



KS3 ASSESSMENT

[PHYSICS]

BRAMHALL HIGH SCHOOL

YEAR 7	Acquiring	Developing	Secure	Mastered
	Is beginning to acquire the necessary knowledge for the topic(s)	Is developing the knowledge necessary to understand the topic	Understands the topic and is able to make links using the knowledge	Fully understands the topic and is able to confidently link knowledge.
Term 1a 7I Energy	Recall the factors that affect the amount of energy needed in a person's diet. Name several fuels State the meaning of: renewable, non-renewable and identify a range of non-renewables State that CO₂ is produced in electricity production Recall the different ways in which energy can be stored.	Explain the differing energy needs of people of different ages and activity levels Can list factors which make a good fuel Suggest ways in which our use of fossil fuels/non-renewable fuels can be reduced and how renewable make electricity List some effects of CO₂ Identify situations in which energy is stored.	Calculate the energy requirements for a particular person or activity. Can practically compare energy in fuels Explain how renewables produce electricity and defend or oppose a decision in favour of using an energy resource in a certain area. Explain how to reduce CO₂ emission Describe energy transfer chains for given situations.	Examine rates of obesity in an area and suggest reasons for any trends. Can evaluate data on a range of fuels to find which is best Decide and explain the best energy resources to use in an area. Use data to evaluate the impact of CO₂ emissions Describe energy transfer chains for given situations and explain where wasted energy ends up

Term 1b 7I Energy	Recall that food contains energy and name some energy rich foods	State why the body needs energy and can use data to workout which foods are more energy rich	Can investigate which food contains the most energy and can state problems of not getting enough energy from our food	Can investigate the energy per gram of food. Can compare the energy requirements of people doing different jobs and living in different locations.
7J Electricity	Recall materials that are conductors, insulators.	State the meaning of: conductor, insulator	Understand that conductors allow charges to move	Can explain the role of charge in circuits
	Identify common circuit Components	Can relate symbols to components in circuits		
	With support can construct a basic circuit from a circuit diagram so it is a complete circuit	Can construct basic series and parallel circuits	Can build complex series and parallel circuits	Can build complex series and parallel circuits and diagnoses faults if they do not work
	Can explain a circuit using a simple model	Can use models to explain series and parallel circuits	Can develop and evaluate models to explain series and parallel circuits	Can evaluate and improve models to represent complex circuits
	Can control a basic circuit with a switch	Can control basic series and parallel circuits with more than one switch	Can control complex parallel circuits with more than one switch and	Can design complex parallel circuits and predict which component will be on and off when controlled by multiple switches

Term 2a 7J Electricity	Can classify circuits as series or parallel	Describe how the current in a parallel circuit divide.	Can recall and use the rules for current and p.d in series and parallel circuits	Can confidently apply the rules for current, PD and resistance to explain series and parallel circuits
	Can measure the current in a circuit using an ammeter	Can measure the current and pd in a series circuit using the correct meter	Can measure the current and pd in a range of circuits	Can explain the slight variations observed practically when measuring pd and current in parallel circuits.
	Can predict how adding bulbs affects a series circuit	Understand that adding bulbs effects the resistance of a series circuit	Can workout the resistance and know its effect on pd and current in a series circuit	Can measure the current and pd in circuits to derive the formulae for working out the total resistance in series circuits and in parallel circuits
	Can identify hazards when using electricity at home	Can explain hazards when using electricity in the home	Can explain hazards when using electricity in the home and when it is being transferred	Can explain how we minimise risks when using electricity in the home an transmit it around the country
7K Forces	Describe how to use a [force meter, newton meter].	Represent [sizes, directions] of forces using arrows.	Compare the size of different forces.	Evaluate the usefulness of different ways of representing the size and direction of forces

