Name: Form:

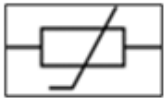
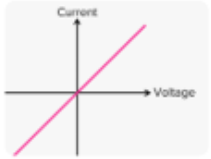
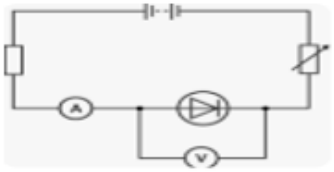
SCIENCE FUNDAMENTAL KNOWLEDGE QUIZ BOOKLET

Key Stage 4
Paper 1
Physics

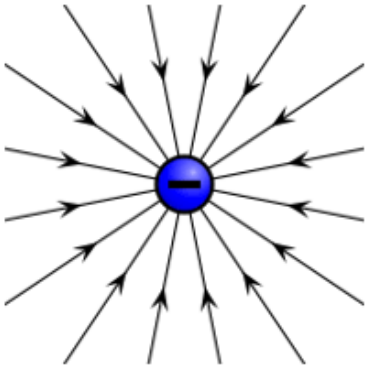
P1– Energy

State the units for the following: Energy: **Joules /J** Time: **Seconds/ s** Power: **Watts / W** Height: **Metres/ m**	Which energy store does a moving object have? **Kinetic**	Which energy store does an object off the ground have? **Gravitational potential**	Which energy store does a fuel have? **Chemical**	Which energy store does energy get wasted to? **Thermal store of surroundings**
Which piece of apparatus is used for the following: Mass: **Balance** Energy: **Joulemeter** Temperature: **Thermometer**	What is this the definition of? ' The energy required to raise 1kg by 1°C' **Specific Heat Capacity**	What can be wrapped around a metal block to stop energy escaping to the surroundings? **Insulation**	How can efficiency be increased between 2 moving parts? **Lubrication / Oil**	What is this the definition of? ' Rate of energy transfer' **Power**
What is this the definition of? ' Amount of energy transferred' **Work Done**	State 3 non renewable fuels - **Coal** - **Oil** - **Gas** - **Nuclear**	Sate 3 renewable energy resources - **Solar** - **Wind** - **Geothermal** - **Hydroelectric** - **Tidal** - **Wave**	State an advantage of using fossil fuels for generating energy **Reliable**	State a disadvantage of using fossil fuels for generating energy **CO_2 which causes global warming**
State an advantage of all renewable energy resources? **Won't run out**	State a disadvantage of both Wind and solar? **Unreliable**	Which pathway is used when an object falls to earth? **Forces**	Which pathway is used if the thermal store of the surroundings increases? **Heating**	State the energy transfers in an object hitting a wall The **Kinetic** Store of energy will decrease. This transfers to **Thermal** Store of the surroundings and the wall, via a **Forces** pathway

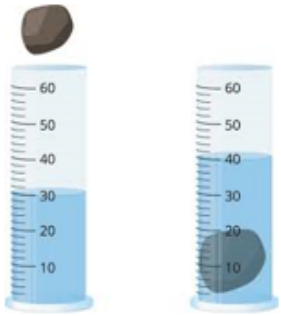
P2– Electricity circuits

What is the units for the following? Current: **Amps/ A** Potential difference: **Volts/V** Charge: **Coulombs/ C** Resistance: **Ohms/ Ω**	What is this the definition of? 'Rate flow of charge' **Current**	What is this the definition of? 'Energy transferred per charge' **Potential difference**	What is this the definition of? 'Reducing the flow of charge' **Resistance**	Which piece of apparatus is used to measure current? How is it placed in a circuit? **Ammeter in series**
Which piece of apparatus is used to measure potential difference? How is it placed in a circuit? **Voltmeter, Parallel**	Which type of circuit is one loop? **Series circuit**	Which type of circuit is more than one loop? **Parallel Circuit**	How to you take multiple reading in a circuit? **Move variable resistor**	How do you take negative values in a circuit? **Swap wires around**
Draw a symbol for a thermistor 	Draw a symbol for a Light dependent resistor 	Draw the graph for a fixed resistor 	Draw the graph for a diode 	Draw the graph for a lamp 
At a high potential difference the resistance in a lamp **increases** this is because the lamp gets **Hot** Which means the ions **Vibrate** more so the electrons **Collide** more often	As the length of the wire increases the resistance increases. State the IV and DV IV=**Length of wire** DV= **Resistance**	Draw a circuit to investigate the potential difference and resistance in a diode 	What expression can be used to describe current in a series circuit $I_1 = I_2 = I_3$	What expression can be used to describe current in a parallel circuit $I_1 = I_2 + I_3$

