



| | Current electricity | Energy | Sound | Forces |
|------------------------|---|--|--|--|
| Key concepts | Measurement of current and how it behaves in series and parallel circuits, and at voltage and resistance. Various models for thinking about what is happening in circuits are explored, and the unit concludes by looking at how we use electricity safely. | Stores of energy are needed to make most things happen. It looks at food, energy stores and transfers, and energy resources in terms of non-renewable fuels and renewable resources. | How sounds are made, transmitted and detected, some uses of sound and compares sound waves with waves on the surface of water. | Revises the concepts of forces and their effects and extends students' knowledge of friction, gravity and springs. |
| Themes | Discovering electricity | Theme park. | Creating music. | Outdoor sports, such as climbing and mountain biking, to link to ideas about forces, friction and pressure. |
| Challenge | Outcomes, questioning, tasks and worksheets in all lessons. Regular progress checks. | Outcomes, questioning, tasks and worksheets in all lessons. Regular progress checks. | Understanding sentence construction in order to develop sentences that can be used as part of a fluid writing style that communicates information clearly. | Outcomes, questioning, tasks and worksheets in all lessons. Regular progress checks. |
| Support | | | | |
| Literacy focus | Presenting information in tables. Classifying data as qualitative or quantitative. | Summarising texts. | Ways of recalling information. | The use of conventions when communicating science. Taking notes from presentations and videos (including the ordering of notes). |
| Numeracy focus | The use of symbols when communicating science. | Using ratios to compare experimental results. | Presenting data graphically. | The use of conventions when communicating science. The SI system. |
| Cross-curricular links | D&T – designing electric powered objects. | Food technology – Kcal/KJoule. Music – energy transfers from action to sound. | Music – how different sounds are made on a variety of instruments. | D&T – designing sports equipment PE – sports |
| SMSC & MBV | Various group work and problem-solving skills such as investigations and experiments. Explore the reasons why household electricity supply reduced from 240v to 230v | Climate change and environmental impacts. Renewable v non-renewable. Debate on the best methods to minimise the environmental impact of energy creation. | Various group work and problem-solving skills such as investigations and experiments. Begin to discuss sounds that humans cannot hear such as why do dogs panic when the power goes off? Can animals hear vibrations that humans cannot? | Various group work and problem-solving skills such as investigations and experiments. |
| ASSESSMENTS | Waterfall assessment 3 | Waterfall assessment 2 | Waterfall assessment 6 | Waterfall assessment 5 |
| Out of school learning | Seneca and Educake | Seneca and Educake | Seneca and Educake | Seneca and Educake |



| Energy | | | | |
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| Lesson | Key concepts | Learning outcomes | Differentiation | Resource |
| 1 | Energy from food - introduces energy by looking at food as the source of energy for our bodies. There is a Working Scientifically spread that introduces the idea of using ratios to compare the energy released per gram of food, and also looks at the use of percentages for making comparisons. | B1: Recall that our bodies need energy, which we get from food B2: Explain why different people need different amounts of energy from food B3: Recall the units for measuring energy are joules (j) or kilojoules (kJ). 1kJ = 1000 J. | Outcomes, questioning, tasks and worksheets in all lessons. | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\7I - Energy\7I-1a |
| 2 | Energy transfers and stores - introduces the idea that energy can be stored and transferred in different ways and that energy cannot be created or destroyed. | B1: Describe the different ways in which energy is transferred B2: Describe different ways in which energy is stored B3: Recall the law of conservation of energy | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\7I - Energy\7I-2 |
| 3 | Fuels - looks at fuels, including formation of fossil fuels and the use of biofuels. There is an assessment opportunity comparing amounts of energy released by different fuels. | B1: Describe what fossil fuels are and how they were made B2: Explain why fossil fuels are described as non-renewable B3: Name some renewable fuels | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\7I - Energy\7I-3 |
| 4 | Other energy resources - looks at various renewable energy resources and introduces the idea that the energy obtained from most of these (and from fossil fuels) originates in the Sun. | B1: Give some examples of renewable energy resources B2: Explain how the Sun is the original source of energy for most of our energy resources B3: Recall which energy resources do not depend on the Sun | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\7I - Energy\7I-4 |
| 5 | Using resources - looks at some of the issues resulting from our use of energy, including a brief summary of the advantages and disadvantages of different energy resources. It introduces the idea of climate change being caused by adding carbon dioxide to the atmosphere and looks at some ways we could reduce our use of fossil fuels. | B1: Describe advantages and disadvantages of different energy resources B2: Describe some ways of using less fossil fuels B3: Explain what efficiency means | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\7I - Energy\7I-5 |



