Biology

GCSE Infection and Response

Learned	Revised	Confident

_____ % Achieved:_____

PATHOGEN (ANTIGEN) MEASLES · ANTIBODY · PATHOGEN CHICKEN POX · ANTIBODY
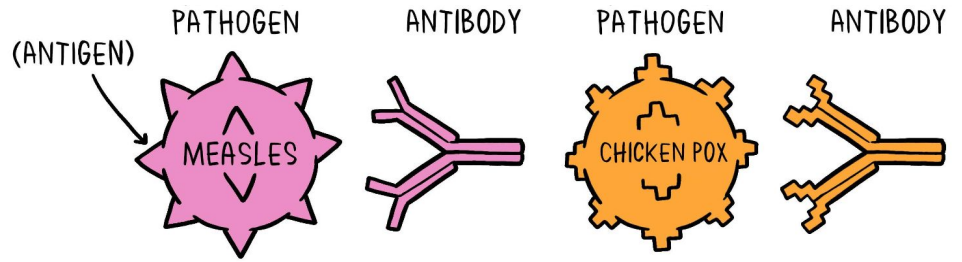
N°	Keyword	Definition
2	Antibiotic	A drug used to kill or prevent the growth of **bacteria (e.g. penicillin)**
3	Antibody	A protein produced by white blood cells in response to the presence on an antigen
4	Antigen	A molecule on the surface of a cell, with a specific shape
5	Antitoxin	A protein produced by white blood cells which counteracts toxins (poisons) produced by bacteria
6	Clinical trials	Drug tests on human volunteers
7	Communicable disease	A disease that can be spread between individuals
8	Double-blind trial	A clinical trial where neither the doctors nor the patients know who has received the drug and who has received the placebo until after the trial
9	Efficacy	Whether something (e.g. a drug) works or not
10	Immunity	The ability of the white blood cells to respond quickly to a pathogen (so symptoms don't occur)
11	Painkiller	A drug that relieves pain. It does NOT treat the disease.
12	Pathogen	A microorganism that causes disease
13	Phagocytosis	The process by which white blood cells engulf pathogens and digest them.
14	Placebo	A dummy pill. Used in drug trials to test the effect of the real drug.
15	Preclinical trial	Drug tests on human cells and tissues, and animals
16	Vaccination	An injection of dead or inactive pathogens to provide immunity

N°	Facts
17	Bacteria, fungi, protists and viruses can all be pathogens (cause disease)
18	The skin, hair, mucus and stomach acid are general defenses that prevent pathogens from infecting the body.

Chemistry

GCSE Quantitative chemistry

1

RELATIVE FORMULA MASS (M_r)

ADD TOGETHER THE RELATIVE ATOMIC MASSES OF ALL THE ATOMS IN THAT COMPOUND'S MOLECULAR FORMULA

Learned	Revised	Confident

_____ % Achieved:_____

MAGNESIUM CHLORIDE

$Mg\ Cl_2$

$1 \times$ [24/12] Mg

$2 \times$ [35.5/17] Cl

$24 + (35.5 \times 2)$

$M_r = 95$

N°	Keyword	Definition
2	Relative formula mass	The relative mass of a compound is the total of all the atomic masses added together e.g. $H_2O = 1 + 1 + 16 = 18$
3	Percentage mass	This is the percentage of a certain atom within a compound, we can use this to find the mass of that elements in the compound
4	Mole	A unit of measurement in chemistry. One mole is equal to the relative formula mass in grams. One mole contains 6.02×10^{23} of those particles
5	Avogadro constant	6.02×10^{23} - the number of particles (atoms / molecules / ions / electrons) found in one mole of <u>ANY</u> substance
6	Conservation of mass	Atoms are not created or destroyed in chemical reactions, the are rearranged. The total mass of the reactants and products is the same
7	Concentration	The quantity (mass or moles) of a substance in a certain volume of solution. This can be in g/dm^3 or mol/dm^3
8	Atom economy	The percentage of the mass of the reactants that ends up as the desired product
9	Yield	The amount of product made in a reaction

