

TEACHERS
Serving
TEACHERS!®



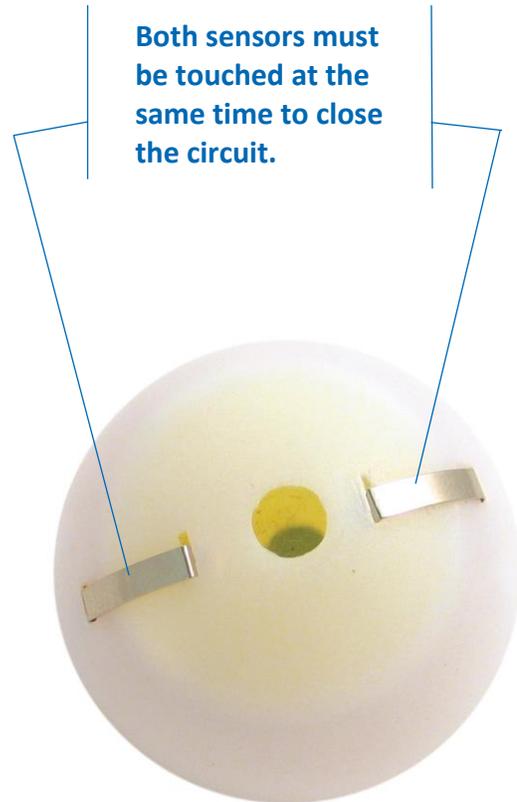
Energy Ball

SS-30

This unique ball is a fun way to demonstrate **open circuits** and **closed circuits**. It can also be used to discuss **conductivity**. When both sensors on the ball are touched, a complete circuit is formed and the ball emits a whistling noise and flashes a red light.

How does the Energy Ball work?

Inside the Energy Ball is an open circuit. By touching both sensors, the circuit closes and electrons flow through your body or another material such as a paper clip. Materials that activate the Energy Ball are good **conductors**, meaning they pass electrons easily. Materials that do not activate the Energy Ball are poor conductors, meaning they do not pass electrons easily.



Useful Reference Materials

Encyclopædia Britannica (Electric Current):

www.britannica.com/EBchecked/topic/182467/electric-current

Encyclopedia.com (Conduction):

www.encyclopedia.com/topic/conduction.aspx

Physics4Kids.com (Conductors and Conductivity)

www.physics4kids.com/files/elec_conduct.html



NGSS Correlations

Our Energy Ball and these lesson ideas will support your students' understanding of these Next Generation Science Standards (NGSS):

Elementary

4-PS3-4

Students can use the Energy Ball to apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

ETS1.A

Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria.

Middle School

ETS1.B

A solution needs to be tested, and then modified on the basis of the test results in order to improve it.

High School

HS-PS4-1

The Energy Ball can be used to develop and model how two objects interacting through electric fields, illustrates the forces between objects and the changes in energy of the objects due to the interaction.

Suggested Science Idea(s)

MS-PS3-5

Energy may take different forms.

4-PS3-4

Use the Energy Ball to test open and closed circuits or test conductors and insulators.



Using Your Energy Ball

Your students will enjoy finding different ways to activate the ball. Try some of these activities!

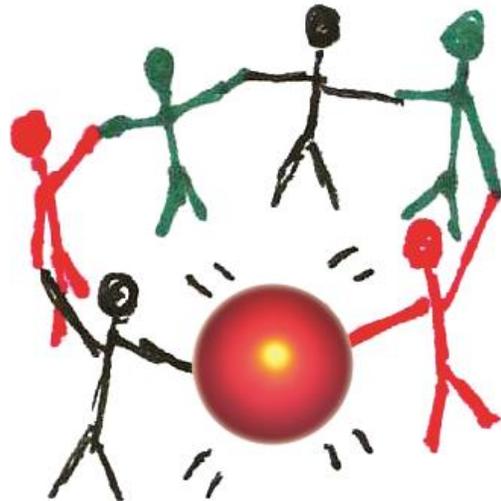
Good Conductors, Bad Conductors:

This is a single-person activity. You can model it first for your students, then let them take turns trying the Energy Ball for themselves. Simply hold the ball so that both sensors are touched. You can also press one sensor with your hand and the other with a paper clip. Try experimenting with other materials (cardboard, plastic, metal) to see which will activate the ball.

Ask students to make a list of materials that are GOOD conductors. Can students determine any common traits among the good conductors of electricity? For more information on conductivity and common conductors, see the *Useful Reference Materials* on page 1.

