

Energy Ball

P6-2300



BACKGROUND:

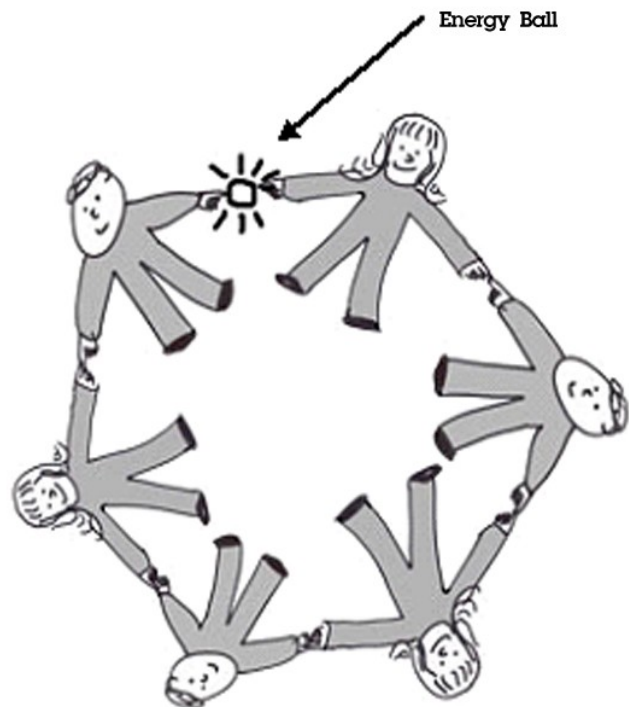
This very cool device consists of a 1.5-inch ball with two small metal electrodes. When the two electrodes are touched simultaneously, the ball flashes and makes a strange noise. The Energy Ball is completely self-contained and requires no additional batteries or energy source. It is often used to demonstrate closed and open circuits.

ACTIVITY:

Arrange students in a circle. Have them touch fingertips. Between two of the students place the energy ball with each of the two students touching one of the electrodes of the energy ball.

Once the students complete the circuit, the Energy Ball will buzz and glow. Have the students take turns breaking contact at their finger tips along the chain. The Energy Ball will stop sounding and glowing. Students will immediately understand open and closed circuits.

Try arranging the students in different formations, such as parallel and series circuits. Experiment with what arrangements complete the circuit, and who can break the circuit. They'll have a great time and have a real understanding of how electric circuits work.



EXPLANATION:

The Energy Ball utilizes a field effect transistor (FET), so even the slightest conduction between the two electrodes activates the light and noise. The FET acts as an electronic switch. When it senses a decrease in resistance between the ball's outer terminals, it switches to the ON state. Current then can flow from the battery through the switch and to the light and noisemaker. When in its OFF state, the FET is very close to its instability point, so it is able to switch ON even when the resistance between the terminals is still very high – even through a long line of people.

Students may ask if the current that activates the light and noise is traveling through their hands. It is not. The part of the circuit that contains the battery, bulb, and noisemaker is parallel to the circuit that the students are making with their hands.