10	**CONSERVATION OF MASS**

↳ NO ATOMS ARE CREATED OR DESTROYED (ONLY THE BONDS CHANGE)

$2\,Na$ + Cl_2 →(COMPLETELY) $2\,NaCl$

2.3g   3.5g   5.8g

11	CALCULATE THE PERCENTAGE MASS OF A PARTICULAR ELEMENT IN A COMPOUND

% MASS OF ◎ IN CALCIUM HYDROXIDE

$Ca(OH)_2$ $\dfrac{(16 \times 2)}{(40 + (2 \times 16) + (2 \times 1))}$ $= 43.2\%$

12	HOW TO CALCULATE THE CONCENTRATION OF A SOLUTION

'40g NaOH DISSOLVED IN 2.5 dm³ OF WATER' $\dfrac{40g}{2.5\,dm^3} = 16g\ per\ dm^3$

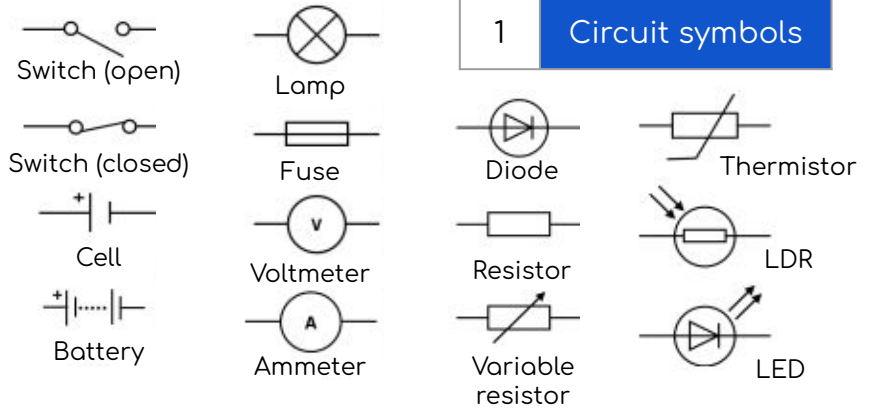| 13	MOLE UNIT WE USE TO MEASURE THE <u>AMOUNT</u> OF CHEMICAL WE HAVE

O_2 $M_r = (16 \times 2) = 32$ 1 MOLE → 32g

Physics

GCSE Electricity

Learned	Revised	Confident

_____ % Achieved:_____

Switch (open)
Switch (closed)
Cell
Battery
Lamp
Fuse
Voltmeter
Ammeter
Diode
Resistor
Variable resistor
Thermistor
LDR
LED

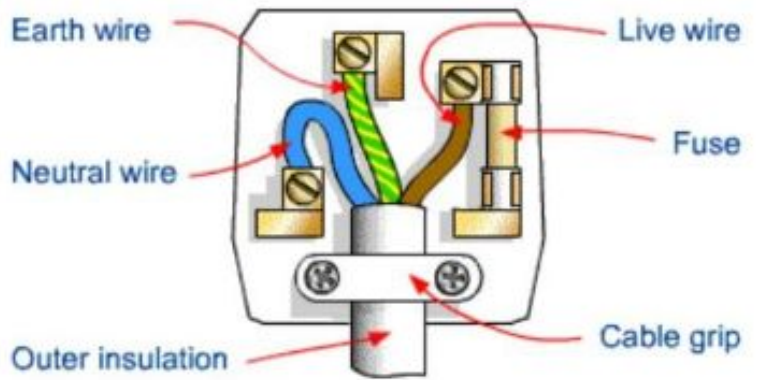| N°	Keyword	Definition
2	Current	Flow of charge, measured in amperes (A)
3	Potential difference	A measure of how much energy is transferred between two points in a circuit, measured in volts (V)
4	Resistance	Anything that opposes the flow of charge (eg, electrons colliding with ions in the wire), measured in Ohms (Ω)
5	Series circuit	Every component is connected in a line (one "loop")
6	Parallel circuit	Every component is connected to the battery separately (it has multiple "loops")

