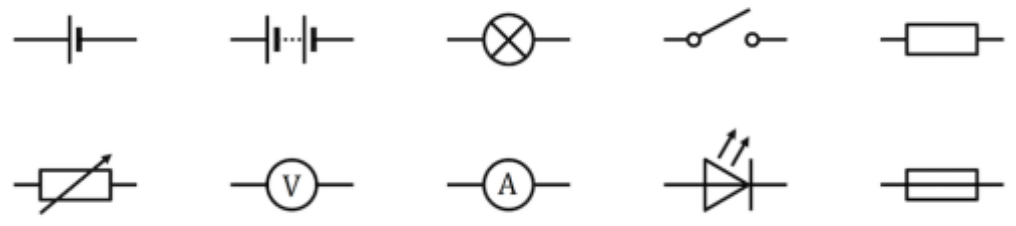



Lesson 1 – Electricity & energy part 1

(all answers are given in the online video)

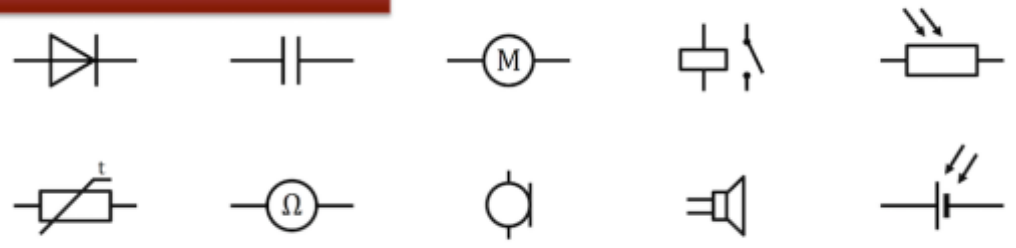
1. **Circuit symbols** – you'll see I revealed the answers to the first 10 symbols too early in the video. Make sure to remember the symbols and the function of each component they represent.


Circuit basics **Circuit symbols - do you know them?**





Circuit basics **Circuit symbols - last 10 (honestly)**





2. **Now get the ruler out for this one...**

A group of pupils are given the following equipment and asked to calculate the power output and resistance of a lamp:

ammeter, voltmeter, 12V battery, lamp, connecting leads

- (a) Draw a circuit diagram to show how the pupils should set up the equipment.

- (b) The group's results are shown in the table below.

Current (A)	Voltage (V)
3.0	12.0

Use these results to calculate the power output of the lamp and its resistance.

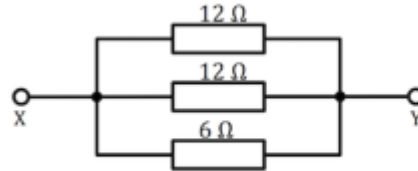
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(all answers are given in the online video)

3. Resistors in parallel

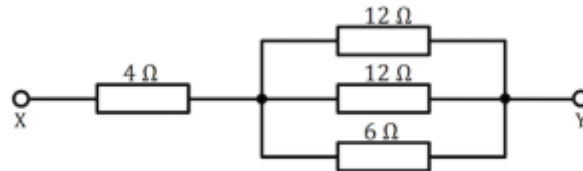
Three resistors are connected as shown in the diagram below.

Calculate the resistance between X and Y.



Four resistors are connected as shown in the diagram below.

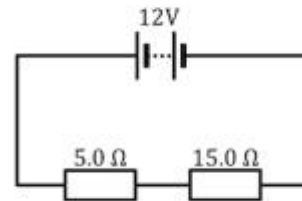
Calculate the resistance between X and Y.



4. Next question – intro. to potential dividers (aka voltage dividers)

A circuit is set up as shown.

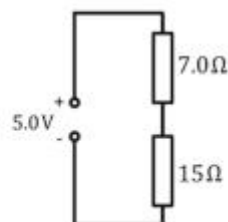
- Calculate the current in the 15 Ω resistor.
- Calculate the voltage across the 15 Ω resistor.



5. More potential dividers

A pupil sets up an electric circuit, as shown in the diagram.

Calculate the voltage across the 15Ω resistor.



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(all answers are given in the online video)

This is the same circuit as before, except the diagram is drawn differently – see video for explanation.

A pupil sets up an electric circuit, as shown in the diagram.
Calculate the output voltage.



6. Last question on potential dividers (intro. to transistor switching)

A circuit is set up as shown.
The initial reading on voltmeters V_1 and V_2 is 6V.
What will be the effect on voltages V_1 and V_2 when the thermistor is heated?



7. Last question – transistor switching circuits

A Physics teacher builds an electronic circuit to demonstrate how streetlights can be switched on automatically in the dark.

(a) Name components X and Y.



should be a street lamp!

A Physics teacher builds an electronic circuit to demonstrate how streetlights can be switched on automatically in the dark.

(b) Explain how the circuit works to switch on the lamp.



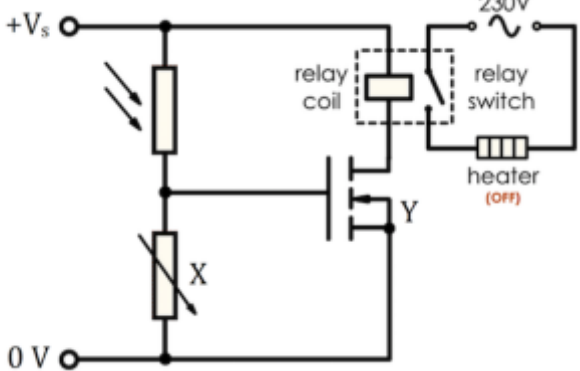
Lesson 1 – Electricity & energy part 1

(all answers are given in the online video)

Note – the positions of the LDR and variable resistor have been swapped, so this circuit now switches on the relay when the light level increases (this is why I've scored out the original question). Make sure you can explain how both circuits work to operate the lamp.

A Physics teacher builds an electronic circuit to demonstrate how streetlights can be switched on automatically in the dark.

(b) Explain how the circuit works to switch on the lamp.

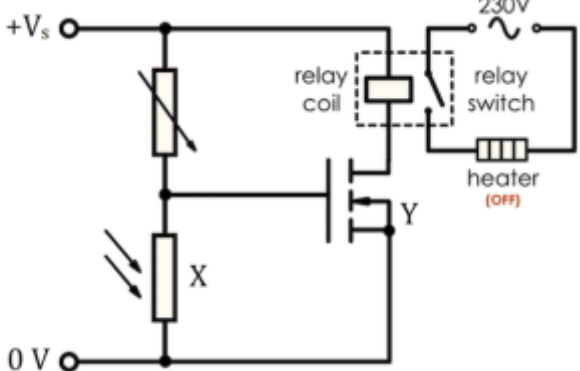


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I didn't have time to go over the next question at the time, so it's explained in another video (*titled 'Live – Electricity and energy part 1 revisited'*).

A Physics teacher builds an electronic circuit to demonstrate how streetlights can be switched on automatically in the dark.

(c) What is the purpose of the variable resistor?



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