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 CO_2 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 CO_2 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 CO_2 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 CO_2 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 indifferent 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 basics 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.	Use a simple model to explain how sounds travel.	Use a model incorporating the idea of vibrations to explain how sound travels through different materials.	Compare how sounds travel through different materials and why they can't travel through a vacuum.
	Recall the parts of a sound wave.	Explain how varying the amplitude and wavelength effects the sound.	Explain the relationship between frequency and pitch.	Interpret complex sound wave patterns.
	Recall the speed of sound.	Describe an experiment to workout the speed of sound.	Use the speed of sound and light to explain thunder and lightning.	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.
	Recall the units for loudness.	Describe the connections between [amplitude and	Explain how human hearing can be damaged by sound.	Explain how human hearing can be protected from sound.

7L Sound	State the meaning of: transverse wave, longitudinal wave, frequency, amplitude	loudness, frequency and pitch]. 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 7L Sound	Recall what sounds can travel through.	Use a simple model to explain how sounds travel.	Use a model incorporating the idea of vibrations to explain how sound travels through different materials.	Compare how sounds travel through different materials and why they can't travel through a vacuum.
	Recall the parts of a sound wave.	Explain how varying the amplitude and wavelength effects the sound.	Explain the relationship between frequency and pitch.	Interpret complex sound wave patterns.
	Recall the speed of sound.	Describe an experiment to workout the speed of sound.	Use the speed of sound and light to explain thunder and lightning.	Explain why the speed of sound differs in different materials, using ideas about mass and stiffness.
	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.
	Recall the units for loudness.	Describe the connections between [amplitude and loudness, frequency & 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.
8I Fluids	State the meaning of: [kinetic theory, particle model] of matter.	Describe how particles move in a [solid, liquid, gas] and how this changes with temperature.	Compare [melting points, boiling points] of materials and link them to the strength of the [bonds, attractions between particles]	Evaluate how well [kinetic theory, particle model] matches evidence.
	Describe the energy change in a substance during [melting, freezing]	Describe what happens to particles during changes of state, in terms of energy and [bonds, forces].	Explain what happens to particles and temperature during changes of state, in terms of energy and forces.	Use the data about latent heats to explain phenomena related to changes of state.
	Calculate the density of a regular shape given the equation	Calculate the density of a regular shape	Calculate the density of a regular and irregular shapes to appropriate accuracy	Calculate the density of a regular, irregular shapes and liquids to appropriate accuracy
Term 1b 8I Fluids	Recall that ice is less dense than water	Describe how the [volumes, densities] of substances change at different temperatures.	Use the [kinetic theory, particle model] to explain density changes at different temperatures	Compare densities of materials and link them to the mass of the particles and how closely they pack together
	Recall that pressure in a fluid changes with depth and acts in all directions.	Describe how pressure in a fluid increases with depth.	Use the equation relating pressure to the depth and density of a liquid.	Find out about the effects of pressure in fluids on organisms.

8I Fluids	Identify the forces acting on a moving object and the directions in which they act.	Describe how action and reaction forces are caused	Calculate a resultant force using a range of forces	Use ideas about density changes to explain how [a hot air balloon flies, how the depth of a submarine is controlled].
8J Light	Recall light travels in a straight line	Describe how you can demonstrate that light travels in straight lines.	Classify materials as opaque, translucent or transparent.	Use a model to explain the effect of various factors on shadow size
	State the meaning of: reflect, scatter, transmit, absorb.	Explain the difference between reflection and scattering.	Use the ray model of light to explain how we see things that are not sources of light.	Use the ray model of light to explain how a periscope works.
	Recall the law of reflection.	Use the law of reflection to make predictions.	Use a ray diagram to describe the differences in light reflected from smooth and from rough surfaces	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	Explain why refraction occurs.	Explain refraction in terms of Wavefronts	Explain refraction in terms of wavefronts and refractive index
	State the meaning of: convex lens, concave lens, converging lens, diverging lens.	Describe the effects of convex and concave lenses on parallel beams of light.	Describe the nature of images formed by [convex, concave] lenses for objects at different distances from the lens.	Explain how convex lenses are used in refracting telescopes.

8J Light	Identify the parts (lens, sensor, film) of a camera	State the functions of parts of the camera.	Describe similarities and differences between cameras and eyes, include how each can focus an image.	Evaluate different ways of correcting defective vision (spectacles, contact lenses, laser treatment)
	Recall white light is a mixture of 7 colours	Recall the 7 colours of the spectrum and explain how to separate them	Explain how white light can be split into a spectrum of colours and link to refraction	Explain the dispersion of white light in terms of the refraction of different wavelengths of light.
	Recall the primary colours for light.	Explain that some of the colours we perceive are a mixture of different wavelengths, frequencies] of light	Describe how [secondary colours of, white] light can be made from primary colours 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
	Recall that the appearance of an object depends on the colour of light shining on it.	Explain why coloured objects appear coloured.	Explain why objects look different in light of different colours.	Explain how paints of different colours can be made by colour subtraction.
	Recall that filters can be used to make coloured light.	Explain how filters can be used to make coloured light.	Explain how secondary filters work	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 State the meaning of: conduction, convection, radiation and evaporation State how conduction, convection, radiation and evaporation can be reduced Define pay back time	Reliably use a thermometer Can match a range of common temperatures to items Describe how energy is transferred in conduction, convection, radiation and evaporation Describe how conduction, convection, radiation and evaporation can be reduced Can select the best insulation using payback time	Uses a thermometer with precision Can link particle vibrations to temperature Use the particle model of matter to explain energy 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	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, 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 Describe the shapes of the [Sun, Earth, Moon] and how we see them Recall length of a day and year on Earth Recall that we get different seasons as the Earth moves around the Sun.	Recall one example of an early model of the Solar System. 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 Explain the changes in day length and height of the Sun in terms of the tilt of	Explain how technological developments have increased our knowledge of the Solar System Compare the relative sizes and distances between the Earth, the Moon, the planets, the Sun, galaxies and the Universe Explain factors which affecting day length and	Consider how technological advances have improved our capability of exploring the Solar System, including human exploration. 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 Obtain information from secondary sources to

