Clifford Holroyde SEN School
Knowledge Based Curriculum Map

SUBJECT_____ SCIENCE _____

Yr 7	Autumn Term 1	Spring Term 1	Summer Term 1
1	Using a microscope - Knowledge – Understanding how to use a microscope. Correctly identifying working mechanism and what they are used for. Correctly working with a microscope to identify cells in plants, animals and humans. Numeracy – Shape, space and measure – –	Speed as a measurement – knowledge – Understand Speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time). The representation of a journey on a distance–time graph; relative motion: trains and cars passing one another. Numeracy – Handling data – – -	Atoms – knowledge - Understand what an atom is and its key characteristics. Explain what molecules are. Provide information about what atoms are made up from. Numeracy – Shape, space and measure – – -
2	Observing animal cells - Knowledge – Accurately label an animal cell. describe the functions of the cell membrane, cytoplasm, nucleus and mitochondria. Numeracy – Shape, space and measure – – -	Forces – knowledge - Identify different types of forces. Explain what a balanced and unbalanced force is. Give examples of unbalance and balanced forces. Numeracy – Number/algebra – – -	Elements and the periodic table – knowledge - Familiarise with the periodic table. Understand the different physical and chemical properties. Numeracy – Handling data – – -
3	Observing plant cells - Knowledge – Accurately label a plant cell. Describe the Structure and function of living organisms: Cells and organisation: the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts; the similarities and differences between plant and animal cells. Numeracy – Shape, space and measure	Gravity and weight – knowledge - Identify different weights. Explain what is meant by weight. Give examples of forces and changes in movement. Numeracy – Number/ algebra – – -	Groups and periods Atoms, elements and compounds – knowledge - Identify the different sections and reasons for this. Understand the difference between elements, atoms and groups. Numeracy – Handling data – – -

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4	Diffusion in cells – knowledge - To describe what diffusion is. To recognise how diffusion works in the movement of materials. Discover what materials move in and between cells. Numeracy – Shape, space and measure – – -	Friction and density – knowledge - Identify how friction can be useful. Explain how friction is used in every day life. Discover different types of density. Numeracy – Algebra/ number – – -	Differences between mixtures and compounds – knowledge- Understand how mixtures are formed. Identify the differences in mixtures and compounds. Discover chemical symbols and formulas. Numeracy – Shape, space measure – – -
5	Adaptations of unicellular organisms – knowledge - To describe what a unicellular organism is. To recognise different forms of unicellular organisms. Numeracy – Shape, space and measure – – -	Balanced and Unbalanced forces – knowledge - adding forces in one dimension, balanced and unbalanced forces; forces measured in newtons Numeracy – Number/algebra – – -	Chemical symbols and formulas – knowledge - Identify the differences in mixtures and compounds. Discover chemical symbols and formulas. Numeracy – Number/ algebra – – -
6	Cells, tissues, organs and systems – knowledge - To describe what hierarchical organisation is. To recognise different organ systems. Discover what organs make up different systems. Numeracy – Proportion and shape – – -	Forces and space – knowledge - Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only) Numeracy – Number/ algebra – – -	Chemical reactions – knowledge - Identify different chemical reactions and their forms. Understand chemical formula Numeracy – Carry out calculations – – -
7	The human skeleton, muscles and movement – knowledge - To identify some bones in the human body. To distinguish between long and short bones. To understand the relationship between muscles and bones. Numeracy –	Stretching and squashing – knowledge - Identify what stretching is. Explain what squashing is. Give examples of stretching and squashing. Numeracy – shape, space and measure – – -	Chemical reactions – knowledge - Understand chemical formula. Discover chemical displacement. Numeracy – Carry out calculations – – -

