Year: 7
Science Topic: Particles & Pure and Impure Substances

	Acquiring	Developing	Securing	Mastering	Mastering +
Demonstrating knowledge	• Identify changes related to simple scientific ideas of state change and dissolving. • Respond to ideas given to them to suggest solutions to separating mixtures. • Represent things in the real world using simple physical models of state change, dissolving or diffusion.	• Use simple models when describing processes of state change, diffusion and dissolving • Use simple scientific ideas to describe ways of separating mixtures • Identify ways of separating mixtures based on information provided • Identify scientific evidence that is being used to support ideas about the ideas of particles	• Use the particle model to describe state change, diffusion and dissolving • Explain processes of separating mixtures by drawing on the particle model • Justify methods of separating mixtures based on evidence provided • Identify the use of evidence and creative thinking by scientists like Robert Boyle in the development of scientific ideas	• Use abstract ideas and models of particles to explain state change, diffusion and dissolving. • Identify the strengths and weaknesses of the particle model • Explain how new scientific evidence is discussed and interpreted by the scientific community and how this may lead to changes in scientific ideas including the work of Robert Boyle	• Students show a level of knowledge and understanding which is beyond the expectations of a year 7 student.
Applying and communicating in science	• Use scientific forms of language when communicating simple scientific ideas about the particle model and processes of separating mixtures. • Identify simple advantages of working together on experiments or investigations. • Suggest improvements to their working methods during solubility investigations.	• Select appropriate ways of presenting scientific data. • Use appropriate scientific forms of language to communicate scientific ideas and processes. • Use scientific conventions when communicating information or ideas. • State whether or not data supports the hypothesis when investigating solubility.	• Use appropriate scientific conventions and terminology to communicate abstract ideas. • Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected. • Appreciate the limitations of science	• Choose forms to communicate qualitative or quantitative data appropriate to the data and the purpose of the communication during solubility investigations. • Distinguish between data and information from primary sources, secondary sources and present them in the most appropriate form. • Present data to support hypotheses	
Investigative skills	• Identify which variables to control, measure or keep the same • Select equipment or information sources from those provided to address a question or idea. • Make some accurate observations or whole number measurements relevant to questions about state change or ideas under investigation during solubility. • Recognise obvious risks when prompted about experimental procedures including heating.	• Decide when it is appropriate to carry out fair tests in investigations. • Identify one or more control variables from those provided during solubility investigations • Select appropriate equipment to investigate solubility or state change. • Make sets of observations or measurements, identifying the ranges and intervals used. • Identify possible risks to themselves and others. • Suggest improvements to their working methods, giving reasons	• Recognise significant variables in solubility investigations, selecting the most suitable to investigate. • Explain why particular pieces of equipment are appropriate for the questions or ideas under investigation. • Repeat sets of observations or measurements in case of error, selecting suitable ranges and intervals. • Make, and act on, suggestions to control obvious risks to themselves and others. • Evaluate the effectiveness of their working methods, making practical suggestions for improving them	• Apply scientific knowledge and understanding in the planning of investigations and making predictions, identifying significant variables, including independent, dependent and control variables. • Justify methods choice and number of observations/measurements. • Collect data, choosing appropriate ranges, numbers and values for measurements and observations. • Independently recognise a range of familiar risks and take action to control them. • Evaluate data to identify sources of error	
Maths skills	• Identify straightforward patterns in observations or in data presented in various formats, including tables and bar charts. • Present simple scientific data in more than one way, including tables and bar charts.	• Identify patterns in data presented in various formats, including line graphs. • Draw straightforward conclusions from data presented in various formats. • Identify scientific evidence used in drawing conclusions.	• Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. • Interpret data in a variety of formats, recognising obvious inconsistencies. • Provide straightforward explanations for differences in repeated observations or measurements. • Draw valid conclusions that utilise more than one piece of supporting evidence, including results tables and line graphs	• Suggest reasons based on scientific knowledge and understanding for any limitations or inconsistencies in evidence collected. • Select and manipulate data and information and use them to contribute to conclusions including calculating the solubility of salts at different temperatures • Draw conclusions that are consistent with the evidence collected and explain them using scientific knowledge and understanding. • Make valid comments on the quality of data. • Present data (either primary or a secondary source) using results tables and graphs	

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Year: 7
Science Topic: Forces Effect and Motion

