	Emerging a student whose understanding of the Y7 Science skills is still emerging will be able to:	**Developing** a student who is developing their Y7 Science skills will be able to:	**Secure** a student who is secure in the skills in the Y7 Science curriculum will be able to:	**Mastered** a student who has mastered the skills in the Y7 Science curriculum will be able to:
Book 1, Chapter 1 Cells –the Building Blocks of Life	Identify an animal and a plant cell. Recognise that substances are able to move in and out of cells. Name some common organs in the human body. Label some of the parts of a flowering plant. Recognise the role of a seed. Name some of the parts of the human reproductive systems. Understand that substances pass from a mother to her developing foetus.	Recognise and label normal and specialised animal and plant cells; use a microscope to make observations. Describe unicellular organisms – including yeast, bacteria, euglena, paramecium and amoeba – as being either prokaryotes or eukaryotes. Recognise the role of diffusion in living organisms. Put the terms cell, tissue, organ and organ system in order of hierarchy, naming some common tissues, organs and organ systems in humans. Describe the role of different parts of the flowering plant in reproduction. Recognise different seeddispersal methods by the structures of the seeds. Name the main parts of the male and female human reproductive systems. Recognise changes that occur during adolescence. Identify substances passed on from a mother that will either help or harm her developing foetus.	Describe the functions of the nucleus, cell membrane, mitochondria, cytoplasm, cell wall, vacuole and chloroplast. Describe the function of specialised parts of different unicellular organisms. Describe the process of diffusion, and name the materials needed by and those removed from the cell. Explain the terms cell, tissue, organ and organ system and the function of all the main organ systems in the body. Explain the differences in insect-pollinated and insectpollinated plants. Identify key variables that need to be controlled when investigating the effect of seed design on seed dispersal. Describe the structures and functions of the main parts of the male and female human reproductive systems; describe how fertility problems may arise. Describe how the menstruation cycle works. Describe the structures and functions of different parts of a pregnant uterus, describing	Compare and contrast the similarities and differences between normal and specialised animal and plant cells. Explain how different structures help organisms to survive. Explain the factors that affect diffusion. Describe some benefits and disadvantages of multicellular organisms, compared to single-celled organisms. Discuss the strengths and weaknesses of windpollinated and insectpollinated plants. Explain the advantages and disadvantages of different seed-dispersal mechanisms. Explain how the male and female reproductive structures are designed for fertilisation; describe methods to combat infertility. Explain how and why some problems occur with menstruation. Explain how a pregnant uterus is different from a normal uterus, including the impact of different substances on the health and development of a foetus.

Book 1, Chapter 3 Mixing, dissolving and separating	Identify basic lab equipment. Use 2D images to draw basic lab equipment. Identify the equipment needed to separate mixtures. Know that some solids dissolve in liquids and some do not. Understand the processes of evaporation and condensation. Identify the main gases found in air. Know that some solids will dissolve in water and some do not.	Name and draw equipment and explain obvious laboratory risks. Use 2D images to represent a range of laboratory equipment. Describe how to separate mixtures. Describe the process of dissolving and the effect of temperature. Understand that seawater is a mixture. Identify sources and uses of salt. Describe the process of distillation. Describe the composition of air. Identify mixtures using chromatography. Explain the idea of a solvent.	Select and draw apparatus accurately; explain safety precautions. Use laboratory equipment safely to gather evidence. Select and explain appropriate separation techniques. Describe methods for producing crystals of different sizes. Explain why most water is not pure, and why this is not necessarily a problem. Describe how salt is extracted. Explain the physical processes involved in distillation. Identify sources of air pollution and their impact. Explain how to separate a mixture using chromatography and interpret chromatograms. Explain mass changes during dissolving; select solvents for different uses.	Justify equipment choice and measurements; explain how to reduce risks. Record evidence in an effective way. Explain the choice and method of separation using correct terms. Use data to draw conclusions about solubility. Explain why contaminated water is a problem and identify what can be done about it. Recognise advantages and disadvantages of salt extraction methods. Identify the uses and advantages of distillation. Explain how distillation can be used to separate gases in air. Use chromatograms to explain the composition of mixtures; compare chromatography and DNA analysis. Use a model to explain dissolving and separation; link the uses of solvents to their properties.

