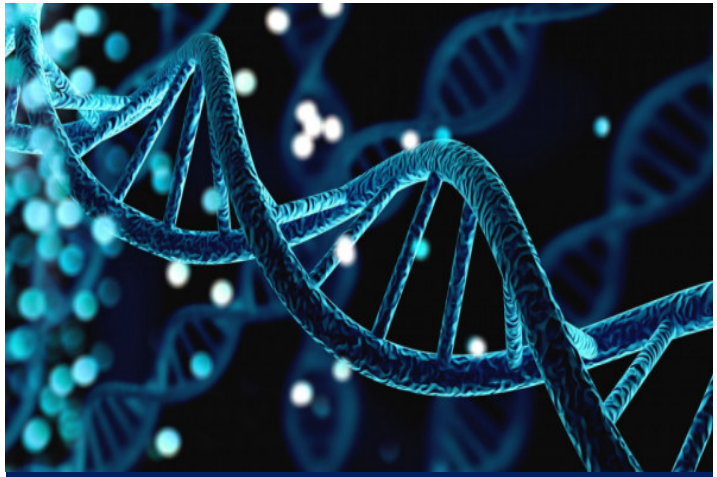
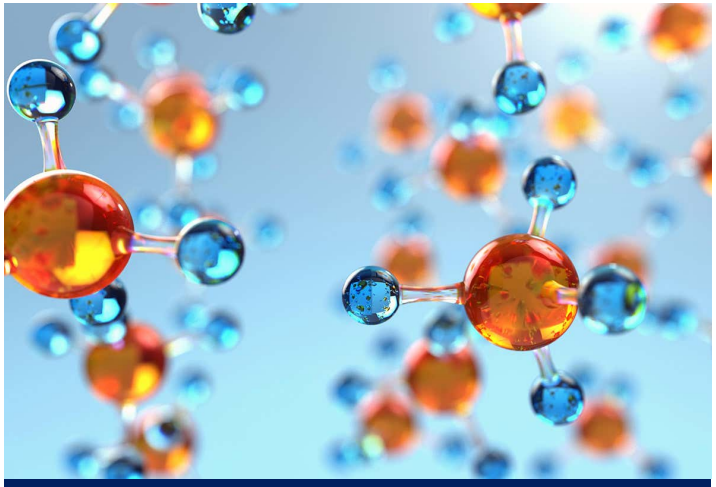
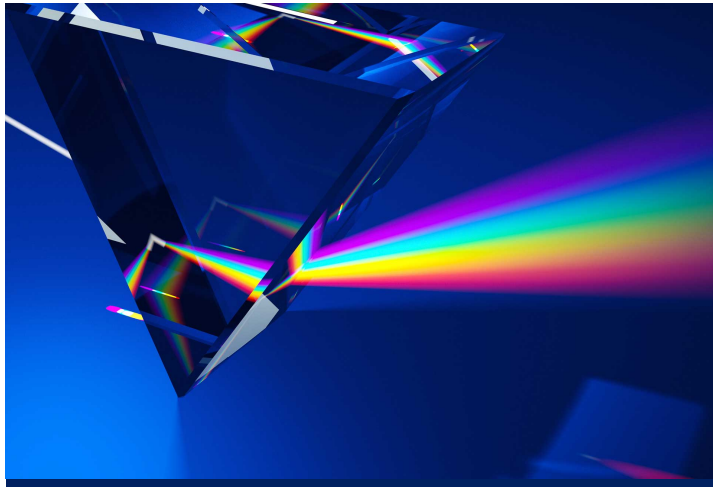
Hessle High School

Science Department







Physics Combined Foundation

This document will help you work with students to assess their understanding of the science curriculum for their exam. The students have their personal learning checklist from their mock exams. They need to revise these topics, then they can use these questions to test their understanding.