	Acquiring	Developing	Securing	Mastering	Mastering +
Demonstrating knowledge	• Name some of the common forces seen in everyday life • Identify the difference between balanced and unbalanced forces • Know that a force can change an object's speed or direction. • Describe friction as a force which opposes motion. • Apply the relationship between the mass of an object and its weight.	• Name the most commonly used forces and name some examples of each • Identify the resultant force acting on an object • Recall that if the forces on an object are balanced it is in equilibrium, with a constant speed and direction. • Explain how friction can be reduced. • Explain and apply the relationship between the mass of an object and its weight.	• Explain the difference between a contact and a non-contact force, and name some examples of each • Compare forwards and backwards forces to find the direction of the resultant force, and use this to predict the direction of acceleration. • Give examples of situations in which friction is useful, and in which friction is a nuisance. • Realise that the acceleration of free fall does not depend on an object's weight.	• Name the less commonly used forces, i.e. support force, upthrust, surface tension, tension • Understand that a force on an object at 90° to its direction of motion will make it move in a circle at a constant speed. • Predict the direction and magnitude of acceleration of an object in complex cases • Describe how frictional forces change relatively to the speed of a falling object	• Students show a level of knowledge and understanding which is beyond the expectations of a year >>> student.
Applying and communicating in science	• Use scientific forms of language when communicating simple scientific ideas and processes. • Identify simple advantages of working together on experiments or investigations. • Suggest improvements to their working methods. • Identify some things in science that people might disagree with	• Select appropriate ways of presenting scientific data. • Use appropriate scientific forms of language to communicate scientific ideas and processes. • Use scientific and mathematical conventions when communicating information or ideas. • Identify some limitations and ethical implications of science. • State whether or not data supports the hypothesis	• Distinguish between opinion and scientific evidence in contexts related to science, and use evidence rather than opinion to support or challenge scientific arguments. • Use appropriate scientific and mathematical conventions and terminology to communicate abstract ideas. • Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected. • Appreciate the power, limitations and ethical implications of science	• Identify lack of balance in the presentation of information or evidence. • Choose forms to communicate qualitative or quantitative data appropriate to the data and the purpose of the communication. • Distinguish between data and information from primary sources, secondary sources and simulations, and present them in the most appropriate form. • Explain and evaluate the power, limitations and ethical implications of science. • Present data to support hypotheses	
Investigative skills	• Choose a variable to change and one to measure. • Select equipment or information sources from those provided • Make some accurate observations or whole number measurements relevant to questions or ideas under investigation. • Recognise obvious risks when prompted	• Identify one or more control variables in investigations • Decide when it is appropriate to carry out fair tests in investigations. • Select appropriate equipment or information sources to address specific questions or ideas under investigation. • Make sets of observations or measurements, identifying the ranges and intervals used. • Identify possible risks to themselves and others. • Suggest improvements to their working methods, giving reasons	• Recognise significant variables in investigations, selecting the most suitable to investigate. • Explain why particular pieces of equipment or information sources are appropriate for the questions or ideas under investigation. • Repeat sets of observations or measurements in case of error, selecting suitable ranges and intervals. • Make, and act on, suggestions to control obvious risks to themselves and others. • Evaluate the effectiveness of their working methods, making practical suggestions for improving them	• Apply scientific knowledge and understanding in the planning of investigations and making predictions, identifying significant variables, including independent, dependent and control variables. • Justify their method choice and number of observations/measurements. • Collect data, choosing appropriate ranges, numbers and values for measurements and observations. • Independently recognise a range of familiar risks and take action to control them. • Evaluate data to identify sources of error	

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Maths skills	• Identify straightforward patterns in observations or in data • Present simple scientific data using tables and line graphs • Use the equation: average speed = distance travelled ÷ time taken. • Can calculate the relative speed of two moving objects.	• Identify patterns in data presented in various formats, including line graphs. • Draw straightforward conclusions from data presented in various formats. • Identify scientific evidence they have used in drawing conclusions. • Are able to label the forces acting on an object in a force diagram. • Are able to plot and interpret graphs of distance against time.	• Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. • Interpret data in a variety of formats, recognising obvious inconsistencies. • Provide straightforward explanations for differences in repeated observations or measurements. • Can add or subtract co-linear forces to find the size and direction of the resultant force. • Can plot and interpret graphs of speed against time.	• Suggest reasons based on scientific knowledge and understanding for any limitations or inconsistencies in evidence collected. • Select and manipulate data and information and use them to contribute to conclusions. • Draw conclusions that are consistent with the evidence they have collected and explain them using scientific knowledge and understanding. • Make valid comments on the quality of their data. • Be able to rearrange equations to find the missing variable. • Present data (their own or a secondary source) using results tables and graphs • Can relate the forces acting on a parachutist to a speed-time graph of his/her motion. Can describe the conditions for terminal velocity. • Can find speed from the gradient of a distance-time graph. Are able to find acceleration from the gradient of a speed-time graph.	