Book 1, Chapter 4 Elements, compounds and reactions	Give some examples of elements. Understand that many elements are found in the Earth's crust. Identify metals and nonmetals. Understand what a compound is. Know the difference between melting and burning. Make observations of a chemical reaction. Recognise what carbon is used for. Know that when an element reacts with oxygen it is an oxygenation reaction.	Give some examples of elements, locate them in the Periodic Table and use the table to identify metals and non-metals. Describe where some elements are found on Earth and identify some of the oldest known elements. Identify some common properties of metal elements and non-metal elements and their uses. Identify metals and nonmetals using data and suggest a reason for particular applications. Describe an example of a compound and represent a chemical reaction using a simple model. Identify changes during a reaction, relate these to reactants and products, and identify a difference between melting and burning. Make observations and identify reactants and products. Recognise where carbon and its compounds are used. Identify oxidation and decomposition reactions.	Give examples of elements and explain how they are organised in the Periodic Table. Explain why different elements are found in different places and why they were discovered at different times. Classify metals and nonmetals using their properties. Explain the properties of elements using data and why they are used for different applications. Explain how compounds can be formed and explain a chemical reaction using simple models. Make accurate observations, explain them using a simple model and a word equation and explain differences between chemical and physical changes in terms of atoms. Make accurate observations, identify differences, and with support, describe reactions using simple models or word equations. Explain different ways in which carbon is important. Explain why oxidation is a reaction; explain the differences between oxidation and thermal decomposition.	Define elements, use symbols, link the organisation of the Periodic Table to element features and explain how scientists organised the Periodic Table. Use ideas and evidence to explain where and why elements and compounds were found. Identify similarities and differences between metals and how these relate to their uses; compare and contrast properties of metals and nonmetals. Select and justify the use of elements for different purposes, based on their properties. Make links between simple models of compounds and chemical symbols. Explain observations using word equations, relate chemical symbols to a simple circle model and use the correct terms and simple models to explain the differences between chemical and physical changes. Suggest reasons for different observations, describe reactions using word equations and start to use symbols to model chemical reactions. Explain, using the correct terms, where carbon is found and why it is useful. Use models and word equations to explain changes during oxidation and thermal decomposition reactions.

Book 1, Chapter 6 Energy transfer and sound	Name common types of energy. Know that energy can be transferred. Name simple forces. Recognise what is meant by temperature. Recognise that sound energy is transferred by waves. Know that sound can be reflected. Recognise that different organisms hear differently. Know a use for ultrasound.	Recognise that energy is transferred by a range of different processes. Identify simple energy transfers which involve gravitational potential energy, elastic potential energy and chemical energy. Recognise that work can be done by a force, and that the work done is equal to the energy transferred. Recognise what is meant by temperature and how it is measured. Recognise that sound energy is transferred by waves and describe how sound waves are made in different situations. Recognise an echo as a reflection of sound. Recognise that some materials are good at reflecting sound and others can absorb it. Recognise that different organisms hear differently. Name different parts of the human ear. Describe what is meant by infrasound and ultrasound.	Interpret and draw energy transfer diagrams for a range of different energy transfers, including gravitational potential energy, elastic potential energy, chemical energy and electrical energy. Explain how energy is transferred using elastic, gravitational and chemical potential energy. Calculate the work done in different situations, given the size of the force and the distance moved. Explain and make predictions about the direction of heat flow in different situations. Explain how longitudinal waves carry sound. Relate the terms frequency and amplitude to sounds. Describe how to measure the speed of sound, and how the speed of sound can be used in different applications to measure distances. Use the particle model to explain why sound cannot travel through a vacuum. Explain what is meant by reflection and absorption of sound. Explain how parts of the ear are adapted to enable us to hear. Describe what is meant by the term hearing range. Describe a wide range of applications for ultrasound and infrasound.	Use Sankey diagrams to explain a range of energy changes and demonstrate that all energy is always accounted for. Analyse changes in gravitational potential energy in different situations, and compare the energy per gram of different fuels. Explain how simple machines transfer energy in a way that offers an advantage. Explain the difference between temperature and heat. Interpret and devise wave diagrams to represent sounds of different wavelength and amplitude. Use calculations to measure the speed of sound and the distance of objects in different applications, applying ideas about echoes. Use the particle model to explain why the speed of sound is different in solids, liquids and gases, and how energy is transferred in the reflection and absorption of sound. Compare and contrast the detection of sound by an ear and a microphone. Explain why these waves are suitable for their applications