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8	Circulation – heart and CPR – To understand how the circulatory system works. To know what CRP is used for. To feel confident with CRP. Numeracy – Number/algebra – – -	between Air and Water resistance. Identify the two types of resistance. Understand how resistance is formed. Discover the differences. Numeracy – Carry out calculations – – -	Pressure in chemicals – knowledge – Understand how pressure can be increased and decreased. Numeracy – Shape, space and measure – – -
	Autumn Term 2	**Spring Term 2**	**Summer Term 2**
9	Matter and properties – knowledge - To understand the different states of matter. To describe the different types of states of matter. To produce examples of the different states of matter. Numeracy – Shape. Space and measure – – -	The human digestive system – Knowledge - Identify the organs involved in human digestion and understand their functions. Numeracy – Shape. Space and measure – – -	Species – knowledge - Identify what a species is. Define characteristics of different species. Understand the differences between species. Numeracy – Number and shape – – -
10	The particle model – knowledge - To understand the what the particle matter is. To describe key characteristics of particles. Numeracy – Proportion and shape – – -	Digesting food – knowledge – understand how the digestive system digests food (enzymes simply as biological catalysts). Numeracy – Number, space and measure – – -	Variation within a species – knowledge - Understand the different variations between species. Identify the concepts of discontinuous and continuous variation. Produce examples of species. Numeracy – Algebra and number – – -
11	Particle behaviour – knowledge - To understand the what is meant by particle behaviour. To describe changes in the states of matter. To show elements that can change into more than one state of matter. Numeracy – shape, space and measure	Bacteria and digestion – knowledge- Identify the purpose of bacteria in digestion. Explain areas where bacteria are present. Give examples of how food is tested Numeracy – Handling data	Genetics - Understand the genetic code that is passed down from parents. Identify the DNA model and key characteristics. Numeracy – Handling data –

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12	Changing state – knowledge - To understand how temperature effects states of matter. To recall melting point and heating points of materials. To discover that melting point and boiling points can change with materials. Numeracy – Shape, space measure – – -	Food groups – knowledge - Identify what consists of a food group. Understand the different food groups. Provide examples of dietary needs. Numeracy – Number and algebra – – -	Chromosomes, genes and DNA, The DNA model – knowledge - Revisit the DNA model. Understand the importance of chromosomes. Discover the pioneers of DNA. Numeracy – Handling data – – -
13	Gases – knowledge - To understand how gases move. To recall Brownian motion and its principles. To discover how particles in a gas behave under pressure. Numeracy – Shape, space and measure – – -	Malnutrition and obesity – knowledge - Explain what malnutrition is. Identify what obesity is. Produce examples of how malnutrition and obesity is approached in the NHS. Numeracy – Shape, space and measure – – -	Extinction, Gene banks and biodiversity – knowledge - Understand the term extinction and make links with species. Identify reasons that contribute to extinction. Predict future problems humanity could face. Numeracy – Number and algebra – – -
14	Water – knowledge - To understand how water moves. To recall water molecules and how they bond. To discover how particles in water behave under pressure. Numeracy – Shape, space and measure	Energy requirements - Explain energy requirements that are present in different foods. Explain where human energy comes from. Understand different foods and their energy variations. Numeracy – Calculate arithmetic means	Adaptation – knowledge - Understand what adaptation is and what form it can take. Identify how some species are more impactful than others. Discover natural selection. Numeracy – Ratio –
15	Mixtures, filtering and evaporation – knowledge - To understand how mixtures form. To recall the filtration processes. To discover how evaporation happens. Numeracy – Shape, space and measure	Drugs and misuse – knowledge - The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. Numeracy – Handling data	Natural selection and evolution/Selective breeding – knowledge - Recall what natural selection is. Explore the impact of selective breeding. Discuss the ethics of selective breeding. Numeracy – interpreting data

