The Hastings Academy: Grade Descriptors for use at Key Stage 3 – Science year 9

Yr 7 Expectations	Reporting	Yr 8 Expectations	Reporting	Yr 9 Expectations	Reporting	**Assessment Objective Biology**	**Assessment Objective Chemistry**	**Assessment Objective Physics**	**Assessment Objective Science Investigations**
				Mastered	Well Above Expectations	• I can explain how evolution occurs by a process of natural selection and accounts both for biodiversity and how organisms are all related to varying degrees. • I can explain how living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways - living organisms are interdependent and show adaptations to their environment. • Can link diffusion with wilting. • I can explain the effects of anaerobic respiration on the body during and after exercise	• I can apply my knowledge of patterns in chemical reactions to suggest how substances, such as salts, could be made. • I understand the applications of chemical reactions in everyday contexts, such as the extraction of iron in the blast furnace • I can explain the atomic structure of the first twenty elements in the periodic table. • I can explain the differences between chemical reactions which are exothermic and those which are endothermic.	• I can evaluate physical phenomena from different perspectives, such as relating the dissipation of energy during energy transfer to the need to conserve limited energy resources.	• Unaided, I can prepare systematic and precise plans for their investigations, including a strategy for dealing with results. • Unaided, I can prepare systematic and precise plans for their investigations, including a strategy for dealing with results. • I can decide on the observations and measurements that need to be taken and the degree of accuracy that is required. • I can set up and use a range of scientific apparatus with precision and skill.
		Mastered	Well Above Expectations	Extended	Above Expectations	• I can explain how living organisms are interdependent and show adaptations to their environment. • I can explain how the characteristics of a living organism are influenced by its genome and its interaction with the environment. • I can describe how the chemicals in ecosystems are continually cycling through the natural world. • Can explain and measure muscle strength. • I can explain bioaccumulation in food chains and some effects of this. • I am able to explain how a leaf is adapted for photosynthesis.	• I can apply my knowledge of particles to explain changes of state and dissolving. • I can describe the effects of corrosive gas pollutants. • I can evaluate the positive and negative effects of the exploitation of raw materials. • I can explain why temperature has a greater effect on rate than surface area and concentration.	• I can apply my knowledge and understanding to a range of contexts including unfamiliar situations. • I can use the principle of moments in practical situations. • I can explain the process of energy transfer by conduction, convection and radiation. • I can describe the relative movement of the Sun and planets within the solar system including the retrograde motion of Mars. • I can plan (with guidance) investigations. Identifying key factors that need to be considered.	• I can decide on the observations and measurements that need to be taken and the degree of accuracy that is required . • I can set up and use a range of scientific apparatus with precision and skill. • I can plan (with guidance) investigations. Identifying key factors that need to be considered. • I can present my data clearly and concisely using graphs with lines of best fit. • I can present my data clearly and concisely using graphs with lines of best fit. • I can produce (unaided) precise plans for my investigations. • I can evaluate my investigations and produce structured reports

Mastered	Well Above Expectations	Extended	Above Expectations	Secure	Meeting Expectations	• I understand that genetic information is carried in the form of chromosomes and genes. • I know the requirements to maintain a healthy body. • I understand the processes of cell respiration and photosynthesis in terms of the main underlying chemical changes. • I can explain the effects of different hormones on plant growth. • I know the word equation for anaerobic respiration. • I can describe the differences between aerobic and anaerobic respiration in animals.	• Can predict the salt formed from a neutralisation reaction. • I can explain the effect of carbon dioxide levels on global temperatures. • I can evaluate evidence of human impact and give balanced views on factors affecting a product's carbon footprint. • I can describe the methods of monitoring water purity.	• Can apply my knowledge and understanding to a range of contexts including unfamiliar situations. • Can produce (unaided) precise plans for my investigations. • Can evaluate my investigations and produce structured reports . • I can explain the process of energy transfer by conduction, convection and radiation. • I understand that global resources are limited and explain why energy should be used efficiently. • I can describe simple applications of electromagnets. • I understand the relationship between applied force, the area over which it acts and the resulting pressure. • I can describe energy conversions in terms of the principle of the conservation of energy • I understand how light is reflected from plane surfaces and that white light can be dispersed to give a range of colours. • I can explain changes in day length, seasonal changes and changes in the elevation of the Sun.	• I can present my data clearly and concisely using graphs with lines of best fit. • I can explain my conclusions using the evidence collected and my knowledge and understanding of science. • I can apply my scientific knowledge from other investigations to plan an investigation.