Book 1, Chapter 5 Forces and their effects (statements) with stars from Book 3 chapter 5	List types of force Know that some forces push and some pull. Know that forces can lead to changes in shape. Know that forces can be balanced or unbalanced. Know that friction is a force recognise that streamlining helps objects move through air or water. Know the units that speed can be measured in. *Identify which objects are moving faster or slower. *Identify the forces acting on an object. *Collect data about time taken on a journey.	List types of force and represent forces using force diagrams; use newton meters. Identify gravity as a pulling force and distinguish between mass and weight. Know that forces can lead to changes in shape and investigate the change of shape of a spring. Identify some situations where forces are balanced and recognise that unbalanced forces are needed for a change to take place. Recognise that friction is a force that slows objects down or stops them from moving. List examples where friction is useful and when it is unwanted, recognise that drag forces slow things down, and recognise that streamlining helps objects move through air or water. Explain how to find the speed of an object. *Describe a situation where objects are travelling at different speeds. *Identify the forces acting on an object and explain how they can cancel each other out so that a stationary object does not move. *Collect data about distance travelled and time taken for types of movement or journeys. *Describe some features of distance–time graphs.	Describe the size and direction of forces using force diagrams. Describe what is meant by mass, explain how gravity forces affect weight, explain why weight varies from planet to planet and explain the term ‘weightless’. Explain the relationship between the amount of change in shape and the size of the force, and use data to state Hooke’s Law. Identify forces acting in pairs, and apply an understanding of forces to explain how a force can cause a change in speed and direction. Explain that friction is a contact force opposing the direction of movement. Compare contrasting situations involving friction, explain how friction can be increased or reduced, explain air and water resistance, and explain how streamlining reduces such resistance. Explain the concept of speed and use understanding of speed to explain how the equation for speed is derived. *Apply the idea of relative speed to two objects moving in situations involving overtaking and collisions. *Explain how opposing forces may or may not be in equilibrium and the effect that this has on a stationary object. *Present data you have collected or data you have been given as distance–time graphs. *Analyse distance–time graphs to describe an object’s movement at different stages in a journey.	Explain the how the size and direction of forces determines their effects. Explain weight as a gravitational attraction between masses which decreases with distance; use scientific concepts to explain the difference between mass and weight. Collect accurate data about forces changing the shape of an object, recognise when shape changes regularly with force size, and explain behaviour when the elastic limit is exceeded. Identify different examples of forces and reaction forces, and predict the changes of speed and direction that different forces can cause. Provide a detailed explanation of friction between surfaces. Explain air and water resistance in terms of frictional drag, explain the forces on flying or falling objects, and explain streamlining using scientific vocabulary. Independently derive the equation for speed and use understanding of the speed equation to explain how speed cameras work. *Apply the concept of relative motion to several moving objects in a variety of situations. *Explain how multiple forces may or may not be in equilibrium and identify the effect this has on an object. *Construct distance–time graphs for complex journeys. *Explain distance–time graphs for complex journeys, including where an object travels at different speeds and accelerates at different rates.

Book 1, Chapter 2 Eating, drinking and breathing	Describe the components of a healthy diet (food groups). Identify people that require more or less energy. Identify some of the organs in the digestive system. Describe the role of the stomach and small intestine in digestion. Describe the movements of the ribs during breathing in and out. Identify which gas in air is used in the body.	Describe the components of a healthy diet (food groups). Recall the tests for starch and sugar. Suggest some foods that contain starch and sugar. List groups of people who need different amounts of energy from food. Describe some of the physical effects of obesity and starvation. Describe the cause and symptoms of scurvy and suggest foods to treat it. Name some of the organs of the digestive system. Describe what is meant by physical digestion and chemical digestion. Describe the role of the stomach and small intestine in digestion. Recall the names of some digestive enzymes. Describe the movements of the ribs and diaphragm during breathing in and out. Describe what is meant by lung volume. Describe which gas from the air is used in the body. Describe where gases are exchanged between the lungs and the blood. Describe examples of disease and lifestyle choices that affect the breathing system.	Explain the role of some of the components of a healthy diet. Recall the tests for protein and fats. Suggest several foods that contain proteins and fats. Compare the energy requirements of different people such as men and women, teenagers and the elderly, pregnant and nonpregnant women. Explain some of the physical effects of obesity and starvation. Locate the organs of the digestive system on a diagram. Recall where physical digestion takes place and where chemical digestion takes place. Explain how teeth and saliva are adapted to digest food. Describe the role of the oesophagus, pancreas and large intestine. Describe some adaptations of the organs of the digestive system. Explain the role of three digestive enzymes. Explain how changes in pressure in the chest bring about breathing in and out. Describe two ways of measuring lung volume. Describe four features of the alveoli that help gas exchange. Explain how each feature of the alveoli supports gas exchange. Explain the effects of exercise, asthma and smoking on the breathing system.	Explain the role of all of the components of a healthy diet. Predict the observations of food tests for several foods for starch, sugar, protein and fats. Explain why different groups of people have different energy requirements. Use data on packaging to plan how individuals could meet their energy requirements. Name the organs of the digestive system in the order that food passes through them. Explain the link between digestion and circulation. Explain how the structure of each of the organs of the digestive system supports its function. Explain how visking tubing can be used to model the digestive system. Compare the pressure in the chest before breathing in and breathing out with atmospheric pressure. Explain the difference between breathing and respiration.