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Yr 8	Autumn Term 1	Spring Term 1	Summer Term 1
1	Photosynthesis, leaves and photosynthesis- knowledge- To describe what photosynthesis is. To recognise the process of photosynthesis and recognise the formula. Numeracy – Understanding/using simple formula – – -	Energy – knowledge – to understand that energy is required for movement. To understand what energy is used to power different objects including life. Numeracy – Handling data – – -	Describing waves – knowledge – to identify key features of waves. To understand the different waves and types of energy that is transferred. Numeracy – Number and shape – – -
2	Minerals from soil – knowledge- To describe ways that plants obtain nutrients from the soil. Know that different soils have different nutrients. Numeracy – Space, shape and time – – -	Energy – knowledge -To recognise energy as a quantity. Appreciate fuel limitations and energy resources that we have on Earth. Numeracy – Handling data – – -	Light as a wave – knowledge – to Identify lights sources. To understand that light travels in waves. To recall dangers associated with light. Numeracy – Understanding frequency – – -
3	Gas exchange in plants – knowledge -To recognise that photosynthesis and gas exchange share similar properties. Numeracy – Handling data – –	Conservation of energy and changes – knowledge – Understand that energy is classed as renewable and non-renewable. Describe ways to generate energy for sustainability. Numeracy – Algebra and number – –	Refraction of light -knowledge– To identify what refraction of light is. To understand ways of showing refraction. To understand that colour has seven colours and explain how to spilt them. Numeracy – Angles and number – –

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4	Breathing – knowledge -To understand the functions of your lungs. To identify the key features of the lungs. To locate and explain the site that gas exchange happens. Numeracy – Capacity – – -	Energy from food – knowledge- Understand that food provides energy for most organisms. To know that energy can undergo Chemical and physical changes. Numeracy – Number – – -	Sound – knowledge – To understand how sound travels. To consider ways to hinder and enhance sound travel. Numeracy – Algebra and handling data – – -
5	Aerobic and anaerobic respiration and energy- knowledge - To know differences in both key terms. To explain ways to enhance both systems. To know how both systems work. Numeracy – Capacity and volume – – -	Fuels – knowledge – Understand the need for improvements in energy. Identify different types of fuel and how they are extracted. Understand that fuels are typically not renewable. Numeracy – Number and shape – – -	Detection of sounds – knowledge – To understand what sound is and how it travels. To have good knowledge of how sound can be detected and ways to avoid detection. Numeracy – Shape and volume – – -
6	Exercise, asthma and smoking – knowledge – To understand the benefits of exercise. To know what asthma is and reasons for this. To understand the dangers of smoking including physical and mental health. Numeracy – shape and number/ handling data	Heating, conduction and convection – knowledge- Appreciate that heat can be lost. Identify what conduction and convection are and how we use them effectively. Numeracy – Number and shape/ energy transfer	Loudspeakers and microphones – knowledge – To understand how loudspeakers and microphones work. To appreciate the advances in science. Numeracy – Ratio –
7	The circulatory system and blood – knowledge – To understand the functions and organs involved in the circulatory system. To identify the key features of blood. Numeracy – Space, shape and volume –	Radiation, Evaporation – knowledge – Understand that radiation can have large amounts of energy but that comes with dangerous consequences. Numeracy – Space, shape and volume	Ultra sound, waves energy and speed – knowledge – To understand how to measure speed. To describe ways ultra sound can be used. Numeracy – Shape, space and volume –

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	Autumn Term 2	Spring Term 2	Summer Term 2
8	Acids and alkalis – knowledge - Defining acids and alkalis in terms of neutralisation reactions; the pH scale for measuring acidity/alkalinity; and indicators. Numeracy – Volume – – -	Reproduction in plants and pollination – knowledge – To understand that plants and animals reproduce. To identify different ways organisms reproduce. Numeracy – Ratio – – -	Ecosystems – Knowledge – To understand what is meant by the term ecosystem. To appreciate that life in ecosystems are delicately balanced. To understand that food chains rely on each other. Numeracy – sequencing – – -
9	Working safely with acids and alkalis – knowledge - describe some hazards associated with handling acids or alkalis in the laboratory. Explain how acids can be used safely, and explain the precautions required when using them. Numeracy – Space, shape and volume/ measuring – – -	Fertilisation and seed formation – knowledge – To understand that fertilisation in plants requires male and female gametes. To understand that plants produce embryos. Numeracy – Space, shape and volume – – -	Food chains and food webs – knowledge – To understand what a food chain is and understand that ecosystems are complex. Appreciate that there are many factors for successful and failing webs and chains. Numeracy – Sequencing/ handling data – – -
10	Neutralisation/Acids and metals – knowledge - describe how an acid and alkali react to form a neutral solution. write a word equation for neutralisation. Numeracy – Measuring/ graph/ handling data – – -	Seed dispersal – knowledge - To appreciate the different ways that plants can disperse or move their seeds. Numeracy – Space shape and volume – – -	Insects and crop pollination – knowledge – to understand the importance of insects and the active part they play in pollination. To understand ways that plants and animals can pollinate. Numeracy – Sequencing/ graph work – – -

