

Name:
Science Class:
Teacher:
Hand in day:

# Y8 Science

## Term 3 Homework Booklet

### Physics

	Hand in Date	Parents Signature
<b>Electricity</b>		
Homework 1		
Homework 2		
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# Year 8 Electricity



## Homework 1

Read the following information and answer the questions on the next page.

### Atoms and electrons

All substances are made of atoms. These are often called particles. An atom is electrically neutral - has no overall electrical charge. However, each atom contains even smaller particles called electrons.

- Each electron has a negative charge.
- If an atom gains an electron, it becomes negatively charged.
- If an atom loses an electron, it becomes positively charged.

Electrons can move from one substance to another when objects are rubbed together.

You may have done this with a party balloon: if you rub a balloon on your sweater, you can get the balloon to stick to the wall or to your hair. This is because of static electricity.

### Moving charges

When you rub two different materials against each other, they become electrically charged. This only works for electrically insulated objects and not with materials like metals, which conduct. For example, if you rub an acetate plastic rod with a duster:

- electrons move from the acetate rod to the duster
- the duster becomes negatively charged and the rod becomes positively charged

The opposite thing happens with a polythene rod:

- electrons move from the duster to the rod
- the rod becomes negatively charged and the duster becomes positively charged

In both examples, the materials gain an equal amount of charge but the charges are opposite (one material becomes negative while the other becomes positive).

## Homework 1 Questions

1. What are all substances made from?
2. What does electrically neutral mean?
3. What charge does an electron have?
4. What charge does an atom have if it gains electrons?
5. What charge does an atom have if it loses electrons?
6. How can you move electrons from one substance to another?
7. Why does a party balloon stick to a wall after it has been rubbed against your sweater?
8. Name two materials that are insulators.
9. What charge does a duster have after it is rubbed against an acetate rod?
10. What charge does a duster have after it is rubbed against a polythene rod?

## Homework 2

### Static Electricity

When two materials are rubbed together how does one of them become negatively charged?

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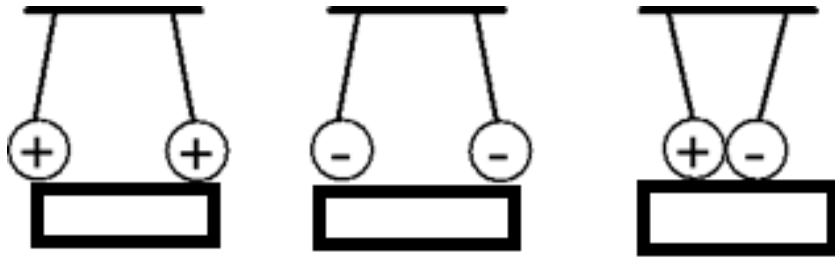
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What is static electricity?

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Label the diagram below to show if the charged balls will 'attract' or 'repel'.



### Current Electricity

What is the name of the small negatively charged particles that transfer energy by flowing through wires?

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What two things are required for current to flow?

1. \_\_\_\_\_

2. \_\_\_\_\_

## Insulators and conductors

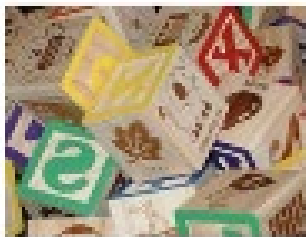


Fill in the gaps for the sentence below

Electrical current is the flow of \_\_\_\_\_ through a circuit. Electrons \_\_\_\_\_ easily through materials that are \_\_\_\_\_. Electrons \_\_\_\_\_ easily through materials that are \_\_\_\_\_.

Sort the objects below into three conductors and three insulators.

Conductors	Insulators
1.	1.
2.	2.
3.	3.



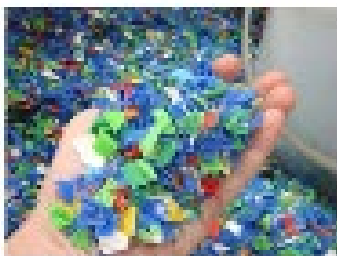
Wood



Aluminium



Steel



Plastic



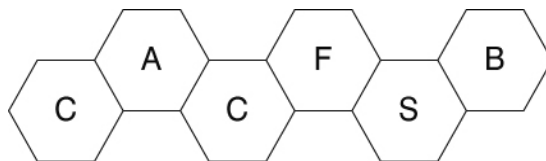
Rubber



Gold

## Homework 3

### Current and Circuit symbols



- 1 a What C is the amount of electricity flowing around a circuit? \_\_\_\_\_
- b What A is the instrument that measures the amount of electricity? \_\_\_\_\_
- c What C makes electricity flow in a circuit? \_\_\_\_\_
- d What F is the part of a light bulb that glows? \_\_\_\_\_
- e What S is a component that can stop or start the current flowing? \_\_\_\_\_
- f What B is two or more cells used together? \_\_\_\_\_