Paper 1

Question	Answer	Sub-topic
What are the units of energy?	Joules	P1.1 Changes in energy stores
What are the energy stores?	Chemical, elastic, magnetic, gravitational, kinetic, nuclear, thermal and electrostatic.	P1.1 Changes in energy stores
How can we transfer energy?	Mechanical (work done), electrical, radiation waves (sound/ light/ heat)	P1.1 Changes in energy stores
What is mechanical transfer (work done)?	The energy transferred when a force moves a distance	P1.1 Changes in energy stores
What is the energy transfer when a charge moves?	electrical transfer	P1.1 Changes in energy stores
What is the energy transferred by electromagnetic radiation? (sound/heat/light)	Radiation waves transfer	P1.1 Changes in energy stores
A battery is a store of _____ energy.	chemical	P1.1 Changes in energy stores
Food is a store of _____ energy.	chemical	P1.1 Changes in energy stores
A moving object is a store of _____ energy	kinetic	P1.1 Changes in energy stores
What is a gravitational potential store?	energy stored in objects raised up above the ground	P1.1 Changes in energy stores
A rock at the top of a hill is a store of _____ energy.	gravitational potential	P1.1 Changes in energy stores
What is an elastic potential store?	Energy stored in an object which has been stretched or compressed.	P1.1 Changes in energy stores
A compressed spring is a store of _____ energy	Elastic potential	P1.1 Changes in energy stores
An inflated balloon is a store of _____ energy	elastic potential	P1.1 Changes in energy stores
Energy stored in the nuclei of atoms is in the _____ store.	nuclear	P1.1 Changes in energy stores
What does conservation of energy mean?	Energy cannot be created or destroyed only transferred to a different store.	P1.2 Conservation of energy
In a closed system there is no net change to the total energy. (T or F?)	TRUE	P1.2 Conservation of energy
Energy transferred =	work done	P1.3 Energy and work

What is the equation for calculating work done?	Work done (J) = Distance (m) x Force (N)	P1.3 Energy and work
Where is energy transferred when work done overcomes friction?	To the surroundings and objects as thermal energy	P1.3 Energy and work
What are the units for distance?	Meters	P1.3 Energy and work
What is the equation for gravitational potential energy using weight?	Weight x height	P1.4 Gravitational potential energy stores
what are the units for weight?	Newtons (N)	P1.4 Gravitational potential energy stores
What are the units for mass?	Kg Kilograms	P1.4 Gravitational potential energy stores
What is the equation for gravitational potential energy using mass?	mass x gravitational field strength x height	P1.4 Gravitational potential energy stores
What is the equation to convert mass into weight	mass x gravitational field strength = Weight	P1.4 Gravitational potential energy stores
When an object is lifted off the ground, what energy store increases?	gravitational potential	P1.4 Gravitational potential energy stores
How do you calculate kinetic energy?	Ek= 0.5 x mass x speed2	P1.5 Kinetic energy and elastic energy stores
What are the units of velocity?	metres per second	P1.5 Kinetic energy and elastic energy stores
The energy in a kinetic store depends on its _____ and _____	Speed and mass	P1.5 Kinetic energy and elastic energy stores
What is the equation to calculate elastic potential energy?	0.5 x spring constant x extension2	P1.5 Kinetic energy and elastic energy stores
What is the elastic potential energy if the spring constant = 4 and extension = 3	18 J	P1.5 Kinetic energy and elastic energy stores
When an energy transfer occurs- not all of it is useful, what is the name for this energy?	Wasted energy	P1.6 Energy dissipation
What is useful energy?	Energy in the place we want it, and, in the form, we need it	P1.6 Energy dissipation
what eventually happens to all wasted energy?	Transferred to the surroundings which become warmer	P1.6 Energy dissipation
What is the scientific word for energy spreading out is?	dissipated	P1.6 Energy dissipation
What is the equation for efficiency?	(useful energy / total energy) x100	P1.7 Energy and efficiency
What is the useful and wasted energy in an electric kettle	Useful: Energy heating water Wasted: energy heating the kettle itself	P1.8 Electrical appliances
What is the equation linking energy transferred, power and time?	P=Energy transferred (J) /time (s)	P1.9 Energy and power
What are the units of power?	Watts (W)	P1.9 Energy and power