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11	The importance of neutralisation – knowledge - describe what the process of neutralisation involves. Write word equations to describe a number of different neutralisation reactions. Numeracy – Measuring/ handing data – – -	Reproduction in humans – knowledge- understand the function of the male and female sex organs. To understand how humans reproduce. Numeracy – Space, shape and volume – – -	Populations – Knowledge – to understand the effect of human population increase on the environment. Understand consequences of an increased population. Numeracy – Sequencing, handling data – – -
12	pH scale and indicators – knowledge -Students can: Identify pH using different indicators. Describe how acidic a solution is using indicator colours and the pH scale. Numeracy – Measuring/ handling data – – -	Gametes and fertilisation – Knowledge – To understand that male and female gametes combine to support reproduction. To understand that fertilisation produces offspring. Numeracy – Handling data – – -	Water pollution and the water cycle – knowledge – Understand the impact of pollution on water based species. Understand the steps of the water cycle and the importance. Numeracy – Sequencing, handling data – – -
13	Making indicators – knowledge - produce an indicator and state the colour in acid, alkali or water. Use an indicator to show the strength of an acid. Numeracy – Ratio and quantity	Menstruation – knowledge – To understand phases of menstruation in humans. To understand the term Gestation. Numeracy – Sequencing, data handling	Air pollution – knowledge – To understand the chemicals that are allowed into the atmosphere and how they can be monitored. Understand the consequences of air pollution on the environment. Numeracy – Shape, and data handling
14	Problematic acids – knowledge- Identify some consequences of acid rain. Describe what causes acid rain. Understand human impact on Earth. Numeracy – Data handling	Health pregnancy and Birth – To understand what a health pregnancy should look like and understand the consequences of a poor pregnancy. Numeracy – Data handling	Effects of climate change – knowledge – Understand the many factors that contribute to an increase in climate change. Numeracy – Data handling/ graphs

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Yr 9	Autumn Term 1	Spring Term 1	Summer Term 1
1	Reproduction – knowledge – to understand the structure Male and female sex organs. Understand legalities with relationships. Numeracy – Data handling/ graphs – – -	Describing waves – knowledge - Waves on water as undulations which travel through water with transverse motion. Waves can be reflected. Numeracy – Shape and number – – -	Earth's resources -knowledge- Understand the composition of the Earth. The structure of the Earth. The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. Numeracy – Data handling/ graphs/ weight – – -
2	Reproduction in plants and humans- knowledge – To understand that plants and flowers require pollination. Numeracy – Data handling/ graphs – – -	Refraction of light – knowledge - The similarities and differences between light waves and waves in matter. Transmission of light. Transmission of light through materials. Ray model to explain imaging in mirrors. Light transfer Numeracy – Angles and frequency – – -	Sedimentary rocks, Igneous and metamorphic rocks -knowledge- To understand the formation of sedimentary, igneous and metamorphic rocks. Numeracy – Sequencing – – -
3	Seed and fruit formation – knowledge – To understand the processes of fruit formation. Label parts of the plant. Understand the importance of soil and roots. Numeracy – Data handling/ graphs	How sound travels – knowledge - The transmission of light through materials: absorption, diffuse scattering material in the retina and in cameras. Colours of different frequencies of light, white light and prisms. Differential colour effects in absorption and diffuse reflection. Numeracy – Shape/ angles	The rock cycle -knowledge- The cycle of rocks including metamorphic, igneous and sedimentary rocks. Numeracy – Data handling/ graphs/ sequencing – –