7K Forces	Recall the names of simple forces. Recall solids and liquids have a high density	Identify [situations, places] where different forces are likely to be found. Use particle model to explain density	Describe the effects of different forces on objects. Calculate the density of regular solids using $D = M/V$	Identify different types of forces acting on objects. Predict how temperature effects density
Term 2b 7K Forces	State what is meant by [elastic, plastic] Recall the different types of friction forces. State what is meant by: friction, air resistance, water resistance, drag. State what is meant by: pressure.	Describe how the extension of a spring depends on the force applied. Describe how friction forces affect movement. Describe how the pressure depends on force and area.	Use the formula relating force and extension for a spring (Hooke's law). Describe the ways drag forces can be increased, reduced]. Use the formula relating force, pressure and area.	Explain what is meant by elastic limit, limit of proportionality. Interpret force diagrams and predict the impact of the forces on moving objects Explain applications of pressure in different situations and be able to refer to pressures in different units

Term 3a 7K Forces	State what will happen to vehicles when forces are balanced or unbalanced	Can draw diagrams to show the forces on a vehicles when it is accelerating	Can explain why every vehicles has a maximum speed	Can explain balanced and unbalanced for situations for moving objects in different media and stationary objects
7L Sound	Recall what sounds can travel through. Recall the parts of a sound wave. Recall the speed of sound.	Use a simple model to explain how sounds travel. Explain how varying the amplitude and wavelength effects the sound. Describe an experiment to workout the speed of sound.	Use a model incorporating the idea of vibrations to explain how sound travels through different materials. Explain the relationship between frequency and pitch. Use the speed of sound and light to explain thunder and lightning.	Compare how sounds travel through different materials and why they can't travel through a vacuum. Interpret complex sound wave patterns. Explain why the speed of sound differs in different materials, using ideas about mass and stiffness.

Term 3b 7L Sound	Recall that human hearing can be damaged by loud sounds.	Can label and explain how the ear works in basic terms.	Can explain the function of the ossicles, cochlea and nerves in hearing.	Can explain the differences in hearing range of animals.
	Recall the human hearing range.	Explain the differences between infra and ultrasound.	Explain how [sonar, echolocation] works.	Relate uses of [ultrasound, infrasound] to their characteristics.
7L Sound	Recall the units for loudness.	Describe the connections between [amplitude and loudness, frequency and pitch].	Explain how human hearing can be damaged by sound.	Explain how human hearing can be protected from sound.
	State the meaning of: transverse wave, longitudinal wave, frequency, amplitude	Model [transverse, longitudinal] waves.	Identify the parts of a [transverse, longitudinal] wave on a model.	Justify the representation of a longitudinal wave as a transverse wave.

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Term 1a 8I Fluids	State the meaning of: [kinetic theory, particle model] of matter. Describe the energy change in a substance during [melting, freezing] Calculate the density of a regular shape given the equation Recall that ice is less dense than water Recall that pressure in a fluid changes with depth and acts in all directions. Identify the forces acting on a moving object and the directions in which they act.	Describe how particles move in a [solid, liquid, gas] and how this changes with temperature. Describe what happens to particles during changes of state, in terms of energy and [bonds, forces]. Calculate the density of a regular shape Describe how the [volumes, densities] of substances change at different temperatures. Describe how pressure in a fluid increases with depth. Describe how action and reaction forces are caused	Compare [melting points, boiling points] of materials and link them to the strength of the [bonds, attractions between particles] Explain what happens to particles and temperature during changes of state, in terms of energy and forces. Calculate the density of a regular and irregular shapes to appropriate accuracy Use the [kinetic theory, particle model] to explain density changes at different temperatures Use the equation relating pressure to the depth and density of a liquid.	Evaluate how well [kinetic theory, particle model] matches evidence. Use the data about latent heats to explain phenomena related to changes of state. Calculate the density of a regular, irregular shapes and liquids to appropriate accuracy Compare densities of materials and link them to the mass of the particles and how closely they pack together Find out about the effects of pressure in fluids on organisms. Use ideas about density changes to explain how [a hot air balloon flies, how the