8L Earth in Space		the Earth's axis.	year length of planets in the Solar system	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

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Term 1a 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.
	Describe the shapes of the [Sun, Earth, Moon] and how we see them	Describe the positions of the Earth and planets in the Solar system and explain with diagrams how we see them	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
	Recall length of a day and year on Earth	Explain an Earth Day and year using a model	Explain factors which affecting day length and year length of planets in the Solar system	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.	Use a model to explain the changes in the seasons.	Obtain information from secondary sources to investigate the relationships in astronomical data
9I Force Fields and electromagnets	Recall the factors that affect the strength of gravity.	Explain why the weight of an object changes if taken to the Moon but not its mass	Explain why astronauts are apparently weightless in space.	Explain why the speed of a planet changes as it moves around its orbit

9I Force Fields and electromagnets	State the direction of weight	State what is meant by: mass, weight.	Use the formula relating gravity, masses and weight	Explain why the value of g can represent both acceleration and gravitational field strength.
	State the meaning of: Sun, star, galaxy, Universe, constellation, Solar System.	Describe the Milky Way.	Describe the different shapes of galaxies in the Universe.	Use secondary sources to identify constellations and carry out calculations using light years
	Recall one example of an early model of the Solar System.	Compare the geocentric and heliocentric models of the Solar System.	Explain why the heliocentric model is our current model of the Solar System.	Explain why astronomers can observe phases of Venus and Mercury, but not of the other planets.
	Recall that [iron, cobalt, nickel] are magnetic materials.	Explain how to arrange two magnets so that they attract or repel each other.	Explain why repulsion of a magnet is the only way to demonstrate that an object is a magnet	Plan a way of finding out what materials magnets work through.
	Recall the shape and direction of a magnet's magnetic field.	Explain how a plotting compass can be used to show the shape and direction of a magnetic field.	Describe the shape of the magnetic field between two bar magnets in different arrangements and compare to the field of the Earth	Evaluate different ways of navigation [stars, GPS, map and compass].
	Recall that [iron, cobalt, nickel] are magnetic materials.	Explain how to arrange two magnets so that they attract or repel each other.	Explain why repulsion of a magnet is the only way to demonstrate that an object is a magnet.	Use observations to develop criteria for deciding whether something is a [magnet, magnetic material]

	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.	Describe the shape of the magnetic field between two bar magnets in different arrangements.	Construct diagrams to show how the magnetic field strength varies with distance from the poles
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]	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	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

		be given a charge of static electricity.	of like charges and unlike charges on one another.	electrostatic phenomena involving repulsion between like charges.
Term 2a 9J Application of forces	State what is meant by: a moment of a force. State what is meant by: lever, load, effort, pivot, fulcrum	Describe the factors that affect the size of a moment. Describe how a simple lever can magnify [force, distance]	Use the formula relating moment, force and perpendicular distance. Explain how levers are used in common devices	Determine the weight of a ruler using moments. Evaluate the use of levers in common devices.
Term 2b 9J Application of forces CP1/SP1 Motion	State what is meant by: pulley State what is meant by a gear Recall the measurements needed to calculate a speed. Recall speed = d/t	Describe how a simple pulley system can magnify [force, distance]. Describe how gears effect rotation Explain how the distance travelled and the time taken affects the speed. Use s= d/t for simple calculations	Explain the effect of multiple pulleys on effort, distance and work done Explain how gears work using ideas about moments. Measure speed in various ways. Rearrange and solve problems using s=d/t	Explain why pulleys conserve energy, i.e. in terms of the smaller force needed has to move through a greater distance. Explain why gears conserve energy, i.e. in terms of the smaller force needed has to move through a greater distance. Evaluate the techniques used to measure speed to eliminate the impact of human reactions. Complete complex s=d/t calculations involving multiple conversions

	Define: scalar and vectors	Recall common scalars and vectors	Construct vector diagrams	Compare speed and velocity in relation to circular motion
Term 3a 9K Forces and Motion & CP1 / SP 1 Motion	Define acceleration.	Understand -ve acceleration means slowing down and +ve is speeding up	Be able to rearrange and use the equation a =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
CP2/SP2 Forces and motion	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 1st Law	Use Newton's 1st 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 2nd Law State what light gates can be used for To understand how a parachute increases air resistance. Identify the forces acting on a [moving, stationary] object and the directions in which they act. State Newton's 3rd Law	Use F=ma for given situations Use light gates to investigate acceleration when the force on a trolley is changed/ Explain how forces change acceleration when an object falls. interpret and draw a free-body force diagram. Can write action and reaction statement and label these on a diagram	Workout resultant forces and use F=ma Use light gates to investigate how force and mass effect acceleration. To explain terminal velocity and recognise this on graphs. Calculate the resultant of forces acting in one dimension. Can compare action reaction diagrams with balanced force diagrams for equilibrium situations	Link F=ma to W = mg and use to solve examples Evaluate methods used to investigate acceleration using a trolley, masses and a ramp. To use F=ma and the ideas of resultant forces to explain terminal velocity and maximum speed Use scale drawings to find the resultant of forces in two dimensions. Can use action reaction diagrams for falling objects