7 **Series circuit rules**

V_{supply}

I_1 (A) $I_1 = I_2 = I_3$ (A) I_3

I_2

R_1 (A) R_2

V_1 V_2

$V_1 + V_2 = V_{supply}$ $R_{total} = R_1 + R_2 + ...$
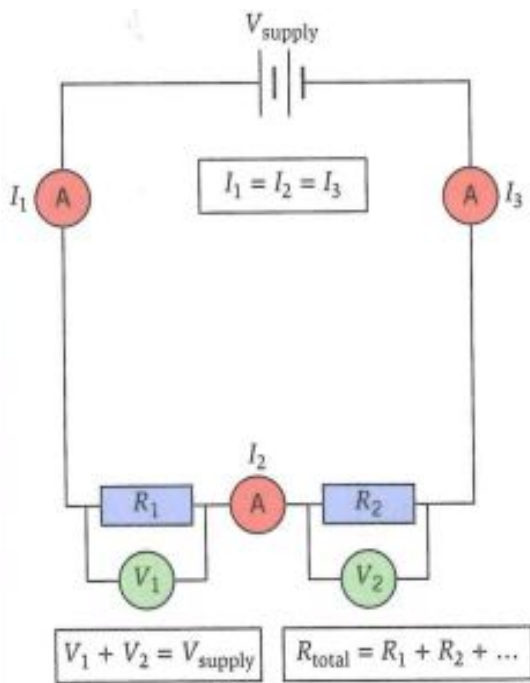
8 **Parallel circuit rules**

V_{supply}

I_{total} $I_{total} = I_1 + I_2$ (A)

current splits at a junction

$V_{supply} = V_1 = V_2$

R_1 (A)

V_1 I_1

R_2 (A)

V_2 I_2

R_{total} = less than the resistance of the smallest resistor
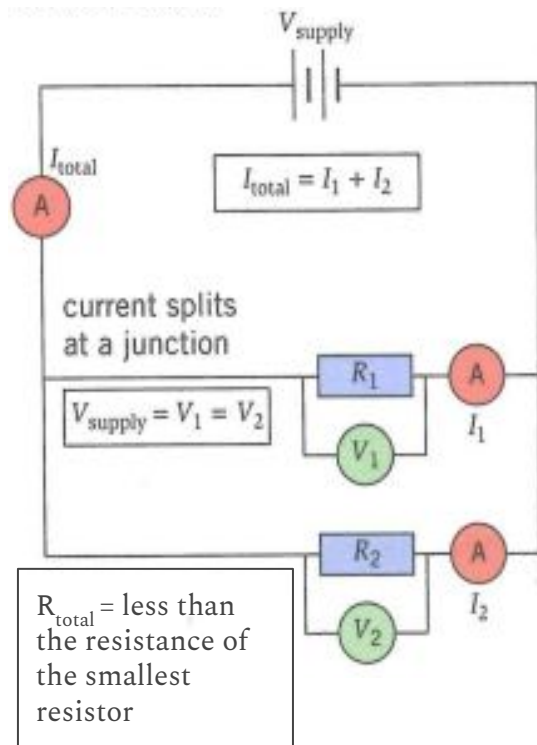
N°	Equations to learn
9	charge flow = current × time
10	potential difference = current × resistance

GCSE Electricity (2)

1

Earth wire — Live wire
Neutral wire — Fuse
Outer insulation — Cable grip

N°	Keyword	Definition
2	Alternating current	Current that changes direction
3	Direct current	Current that flows in one direction only
4	Step up transformer	Increases the potential difference and decreases the current (reducing resistance and heat loss, and increasing efficiency)
5	Step down transfer	Decreases the potential difference to a safe level (230V for homes).
6	The national grid	A network of cables and transformers that links electricity power stations to consumers

N°	Facts
7	UK alternating current has a potential difference of 230 V and a frequency of 50 Hz