Extended	Above Expectations	Secure	Meeting Expectations	Approaching	Below Expectations	• I know and understand the differences between plant and animal cells. • I understand why food chains and food webs exist in the environment • I understand the circulatory, digestive and respiratory systems in humans and can use appropriate scientific terminology to describe them. • I know that plants need mineral salts. • I can describe how gases enter and leave leaves.	• I can identify common gases. • I can use the pH scale when classifying solutions as acidic, alkaline or neutral. • I can explain rusting in terms of oxidation and know how rusting can be controlled. • I can discuss the positive and negative effects of obtaining and using the raw materials from the Earth. • I am able to relate carbon dioxide levels to global warming and how humans can impact carbon dioxide levels. • I can calculate relative formula mass. • I can relate energy changes to the bond being broken and made. • I can use particle diagrams to explain the effect of temperature, catalysts, surface area and concentration on the rate of a chemical reaction . • Can compare exothermic and endothermic reactions.	• Can compare specular reflection and diffuse scattering. • I understand the relationship between applied force, the area over which it acts and the resulting pressure. • I can distinguish between temperature and thermal energy • I can describe energy conversions in terms of the principle of the conservation of energy. • I can recall that energy sources are ultimately dependent on the Sun's energy. • I understand the meaning of temperature. • I can identify a variety of energy sources and know the difference between renewable and non-renewable sources • I can explain the relationship between loudness and amplitude, and pitch and frequency of a sound. • I can describe how day, night and year length are caused by the movement of the Earth.	• I can explain my conclusions using the evidence collected and my knowledge and understanding of science • I can use my knowledge to make predictions about what they think will happen. • I can interpret my data and begin to explain these using my scientific knowledge and understanding. • I can draw conclusions and relate it to my knowledge and understanding. • Can make predictions using my scientific knowledge.
Secure	Meeting Expectations	Approaching	Below Expectations	Developing		• I can assign organisms to their major groups. • I know the functions of food, the roles of nutrients in the diet and the reasons for maintaining a healthy diet. • I can describe, in simple terms, the parts and basic functions of the major organ systems in humans.	• I can suggest why certain materials are suitable for specific purposes . • I know that products made from paper, glass or aluminium can be recycled. • Can identify reactants and products in word equations. • I can summarise the carbon cycle and how humans may affect this. • I am able to relate recycling to reducing a product's carbon footprint. • I can describe methods to monitor the rate of a chemical reaction.	• Can contrast the speed of sound with speed of light. • Can describe the link between frequency and pitch. • Can explain how images are formed in a mirror. • Can explain what refraction is . • I understand the meaning of temperature. • I can identify a variety of energy sources and know the difference between renewable and non-renewable sources. • I can describe how forces can affect the movement and shape of objects. • I can identify a range of energy sources. • I can carry out a fair test and say which factors need to be kept constant	• I can design a fair test to answer questions that arise from their work in science. • I can use my knowledge to make predictions about what they think will happen . • I can interpret my data and begin to explain these using my scientific knowledge and understanding. • I can draw conclusions based on the available evidence • I can use a range of apparatus with appropriate precision and safety. • I can interpret my data and begin to explain these using my scientific knowledge and understanding. • I can draw conclusions based on the available evidence

Approaching	Below Expectations	Developing		Beginning	Well Below Expectations	• I can classify the animals and plants found in a local habitat using groupings • I can name the major organs of the human body and identify the position of these organs	• I know that some everyday substances, such as sugar or salt, will dissolve in water. • I know that materials, such as wood, decay naturally while others, such as plastics, do not. • I am able to state that humans can have impact on the Earth and the importance of recycling. • I can describe what happens when some everyday substances are heated or cooled.	• Can state that a wave carries energy. • Can name the two main types of waves. • Can describe how sound waves travel. • I can recall that there are different sources of energy, such as oil, gas or coal. • Can describe transverse and longitudinal waves. • Can explain why speed of sound changes in different materials. • Can describe link between loudness and amplitude. • I can describe how heat transfers from different places. • I know that there are different sources of energy. • I can explain that sounds are produced by vibrations.	• I can suggest how ideas can be investigated and make predictions about what might happen. • I can carry out a fair test and say which factors need to be kept constant. • I can draw conclusions and relate it to my knowledge and understanding. • I can use appropriate instruments to make measurements and know when a test is fair. • I can make a simple record of my observations . • Can interpret my data and begin to explain these using my scientific knowledge
Developing		Beginning	Well Below Expectations						
Beginning	Well Below Expectations								

