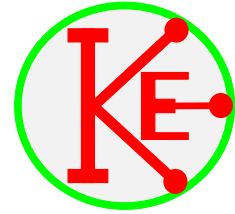


## Investigation of Photo-Diodes.



The junction between the two types of semiconductor in a diode is sensitive to light.

A normal diode is enclosed in plastic or the junction is hidden.

The junction of an LED has to be open to enable the light to be emitted. But when the LED is connected in reverse so that it is not conducting, then a small current can pass through the LED when the junction is exposed to light. This is what happened in the last investigation with the green LED.

Photodiodes are manufactured so that their junction can be exposed to light.

(a) Examine a photodiode and draw a picture showing the junction.

(b) Use Squeekie set to CONTINUITY to investigate a photodiode. Describe your results below.

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(c) With the photodiode connected to Squeekie so that Squeekie is not producing a tone, move the crocodile clip lead from CONTINUITY to INSULATION.

(i) What do you notice about the pitch from Squeekie?

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(ii) Describe what happens to the pitch from Squeekie as the intensity of the light falling onto the photodiode changes.

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Some photo diodes are designed to only work with infrared radiation (IR).

(d) Examine an IR photodiode. How does it differ from a visible light photodiode?

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- (e) Test the IR photodiode with Squeekie set to Continuity. Describe what you observe.

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- (f) With the IR photodiode connected to Squeekie so that Squeekie is not producing a tone, move the crocodile clip lead from CONTINUITY to INSULATION.

- (i) What do you notice about the pitch of the tone from Squeekie?

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- (ii) Describe what happens to the pitch from Squeekie as the intensity of the light falling onto the IR photodiode changes.

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- (g) Work with a friend and set up another Squeekie and an IR LED so that the IR LED is emitting IR radiation. Hold the IR LED near to the IR photodiode connected to Squeekie. Describe what happens to the pitch of the tone from Squeekie now.

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- (h) Point a TV remote control towards the IR photodiode and Squeekie. Press a button on the remote control. Describe what happens to the pitch of the tone from Squeekie.

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**Further investigations.**

- (j) Use the Internet / books to find the circuit symbol for a photodiode and draw it below. Label the anode and cathode. Remember to state your source of information.

- (k) List three uses of photodiodes.

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