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Science Topic: Y7 Cells, Tissues, Food and Digestion

	Acquiring	Developing	Securing	Mastering	Mastering +
Demonstrating knowledge	• Identify the main parts of cells, the digestive system and food • Represent cells/digestive system using simple models and diagrams. • Use evidence/knowledge of cells, the digestive system and food to answer questions or to support findings	• Describe the main parts of cells, the digestive system and food • Represent cells/digestive system using simple physical models • Find and use evidence/knowledge of cells, the digestive system and food to answer questions or to support findings	• Use abstract ideas or detailed models when describing cells, the digestive system and food • Explain these topics and suggest solutions to problems by drawing on scientific ideas or models • Recognise questions relating to the topic that do not yet have definitive answers	• Use abstract ideas, models or multiple factors when explaining cells, the digestive system and food • Identify the strengths and weaknesses of models of cells and the digestive system • Describe some scientific evidence that supports or refutes particular ideas or arguments relating to cells, the digestive system and food	• Students show a level of knowledge and understanding which is beyond the expectations of a year 7 student.
Applying and communicating in science	• Use scientific terms related to cells, the digestive system and food when communicating • Identify simple advantages of working together on investigations • Suggest improvements to their working methods • Identify some things relating to food and diet that some people may disagree with	• Select appropriate ways of presenting scientific data • Correctly use scientific terms related to cells, the digestive system and food • Identify some ethical implications of research in food and diet • State whether or not data supports the hypothesis • Apply understanding of cell specialisation to unfamiliar examples of specialised cells	• Use evidence rather than opinion to support or challenge scientific arguments relating to cells, the digestive system and food (sugar debate?) • Suggest how collaborative approaches to investigations may improve the evidence collected • Appreciate the power, limitations and ethical implications of research in this topic • Apply understanding of cell specialisation to unfamiliar examples of specialised cells	• Communicate data relating to cells, the digestive system and food in appropriate tables and graphs • Distinguish between data and information from primary sources, secondary sources and simulations, and present them in the most appropriate form • Explain and evaluate the power, limitations and ethical implications of research in this topic • Present data to support hypotheses	
Investigative skills	• Identify one or more control variables in investigations on cells and food • Select equipment or information sources from those provided to address a question or idea • Make some accurate observations relevant to cells and food • Recognise obvious risks when prompted	• Decide when it is appropriate to carry out fair tests in investigations on food • Select appropriate equipment to investigate cells and food • Make sets of observations on food and cell experiments • Identify possible risks to themselves and others • Suggest improvements to their working methods, giving reasons	• Recognise significant variables in investigations on food • Explain why particular pieces of equipment or information sources are appropriate for the ideas under investigation • Make, and act on, suggestions to control obvious risks to themselves and others • Evaluate the effectiveness of their working methods, making practical suggestions for improving them	• Apply scientific knowledge and understanding in the planning of investigations on food - making predictions, identifying significant variables, including independent, dependent and control variables • Justify method choice for food investigation • Collect accurate observations • Independently recognise a range of familiar risks and take action to control them	
Maths skills	• Identify straightforward patterns in observations on cells and food investigations • Present findings from these investigations • Use simple equations to interpret data on balancing diets • Calculate the magnification of images under a microscope	• Identify patterns in observations on cells and food investigations • Draw straightforward conclusions from observations on cells and food • Identify scientific evidence they have used in drawing conclusions	• Decide on the most appropriate formats to present observations on food and cell investigations • Interpret observations from these investigations • Draw valid conclusions that utilise more than one piece of supporting evidence	• Select information from secondary sources as well as from investigations on cells and food to contribute to conclusions • Draw conclusions from the evidence collected and explain them using scientific knowledge • Present data from investigations on food and cells in an appropriate diagram, table or graph	