			Calculate a resultant force using a range of forces	depth of a submarine is controlled].
Term 1b 8J Light	Recall light travels in a straight line State the meaning of: reflect, scatter, transmit, absorb. Recall the law of reflection.	Describe how you can demonstrate that light travels in straight lines. Explain the difference between reflection and scattering. Use the law of reflection to make predictions.	Classify materials as opaque, translucent or transparent. Use the ray model of light to explain how we see things that are not sources of light. Use a ray diagram to describe the differences in light reflected from smooth and from rough surfaces	Use a model to explain the effect of various factors on shadow size Use the ray model of light to explain how a periscope works. Use ray diagrams to explain some of the features of images formed by mirrors.
Term 2a 8J Light	Recall that [light, sound] travels at different speeds in different materials State the meaning of: convex lens, concave lens, converging lens, diverging lens. Identify the parts (lens, sensor, film) of a camera	Explain why refraction occurs. Describe the effects of convex and concave lenses on parallel beams of light. State the functions of parts of the camera.	Explain refraction in terms of Wavefronts Describe the nature of images formed by [convex, concave] lenses for objects at different distances from the lens. Describe similarities and differences between cameras and eyes, include	Explain refraction in terms of wavefronts and refractive index Explain how convex lenses are used in refracting telescopes. Evaluate different ways of correcting defective vision (spectacles, contact lenses, laser treatment)

	Recall white light is a mixture of 7 colours Recall the primary colours for light. Recall that the appearance of an object depends on the colour of light shining on it. Recall that filters can be used to make coloured light.	Recall the 7 colours of the spectrum and explain how to separate them Explain that some of the colours we perceive are a mixture of different wavelengths, frequencies] of light Explain why coloured objects appear coloured. Explain how filters can be used to make coloured light.	how each can focus an image. Explain how white light can be split into a spectrum of colours and link to refraction Describe how [secondary colours of, white] light can be made from primary colours of light. Explain why objects look different in light of different colours. Explain how secondary filters work	Explain the dispersion of white light in terms of the refraction of different wavelengths of light. Explain how colour is detected by the eyes, why this is an issue in low light and how our eyes work in low light Explain how paints of different colours can be made by colour subtraction. Workout the colour after light passes through 2 filters
Term 2b 8K Energy	Can read temperatures using a thermometer Recall temperature of room, mp and bp of water	Reliably use a thermometer Can match a range of common temperatures to items Describe how energy is transferred in conduction,	Uses a thermometer with precision Can link particle vibrations to temperature Use the particle model of matter to explain energy	Can use a range of thermometers with precision Can explain the difference between temperature and heat using the particle model Compare conduction, convection, radiation and evaporation in [metals,

	State the meaning of: conduction, convection, radiation and evaporation State how conduction, convection, radiation and evaporation can be reduced Define pay back time	convection, radiation and evaporation Describe how conduction, convection, radiation and evaporation can be reduced Can select the best insulation using payback time	transfer by conduction, convection, radiation and evaporation Use the particle model to explain how conduction, convection, radiation and evaporation can be reduced Can calculate the payback time from information provides	thermal conductors, thermal insulators] Evaluate qualitative and quantitative ways of decreasing energy transfer by evaporation, including lids, pressure effects, and motion of air Can calculate and compare payback times and take into consideration other factors when buying insulations
Term 3a 8K Energy	State the meaning of: efficiency. Name types of household insulation Find the power rating of appliances	Identify useful and wasted energies for appliances and on Sankey diagrams Suggest places where houses lose energy Put appliances in the order of energy use	Calculate energy efficiencies for appliances and from Sankey diagrams Calculate the payback time of insulation Use the formula relating power, energy and time (in kW, kWh and hours).	Explain why the efficiency can never be greater than 1 and use Sankey diagrams Explain how types of insulation prevent heat transfers Carryout energy cost calculations with conversions Evaluate different ways of