8	The National Grid

Power station — High voltage transmission lines — Consumers, for example homes, factories and shops

Step-up transformers — Step-down transformers
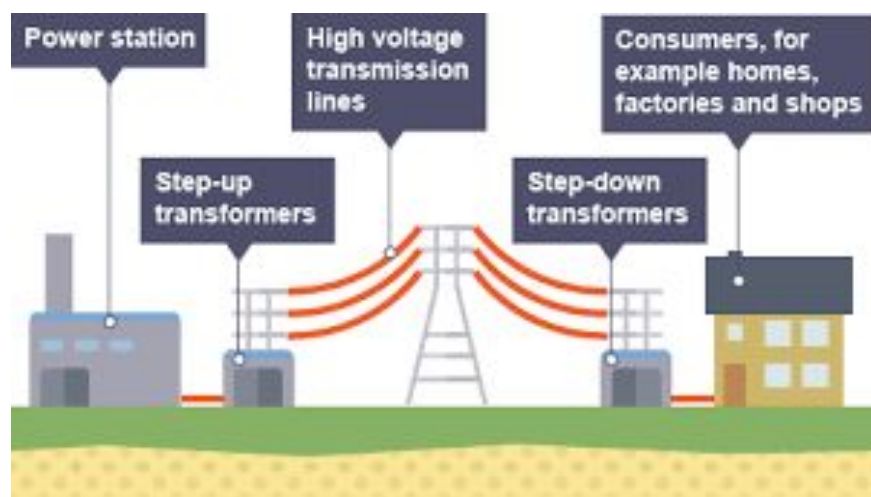
N°	Equations to learn
9	power = potential difference × current
10	power = (current)2 × resistance
11	energy transferred = power × time
12	energy transferred = charge flow × potential difference

GCSE Particle model

1

Heating → Melting → Boiling
Solid   Liquid   Gas
Freezing   Condensing   Cooling
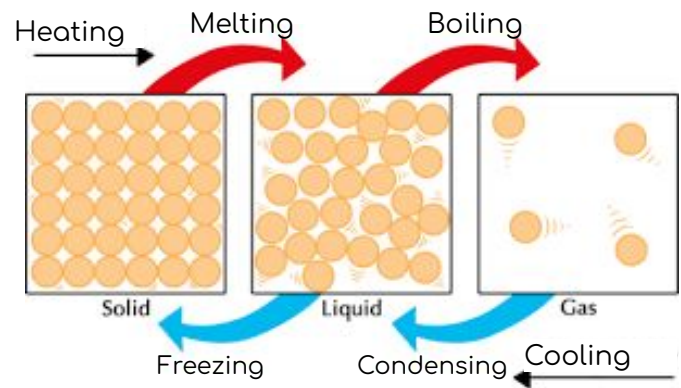
N°	Keyword	Definition
2	Density	A measure of the "compactness" of a substance.
3	Evaporating	When particles at the surface of a liquid spontaneously gain enough energy to turn into gas particles - this happens below the boiling point.
4	Internal energy	The total energy that a system's particles have in their kinetic and potential energy stores
5	Pressure	Force per unit area
6	Specific latent heat	Energy required to change the state of 1 kg of a substance without a change in temperature (SLH fusion is for melting/freezing, SLH vaporisation is for boiling/condensing).
7	Sublimation	Change in state from a solid to a gas (without becoming a liquid)

	Solid	Liquid	Gas
8	Regular arrangement (touching)	Irregular arrangement (touching)	Irregular arrangement (not touching)
9	Vibrate in fixed positions	Free to move	Random speeds and random directions
10	Lowest energy	Medium energy	Highest energy
11	Strongest forces	Medium forces	Weakest forces

N°	Facts
12	Substances change state when they have enough energy to overcome the bonds holding the particles together.
13	The temperature of a gas is related to the average energy in the kinetic energy stores of the gas particles.

N°	Equations to learn
14	$$\text{density} = \frac{\text{mass}}{\text{volume}}$$