Year: 7
Science Topic: Electricity, Magnets and Electromagnets

	Acquiring	Developing	Securing	Mastering	Mastering +
Demonstrating knowledge	• Identify key facts relating to electricity and magnetism. • Represent circuits and electricity using simple physical models. • Use scientific evidence about electricity and magnetism to answer questions or to support their findings	• Use scientific ideas when describing electricity and magnetism. • Use simple models to describe circuits and electricity. • Identify scientific evidence that supports or refutes ideas about electricity and magnetism	• Use abstract ideas or models of more than one step when describing circuits and electricity. • Explain processes, suggest solutions to problems or answer questions by drawing on abstract ideas or models about the topic. • Recognise scientific questions about electricity that do not yet have definitive answers.	• Use abstract ideas, models or multiple factors when explaining circuits and electricity. • Identify the strengths and weaknesses of circuit models. • Describe some scientific evidence that supports or refutes ideas about electricity and magnetism. • Explain how new scientific evidence is discussed and interpreted by the scientific community and how this may lead to changes in scientific ideas	• Students show a level of knowledge and understanding which is beyond the expectations of a year >>> student.
Applying and communicating in science	• Use key terms such as current, voltage, resistance, conductor and magnetisation when communicating • Identify simple advantages of working together on electricity and magnetism investigations. • Suggest improvements to their working methods.	• Select appropriate ways of presenting scientific data on resistance and magnet strength. • Correctly use key terms such as current, voltage, resistance, conductor and magnetisation when communicating • Use correct units and equations when calculating current, voltage and resistance • State whether or not data supports the hypothesis on resistance and electromagnetisms experiments	• Correctly use key terms such as current, voltage, resistance, conductor and magnetisation along with key calculations when communicating • Suggest how collaborative approaches to resistance and electromagnetism investigations may improve the evidence collected. • Appreciate the power, limitations and ethical implications of science	• Identify lack of balance in the presentation of information or evidence. • Communicate qualitative and quantitative data relating to electricity and magnetisms investigations. • Distinguish between data and information from primary sources and secondary sources and present them in the most appropriate form. • Explain and evaluate the power and limitations of research in electricity and magnetism. • Present data on resistance and electromagnets	
Investigative skills	• Identify one or more control variables in resistance and electromagnet investigations • Select equipment or information sources to investigate resistance and electromagnets. • Make some accurate whole number measurements to ideas under investigation. • Recognise obvious risks when prompted such as electrocution	• Decide when it is appropriate to carry out fair tests in investigations. • Select appropriate equipment or information sources to investigate resistance and magnetism. • Make sets of observations or measurements, identifying the ranges and intervals used. • Identify possible risks to themselves and others such as electrocution • Suggest improvements to their working methods, giving reasons	• Recognise significant variables in resistance and magnetism, selecting the most suitable to investigate. • Explain why particular pieces of equipment are appropriate for the investigation. • Make, and act on, suggestions to control obvious risks to themselves and others such as electrocution • Evaluate the effectiveness of their working methods, making practical suggestions for improving them	• Apply scientific knowledge and understanding in the planning of resistance and electromagnet investigations and making predictions, identifying significant variables, including independent, dependent and control variables. • Justify their method choice and number of observations/measurements. • Collect data, choosing appropriate ranges, numbers and values for measurements and observations on resistance and electromagnets • Independently recognise risks such as electrocution, and act on them • Evaluate data to identify sources of error	
Maths skills	• Identify straightforward patterns in data from electromagnetism and resistance experiments using scatter graphs • Present simple scientific data on electromagnets and resistance in tables and scatter graphs. • Use simple equations to calculate resistance, voltage and current	• Identify patterns in data presented in scatter graphs. • Draw straightforward conclusions from scatter graphs about resistance and electromagnetism. • Identify scientific evidence they have used in drawing conclusions. • Use simple equations to calculate resistance, voltage and current, changing the units where appropriate	• Decide on the most appropriate formats to present sets of scientific data, such as using scatter graphs for continuous variables. • Interpret data in tables and scatter graphs to identify anomalies • Provide straightforward explanations for differences in repeated observations or measurements. • Draw valid conclusions about electromagnets and resistance that utilises results tables and line graphs	• Suggest reasons for inconsistencies in evidence collected during investigations on electromagnets and resistance • Select and manipulate data to contribute to conclusions about electricity and magnetism • Draw conclusions that are consistent with the evidence they have collected and explain them using scientific knowledge and understanding. • Make valid comments on the quality of their data. • Be able to rearrange equations to calculate resistance, voltage and current • Present data (their own or a secondary source) using results tables and scatter graphs	

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Year: 7
Science Topic: Atoms, Elements and Compounds