The Hastings Academy: Grade Descriptors for use at Key Stage 3 – Science Year 8

Yr 7 Expectations	Reporting	Yr 8 Expectations	Reporting	Yr 9 Expectations	Reporting	**Assessment Objective Biology**	**Assessment Objective Chemistry**	**Assessment Objective Physics**	**Assessment Objective Science Investigations**
				Mastered	Well Above Expectations				
		Mastered	Well Above Expectations	Extended	Above Expectations	• I am able to explain the importance of plants. • I know the difference between photosynthesis and chemosynthesis. • I can explain how the characteristics of a living organism are influenced by its genome and its interaction with the environment. • I can explain bioaccumulation in food chains and some effects of this.	• I recognise the Periodic Table as a means of arranging elements and can describe the physical and chemical properties of elements in terms of their position. • I can explain the differences between mixtures and compounds in terms of their physical and chemical properties. • I can explain the trend in reactivity of Group 1 • I can use the reactivity series to make predictions about reactions of metals. • I can explain trends and patterns in the periodic table. • I can describe the physical and chemical properties of metals and non-metals and their compounds. • I can apply my knowledge of patter ns in a chemical reaction to suggest how substances, such as salts, could be made.	• Can describe what happens when waves superpose. • Can compare the eye with a camera. • I can find speed and acceleration from graphs. • I can give detailed interpretations of graphs, such as speed/time graphs. • I can apply my knowledge and understanding to a range of contexts including unfamiliar situations.	• Can apply my knowledge and understanding to a range of contexts including unfamiliar situations. • Can produce (unaided) precise plans for my investigations. • Can evaluate my investigations and produce structured reports. • I can decide on the observations and measurements that need to be taken and the degree of accuracy that is required. • I can set up and use a range of scientific apparatus with precision and skill.

Mastered	Well Above Expectations	Extended	Above Expectations	Secure	Meeting Expectations	• I understand that genetic information is carried in the form of chromosomes and genes. • I can describe the important stages in evolution by natural selection. • I can describe the effects drugs have on the body.	• I can describe some methods of separation to obtain pure substances from mixtures. • I can explain the differences between elements, compounds and mixtures. • I can relate the properties and uses of everyday materials. • I can explain the differences between mixtures and compounds in terms of their physical and chemical properties. • Can write balanced symbol equations for common reactions.	• Can explain why the speed or direction of motion of objects can change. • Can compare human hearing range with other animals. • Can explain uses of ultrasound. • Can compare specular reflection and diffuse scattering. • Can explain how surfaces appear coloured. I can plan (with guidance) investigations. Identifying key factors that need to be considered. • I can present my data clearly and concisely using graphs with lines of best fit. • I can use the principle of moments in practical situations. • I can explain the process of energy transfer by conduction, convection and radiation. • I can describe, in simple terms, the relationship between the angle of incidence and the angle of reflection.	• I can plan (with guidance) investigations. Identifying key factors that need to be considered. • I can present my data clearly and concisely using graphs with lines of best fit. • Can apply my knowledge and understanding to a range of contexts including unfamiliar situations
Extended	Above Expectations	Secure	Meeting Expectations	Approaching	Below Expectations	• I understand that organisms compete for resources. • I know that living organisms show variation. • I am able to explain what causes variation. • I know where genes are found inside a cell.	• I am able to describe the trend in the acidity of metal oxides and use this to make predictions. • I can describe the composition of the atmosphere. • Can write and interpret chemical formulae. • Can write symbol equations for common reactions.	• Can contrast the speed of sound with speed of light. • Can describe the link between frequency and pitch. • Can analyse ways hearing can be damaged. • Can describe what ultrasound is. • Can explain how images are formed in a mirror. • Can explain what refraction is. • Can explain how the eye works. • Can describe how primary colours of light combine to make secondary colours. • Can make predictions using my scientific knowledge. • I can calculate mean speed from measurements made of distance and time. • I understand how light is reflected from plane surfaces and that white light can be dispersed to give a range of colours.	• I can apply my scientific knowledge from other investigations to plan an investigation. • I can explain my conclusions using the evidence collected and my knowledge and understanding of science. • I can interpret my data and begin to explain these using my scientific knowledge and understanding.

