

Activity - Electricity and Tennis Balls

Objective: To Demonstrate the basic concepts of DC electricity using tennis balls.

Materials: About a dozen old tennis balls or similar balls.

Background:

There are several technical terms that are useful, even vital, to understanding direct current electricity. Using a simple, mechanical analogy with tennis balls these terms can all be demonstrated and their relationships to one another explored. This activity is a good problem-solving/creative thinking opportunity--be sure to spend plenty of time coming up with ideas.

Procedure: Select a lab member to play the *battery* and another to be the *light bulb*. Give the tennis balls (in a container) to the battery.

The idea is to give energy to the bulb from the battery so that it can light. This energy will have to be carried by something; in this case balls that represent charges ('balls' of charge).

Have the battery gently toss the balls to the light bulb.

- Questions:**
- 1.) What happens after a short while? What is this an analogy to as regards a battery and light bulb system?
 - 2.) How can the bulb be lit for longer?
 - 3.) If you connect a bulb to one end of a battery only, will it light?
 - 4.) How could you increase the power that the bulb is receiving, and hence light brighter?

Extensions:

(i) There is one other term that is used in DC circuits, but it is not needed for most simple experiments. That is *resistance* (R). Resistance is simply a measure of how hard it is to get the electrons to move through a particular component. The best way to visualize this (though easier in words than practice) is to imagine repeating the above activity underwater, or in Jello™.

* How would the activity be different in these cases?

(ii) Build a simple circuit out of the people in the class! Be creative.