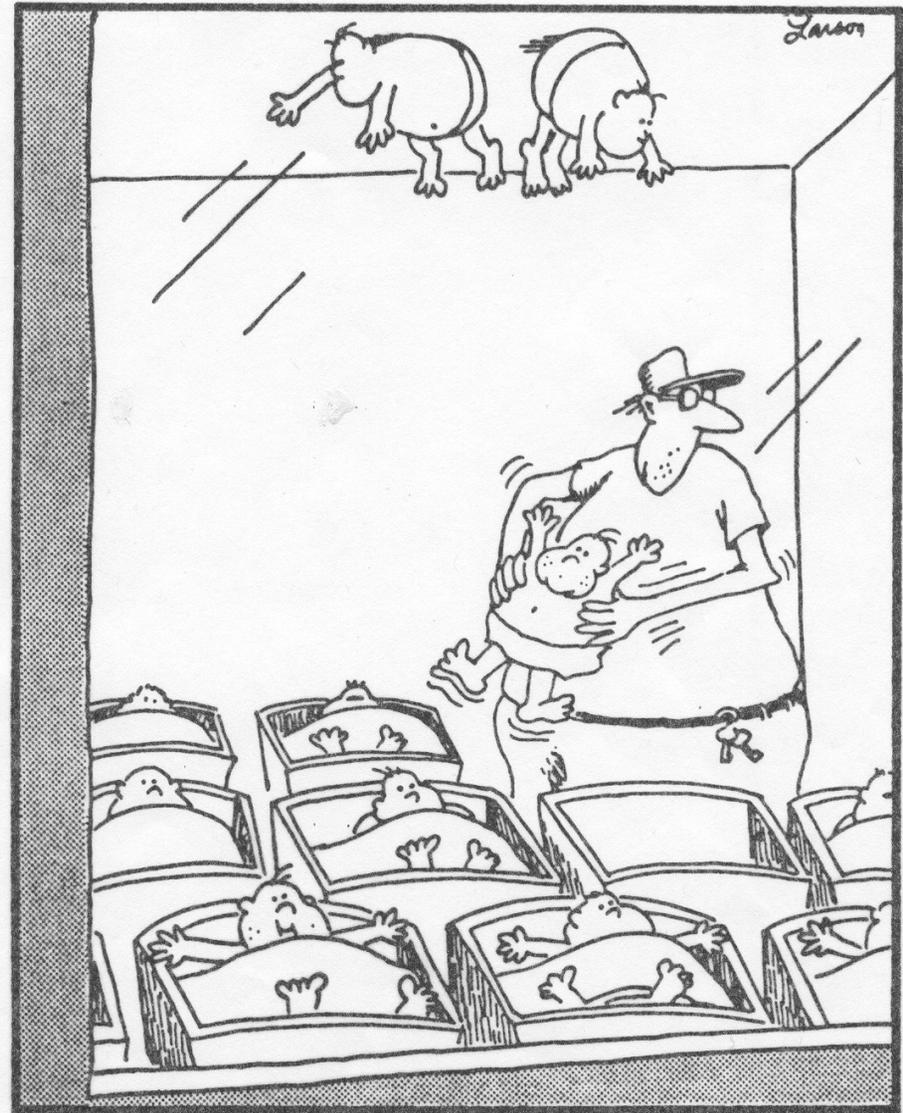
Moby

Electricity

■ Cartoon:

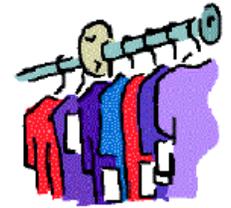
Gary Larson

The Far Side



Late at night, and without permission, Reuben would often enter the nursery and conduct experiments in static electricity.