What is the definition of power?	Power is the rate of transfer of energy or the rate of doing work	P1.9 Energy and power
what is the equation of the efficiency of an appliance?	Efficiency = (Useful power out/ total power in) x100	P1.9 Energy and power
What is the equation for wasted power?	power wasted = total power in - useful power out	P1.9 Energy and power
Non-metals conduct energy better than metals (T/F)	F	P2.1 Energy transfer by conduction
Thermal energy is conducted from the ___ end of an object to the ____ end.	Thermal energy is conducted from the hot end of an object to the cold end.	P2.1 Energy transfer by conduction
How is thermal conductivity of a material related to the rate of energy transfer by conduction.	The higher the thermal conductivity of a material the higher the rate of energy transfer by conduction across the material.	P2.1 Energy transfer by conduction
Do insulators have a low or high thermal conductivity?	Low thermal conductivity	P2.1 Energy transfer by conduction
What is thermal conductivity?	The ability of a material to transfer energy by heating.	P2.1 Energy transfer by conduction
What is a conductor?	A material with a high thermal conductivity (it's good at transferring heat).	P2.1 Energy transfer by conduction
What is an insulator?	A material with a low thermal conductivity (it's bad at transferring heat).	P2.1 Energy transfer by conduction
What is conduction?	The transfer of energy through a material by the vibration of its atoms.	P2.1 Energy transfer by conduction
What is the definition of specific heat capacity?	The amount of energy required to raise the temperature of 1 kg by 1 degree Celsius.	P2.4 Specific heat capacity
$\Delta E = m c \Delta \theta$ E= _____ M=_____ c= _____ $\Delta \theta$= _____	E,= Energy (J) m= mass (kg) c= specific heat capacity (J/kg °C) $\Delta\theta$ = change in temperature	P2.4 Specific heat capacity
As mass of an object increases the time taken to heat an object Decreases/increases?	Increase	P2.4 Specific heat capacity
How does loft insulation reduce heat loss?	Made from fiberglass which has a low thermal conductivity. The material is mainly air, which stops conduction. The glass fibres stop convection.	P2.5 Heating and insulating buildings
How does cavity wall insulation reduce heat loss?	Made from insulating foam. Contains air pockets to stop conduction.	P2.5 Heating and insulating buildings
How does double glazing reduce heat loss?	Vacuum between two panes of glass. Reduces conduction and convection	P2.5 Heating and insulating buildings
How does aluminium foil behind a radiator reduce heat loss?	Shiny surface reflects heat back into the room.	P2.5 Heating and insulating buildings
What factors affect how quickly a substance heats up?	Mass, thermal energy applied, specific heat capacity.	P2.5 Heating and insulating buildings
What is a fuel?	Substances that release energy when burned.	P3.1 Energy demands

What is a fossil fuel?	Fuels made from dead animals and plants. Non-renewable.	P3.1 Energy demands
What does renewable mean?	It is replaced at the rate it is being used.	P3.1 Energy demands
Name the 3 fossil fuels	Coal, oil and gas.	P3.1 Energy demands
What is a non-renewable energy source?	One that once used cannot be replenished.	P3.1 Energy demands
What is a biofuel?	biofuels are any fuel taken from a living or recently living organism	P3.1 Energy demands
what are the advantages of biofuels?	They are carbon neutral and renewable	P3.1 Energy demands
what does carbon neutral mean?	They give out carbon dioxide when they burn but have taken in that carbon dioxide when growing through photosynthesis	P3.1 Energy demands
Why are fossil fuels more reliable than wind energy?	It is not windy all the time and currently there is a constant supply of fossil fuels.	P3.2 Energy from wind and water
How do wind turbines work?	Wind turns the turbine; Turbines turns the generator. Generator makes electricity.	P3.2 Energy from wind and water
what are the energy transfers in a hydroelectric power plant?	Gravitational potential energy --> kinetic energy --> electrical energy	P3.2 Energy from wind and water
What are the disadvantages of wind turbines?	An eyesore, intermittent - only work when windy,	P3.2 Energy from wind and water
what are the advantages of tidal power?	Renewable	P3.2 Energy from wind and water
What are the disadvantages of tidal power?	construction of barrage very costly and can impact on wildlife. Only a few locations are suitable	P3.2 Energy from wind and water
What are the advantages of hydroelectric power?	No waste, water can be stored and used to generate power.	P3.2 Energy from wind and water
What are the disadvantages of hydroelectric power?	Dams destroy habitat, affects water quality.	P3.2 Energy from wind and water
What are the advantages of wind power?	No fuel needed; area underneath can be used for farming.	P3.2 Energy from wind and water
What are the disadvantages of wind power?	Noisy, unsightly.	P3.2 Energy from wind and water
What are the disadvantages of solar power?	Only work in sunlight, manufacturing costs can be expensive	P3.3 Power from the Sun and the Earth
what is the main disadvantage of geothermal energy?	Only works in volcanic regions	P3.3 Power from the Sun and the Earth
how do geothermal power stations work?	In volcanic regions cold water can be pumped into the earth and is then heated by hot rocks. Water becomes steam and turns a turbine which turns a generator to make electricity?	P3.3 Power from the Sun and the Earth
What are the advantages of geothermal power?	Power stations are small, no pollution.	P3.3 Power from the Sun and the Earth
What are the disadvantages of geothermal power?	Can only be built in specific locations, can cause production of hazardous gases from underground.	P3.3 Power from the Sun and the Earth
What are the advantages of solar power?	renewable no pollution.	P3.3 Power from the Sun and the Earth
What are different examples of fossil fuels?	Crude oil, natural gas, coal	P3.4 Energy and the environment