| Current electricity | | | | |
|---------------------|---|--|---|---|
| Lesson | Key concepts | Learning outcomes | Differentiation | Resource |
| 1 | Switches and currents - contains the introduction for the unit, which looks at how the idea of current electricity was developed. It revises some KS2 concepts, including the representation of circuits using standard symbols and the effects of adding bulbs to series circuits. The use of ammeters to measure current and the idea of resistance are introduced. | B1: Explain how switches work B2: Describe what happens when the number of bulbs in a circuit is changed B3: Describe what current is and how it is measured | Outcomes, questioning, tasks and worksheets in all lessons. | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Current electricity\Lesson 1 - measuring electricity |
| 2 | Models for circuits - starts by looking at the use of models in science. It looks at different models which are used to help students to think about what happens in electrical circuits. Students are encouraged to evaluate the different models. | B1: Explain why models are used B2: Use a physical model to help explain electric circuits B3: Evaluate a physical model | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Current electricity\Lesson 2 - models for circuits (single) U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Current electricity\Lesson 3 - drawing tables (single) |
| 3 | Series and parallel circuits - introduces the differences between series and parallel circuits and how current behaves in the different types of circuit. Models are introduced to help students understand the differences. | B1: State what is meant by a series circuit and a parallel circuit B2: Explain how switches can control different kinds of circuit B3: Describe the differences in how current behaves in series and parallel circuits and how changing the number of components affects it. | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Current electricity\Lesson 4 - series and parallel circuits |
| 4 | Changing the current - introduces voltmeters and the idea that voltage is the push making current flow. Resistance is introduced qualitatively | B1: Describe how changing the number or type of components in a circuit affects the current B2: Describe how a voltmeter is used B3: Explain why the current increases when the voltage of the supply is increased and the relationship between resistance and current | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Current electricity\Lesson 5 - changing the current |
| 5 | Using electricity - looks at ring mains as a form of parallel circuit as well as the use of fuses and other aspects of electrical safety. | B1: Explain some safety precautions to be followed when using electricity B2: Describe the job that fuses and circuit breakers do B3: Explain how a fuse works and recall how the different wires are connected in a plug | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Current electricity\Lesson 6 - using electricity safely |



| Forces | | | | |
|--------|---|--|---|--|
| Lesson | Key concepts | Learning outcomes | Differentiation | Resource |
| 1 | Different forces -introduces the outdoor activity theme for the unit and revisits ideas about forces first met at KS2: that forces are pushes or pulls and that forces can change the speed or direction of movement of something or change its shape. This topic also looks at the difference between mass and weight. | B1: Recall the effects of forces on an object B2: Name forces and classify them as contact or non-contact forces B3: Recall how to measure forces and masses and their units | Outcomes, questioning, tasks and worksheets in all lessons. | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Forces\Lesson 1 |
| 2 | Springs - looks at springs and how the extension of a spring depends on the force applied. The use of springs inside force meters is also considered. | B1: Describe the terms stretched and compressed B2: Describe what is meant by elastic limit B3: Describe how the extension of a spring depends on the force applied | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Forces\Lesson 2 |
| 3 | Friction - looks at friction, the effects of friction and lubrication. It also discusses various ways in which friction is helpful and not helpful. | B1: Recall the effects of friction B2: Explain some ways in which friction can be changed B3: Identify situations in which friction is helpful or not helpful | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Forces\Lesson 3 |
| 4 | Pressure - introduces the idea that pressure is a measure of the force on a given area, in the context of outdoor activities. The equation for calculating pressure is introduced (students are not expected to be able to rearrange the equation themselves at this level). | B1: Define pressure B2: Calculate pressure and recall its units B3: Describe the effects of high and low pressure in simple situations | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Forces\Lesson 4 |
| 5 | Balanced and unbalanced - looks at the effects of balanced and unbalanced forces on moving and stationary objects. Need for safety standards in sporting equipment. | B1: Describe balanced and unbalanced forces B2: Identify balanced and unbalanced forces B3: Explain the effects of balanced and unbalanced forces | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Forces\Lesson 5 |



| Sound | | | | |
|--------|--|--|---|---|
| Lesson | Key concepts | Learning outcomes | Differentiation | Resource |
| 1 | Making sounds - looks at some of the ways in which animals use or make sounds and revises some KS2 work. It looks at how sound is produced, links pitch and frequency to the size of the vibrating object and also links volume/intensity to the amplitude of the vibrations. | B1: Define intensity, pitch and frequency B2: Explain what causes sound and how to make louder sounds B3: Explain the link between frequency and pitch | Outcomes, questioning, tasks and worksheets in all lessons. | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Sound\Lesson 1 |
| 2 | Moving sounds - introduces sounds being passed on by vibrations and looks at the speed of sound in different materials. | B1: Define amplitude and vibration B2: Describe how sound moves through materials B3: Explain why sounds get fainter further from their source | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Sound\Lesson 2 |
| 3 | Detecting sounds - explains how ears and microphones detect sound and looks at the hearing ranges of some different animals. The use of sound detectors to measure noise levels is introduced and there is an assessment opportunity investigating the performances of sound insulators. | B1: Describe the parts of the ear and their functions B2: Describe how microphones convert sound into electrical signals B3: Recall that different animals have different hearing ranges | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Sound\Lesson 3 |
| 4 | Using sound - looks at some uses of sound, including echolocation and sonar. | B1: Describe what we use sound for B2: Describe some uses of ultrasound B3: Explain how sonar and echolocation work | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Sound\Lesson 4 |
| 5 | Comparing waves - compares sound waves with waves on the surface of water and introduces the idea of superposition. The effect human-made noises can have on animals. | B1: Compare longitudinal and transverse waves B2: Recall that all waves can be reflected B3: Explain what superposition means | | U:\Subject Areas\Science\Schemes of work\2019 onwards\Year 7\Physics\Sound\Lesson 5 |