

## You Can Run but You Can't Hide Pre-Quiz **Answer Key**

1. How were the police able to see the burglars?

*Example answer:* They used a special infrared camera that detects heat. Since the bodies of the burglars are warmer than the surrounding ground, buildings and trees, they show up as bright white objects.

2. What part of the electromagnetic spectrum was important in the design of the equipment that the police used to track the burglars?

The spectrum used is known as infrared (IR).

3. What does IR stand for?

IR stands for infrared.

(Don't expect students to necessarily know the details of IR at this pre-assessment stage.)

4. What are the wavelengths of IR?

IR is beyond the red edge of visible light and extends from a wavelength of 740 nm (0.00003 inches) with a frequency of 400 THz to a wavelength of about 30 cm (12 inches) with a frequency of 3 GHz. Infrared is invisible to the eye, but people can feel it as heat.

5. List four ways scientists and engineers use IR to conduct research and design products.

*Example answers:* Scientists and engineers use IR to create night vision technology, study temperatures, track objects, for heating, for communications (such as a remote control devices), study chemical compositions, study the earth and weather, and study astronomy.

6. Explain how an IR sensor works.

*Example answer:* A light emitting diode (LED) emits IR light. The IR light is reflected off an object and back towards the IR sensor, which detects the presence of an object.