what are the disadvantages of fossil fuels?	Produces carbon dioxide (global warming), sulfur dioxide (acid rain) and non-renewable	P3.4 Energy and the environment
what is the effect of acid rain?	Poison lakes and rivers, killing fish and birds. Kills trees. Damages building and statues.	P3.4 Energy and the environment
What are the advantages of nuclear power?	High energy output, power station has high lifespan.	P3.4 Energy and the environment
What are the disadvantages of nuclear power?	Radioactive waste, high building costs.	P3.4 Energy and the environment
What are the advantages of using energy from renewable sources?	No greenhouse gasses. They won't run out. Less maintenance.	P3.4 Energy and the environment
What are the disadvantages of using energy from renewable sources?	Expensive, unreliable, generates less energy than fossil fuels.	P3.4 Energy and the environment
what is the important of a power station having a short start up time?	Can meet surges in demand for electricity	P3.5 Big energy issues
how do we ensure we have enough electricity in times of high demand?	switch on natural gas power stations, use renewable energy sources if conditions appropriate, use pumped energy stores.	P3.5 Big energy issues
What is the problem with the supply of electricity?	electricity power stations have a start-up time making it difficult to match the supply of energy with the demand	P3.5 Big energy issues
What is current?	The flow of electrical charge	P4.2 Current and charge
What piece of equipment measures current?	An ammeter	P4.2 Current and charge
What is the unit of current?	Amps or Amperes	P4.2 Current and charge
What is the equation that links Charge, Current and Time?	Charge = Current x Time	P4.2 Current and charge
What is the symbol for charge	Q	P4.2 Current and charge
What is the unit of charge	Coulombs	P4.2 Current and charge
What is a series circuit?	A circuit where the components are in one loop.	P4.3 Potential difference and resistance
What is a parallel circuit?	A circuit where the components are in two or more loops	P4.3 Potential difference and resistance
If a circuit is complete, what is needed for current to flow?	A potential difference.	P4.3 Potential difference and resistance
How do you calculate resistance?	Voltage / current	P4.3 Potential difference and resistance
What are the units of resistance?	Ohms or Ω	P4.3 Potential difference and resistance
What is potential difference?	The difference in energy between two parts of a circuit.	P4.3 Potential difference and resistance
What are the units of potential difference?	Volts (V)	P4.3 Potential difference and resistance
Describe the relationship between current and potential difference for an ohmic conductor.	It is directly proportional. Directly= it passes through 0,0 on a graph. Proportional = as one increases the other increases the same amount.	P4.3 Potential difference and resistance