	Foundation	Developing	Secure	Mastering	Mastering +
Demonstrating knowledge	• Identify different atoms as the building blocks of more complicated substances such as molecules and compounds • Use the model of balls or Lego bricks to represent atoms, elements and compounds. • Use knowledge of atoms, elements and compounds to answer questions	• Describe how atoms join together to form molecules and compounds • Use the ball model to represent chemical reactions • Describe the difference between a mixture and a compound • Recognise the different areas of the Periodic Table of elements	• Use chemical symbols to write chemical formulae • Explain how chemical reactions result in new chemicals being formed • Describe how John Dalton used creative thinking to develop the theory of atoms. • Identify the historical evidence that led to the production of the modern periodic table	• Describe the evidence that led to the Law of conservation of mass. • Use abstract ideas and models to explain why the Law of conservation of mass sometimes appears to be incorrect. • Identify chemical formulae of compounds and name those compounds • Be able to write a word equation	• Students show a level of knowledge and understanding which is beyond the expectations of a year >>> student.
Applying and communicating in	• Use scientific forms of language when communicating simple scientific ideas on atoms, elements and compounds. • Identify simple advantages of working together on experiments to form compounds. • Suggest improvements to their working methods during making a new compound	• Select appropriate ways of presenting scientific data. • Use appropriate scientific forms of language to communicate scientific ideas and processes on atoms, elements and compounds. • Use scientific and mathematical conventions when communicating information or ideas. • State whether or not data supports the hypothesis when investigating the conservation of mass	• Distinguish between opinion and scientific evidence in contexts related to science, and use evidence rather than opinion to support or challenge scientific arguments. • Use appropriate scientific and mathematical conventions and terminology to communicate abstract ideas such as elements, compounds and mixtures • Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected.	• Choose forms to communicate qualitative or quantitative data appropriate to the data and the purpose of the communication. • Distinguish between data and information from primary sources, secondary sources and simulations, and present them in the most appropriate form. • Explain and evaluate the power, limitations and ethical implications of science. • Present data to support the hypothesis in the investigation of the Law of conservation of mass	
Investigative skills	• Identify which variables to control, measure or keep the same when investigating the Law of conservation of mass • Select equipment from those provided to address a question or idea. • Make some accurate observations and balance readings relevant to the investigation • Recognise obvious risks of heating when prompted	• Decide when it is appropriate to carry out fair tests in investigations. • Identify one or more control variables in investigations from those provided. • Select appropriate equipment to address specific questions or ideas under investigation. • Make sets of observations and measurements, identifying the ranges and intervals used. • Identify possible risks to themselves and others. • Suggest improvements to their working methods, giving reasons	• Recognise significant variables in investigations, selecting the most suitable to investigate. • Explain why particular pieces of equipment or information sources are appropriate for the questions or ideas under investigation. • Repeat sets of observations and measurements in case of error, • Make, and act on, suggestions to control obvious risks to themselves and others. • Evaluate the effectiveness of their working methods, making practical suggestions for improving them	• Apply scientific knowledge and understanding in the planning of investigations and making predictions, identifying significant variables, including independent, dependent and control variables. • Justify their method choice and number of observations/measurements. • Collect data, choosing appropriate ranges, numbers and values for measurements and observations. • Independently recognise a range of familiar risks and take action to control them. • Evaluate data to identify sources of error	
Maths skills	• Identify straightforward patterns in observations or in data presented in results tables • Present simple scientific data in more than one way, including tables and bar charts.	• Identify patterns in data presented in various formats • Draw straightforward conclusions from data presented in various formats. • Identify scientific evidence they have used in drawing conclusions.	• Decide on the most appropriate formats to present sets of scientific data • Interpret data in a variety of formats, recognising obvious inconsistencies. • Provide straightforward explanations for differences in repeated observations or measurements. • Draw valid conclusions that utilise more than one piece of supporting evidence, including results tables and bar graphs	• Suggest reasons based on scientific knowledge and understanding for any limitations or inconsistencies in evidence collected. • Select and manipulate data and information and use them to contribute to conclusions. • Draw conclusions that are consistent with the evidence they have collected and explain them using scientific knowledge and understanding. • Make valid comments on the quality of their data. • Present data (their own or a secondary source) using results tables and graphs	

Year 7
Science Topic: Animal and Plant Reproduction

	Acquiring	Developing	Securing	Mastering	Mastering +
Demonstrating knowledge	• Students can identify the main organs of male, female and plant reproductive systems. • Students can identify what changes take place in males and females during puberty.	• Students can describe the main stages of the female menstrual cycle. • Students can describe the functions of the organs of human and plant reproductive systems.	• Students can describe how the menstrual cycle is affected depending on whether or not fertilisation occurs. • Students can describe the process of fertilisation, gestation and birth, referring to gametes. • Students can describe how pollination occurs in plants, referring to pollen.	• Students can compare the differences between different types of pollination in plants and explain how seeds are formed. • Students can evaluate different methods of seed dispersal.	• Students show a level of knowledge and understanding which is beyond the expectations of a year >>> student.
Applying and communicating in science	• Students can recognise diagrams of the male, female and plant reproductive systems. • Students usually use appropriate words to describe reproduction and the menstrual cycle. • Students can state an opinion that someone might have about reproduction and pollination.	• Students can label diagrams of reproductive systems and the menstrual cycle when some are filled in. • Students use appropriate terminology to describe reproduction and the menstrual cycle. • Students understand that people have different opinions and beliefs about reproduction and pollination.	• Students can label blank diagrams of reproductive systems and the menstrual cycle. • Students can identify facts and myths about reproduction and the menstrual cycle. • Students appreciate different people's opinions and beliefs about reproduction and pollination and consider these in their discussions.	• Students can construct their own representations of human and plant reproductive systems as well as the menstrual cycle. • Students can process primary and secondary data referring to reproduction and present them appropriately. • Students evaluate different people's opinions and beliefs about reproduction and pollination and consider these in their discussions. • Students can assess how insect pollination affects food security.	
Investigative skills	• Not assessed in this topic				
Maths skills	• Students may be able to identify a stage of the menstrual cycle if drawn graphically. • Students know there are some days of the cycle where females are more fertile.	• Students can recognise stages of the menstrual cycle when drawn graphically and can use this to answer simple questions that have been posed. • Students can identify when a female is most fertile.	• Students can process primary and secondary data referring to reproduction and present them using line graphs, pie charts etc. • Students can suggest reasons for the data that they have been presented with. • Students can describe the times when females are more fertile.	• Students can process primary and secondary data referring to reproduction and present them appropriately. • Students can suggest reasons for the data they have been presented with and explain reasons for that data. Students can explain why females are more fertile at certain times of their menstrual cycle.	

