Motion and Forces

Opportunities for Breadth and Challenge: Researching various examples of Forces in practice. This could include Parachute jumping, The SSC Bloodhound, Bungee Jumping. Challenging students to the application of the Forces in each example.			
Links to Sequencing for Learning: This unit links to previous work on Forces done in KS2 Push and Pull Factors as well as interaction forces. This unit prepares pupils for work in Y9 Forces and Motion			
Section	What we are learning (key knowledge)	Key words	Assessment
1	Speed ○ To Calculate Speed ○ To describe relative motion	Meters per second, instantaneous speed. Average speed, relative motion.	Investigation and calculations of speed
2	Motion Graphs ○ To interpret a distance/time graph ○ To calculate speed using a distance/time graph	Distance/time graph. acceleration	Labelled graph
3	Forces ○ explain what forces do ○ describe what is meant by an interaction pair	Push, Pull, Friction, Air Resistance, Gravity, Interaction pairs, Newtons, Newton meter.	Prior knowledge
4	Squashing and Stretching ○ describe how forces deform objects ○ explain how solid surfaces provide a support force ○ use Hooke's Law	Deform, Compress, Stretch, Tension, Extension, Elastic Limit, Linear	Retrieval Qs of keywords
5	Drag Forces and Friction ○ describe the effect of drag forces and friction ○ explain why drag forces and friction arise	Friction, Lubrication, Resistance, Streamlined	Labelled force diagrams
6	Friction Investigation ○ To complete a MUM mark on the variables that effects Friction	Friction, Resistance, Resistive Forces, Newtons.	MUM- Friction investigation
7	Forces at a distance ○ describe the effects of a field ○ describe the effect of gravitational forces of Earth and in space	Magnetic Force, Electrostatic Force, Weight, Mass, Gravitational Field Strength	Labelled diagrams
8	Balanced and Unbalanced Forces ○ describe the difference between balanced and unbalanced forces ○ describe situations that are in equilibrium ○ explain why the speed or direction of motion of objects can change	Balanced, Unbalanced, Equilibrium, Resistive Forces, Driving Force	Homework- Research the Forces acting on a Parachute jump. Using all prior knowledge.
9	Revision		Class assessment
10	End of Unit Test		EUT
11	Test Feedback		Test feedback sheet

Energy

Opportunities for Breadth and Challenge: link foods and fuels to energy content.			
Links to Sequencing for Learning: This unit links to previous work on Energy done in KS2 This unit prepares pupils for work in Y9 on Energy transfer			
Section	What we are learning (key knowledge)	Key words	Assessment
1	Food and Fuels o Compare the energy values of food and fuels. o Compare the energy in food and fuels with the energy needed for different activities.	Energy, Joules, Kilojoules.	Prior knowledge
2	Energy adds up o Describe energy before and after a change. o Explain what brings about transfers in energy.	Law of conservation of energy, chemical store, energy store	Energy transfer circuit
3	Energy and Temperature o State the difference between energy and temperature. o Describe what happens when you heat up solids, liquids, and gases. o Explain what is meant by equilibrium.	Thermometer, kinetic, vibration, changes in state	Investigation write up
4	Energy Transfer:- Particles o Describe how energy is transferred by particles in conduction and convection. o Describe how an insulator can reduce energy transfer. o Describe the pattern in conduction shown by results, using numerical data to inform a conclusion.	Conduction, Convection, Radiation, insulators, convection current.	MUM- Conduction
5	Energy Transfer- Radiation o Describe some sources of infrared radiation. o Explain how energy is transferred by radiation. o Identify risks and explain why it is important to reduce them.	Infrared radiation. Radiation, thermal imaging camera, thermal, Vacuum	Diagram labelled
6	Energy Resources o Describe the difference between a renewable and a non-renewable energy resource. o Describe how electricity is generated in a power station.	Renewable, Nonrenewable, Fossil fuels, Nuclear, Hydroelectric, Wind, Wave, Geothermal, Power station	Question comparing renewable and non-renewable
7	Energy and Power o Explain the difference between energy and power. o Describe the link between power, fuel use, and cost of using domestic appliances.	Kilowatts, Power, Kilowatt hours, Power rating	Keyword definitions
8	Work, Energy and Machines o Calculate work done. o Apply the conservation of energy to simple machines.	Work done, Gears, Level, simple machine	Questions on calculations