What factors affect resistance?	Length and thickness of wires. Number of components. Temperature and type (series/parallel) of circuit. Materials.	P4.3 Potential difference and resistance
What happens to the resistance as a wire gets longer?	Resistance increases.	P4.3 Potential difference and resistance
Describe the relationship between current and potential difference for a filament lamp.	S shaped- current increases less at higher potential differences because the particles are hotter	P4.4 Component characteristics
Describe the relationship between resistance and temperature for a thermistor.	As the resistance decreases, the temperature increases.	P4.4 Component characteristics
Describe the relationship between resistance and light intensity for an LDR.	As the resistance decrease the light intensity increases.	P4.4 Component characteristics
When are LDRs useful?	LDRs all lights to switch on automatically when the light intensity is low.	P4.4 Component characteristics
Draw a circuit to show how you would measure the resistance of a diode?	Voltmeter in parallel around component and ammeter in series.	P4.5 Series circuits
Draw a circuit to show how you would measure the resistance of a resistor?	Voltmeter in parallel around component and ammeter in series.	P4.5 Series circuits
Draw a circuit to show how you would measure the resistance of a lamp?	Voltmeter in parallel around component and ammeter in series.	P4.5 Series circuits
How is the total resistance of two components in series calculated?	It is the sum of the resistance of each component.	P4.5 Series circuits
A 7Ω lamp and a 5Ω diode are in series- what is the total resistance of the circuit?	7Ω + 5Ω = 12Ω	P4.5 Series circuits
Why is resistance of components in series the sum of each component's resistance?	Because current is the same everywhere, but the potential difference is shared between the resistors.	P4.5 Series circuits
How is the total resistance of two components in parallel calculated?	The total resistance is lower than the component with the lowest resistance.	P4.5 Series circuits
A 7Ω lamp and a 5Ω dioxide are in parallel- what is the approximate total resistance of the circuit?	Below 5Ω as this is the lowest resistance of the components.	P4.5 Series circuits

Why is the total resistance of a parallel circuit lower than the resistance of the components?	Because current is shared between the two loops and potential difference is the same.	P4.5 Series circuits
What is the pattern for potential difference in a series circuit?	It is split between the components.	P4.6 Parallel circuits
What is the pattern for potential difference in a parallel circuit?	It is the same throughout the whole circuit.	P4.6 Parallel circuits
What is the pattern for current in a parallel circuit?	It is split between the components.	P4.6 Parallel circuits
What is the national grid?	A system of cables and transformers linking power stations to consumers	P5.1 Alternating current
What is the frequency of mains electricity in the uk?	50Hz	P5.1 Alternating current
What is the potential difference of Uk mains in the home?	230 V	P5.1 Alternating current
What current is used in a battery or cell?	Direct current	P5.1 Alternating current
What direction does the current flow in direct current?	A single direction	P5.1 Alternating current
What do step up transformers do to electricity?	Increase the potential difference and decrease the current.	P5.1 Alternating current
Why do step up transformers increase potential difference?	To reduce the energy lost through resistance heating	P5.1 Alternating current
What do step down transformers do to electricity?	Decrease the potential difference and increase the current.	P5.1 Alternating current
What is alternating current?	Electric currents that repeatedly change direction.	P5.1 Alternating current
What is direct current?	Electric currents that flow in one direction.	P5.1 Alternating current
What are the different types of wire found in a plug and their colour?	Live wire - brown, Neutral wire - blue, Earth wire - green and yellow	P5.2 Cables and plugs
What are the pins of a plug made of and why?	Brass - it's a good conductor and doesn't rust	P5.2 Cables and plugs
Most electrical appliances are connected to the mains using threecore cable _____	threecore cable	P5.2 Cables and plugs
What is the role of a fuse?	To break if current gets too high	P5.2 Cables and plugs
What are the colours of live wire, neutral wire & earth wire	Brown, Blue and green/yellow stripes	P5.2 Cables and plugs
What is the potential difference of the live wire, neutral wire & earth wire	live =230 V neutral= 0V Earth =0V	P5.2 Cables and plugs
What does the blue wire in a plug do?	Neutral wire. Carries a zero voltage. Completes the circuit.	P5.2 Cables and plugs
What does the brown wire in a plug do?	Live wire. Carries the electrical current.	P5.2 Cables and plugs
What does the green/yellow wire in a plug do?	Earth wire. Safety feature that prevents electric shocks.	P5.2 Cables and plugs