Build an Energy Ring:

Select at least two students for this demonstration. Have each student touch one sensor, and then hold hands. The Energy Ball can be used with many students at once. See how many students can hold hands and keep the circuit going. This is an easy way to demonstrate the difference between open and closed circuits. You can designate one student to be the “switch.” If the switch releases one or both of the hands they’re holding, the ball will stop flashing—representing an open circuit. If the “switch” goes back to holding hands again, the circuit will be closed again and the Energy Ball will resume flashing.



TAKE THE EI CHALLENGE: How many students can you include in your energy circle? Some teachers report being able to make a series circuit with 60 or more students! Can your class break that record? Send your photo to socialmedia@TeacherSource.com!

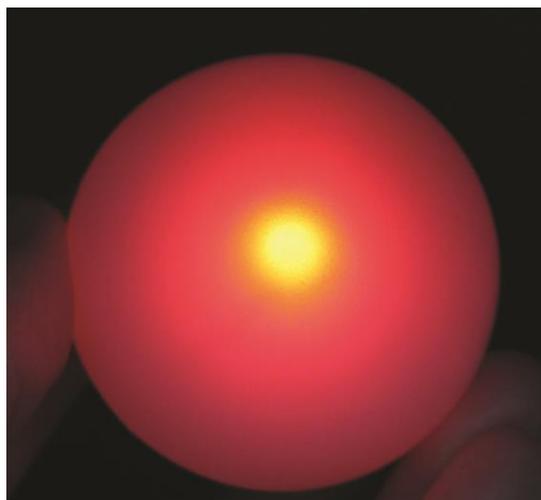
Using Your Energy Ball

Open Circuit, Closed Circuit:

Try playing a variation of *Duck, Duck, Goose* with the Energy Ball. First, form a circle of hands with the Energy Ball between two students. One student (who will be “it”) should remain outside the circle. This student should then go around the perimeter of the circle, pointing to each person in turn and saying either “closed” or “open.” Whenever a student is designated as “open,” he or she should break the circuit and try to make it around the circle and complete the circuit before the person who was “it.”

Insulator or Conductor?

For this activity, you’ll need assorted materials such as a metal spoon, a wooden Popsicle stick, a roll of aluminum foil, a piece of cardboard, etc. Choose two students. Instruct each student to place a finger on one of the Energy Ball sensors. Then, instead of holding hands or otherwise being in direct contact (to complete the circuit), have the students hold one of the materials between them. If the Energy Ball lights up, that material is a conductor. If it doesn’t light up, the material is an insulator.



Energy ball with a complete circuit

Take Your Lesson Further

As science teachers ourselves, we know how much effort goes into preparing lessons. For us, “*Teachers Serving Teachers*” isn’t just a slogan—it’s our promise to you!

Please visit our website
for more lesson ideas:

www.TeacherSource.com

Check our blog for classroom-tested
teaching plans on dozens of topics:

<http://blog.TeacherSource.com>

To extend your lesson, consider these Educational Innovations products:

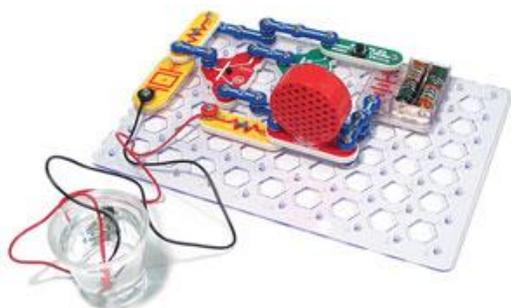


Light Bulb Experiment Kit (OHM-300)

Demonstrate the difference between parallel and series circuits in a way that students can easily understand. This kit contains 4 Light Bulb Holders with Fahnestock Clips, 4 pairs of wires with alligator clips, 10 Miniature Light Bulbs, 8 D-Cell Battery Holders, and 8 D batteries.

Energy Tube (OHM-250)

Safely demonstrate open and closed series circuits without any danger of electric shocks! When the tube is 'turned on,' the red, green, and blue lights light up and it makes an eerie fluttering tone. Activating the tube is the fun part—just touch the metal ends with both hands. Your body forms the conducting material that bridges the gap between the two metal strips and closes the circuit! 7 x 1.5 inches.



Electronic Snap Circuits (OHM-125)

Snap together electronic blocks to build over 300 different electronic circuits. All of the components (diodes, capacitors, resistors, transistors, etc.) are mounted with snaps that can be easily connected and disconnected. No soldering or wire twisting required. Learn by snapping together components to build a radio, light bulb circuits, doorbell, siren, water detector or electronic fan.