P2– Electricity in the home

State the colours of the following wires: Live: **Brown** Neutral: **Blue** Earth: **Green and Yellow stripes**	State the Potential Difference of the following wires Live: **230V** Neutral: **0V** Earth: **0V**	Which wires carries the current into a plug? **Live**	Which wire carries the current away from the plug? **Neutral**	Which wires carries the current if there is a fault? **Earth**
What is this the definition of? 'Current flows in one direction' **Direct Current**	What is this the definition of? 'Current changes direction and magnitude' **Alternating Current**	What material are the pins made from and why? **Brass- Good conductor**	What material is the outer casing in a plug made from and why? **Plastic- Good insulator**	If you touch a live wire you get an electric shock because, the live wire has a potential difference of **230V**, the person has a PD of **0V**, this is a **Large** Difference so **Current** flows through the person
What is this the definition of? ' The transformers and Pylons that transport electricity round the country' **National Grid**	What does a step up transformer do? A step up transformer increases the **Potential Difference** this will decrease the **Current** which will decrease the **Energy** lost to the surroundings Which makes it more **Efficient**	What does a step down transformer do? A step down transformer decreases the **Potential Difference** Which will make it **Safe** to go into people's houses	**Triple Only** Explain why a jumper becomes negatively charged when a ballon is rubbed on it? - **Electrons Transfer** - **From the ballon to the jumper** - **Causing the ballon to be positive and jumper to be negative**	**Triple Only** Draw a negative electric field 

P3– Particles

Describe the Arrangement of S,L,G Solids are **Ordered** And **Touching** Liquids are **Random** And **Touching** Gases are **Random** and **Not Touching**	Describe the movement of S,L,G Solids **Vibrate** In a fixed position Liquids can **Flow** Gases move **Fast** and **Random**	Describe the force of attraction in S, L and G Solids: **Strong** Liquids: **Weaker** Gas: **Very Weak**	State the units of the following: Density: **Kg/m^3** Mass: **Kg** Volume: **m^3**	Which piece of apparatus is used to measure the following Mass: **Balance** Volume of liquids: **Measuring Cylinder** Length: **Ruler**
Describe how to measure the volume of a cube. Measure the **Length**, **Width**, **Height** with a ruler To calculate the volume do **Length** x **Width** .x **Height**	What is the name of this piece of equipment? **Eureka Can** 	What is the volume of the rock? **10cm^3** 	What is this the definition of: 'Kinetic Energy + Potential Energy' **Internal Energy**	If the temperature increases which energy increases? **Kinetic Energy**
If Potential energy increases how do the particles change? **Particle space out**	What is this the definition of? ' Energy required to change the state of 1kg of a material' **Specific Latent Heat**	State 2 ways to increase gas pressure **Increase temperature** **Increase particles** **Decrease volume**	Gas pressure is caused by particles **Colliding** with the walls of a container, which causes a **Force** at right angles	What happens to the temperature when a substances changes state? **Stays constant**

P4– Atomic structure

What is the size of the following: Atom: 1x10^{-10} m Nucleus: 1x 10^{-14} m	State which scientist discovered the following? Electrons: JJ Thompson Nucleus: Rutherford Shells: Bohr Neutrons: Chadwick	State what an isotope is Same P + E, but different number of N	What is an alpha particle made from? 2 Protons and 2 Neutrons	Describe what a beta particle is Fast moving electron
Describe what a Gamma ray is Wave of energy	Put the 3 types of radiation in order of ionising power. Most first Alpha, Beta, Gamma	Put the 3 types of radiation in order of penetrating power. Most first Gamma, Beta, Alpha	What happens in the nucleus when Beta decay take place? Neutrons turns into Proton and emits an electron	State what the following is stopped by: Alpha: Paper Beta: Aluminium Gamma: Thick lead
What is this the definition of? ' The time taken for the activity to decrease by half' Half life	What is this the definition of? ' The exposure to radiation' Irradiation	What is this the definition of? The absorption of radiation' Contamination	Explain why in the gold foil experiment most alpha went straight through Mainly empty space	Explain why in the gold foil experiment some deflected at an angle. Nucleus is positive and repels positive alpha
Explain why in the gold foil experiment very few came straight back Nucleus is small and solid	State 2 ways to reduce expose to radiation - Increase distance - Reduce time - Put up a shield	**Triple Only** Describe what is absorbed during nuclear fission Neutron	**Triple Only** Describe Nuclear fusion 2 Light nuclei, fuse to form a heavier nucleus	**Triple Only** Where does nuclear fusion take place naturally Stars / Sun