What is the equation that links Energy transferred (E), Power (P) and Time (t)	Energy transferred = power x time	P5.3 Electrical power and potential difference
What is power?	The rate at which something transfers one type of energy into another type of energy	P5.3 Electrical power and potential difference
What is the equation that links current (I), Power supplied (P) and Potential difference (V)	Power supplied = Current x Potential difference	P5.3 Electrical power and potential difference
If the current is doubled how many times greater is the power supplied to the resistor?	Four times greater	P5.3 Electrical power and potential difference
What is the equation that links Current (I), Charge flow (Q) and time. (t)	Charge flow = current x time	P5.4 Electrical currents and energy transfer
When charge flows through a resistor, energy is transferred where?	Energy is transferred to the resistor making it hotter	P5.4 Electrical currents and energy transfer
What does a domestic electricity meter measure?	How much energy is supplied to the home	P5.5 Appliances and efficiency
How can efficiency be calculated? Equation 1	(Useful energy output/total energy output) x 100	P5.5 Appliances and efficiency
How can efficiency be calculated? Equation 2	(Useful power output/total power output) x 100	P5.5 Appliances and efficiency
Define density.	The number of particles in 1cm3.	P6.1 Density
How do you determine the density of a regular solid?	Measure dimensions and get mass using scales.	P6.1 Density
How do you determine the density of a liquid?	Measure volume using measuring cylinder and mass using scales.	P6.1 Density
How is density calculated?	density (kg/m3 = mass (kg)/ volume (m3)	P6.1 Density
How can you calculate the volume of an irregular shape?	Put the shape in water and the volume of the shape is equal to the amount of water displaced	P6.1 Density
why do some objects float on water?	They float because their density is less than the density of the water	P6.1 Density
Draw a diagram of a solid?	Particles touching, arranged in rows.	P6.2 States of matter
Draw a diagram of a liquid?	Particles touching but not arranged in rows.	P6.2 States of matter
Draw a diagram of a gas?	No particles touching and arranged randomly.	P6.2 States of matter
How do solids move?	Vibrate.	P6.2 States of matter
How do liquids move?	Moving over each other.	P6.2 States of matter
How do gases move?	At random speeds and directions.	P6.2 States of matter
Describe solids	vibrate in a fixed position, little energy and strong forces of attraction between the particles	P6.2 States of matter
Describe liquids	Less forces of attraction and moderate energy. Particles can slide over one another.	P6.2 States of matter
describe gases	No forces of attraction, move freely and lots of energy.	P6.2 States of matter

Explain the difference in density between the states.	Decrease in density from solids to gases.	P6.2 States of matter
Explain the difference in energy between the states.	Increase in energy from solids to gases.	P6.2 States of matter
Name the changes in state between solids and liquids.	Melting and freezing.	P6.3 Changes of state
Name the changes in state between liquids and gases.	Evaporation and condensation.	P6.3 Changes of state
Name the changes in state between solids and gases.	Sublimation.	P6.3 Changes of state
What type of reaction is a change of state? Why?	Physical as it can be reversed.	P6.3 Changes of state
Why does a heating or cooling curve plateau?	Change of state. Particles are rearranging	P6.3 Changes of state
What is conservation of mass?	the idea that when substance changes state the number of particles does not change therefore mass remains the same	P6.3 Changes of state
what is sublimation	when an object change state directly from a solid to a gas	P6.3 Changes of state
what is evaporation?	when a liquid becomes a gas below its boiling point	P6.3 Changes of state
what is the difference between a physical and chemical change?	A physical change is reversible, typically just a change in state	P6.3 Changes of state
What is internal energy?	Energy stored by the particles (atoms and molecules)	P6.4 Internal energy
What contributes to internal energy?	Total kinetic energy and potential energy of all the particles (atoms and molecules)	P6.4 Internal energy
What is the effect of increasing temperature on internal energy?	Internal energy increases as kinetic energy of particles increases.	P6.4 Internal energy
What are the units of specific latent heat?	joules per kilogram, J/kg	P6.5 Specific latent heat
What is specific latent heat of fusion?	Energy needed to convert 1kg of a solid to a liquid or vice versa.	P6.5 Specific latent heat
What is specific latent heat of vaporisation?	Energy needed to convert 1kg of a gas to a liquid or vice versa.	P6.5 Specific latent heat
What is the relationship between temperature and pressure of a gas and the motion of the particles?	As the particles have more motion, the temperature increases and so pressure increases.	P6.6 Gas pressure and temperature
What is the relationship between temperature and pressure of a gas?	Directly proportional	P6.6 Gas pressure and temperature
what is Brownian motion?	the random movement of particles	P6.6 Gas pressure and temperature
What causes pressure?	particles colliding with the side of a container and exerting a force on it	P6.6 Gas pressure and temperature
why does increasing temperature affect gas pressure?	the particles have more kinetic energy and so there are more collisions with the side of the container.	P6.6 Gas pressure and temperature