Secure	Meeting Expectations	Approaching	Below Expectations	Developing		• I can name the main resources that plants and animals need to survive. • I can give examples of genetic and environmental variation. • I can recall the names of some illegal recreational drugs. • I understand the ways by which human activity, such as deforestation, can change the environment	• I can use the terms mixture and compound accurately. • I can describe some methods for separating compounds. • I can describe how repeating patterns in the elements led to the development of the Periodic Table . • I can interpret my data and begin to explain these using my scientific knowledge and understanding. • Can match an element to its correct symbol. • Can compare the properties of one atom of an element to the properties of many atoms. • Can identify reactants and products in word equations.	• Can describe transverse and longitudinal waves. • Can explain why speed of sound changes in different materials. • Can describe link between loudness and amplitude. • Can describe the functions of the parts of the ear. • Can describe what an echo is. • Can describe the parts of the eye. • I can explain the relationship between loudness and amplitude, and pitch and frequency of a sound.	• I can use a range of apparatus with appropriate precision and safety. • I can use my knowledge to make predictions about what they think will happen. • I can draw conclusions and relate it to my knowledge and understanding
Approaching	Below Expectations	Developing		Beginning	Well Below Expectations	• I can use my knowledge of basic life processes, such as growing, feeding, moving or using their senses, to describe similarities and differences between living things. • I know the conditions necessary to keep healthy. • I can provide simple explanations for changes affecting animal and plant behaviour.	I can recognise key areas of the Periodic Table, namely metals and non-metals, the noble gases and groups 1, 2 and 7. • I am able to state that temperature, catalysts surface area and concentration may affect the rate of a chemical reaction. • I can carry out a fair test and say which factors need to be kept constant. • I can draw conclusions and relate it to my knowledge and understanding. • Can describe what elements and compounds are. • I can sort materials into groups according to their properties.	• Can name the two main types of waves. • Can describe how sound waves travel. • Can name the parts of the ear. • I know how shadows are formed. • I can carry out a fair test and say which factors need to be kept constant. • I can draw conclusions and relate it to my knowledge and understanding	• I can carry out a fair test and say which factors need to be kept constant. • I can draw conclusions based on the available evidence. • I can suggest how ideas can be investigated and make predictions about what might happen.
Developing		Beginning	Well Below Expectations			• I know what is required to keep healthy and safe.	• I can describe a variety of ways of sorting materials into groups according to their properties. • Can name an element. • I can compare familiar objects, materials and living things and predict what might happen. • I can sort materials into groups.	• Can state that a wave carries energy. • Can simply state how the ear works. • I can explain that sounds are produced by vibrations. • I know some colours are more easily seen in the dark. • I can explain that sounds are produced by vibrations. • I know that light does not pass through all materials and when this happens shadows are formed.	• I can use appropriate instruments to make measurements and know when a test is fair. • I can make a simple record of my observations and conclusions.
Beginning	Well Below Expectations								

