

DISCUSSION

Optional Study and Discussion

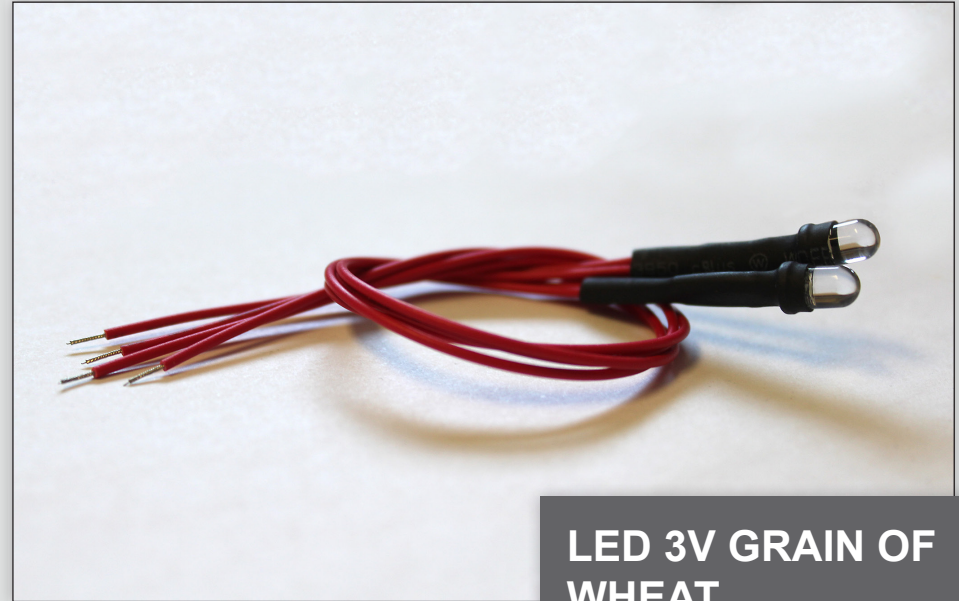
Have students further investigate what objects are conductors and what objects are insulators using their bulb and battery circuits. Students will do best if they also have extra wires to help make the connections.

Try common objects such as an eraser, paperclip, pencil, scissors, tape, etc. It may be helpful to have students connect the wires to the battery with electrical tape temporarily so that they can focus on holding the leads on the conductor or insulator.

Remember that it's important to disconnect all circuits completely before storing materials afterward.



T E A C H E R S G U I D E



**LED 3V GRAIN OF
WHEAT**
ITEM # 9125-03

ENERGY - ELECTRICITY

Upgrade your outdated bulbs to the 21st century! Now introducing miniature LED lights! These white color LED bulbs offer an easy replacement making them ideal for use in a variety of miniature equipment and circuit applications. The wheat bulbs can also be used in control panels, high quality commercial and industrial controls. These are similar to the wire ended lamps but they have stranded wire leads about 8" (200mm) long.
LED white color specs: 0.003A, 3V.

Materials

- library resources or internet capable computers
- LED grain of wheat lights (one for each pair of students)
- 2 x 1.5V batteries (for each pair of students)

Goals & Objectives

Students will:

- discuss different light sources and their functions.
- research the timeline when different light sources were invented or discovered.
- discover how to light the bulb with the help of a battery (circuits).

CAUTION!

Never connect the terminals of a battery with a plain wire as it can get dangerously hot. Never leave a circuit connected when storing materials, ensure all parts are disconnected.



ACTIVITIES

- 1 Introduce the different types of bulbs to students. Break students into pairs (or larger groups as needed), and have the groups research the different types of light sources available (incandescent bulbs, sun, lasers, fluorescent bulbs, and LED bulbs.)

Note

It is always best to DO an experiment ahead of time to be able to best present it to the class.

- 2 Let students know that it is their job to become and “expert” on their type of light source. Have each group determine the following: how the light source functions (with details), when it was invented (or discovered), and what practical applications there are for the light source.

- 3 Allow each group to share their findings, either through a jigsaw (one “expert” from each category takes their knowledge and forms a new small group where they share out in that smaller setting) or through a presentation to the whole class. Use a rubric to determine the quality of the information presented.

- 4 You may choose to use a timeline (long string stretched across the room) and clothespins with cards bearing the names of the light sources to help students visualize when different light sources were invented or discovered. Feel free to add other light sources not researched, including torches, candles, oil lamps, etc.

- 5 As an inquiry activity, you can simply give the students the materials (bulb with wire leads and a battery) and ask them to make the bulb light up. Let them know that once they have figured it out, they should come show the teacher how they’ve succeeded, but not show the students around them until the others have had a chance to experiment on their own. Guide students who are struggling with hints, but try to let them make the discovery on their own so that it is a true inquiry activity. Have students journal what they’ve tried – both the designs that worked and the designs that did not.

- 6 Once students have discovered how to make the bulb light, ask them to more formally draw a picture of the circuit they’ve created. Show them the symbols for battery and bulb, and have them practice drawing a circuit with one battery and one bulb, two batteries and one bulb, one battery and two bulbs, etc.