2 Tick the boxes to show if each statement is true or false.

	True	False
a If one bulb breaks in a simple circuit, the other bulbs will go off.	<input type="checkbox"/>	<input type="checkbox"/>
b Current gets used up as it goes around a circuit.	<input type="checkbox"/>	<input type="checkbox"/>
c If you put more bulbs into a circuit they will get brighter.	<input type="checkbox"/>	<input type="checkbox"/>
d A cell is the same thing as a battery.	<input type="checkbox"/>	<input type="checkbox"/>

3 Draw the correct circuit symbols in the boxes.

cell

ammeter

bulb

switch

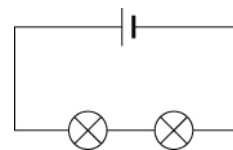
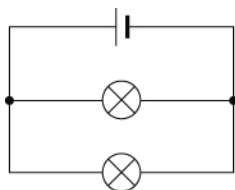
## Homework 4



### Series and Parallel Circuits

1 The diagrams show two circuits.

Write 'series' and 'parallel' under the correct circuits.



\_\_\_\_\_

2 These statements are all about series and parallel circuits.

Tick the box to show if each statement is true or false.

For the statements that are false, change the statement to make it correct. Write the correct statement in the space provided below.

	True	False
a All the bulbs in a series circuit are on or off together.	<input type="checkbox"/>	<input type="checkbox"/>
_____		
_____		
b If you add more bulbs to a parallel circuit they get dimmer.	<input type="checkbox"/>	<input type="checkbox"/>
_____		
_____		
c If you break a bulb in a parallel circuit, the other bulbs stay on.	<input type="checkbox"/>	<input type="checkbox"/>
_____		
_____		
d The current is the same everywhere in a parallel circuit.	<input type="checkbox"/>	<input type="checkbox"/>
_____		
_____		
e If you add more bulbs to a series circuit the current gets bigger.	<input type="checkbox"/>	<input type="checkbox"/>
_____		
_____		

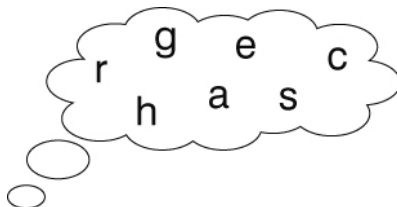
## Homework 5



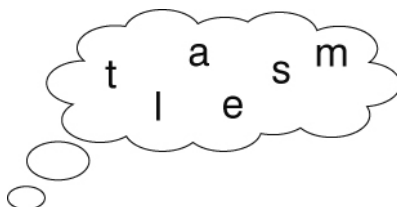
### Electricity Models

1 Here are some mixed-up words. Put the letters in the correct order to complete the words in the sentences.

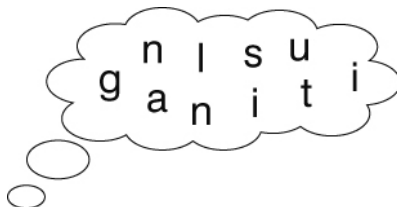
a An electric current is a flow of \_\_\_\_\_.



b These can move around easily inside \_\_\_\_\_, so these are good conductors.



c They cannot move around easily inside \_\_\_\_\_ materials



2 Draw lines to match up the boxes.

**This part of the central heating system**

pipes

boiler and pump

radiator

hot water

**... is a model for this part of an electric circuit.**

charges

wires

cell

bulb

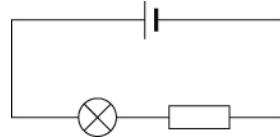
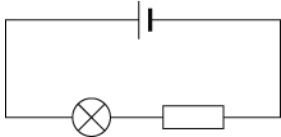


## Homework 6

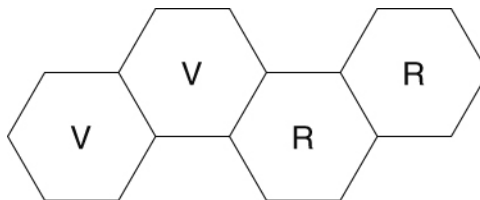
### Resistance



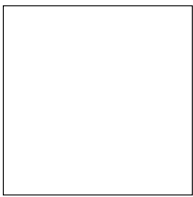
- 1 a Draw a voltmeter to measure the voltage of the cell.      b Draw a voltmeter to measure the voltage across the bulb.



2



- a What V is the unit for voltage? \_\_\_\_\_
- b What V is the instrument used to measure voltage? \_\_\_\_\_
- c What R is a way of saying how easy it is for current to flow? \_\_\_\_\_
- d What R is a component that reduces the size of the current in a circuit? \_\_\_\_\_
- 3 Draw the symbol for a variable resistor in the box.



- 4 Complete these sentences by choosing words from the brackets.

Components like bulbs have a \_\_\_\_\_ (high/low) resistance. Connecting wires have a \_\_\_\_\_ (high/low) resistance.

When the resistance of the components in a circuit is increased, the current \_\_\_\_\_ (increases/decreases).