9	Revision		Class assessment
10	End of Unit Test		EUT
11	Test Feedback		Test feedback sheet

Sound

Opportunities for Breadth and Challenge: link foods and fuels to energy content.			
Links to Sequencing for Learning: This unit links to previous work on Waves at KS2 This unit prepares pupils for work in Y9/10 on Waves and the Electromagnetic spectrum			
Section	What we are learning (key knowledge)	Key words	Assessment
1	Waves o describe the different types of waves and their features o describe what happens when water waves hit a barrier o describe what happens when waves superpose	Oscillation, Vibration, Undulation, Energy, Sound, Amplitude, Frequency, Wavelength, Peak, Crest, reflect, Incident.	Prior knowledge
2	Sound and Energy Transfer o describe how sound is produced and travels o explain why the speed of sound is different in different materials o contrast the speed of sound and the speed of light	Vibration, Medium, Vacuum, Speed	Question on speed of sounds and light
3	Loudness and Pitch o describe the link between loudness and amplitude o describe the link between frequency and pitch o state the range of human hearing and describe how it differs from the range of hearing in animals	Microphone, Oscilloscope, Hertz, Kilohertz, Pitch. Audible range, infrasound, ultrasound	Labelled diagrams showing loudness and frequency.
4	MUM- Investigation Does the thickness of an elastic band effect the frequency produced?		MUM- Investigation write up
5	Detecting Sound o describe how the ear works o describe how your hearing can be damaged o describe how a microphone detects sound	Ear, Pinna, Auditory Canal, Ear drum, Outer Ear, Ossicles, Amplify, Decibels, Diaphragm, Amplifer	Ear labelled diagram
6	Echoes and Ultrasound o describe what ultrasound is o describe some uses of ultrasound	Echo, Reverberation, Transmitter, Receiver.	Poster on uses of Ultrasound
7	Revision		Class assessment
8	End of Unit Test		EUT
9	Test Feedback		Test feedback sheet

Light

Opportunities for Breadth and Challenge: link foods and fuels to energy content.			
Links to Sequencing for Learning: This unit links to previous work on Waves at KS2 This unit prepares pupils for work in Y9/10 on Waves and the Electromagnetic spectrum			
Section	What we are learning (key knowledge)	Key words	Assessment
1	Light ○ describe what happens when light interacts with materials ○ state the speed of light	Source, Emits, Reflects, Absorbed, Luminous, Non-luminous, Transmits, Transparent, Translucent, Opaque.	Prior knowledge
2	Reflection ○ explain how images are formed in a plane mirror ○ explain the difference between specular reflection and diffuse scattering	Image, Virtual, Plane, Incident, Reflected, Normal, Specular, Diffuse.	Diagrams to show the difference
3	Refraction ○ describe and explain what happens when light is refracted ○ describe and explain what happens when light travels through a lens	Refraction, Medium, Convex, Converging, Focus, Focal.	Examples of refraction
4	MUM- Investigating refraction through a glass block.		MUM- Diagram of investigation
5	The Eye ○ describe how the eye works ○ describe how a simple camera forms an image	Retina, Iris, Cornea, Inverted, Photoreceptor, Optic nerve, Pixels, Charged Couple Device.	Labelled diagram of the eye
6	Colour ○ explain what happens when light passes through a prism ○ describe how primary colours add to make secondary colours ○ explain how filters and coloured materials subtract light	Prism, Spectrum, Dispersion, Continuous, Frequency, Primary Colours, Secondary colours, Filters.	Diagram of refraction through a prism
7	Revision		Class assessment
8	End of Unit Test		EUT
9	Test Feedback		Test feedback sheet