how is pressure calculated?	pressure (N/m2) = Force (N) / area (m2)	P6.6 Gas pressure and temperature
What are the two units for pressure?	N/m2 or pascals (Pa)	P6.6 Gas pressure and temperature
What causes the pressure of a gas on a surface?	Particles of the gas repeatedly hitting the surface	P6.6 Gas pressure and temperature
What is a radioactive substance?	A substance contains unstable nuclei that becomes stable by emitting radiation	P7.1 Atoms and radiation
Radioactive sources emit what type of radiation?	Alpha, beta and gamma	P7.1 Atoms and radiation
What is the symbol for alpha radiation?	α	P7.1 Atoms and radiation
What is the symbol for beta radiation?	β	P7.1 Atoms and radiation
What is the symbol for gamma radiation?	γ	P7.1 Atoms and radiation
Radioactive decay is a _____ event	Random	P7.1 Atoms and radiation
what equipment can we use to measure radioactivity?	using a Geiger counter	P7.1 Atoms and radiation
What is the plum pudding model?	JJ Thompson suggested Atoms were spheres of positive charge with negative electrons embedded within.	P7.2 The discovery of the nucleus
What experiment was used to disprove the plum pudding model?	Gold foil experiment/Alpha scattering	P7.2 The discovery of the nucleus
What was the result of the alpha scattering/gold foil experiment?	Most of the alpha particles passed straight through the foil some were deflected backwards	P7.2 The discovery of the nucleus
How did Bohr change Rutherford's model of the atom?	electrons orbit the nucleus at specific distances and energy levels	P7.2 The discovery of the nucleus
What results from the gold foil experiment proved that atoms have a positively charged centre	Some alpha particles were deflected backwards	P7.2 The discovery of the nucleus
What is the radius of an atom	1 × 10-10 metres	P7.2 The discovery of the nucleus
The radius of a nucleus is less than _____of the radius of an atom.	1/10 000	P7.2 The discovery of the nucleus
What did James Chadwick discover?	existence of neutrons within the nucleus (Isotopes)	P7.2 The discovery of the nucleus
Describe the structure of an atom?	A positively charged nucleus containing protons and neutrons, surrounded by electrons on shells.	P7.1 Atoms and radiation
What are the properties of protons?	Positively charged with a relative mass of 1- found in the nucleus.	P7.2 The discovery of the nucleus
What are the properties of neutrons?	Neutrally charged with a mass of 1- found in the nucleus.	P7.3 Changes in the nucleus
What are the properties of electrons?	Negatively charged with a mas much smaller than 1, sit on shells surrounding the nucleus in the formation of 2, 8 and 8.	P7.3 Changes in the nucleus
Why do atoms have no overall charge?	Equal number of protons and electrons and neutrons have no charge.	P7.3 Changes in the nucleus
What is the atomic number of an element?	The number of protons (small number)	P7.3 Changes in the nucleus