Year: 7
Science Topic: Acids and Alkalis & Simple chemical reactions

	Acquiring	Developing	Securing	Mastering	Mastering +
Demonstrating knowledge	• To describe what types of substances acids and alkalis are and where they might be found in the home. • Can identify from particle diagrams the rearrangement of atoms in a chemical reaction.	• To describe the hazards associated with acids and alkalis. • Explain how we can reduce the risk. • Recognise some hazard symbols. • Use particle diagrams to show the rearrangement of atoms in a chemical reaction.	• Show understanding of what the pH scale is. • To explain how we can use the pH scale to find out which substances are acids and alkalis. • Interpret the colour changes presented by indicators. • Can use particle diagrams to predict the products of chemical reactions.	• Explain what happens when an acid reacts with an alkali. • Give examples of where neutralisation is used. • Are able to outline the enhanced precautions necessary when transporting and working with corrosive substances. • Can use word equations to represent a chemical reaction.	• Students show a level of knowledge and understanding which is beyond the expectations of a year >>> student.
Applying and communicating in science	• Use scientific forms of language when communicating simple scientific ideas and processes about acids and alkalis and types of chemical reactions • Identify simple advantages of working together on experiments or investigations. • Suggest improvements to their working methods during neutralisation investigation	• Select appropriate ways of presenting scientific data. • Use appropriate scientific forms of language to communicate scientific ideas and processes. • Use scientific and mathematical conventions when communicating information or ideas. • State whether or not data supports the hypothesis when investigating neutralisation	• Use appropriate scientific and conventions and terminology to communicate abstract ideas. • Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected. • Appreciate the limitations of science	• Choose forms to communicate qualitative or quantitative data appropriate to the data and the purpose of the communication for neutralisation investigation • Distinguish between data and information from primary sources, secondary sources and simulations, and present them in the most appropriate form. • Present data to support hypotheses	
Investigative skills	• Identify which variables to control, measure or keep the same to make cabbage indicator, reaction between NaOH and HCl • Select equipment to investigate using indicators, neutralisation and types of chemical reactions • Make some accurate observations that compare the colours of litmus and universal indicator and the ways of telling a chemical reaction has taken place • Recognise obvious risks to themselves and others when working with acids and alkalis • Are able to describe observations that show chemical change and suggest ways to measure the changes.	• Decide when it is appropriate to carry out fair test in investigations • Identify one or more control variables in investigations from those provided • Select appropriate equipment or information sources to investigate neutralisation • Make sets of observations or measurements, identifying ranges and intervals used • Identify possible risks to themselves during investigating neutralisation • Suggest improvements to their working methods, giving reasons	• Recognise significant variables in the neutralisation of HCl by Na_2CO_3 selecting the most suitable to investigate. • Explain why using a measuring cylinder is appropriate for the questions or ideas under investigation. • Repeat sets of observations or measurements, identifying the ranges and intervals used. • Make, and act on, suggestions to control obvious risks to themselves and others. • Evaluate the effectiveness of their working methods, making practical suggestions for improving them	• Apply scientific knowledge and understanding to write a hypothesis about how changing concentration of an acid affects the amount of carbonate needed to neutralise it. • Make predictions, identifying significant variables, including independent, dependent and control variables, explaining how these will be monitored • Justify their method choice and number of observations/measurements. • Explain how to collect data, choosing appropriate ranges, numbers and values for measurements and observations. • Independently recognise a range of familiar risks and take action to control them. Explain why there is a need to apply a risk assessment • Evaluate data to identify sources of error	
Maths skills	• Identify straightforward patterns in observations or in data presented in various formats, including tables, bar charts. • Present simple scientific data in more than one way, including tables and bar charts.	• Identify patterns in data presented in various formats, including line graphs. • Draw straightforward conclusions from data presented in various formats. • Identify scientific evidence they have used in drawing conclusions.	• Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. • Interpret data in a variety of formats, recognising obvious inconsistencies. • Provide straightforward explanations for differences in repeated observations or measurements. • Draw valid conclusions that utilise more than one piece of supporting evidence, including results tables and line graphs	• Suggest reasons based on scientific knowledge and understanding for any limitations or inconsistencies in evidence collected. • Select and manipulate data and information and use them to contribute to conclusions. • Draw conclusions that are consistent with the evidence they have collected and explain them using scientific knowledge and understanding. • Make valid comments on the quality of their data. • Present data (their own or a secondary source) using results tables and graphs	

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Year: 7
Science Topic: Energy Transfers & Energy Resources

