

DARLINGTON PAIR - BREADBOARD

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On behalf of The World Association of Technology Teachers

W.A.T.T.



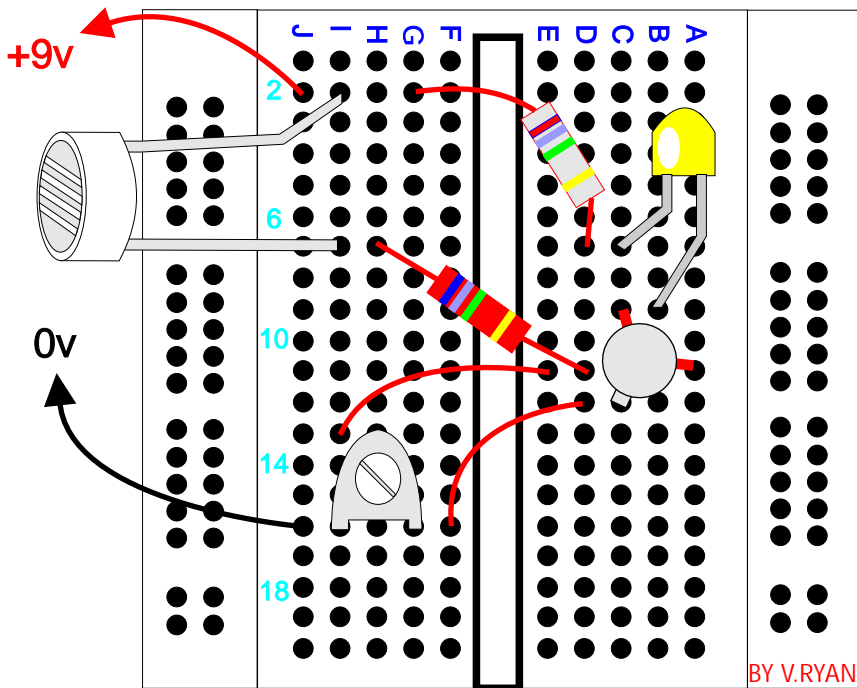
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This exercise can be printed and used by teachers and students. It is recommended that you view the website (www.technologystudent.com) before attempting the design sheet .

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BREADBOARD PROJECT

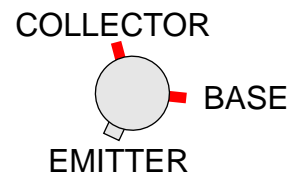
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Components:

- 680 ohm resistor to protect the LED.
- 1K resistor from LDR to the base of the NPN transistor.
- One BFY50 npn transistor (try any alternative).
- One 10K preset resistor.
- One LDR.

TRANSISTOR LAYOUT



1. Build the breadboard circuit shown above. This is a **dark sensor** and relies on several components, in particular the transistor. When the LDR is covered the LED will light, although there may be a need to alter the setting of the preset resistor.

How it works:

When light shines into the LDR its resistance is high and consequently current cannot flow from positive 9 volts to negative 0 volts. If the LDR is completely covered its resistance falls dramatically. Current then flows into the base of the transistor switching it on. Consequently current can flow through the collector and emitter - therefore, the LED lights.

2. Try building a light sensor, that is a circuit in which the LED lights if light shines into the LDR. **HINT**; try swapping round the LDR and the preset resistor.

3. Try building a similar circuit but this time add an arrangement of transistors called a Darlington Pair. Do you find any difference in the operation of the circuit ?

4. Try building a similar dark sensor but this time with a relay rather than an LED.