What is the mass number of an element?	The number of protons and neutrons (big number)	P7.3 Changes in the nucleus
What is an isotope?	Atom of the same element with a different number of neutrons.	P7.3 Changes in the nucleus
What is alpha radiation?	2 protons and 2 neutrons emitted from the nucleus (the same as a helium nucleus).	P7.3 Changes in the nucleus
Name the 4 types of radiation that a nucleus can emit?	Alpha, beta, gamma and neutron.	P7.3 Changes in the nucleus
What is beta radiation?	An electron	P7.3 Changes in the nucleus
Write the nuclear equation for: Bismuth–211 decays by alpha emission	Bismuth 21183 --> Thallium20781 + He42	P7.3 Changes in the nucleus
Write the nuclear equation for: Uranium–235 decays by alpha emission	Uranium 23592 --> Thorium23190 + He42	P7.3 Changes in the nucleus
Write the nuclear equation for: Phosphorus–32 decays by beta emission	Phosphorus 3215 --> Sulfur3216 + e0-1	P7.3 Changes in the nucleus
Write the nuclear equation for: Hydrogen–3 decays by beta emission	Hydrogen 31 --> Helium32 + e0-1	P7.3 Changes in the nucleus
What happens in the nucleus due to beta radiation?	A neutron becomes a proton.	P7.3 Changes in the nucleus
What happens to the mass number when beta decay occurs?	Nothing as a neutron becomes a proton so there is no change in mass.	P7.3 Changes in the nucleus
What happens to the atomic number when beta decay occurs?	It increases by 1 as there is one more proton than before.	P7.3 Changes in the nucleus
What is the symbol for alpha radiation?	α	P7.3 Changes in the nucleus
What is the symbol for beta radiation?	β	P7.3 Changes in the nucleus
What is the symbol for gamma radiation?	γ	P7.3 Changes in the nucleus
What is alpha radiation blocked by?	Paper as it is the least penetrating.	P7.4 More about alpha, beta, and gamma radiation
What are potential uses of radiation?	Killing cancerous cells, measuring paper thickness, in smoke alarms	P7.4 More about alpha, beta, and gamma radiation
What does irradiated mean?	An object that has been exposed to ionising radiation but is not itself radioactive	P7.4 More about alpha, beta, and gamma radiation
What can the effects of ionising radiation be?	damage human cells, If DNA is damaged (mutated) cancer could develop and tumours could form.	P7.4 More about alpha, beta, and gamma radiation
What is alpha radiation?	this consists of two neutrons and two protons; it is the same as a helium nucleus	P7.4 More about alpha, beta, and gamma radiation
what is beta radiation?	a high-speed electron ejected from the nucleus as a neutron turns into a proton	P7.4 More about alpha, beta, and gamma radiation

What is gamma radiation?	electromagnetic radiation from the nucleus	P7.4 More about alpha, beta, and gamma radiation
What causes radioactive decay?	nuclei unstable and release radiation in order to become stable.	P7.4 More about alpha, beta, and gamma radiation
What is radioactive contamination?	The unwanted presence of radioactive atoms on other materials.	P7.4 More about alpha, beta, and gamma radiation
Why is radioactive contamination a hazard?	The radioactive nuclei decaying and emitting radiation.	P7.4 More about alpha, beta, and gamma radiation
What is radioactive irradiation?	exposing an object to nuclear radiation so it does not become radioactive.	P7.4 More about alpha, beta, and gamma radiation
What is beta radiation blocked by?	Thin aluminium as it is moderately penetrating.	P7.4 More about alpha, beta, and gamma radiation
What is gamma radiation?	An electromagnetic wave emitted by the nucleus.	P7.4 More about alpha, beta, and gamma radiation
What is gamma radiation blocked by?	Thick lead or thick concrete as it is the most penetrating.	P7.4 More about alpha, beta, and gamma radiation
Rank alpha, beta and gamma from highest ionising ability to least.	Alpha, beta and gamma.	P7.4 More about alpha, beta, and gamma radiation
What is count rate?	Number of decays recorded per second by a detector.	P7.5 Activity and half-life
What is half-life?	Average time taken for number of radioactive nuclei in a sample to halve	P7.5 Activity and half-life
What is radioactivity measured in?	Becquerels (Bq) 1 becquerel is equal to 1 nucleus decaying every second	P7.5 Activity and half-life
Define the half-life of a radioactive isotope?	The time taken for the number of nuclei of a radioactive sample to halve.	P7.5 Activity and half-life
Hydrogen has two radioactive isotopes H2 and H3- will they have the same half-life?	No as each isotope has its own half-life value.	P7.5 Activity and half-life
Strontium has a half-life of one day. A sample contains 2400 strontium nuclei. How many will be left after 4 days?	150 radioactive nuclei. The remaining 2250 are still there but are now stable.	P7.5 Activity and half-life
Define the half-life of a radioactive isotope?	The time taken for the number of nuclei of a radioactive sample to halve.	P7.5 Activity and half-life