The Hastings Academy: Grade Descriptors for use at Key Stage 3 – Science Year 7

Yr 7 Expectations	Reporting	Yr 8 Expectations	Reporting	Yr 9 Expectations	Reporting	**Assessment Objective Biology**	**Assessment Objective Chemistry**	**Assessment Objective Physics**	**Assessment Objective Science Investigations**
				Mastered	Well Above Expectations				
		Mastered	Well Above Expectations	Extended	Above Expectations				
Mastered	Well Above Expectations	Extended	Above Expectations	Secure	Meeting Expectations	Can draw cells viewed under a microscope to scale • Can calculate magnification of a microscope. • Can demonstrate a good understanding of cell structure and function. • Can relate structure and function of specialised cells. • Can evaluate different methods of seed dispersal. • Can relate the structure of the lungs to efficient gas exchange. • Can explain the changes that occur during breathing. • Can explain how organ systems link together. • Can describe diffusion. • I can label a diagram showing a cross section of the leaf. • I am able to explain why foods need to be digested. • I can recall the word equation for aerobic respiration	• I can use explain the differences in the three states of matter using the particle model. • Can predict state of matter from data on boiling and melting points. • Can compare diffusion speed in different states of matter. • Can use a pattern to predict products of decomposition reactions. • Can explain sublimation. • I can apply my knowledge of particles to explain changes of state, diffusion and dissolving	Can interpret a graph showing Hooke's Law in extension of a spring. • Can calculate weight using the correct equation. • Can describe situations that are in equilibrium. • I can relate the term 'energy' to work. • I understand a voltage across a circuit component. • I can use models to describe and explain phenomena, such as the flow of charge in parallel circuits.	Can apply my knowledge and understanding to a range of contexts including unfamiliar situations. • Can produce (unaided) precise plans for my investigations. • Can evaluate my investigations and produce structured reports. • Can make predictions using my scientific knowledge.

Extended	Above Expectations	Secure	Meeting Expectations	Approaching	Below Expectations	Can prepare good slides and view using a microscope under different magnifications. • Can explain functions of the parts of plant and animal cells. • Can explain how different cells are specialised for their functions. • Can describe changes from fertilisation to birth. • Can describe the menstrual cycle. • Can compare the differences between wind and insect pollinated flowers. • Can relate a model of the lungs to breathing. • Can name some substances that move in and out of cells. • I understand why most food chains begin with a plant. • I can write a word equation for photosynthesis. • I can list how a leaf is adapted for photosynthesis. • I understand why we need a balanced diet. • I can describe how food is digested and absorption. • I can describe the functions of the main organs in the digestive system.	Can interpret data about melting points. • Can interpret data from tables and graphs about changes of state. • Can explain what factors affect diffusion. • Can analyse why chemical reactions are useful. • Can explain what a thermal decomposition reaction is. I can plan (with guidance) investigations. Identifying key factors that need to be considered. • Can use ideas about particles to explain the properties of a substance in its three states. • Can use the particle model to explain boiling. • Can describe evidence for diffusion. • Can compare chemical reactions to physical reactions. • Can write word equations for common reactions. • Can explain what an oxidation reaction is. • Can explain what conservation of mass is. • Can describe some uses of neutralisation reactions. • I can describe the changes in state in heating and cooling water.	• Can compare weight and mass. • Can compare balanced and unbalanced forces. • Can explain why the speed or direction of motion of objects can change. • I can use the principle of moments in practical situations. • I can explain the process of energy transfer by conduction, convection and radiation. • I understand that global resources are limited and explain why energy should be used efficiently. • I can describe simple applications of electromagnets.	• Can apply my scientific knowledge from other investigations to plan an investigation . • Can explain my conclusions using the evidence collected and my knowledge and understanding of science. • I can plan (with guidance) investigations. Identifying key factors that need to be considered. • I can present my data clearly and concisely using graphs with lines of best fit.

