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SCIENCE FUNDAMENTAL KNOWLEDGE QUIZ BOOKLET

Key Stage 4 Paper 1 Physics



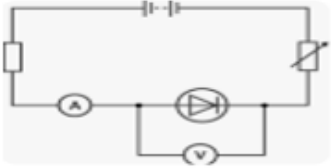
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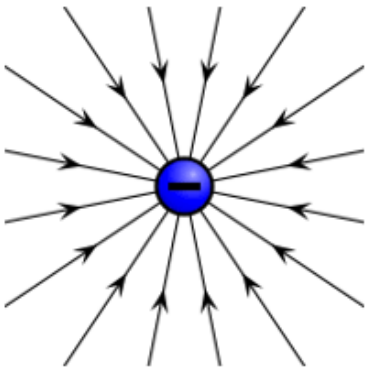
P1– Energy

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 <u>non renewable</u> fuels - Coal - Oil - Gas - Nuclear	State 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 CO₂ 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

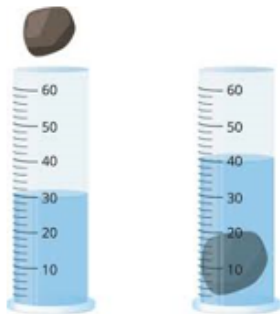
P2- Electricity circuits

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 balloon is rubbed on it? - Electrons Transfer - From the balloon to the jumper - Causing the balloon 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/m³ Mass: Kg Volume: m³	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? 10cm³ 	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: $1 \times 10^{-10} \text{ m}$ Nucleus: $1 \times 10^{-14} \text{ m}$	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