	Acquiring	Developing	Securing	Mastering	Mastering +
Demonstrating knowledge	• Identify differences and similarities between renewable and non - renewable methods of power generation. • Can name some fossil fuels and their uses. • Respond to ideas on ways of reducing heat transfer to answer questions or suggest solutions to problems. • Represent heat transfer using simple physical models.	• Describe how energy can be transferred from one type of store to another • Use simple models to describe the process of heat transfer. • Describes how fossil fuels are formed.	• Apply the law of conservation of energy to simple energy transfers. • Explain the process of heat transfer through conduction and radiation and suggest how heat losses can be reduced. • Explains why some fuels are renewable and others are not.	• Apply the law of conservation of energy to energy transfers involving multiple stages. • Identify the strengths and weaknesses of particular models of heat transfer.	• Students show a level of knowledge and understanding which is beyond the expectations of a year >>> student.
Applying and communicating in science	• Use scientific forms of language when communicating simple ideas about energy resources and energy transfers. • Identify simple advantages of working together on experiments or investigations. • Suggest improvements to their working methods. • Identify some methods of power generation that people might be against.	• Select appropriate ways of presenting scientific data. • Use appropriate scientific forms of language to communicate scientific ideas and processes. • Use scientific and mathematical conventions when communicating information or ideas. • Identify some limitations and ethical implications of certain types of power generation. • State whether or not data supports the hypothesis	• Distinguish between opinion and scientific evidence relation to global warming and climate change, and use evidence rather than opinion to support or challenge scientific arguments. • Use appropriate scientific and mathematical conventions and terminology to communicate abstract ideas. • Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected. • Appreciate the benefits, limitations and ethical implications of different types of power generation.	• Identify lack of balance in the presentation of information or evidence relating to global warming and climate change. • Choose forms to communicate qualitative or quantitative data appropriate to the data and the purpose of the communication. • Distinguish between data and information from primary sources, secondary sources and simulations, and present them in the most appropriate form. • Explain and evaluate the benefits, limitations and ethical implications of different types of power generation. • Present data to support hypotheses	
Investigative skills	• Identify one or more control variables in solar cell investigation from those provided. • Select equipment or information sources from those provided to investigate solar cells. • Make some accurate observations or whole number measurements relevant to questions or ideas under investigation. • Recognise obvious risks when prompted	• Decide when it is appropriate to carry out fair tests in investigations. • Select appropriate equipment or information sources to address specific questions or ideas under investigation. • Make sets of observations or measurements, identifying the ranges and intervals used. • Identify possible risks to themselves and others. • Suggest improvements to their working methods, giving reasons	• Recognise significant variables in investigations, selecting the most suitable to investigate. • Explain why particular pieces of equipment or information sources are appropriate for the questions or ideas under investigation. • Repeat sets of observations or measurements in case of error, selecting suitable ranges and intervals. • Make, and act on, suggestions to control obvious risks to themselves and others. • Evaluate the effectiveness of their working methods, making practical suggestions for improving them	• Apply scientific knowledge and understanding in the planning of investigations and making predictions, identifying significant variables, including independent, dependent and control variables. • Justify their method choice and number of observations/measurements. • Collect data, choosing appropriate ranges, numbers and values for measurements and observations. • Independently recognise a range of familiar risks and take action to control them. • Evaluate data to identify sources of error	
Maths skills	• Use nutrition labels to identify amount of energy contained in different foods. • Present simple scientific data in more than one way, including tables and bar charts. • Use simple equations to identify the amount energy going in to a system and the energy coming out and therefore the wasted energy.	• Use nutrition labels to identify similarities and differences between the energy content of different types of food. • Draw straightforward conclusions from data presented in various formats. • Identify scientific evidence they have used in drawing conclusions. • Use simple equations to input data about energy transfers to find the missing variable, changing the units where appropriate	• Decide on the most appropriate formats to information on the energy content of different types of food. • Interpret data in a variety of formats, recognising obvious inconsistencies. • Provide straightforward explanations for differences in repeated observations or measurements. • Draw valid conclusions on energy transfers that utilise more than one piece of supporting evidence, including results tables and line graphs	• Suggest reasons based on scientific knowledge and understanding for any limitations or inconsistencies in the information given on food labels. • Select and manipulate data and information and use them to contribute to conclusions. • Draw conclusions that are consistent with the evidence they have collected and explain them using scientific knowledge and understanding. • Make valid comments on the quality of their data. • Be able to rearrange equations to find the missing variable. • Present data (their own or a secondary source) using results tables and graphs	

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Year: 7
Science Topic: Photosynthesis, Adaptations and the Environment