Secure	Meeting Expectations	Approaching	Below Expectations	Developing		• Can prepare own slides and view under a microscope. • Can draw and label plant and animal cells. • Can describe sexual intercourse and fertilisation. • Can name the label the main structures in flowers and describe fertilisation. • Can explain gas exchange across the alveoli. • I can describe how organisms are adapted. • I can draw a food chain. • I can name the food groups in a balanced diet • I can label the main organs in the digestive system.	• Can use particle model diagrams to explain the properties of different states. • Can use the particle model to explain diffusion. • Can write the chemical names for simple compounds. • Can identify reactants and products in word equations. • Can explain combustion. • I can describe some methods for separating compounds. • I can describe changes in the rock cycle.	Can explain what forces do. • Can describe how forces deform objects. • Can evaluate how to reduce drag and friction. • Can analyse data about planets in the solar system. To explain day and night and why we have seasons. • I understand the relationship between applied force, the area over which it acts and the resulting pressure. • I can calculate the average speed from measurements made of distance and time. • I can distinguish between temperature and thermal energy. • I can describe energy conversions in terms of the principle of the conservation of energy. • I can recall that energy sources are ultimately dependent on the Sun's energy. • I can recall the properties of electromagnets.	Can design a fair test to answer questions that arise from their work in science. • Can interpret my data and begin to explain these using my scientific knowledge and understanding. • I can use a range of apparatus with appropriate precision and safety. • I can explain my conclusions using the evidence collected and my knowledge and understanding of science.
Approaching	Below Expectations	Developing		Beginning	Well Below Expectations	• Can use a microscope to view prepared slides. • Can label plant and animal cells correctly. • Can identify the main organs of the reproductive system. • Can describe the function of flowers and seeds. • Can name the main organs and structures in the breathing and circulatory systems. • I can provide simple explanations for changes affecting animal and plant behaviour, such as seasonal changes or the use of colour in camouflage.	• I can recognise the need for safety precautions • Can describe how materials are made up of particles. • Can describe changes of state using keywords. • Can explain how we know a chemical reaction has occurred. • Can compare properties of acids and alkalis. • Can use the pH scale to identify acids, alkalis and neutral solutions. • I can describe the layers of the Earth.	• Can describe the most commonly used forces. • Can draw and label a force diagram. • Can describe the effects of drag and friction. • Can compare planets in the solar system. • I understand the meaning of temperature. • I can identify a variety of energy sources and know the difference between renewable and non-renewable sources. • I can describe the effect of friction on moving objects. • I can recall the properties of magnets and the magnetic field pattern produced by a bar magnet. • I can describe the effect of changing current in an electric circuit and explain what happens in series and parallel circuits	• Can suggest how ideas can be investigated and make predictions about what might happen. • Can carry out a fair test and say which factors need to be kept constant. • Can draw conclusions and relate it to my knowledge and understanding. • I can use a range of apparatus with appropriate precision and safety. • I can interpret my data and begin to explain these using my scientific knowledge and understanding.

Developing		Beginning	Well Below Expectations			Can use a microscope with help to view prepared slides. • Can name some parts of plant and animal cells. • Can describe what the lungs and heart are for. • Can describe some changes that occur at puberty. • I can sort living things into groups using observable features, such as number of legs or shape of leaf. They sequence the basic stages of human development and know what is required to keep healthy and safe.	• Can describe a way to tell if a chemical reaction has occurred. • Can explain why a fuel is useful. • Can carry out chemical reaction practicals with some assistance . • Can describe what happens when some everyday substances are heated or cooled.	• Can describe what forces do and name some common forces. • Can describe the structure of the universe. • Can describe eclipses.. • I can describe how forces can affect the movement and shape of objects. • I can identify a range of energy sources, such as a battery for a torch. • I can describe how heat transfers from different places. • I can describe how to construct simple circuits using terms, such as switches, bulbs or batteries, and identify materials as insulators or conductors.	I can carry out a fair test and say which factors need to be kept constant. • I can draw conclusions and relate it to my knowledge and understanding. • Can suggest how ideas can be investigated and make predictions about what might happen.
Beginning	Well Below Expectations					Can only view prepared slides if microscope is already set up. • Can name very few or no parts of a plant or animal cell. • Can name only a few of the organs of the breathing and circulatory system. • I can sort living things into groups using observable features, such as number of legs or shape of leaf . • I can talk about a variety of living things and sort them into animals and plants. • They recognise and name external parts of the body, using words such as head or arm, and of plants, using words such as leaf or flower. • Can compare familiar objects, materials and living things and predict what might happen.	Can name a fuel. • Can name one acid or alkali. • Can only carry out chemical reaction practical's with assistance.	• Can describe a force as a push or pull. • Can name some planets, but not their order. • Can name a phase of the moon. • Can compare familiar objects, materials and living things and predict what might happen. • Can only name one or two common forces. • Can name objects in the solar system. • Can describe the phases of the moon. • I can talk about some appliances in the classroom and at home which use electricity, such as a television or a kettle. • I can describe what happens when objects are pushed and pulled, using terms such as 'speeds up' or 'stops'. • I can recall that there are different sources of energy, such as oil, gas or coal. • I can outline the dangers of misuse of mains electricity and know how to use electrical appliances safely.	I can suggest how ideas can be investigated and make predictions about what might happen. • I can use appropriate instruments to make measurements and know when a test is fair.