Experiencing Electrostatics



http://phet.colorado.edu/simulations/sims.php?sim=Balloons_and_Static_Electricity



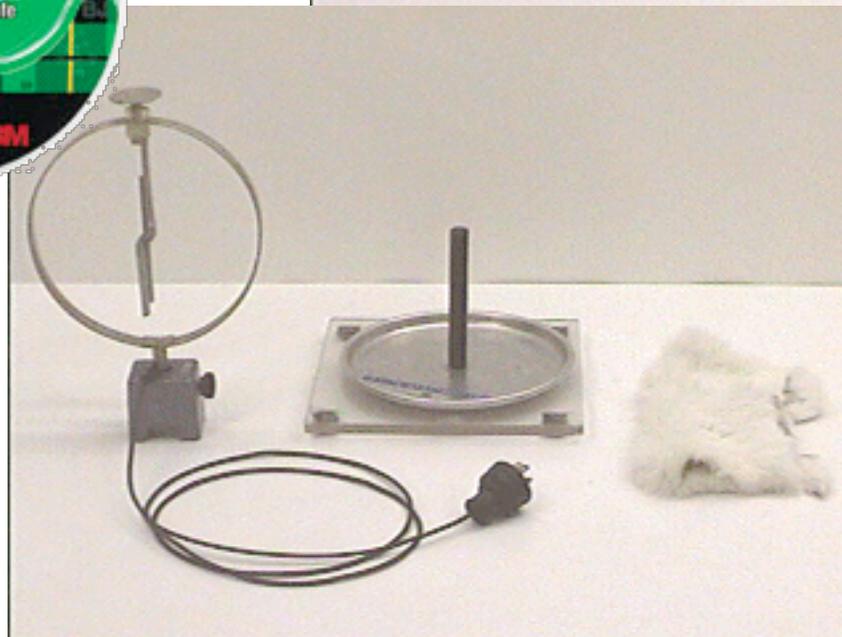
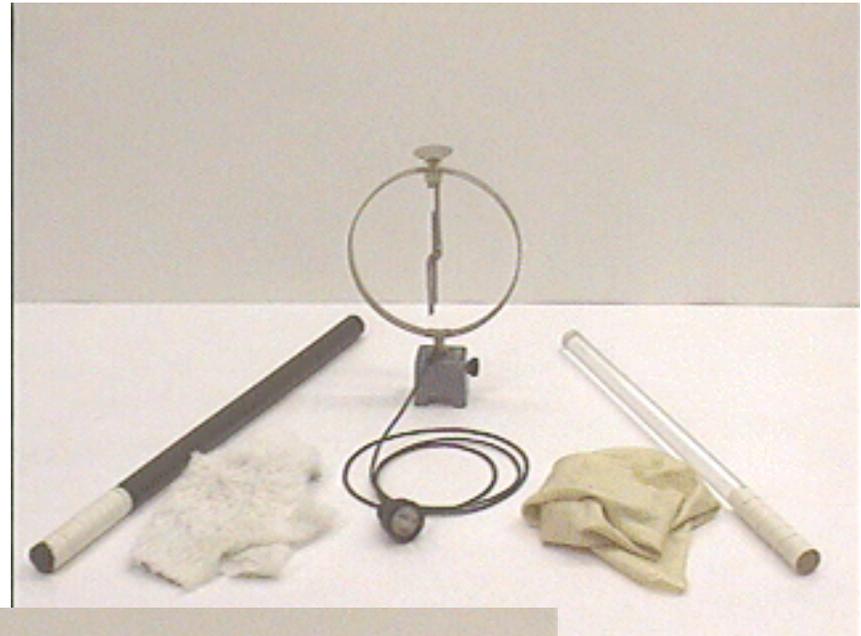
Model: Charge

A hidden property of matter



- Matter is made up of two kinds of electric matter (positive and negative) that have equal magnitude and that cancel when they are together and hide matter's electrical nature.
- Matter with an equal balance is called neutral.
- Like charges repel, unlike charges attract.
- The algebraic sum of positive and negative charges is a constant (i.e., $N_+ - N_- = \text{const.}$)

Two kinds of charges



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Conductors and Insulators



■ Insulators

- In some matter, the charges they contain are bound and cannot move around freely.
- Excess charge put onto this kind of matter tends to just sit there.

■ Conductors

- In some matter, charges in it can move around throughout the object.
- Excess charge put onto this kind of matter redistributes itself or flows off (if there is a conducting path to ground).

■ Unbalanced charges attract neutral matter (polarization)