

Detecting Infrared

OBJECTIVES

1. To detect infrared light
2. To determine the way in which infrared signals are transmitted

WHAT YOU NEED

- Solar cell (purchase from Jaycar or taken out of a solar light)
- 2 x insulated wire cables with alligator clips on the ends
- Amplifier/speaker (may also require an audio cable with 1/8" plug)
- Torch
- Fluorescent light source
- Remote controls for TVs, stereos etc.
- Laptop and audio plug



WHAT TO DO

1. Connect the solar cell to the speaker/amplifier using the insulated wire cables. Clip one insulated wire to one of the leads from the solar cell. Clip the other insulated wire to the other lead from the solar cell.
2. Clip the other ends of the insulated wire to the speaker, one to each lead. (If you are connecting to an audio cable plug, place one alligator clip on the tip of the plug and one closer to the plastic base.)
3. Turn off the lights in the room or place the solar cell in a shoe box with only a small window cut out of the top.
4. Shine a torch on the solar cell and listen to the speaker. Record your observations.
5. Move the torch further away and then closer. Record your observations.
6. Move your hand back and forth to interrupt the light beam from the torch while still listening to the speaker. Record your observations.
7. Hold a fluorescent light above the solar cell. Record your observations.
8. Hold down a button on the remote control and shine at the solar cell. Listen to the speaker.
9. Interrupt the remote control signal using a tissue, piece of paper, cardboard, clear plastic and coloured plastic. Record your observations.

QUESTIONS

1. Does the sound from the photocell detector result from the degree of brightness of the light or from changes in the light? What is your evidence?
2. Is the light from a fluorescent bulb constant or does it change? Explain how you know.
3. The small device in the end of the remote control that produces the infrared light is called an infrared diode. Is the "brightness" of the light from the infrared diode constant or does it flicker? How do you know?
4. Which objects will block visible light but not infrared light?
5. Space is not as empty as we often think it is. Much of space is filled with gas and dust astronomers call the interstellar medium. This dust can block visible light from distant objects making them impossible to see. Why did the development of infrared telescopes allow astronomers to "see" these previously unseen objects?

RESOURCES used to develop this activity

1. Stratospheric Observatory for Infrared Astronomy. 2003. Active Astronomy: Classroom Activities for Learning About Infrared Light. http://www.sofia.usra.edu/Edu/materials/edu_materials.html. Accessed 3 September 2009.