Term 3b 8L Earth in Space	Recall which bodies in the Solar System	Recall one example of an early model of the Solar System.	Explain how technological developments have increased our knowledge of the Solar System	Consider how technological advances have improved our capability of exploring the Solar System, including human exploration.
8L Earth in Space	Describe the shapes of the [Sun, Earth, Moon] and how we see them Recall length of a day and year on Earth	Describe the positions of the Earth and planets in the Solar system and explain with diagrams how we see them Explain an Earth Day and year using a model	Compare the relative sizes and distances between the Earth, the Moon, the planets, the Sun, galaxies and the Universe	Use secondary sources to find out how the number of known planets has changed over time. Explain the phases of the moon Explain why some planets do not fit the expected patterns
	Recall that we get different seasons as the Earth moves around the Sun.	Explain the changes in day length and height of the Sun in terms of the tilt of the Earth's axis.	Explain factors which affecting day length and year length of planets in the Solar system	Obtain information from secondary sources to investigate the relationships in astronomical data
	Recall that we get different seasons as the Earth moves around the Sun.	Explain the changes in day length and height of the Sun in terms of the tilt of the Earth's axis.	Use a model to explain the changes in the seasons.	Explain in detail why we get seasons and why it is warmer at the equator
	Recall the meaning of mass and weight	Explain why the weight of an object changes if taken to the Moon but not its mass	Use the formula relating gravity, masses and weight	Explain why the value of g can represent both acceleration and gravitational field strength

YEAR 9	Acquiring	Developing	Secure	Mastered
	Is beginning to acquire the necessary knowledge for the topic(s)	Is developing the knowledge necessary to understand the topic	Understands the topic and is able to make links using the knowledge	Fully understands the topic and is able to confidently link knowledge.
Term 1a 9I Force Fields and electromagnets	Recall that [iron, cobalt, nickel] are magnetic materials. Recall the shape and direction of a magnet's magnetic field. Recall that [iron, cobalt, nickel] are magnetic materials. Describe what magnets can do to magnetic materials and to other magnets.	Explain how to arrange two magnets so that they attract or repel each other. Explain how a plotting compass can be used to show the shape and direction of a magnetic field. Explain how to arrange two magnets so that they attract or repel each other. Explain how to arrange two magnets so that they attract or repel each other.	Use the formula relating gravity, masses and weight Describe the different shapes of galaxies in the Universe. Explain why the heliocentric model is our current model of the Solar System. Explain why repulsion of a magnet is the only way to demonstrate that an object is a magnet Describe the shape of the magnetic field between two bar magnets in different arrangements and compare to the field of the Earth	Compare method used to find the shape and strength of magnetic fields Explain how electromagnets are used in [circuit breakers, relays] Explain some of the differences between a simple motor and one used in domestic appliances. Use the idea of induced charges to explain unfamiliar electrostatic phenomena. Use ideas about attraction and repulsion to explain electrostatic phenomena involving repulsion between like charges.

Term 1b 9I Force Fields and electromagnets	Recall the shape and direction of a magnet's magnetic field. Describe the shape of the magnetic field around a coil of wire with a current flowing in it. Describe how a wire carrying a current must be oriented in a magnetic field to produce a force. State what is meant by: electric field. Recall how objects can be given a charge of static electricity.	Find the shape of a magnetic field using iron filings. Describe how the strength of an electromagnet can be changed. Describe how the force produced by a motor can be changed. Describe the effect of an electric field on electrically charged objects. Describe the kinds of materials that [can, cannot] be given a charge of static electricity.	Use plotting compasses to plot the shapes of various magnetic fields. Work out the direction of the magnetic field around a coil of wire using the right-hand grip rule. Describe how the motor effect is used in a simple electric motor Explain how a charge can be induced in an uncharged object. Describe an investigation to demonstrate the effect of like charges and unlike charges on one another.	Compare method used to find the shape and strength of magnetic fields Explain how electromagnets are used in [circuit breakers, relays] Explain some of the differences between a simple motor and one used in domestic appliances. Use the idea of induced charges to explain unfamiliar electrostatic phenomena. Use ideas about attraction and repulsion to explain electrostatic phenomena involving repulsion between like charges.
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Term 2a 9J Application of forces	State what is meant by: a moment of a force.	Describe the factors that affect the size of a moment.	Use the formula relating moment, force and perpendicular distance.	Determine the weight of a ruler using moments.
	State what is meant by: lever, load, effort, pivot, fulcrum	Describe how a simple lever can magnify [force, distance]	Explain how levers are used in common devices	Evaluate the use of levers in common devices.
	State what is meant by: pulley	Describe how a simple pulley system can magnify [force, distance].	Explain the effect of multiple pulleys on effort, distance and work done	Explain why pulleys conserve energy, i.e. in terms of the smaller force needed has to move through a greater distance.
	State what is meant by a gear	Describe how gears effect rotation	Explain how gears work using ideas about moments.	Explain why gears conserve energy, i.e. in terms of the smaller force needed has to move through a greater distance.
Term 2b CP1/SP1 Motion	Recall the measurements needed to calculate a speed.	Explain how the distance travelled and the time taken affects the speed.	Measure speed in various ways.	Evaluate the techniques used to measure speed to eliminate the impact of human reactions.
	Recall speed = d/t Define: scalar and vectors	Use $s = d/t$ for simple calculations Recall common scalars and vectors	Rearrange and solve problems using $s = d/t$ Construct vector diagrams	Complete complex $s = d/t$ calculations involving multiple conversions Compare speed and velocity in relation to circular motion

