



# Flicker Checker

## TEACHER INSTRUCTIONS

### Question

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What will happen when you spin the flicker checker under your lights?

### Materials

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- Flicker Checker
- Fluorescent Lighting

### Time

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- 5-30 minutes, depending on area for testing

### Procedure

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1. Review the student worksheet.
2. Walk around the classroom and building and pre-determine areas that might be good for testing the flicker checker. You should look for fluorescent lighting. It may also make sense to arrange a time for your building manager/maintenance personnel to talk with you or your students about the types of lighting used in the building in various areas. Experiment with opening and closing the circuit by having two students separate their hands. Discuss the terms open and closed circuits. Have the students touch just their index fingers together and observe the ball.
3. Allow students time to follow the procedure and record their data and observations.
4. Discuss the results as a class. Ask students to share their energy savings ideas with the class.



# Flicker Checker Investigation

## STUDENT WORKSHEET

### Question

What will happen when you spin the flicker checker under your lights?

### Hypothesis

Predict how the flicker checker will react to the lights.

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### Materials

- Flicker Checker
- Fluorescent Lighting

### Background

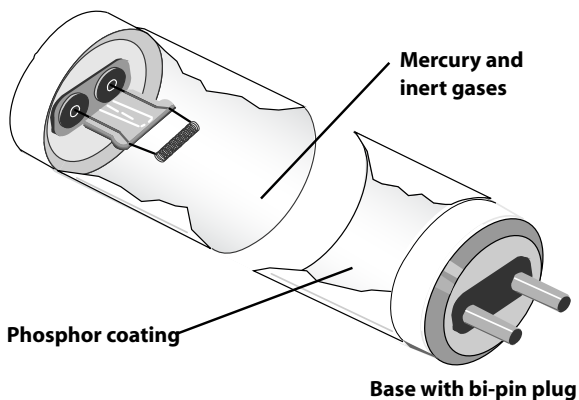
An incandescent bulb produces light by passing electricity through a wire inside the bulb. This wire is called a filament. When electricity flows through the wire, it gets very hot and glows, producing light. Incandescent bulbs use 90 percent of the electricity to produce heat and only ten percent to produce light. They are very inefficient in their use of energy.

A fluorescent bulb produces light by passing electricity through a gas inside the bulb. The electrons in the gas molecules become more energetic and some escape. They bounce around and crash into the walls of the bulb. The walls of the bulb are painted with a special material that gives off light when hit by electrons.

Fluorescent lights have ballasts that help move the electricity through the gas inside the bulb. A ballast is an electromagnet that produces a large voltage between the two ends of the bulb so the electricity will flow between them.

There are two types of ballasts, magnetic and electronic. Magnetic ballasts produce a frequency of 60 Hertz (Hz), which means the light is flickering on and off 60 times a second. Electronic ballasts produce a frequency of 10,000-20,000 Hz. Fluorescent lights with electronic ballasts are more energy efficient than those with magnetic ballasts.

### Fluorescent Tube Lamp



In fluorescent tubes, a very small amount of mercury mixes with inert gases to conduct the electrical current. This allows the phosphor coating on the glass tube to emit light.

### FLICKER CHECKER SHOWING A MAGNETIC BALLAST