	Acquiring	Developing	Securing	Mastering	Mastering +
Demonstrating knowledge	• Identify ways in which animals are adapted to suit their environments • Use a food chain or web to describe feeding relationships • Use straightforward scientific evidence to answer questions, or to support their findings.	• Use scientific ideas when describing photosynthesis and adaptations • Model the leaf to demonstrate how it is adapted for photosynthesis. • Model feeding relationships using food webs, pyramids of number and pyramids of biomass • Identify scientific evidence that is being used to support or refute ideas or arguments	• Use abstract ideas or models or more than one step when describing photosynthesis and adaptations • Explain photosynthesis and the impact of changes in the environment on feeding relationships • Recognise scientific questions that do not yet have definitive answers. • Identify the use of evidence and creative thinking by scientists in the development of understanding of bioaccumulation	• Use abstract ideas, models or multiple factors when explaining photosynthesis and adaptations • Identify the strengths and weaknesses of particular models of leaves and feeding relationships. • Describe some scientific evidence that supports or refutes particular ideas or arguments, including those in development.	• Students show a level of knowledge and understanding which is beyond the expectations of a year >>> student.
Applying and communicating in science	• Use scientific forms of language when referring to photosynthesis, adaptations and the environment • Identify simple advantages of working together on experiments in to variegated leaves. • Suggest improvements to their working methods when investigating variegated leaves. • Identify some things in science that people might disagree with	• Select appropriate ways of presenting scientific data on effect of light intensity on rate of photosynthesis. • Use appropriate scientific forms of language to communicate scientific ideas and processes. • Calculate a mean from repeat data and use this to support conclusions • Identify some limitations and ethical implications of investigating the effect of light intensity on the rate of photosynthesis • State whether or not data supports the hypothesis	• Distinguish between opinion and scientific evidence in contexts related to science, and use evidence rather than opinion to support or challenge scientific arguments (bioaccumulation) • Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected. • Appreciate the power, limitations and ethical implications of science	• Identify lack of balance in the presentation of information or evidence. • Choose forms to communicate qualitative or quantitative data appropriate to the data and the purpose of the communication. • Distinguish between data and information from primary sources, secondary sources and simulations, and present them to explain how food chains can be effected by changes in the environment. • Explain and evaluate the power, limitations and ethical implications of science. • Present data to support hypotheses	
Investigative skills	• Identify one or more control variables in investigations of photosynthesis or populations size • Select equipment or information sources from those provided to sample two areas of the field • Make some accurate observations or whole number measurements to compare population in two locations on the field. • Recognise obvious risks when prompted	• Decide when it is appropriate to carry out fair tests in investigations. • Select appropriate equipment or information sources to sample two areas of a field • Make sets of observations or measurements, identifying the ranges and intervals used. • Identify possible risks to themselves and others. • Suggest improvements to their working methods, giving reasons	• Recognise significant variables in sampling two areas, selecting the most suitable to investigate. • Explain why particular pieces of equipment or information sources are appropriate for sampling or ideas under investigation. • Repeat sets of observations or measurements in case of error, selecting suitable ranges and intervals. • Make, and act on, suggestions to control obvious risks to themselves and others. • Evaluate the effectiveness of their working methods, making practical suggestions for improving them	• Apply scientific knowledge and understanding in the planning of investigations and making predictions, identifying significant variables, including independent, dependent and control variables to sample and compare two areas of the field • Justify their method choice and number of observations/measurements. • Collect data, choosing appropriate ranges, numbers and values for measurements and observations. • Independently recognise a range of familiar risks and take action to control them. • Evaluate data to identify sources of error	

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Maths skills	• Identify straightforward patterns in observations or in data presented in various formats, including tables, pie and bar charts. (sampling and photosynthesis investigations) • Present simple scientific data in more than one way, including tables and bar charts. (sampling and photosynthesis investigations)	• Identify patterns in data presented in various formats, including line graphs. (photosynthesis investigation) • Draw straightforward conclusions from data presented in various formats. (sampling and photosynthesis investigation) • Identify scientific evidence they have used in drawing conclusions. (sampling and photosynthesis investigation)	• Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. (photosynthesis and sampling investigation) • Interpret data in a variety of formats, recognising obvious inconsistencies. (sampling and photosynthesis investigation) • Provide straightforward explanations for differences in repeated observations or measurements. (sampling and photosynthesis investigation) • Draw valid conclusions that utilise more than one piece of supporting evidence, including results tables and line graphs (sampling and photosynthesis investigation)	• Suggest reasons based on scientific knowledge and understanding for any limitations or inconsistencies in evidence collected. (sampling and photosynthesis investigation) • Select and manipulate data and information and use them to contribute to conclusions. (sampling and photosynthesis investigation) • Draw conclusions that are consistent with the evidence they have collected and explain them using scientific knowledge and understanding. (sampling and photosynthesis investigation) • Make valid comments on the quality of their data. (sampling and photosynthesis investigation) • Present data (their own or a secondary source) using results tables and graphs(sampling and photosynthesis investigation)	