Term 3a 9K Forces and Motion & CP1 / SP 1 Motion CP2/SP2 Forces and motion	Define acceleration.	Understand -ve acceleration means slowing down and +ve is speeding up	Be able to rearrange and use the equation $a = \frac{v-u}{t}$	Use the equation $v^2 - u^2 = 2ax$ to calculate the acceleration
	To interpret d/t graphs	Can workout the distance travelled from distance/time graphs.	Can workout speeds from distance time graphs.	Can compare journeys shown on distance time graphs.
	To interpret s/t graphs	Can workout speeds from distance time graphs.	Can workout accelerations from distance time graphs	Can workout the distance travelled from distance/time graphs
	State what is meant by: friction, air resistance, water resistance, drag.	Describe how friction forces effect movement.	Compare the size of different forces.	Evaluate the usefulness of different ways of representing the size and direction of forces.
	State what is meant by: balanced forces, unbalanced forces.	Explain the effects of [balanced, unbalanced] forces in simple situations.	Explain why a vehicle needs a force from the engine to keep moving at a constant speed.	Work out the resultant of two forces that are not acting along the same line.
	State Newton's 1 st Law	Use Newton's 1 st Law on stationary and moving objects	Interpret force diagrams and predict what will happen to moving objects	Workout the size off resultant forces using vector diagrams

Term 3b CP2/SP2 Forces and motion	State Newton's 2 nd Law	Use $F=ma$ for given situations	Workout resultant forces and use $F=ma$	Link $F=ma$ to $W = mg$ and use to solve examples
	State what light gates can be used for	Use light gates to investigate acceleration when the force on a trolley is changed/	Use light gates to investigate how force and mass effect acceleration.	Evaluate methods used to investigate acceleration using a trolley, masses and a ramp.
	To understand how a parachute increases air resistance.	Explain how forces change acceleration when an object falls.	To explain terminal velocity and recognise this on graphs.	To use $F=ma$ and the ideas of resultant forces to explain terminal velocity and maximum speed
	Identify the forces acting on a [moving, stationary] object and the directions in which they act.	interpret and draw a free-body force diagram.	Calculate the resultant of forces acting in one dimension.	Use scale drawings to find the resultant of forces in two dimensions.
	State Newton's 3 rd Law	Can write action and reaction statement and label these on a diagram	Can compare action reaction diagrams with balanced force diagrams for equilibrium situations	Can use action reaction diagrams for falling objects
	List 2 factors increasing thinking distance	Suggest factors increasing braking and thinking distance	Link braking distance and thinking distance factors to reaction time, KE and friction	Explain how work done by brakes is related to the square of the velocity
		Understand a car will keep moving due to its momentum	Calculate momentum of objects and know it is conserved in a collision	Use conservation of momentum to be able to complete calculations in elastic and inelastic collisions