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4	Seed dispersal – To understand how seeds disperse and how they are moved around in nature. Seed dispersal wind/insect Numeracy – Data handling/ graphs – – -	Using ultrasound – knowledge - Waves – understanding sound waves. Waves – understanding energy and waves. Numeracy – Data handling/ shape and measure – – -	Earth as a resource -knowledge- Understand that Earth is a source of limited resources and the efficacy of recycling. Numeracy – Data handling/ graphs – – -
5	Healthy pregnancy – knowledge – To understand the importance of healthy living during pregnancy. To consider 'old wife' tales and misconceptions. Numeracy – Graph and data handling – – -	Using sound – knowledge - Defected by their effects on microphones. Understand the detection of sound and their effects on microphone. Numeracy – Data handling/ graphs – – -	Recycling -knowledge- Understand what is recycled and why. What happens to out waste products and innovative ways to recycle. Numeracy – Data handling – – -
6	The growth of a baby and milestones – To understand the processes involved in foetal development. Understand key milestones through childhood. Numeracy – Data handling/ graphs/ sequencing –	Loud speakers and microphones – knowledge – understand how loud speakers and microphones work and their uses. Numeracy – Ratio – –	Biofuels and the carbon cycle-knowledge- Understand the carbon cycle. The composition of the atmosphere. The production of carbon dioxide by human activity and the impact on climate. Numeracy – Graphs and data handling –
	Autumn Term 2	**Spring Term 2**	**Summer Term 2**
7	Everyday chemistry – knowledge - Defining acids and alkalis in terms of neutralisation reactions; the pH scale for measuring acidity/alkalinity; and indicators. Numeracy – Algebra and number	Ecosystems – knowledge - understand the interdependence of organisms in an ecosystems, including food webs and insects pollinated crops. Numeracy – Sequencing/ data handling	The sun as a star/ Our solar system -knowledge- Understand that our sun as a star. Develop knowledge of the solar system and its planets. Numeracy – Quantity and number

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8	Neutralisation reactions – knowledge - measuring acidity alkalinity neutralisation reactions; the pH scale for measuring acidity/alkalinity; and indicators. Numeracy – Data handling – – -	Food chains and food webs- knowledge- The importance of plant reproduction through insect pollinated crops. Numeracy – Data handling/ graphs/ sequencing – – -	Gravity and orbits/ The moon and its craters - knowledge- Appreciate gravity as a force, weight = mass * gravitational field strength. Gravity forces between Earth and Moon. Earth and sun. Numeracy – Shape, space and size. – – -
9	Earth as a source of limited resources Sustainable development – knowledge - Earth as a source of limited resources and the efficacy of recycling. Where does waste go? Sustainable development. Numeracy – Data handling/ number – – -	The importance of insects in crop pollination Populations -knowledge- The importance of plant reproduction through insect pollination in human food security. Numeracy – Data handling/ graphs / sequencing – – -	Days and seasons -knowledge- Develop knowledge of the seasons and Earths tilt. Day length at different times of the year. In different hemispheres. Numeracy – Data handling – – -
10	Materials – knowledge - Understand what Polymers and ceramics are and how to produce composite materials. Numeracy – Data handling – – -	Effect of increased human population knowledge- How organisms affect, and are affected by their environment, including the accumulation of toxic materials. Numeracy – Data handling/ graphs – – -	The phases of the moon /Eclipses -knowledge- understand atmosphere of the moon and its craters. Recall missions to the moon and the race to the moon. The phases of the moon. Location of the moon. Numeracy – Data handling/ graphs/ weight/ conversion – – -

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11	Medicines and cooking – knowledge – To understand the importance and origins of medicine cooking and chemistry. Numeracy – sequencing/ data handling – – -	Water pollution -knowledge- The impact of increased human population .Water pollution and consequences. Numeracy – volume and measure – – -	Journey into space-knowledge- Understand our sun as a star, other stars in our galaxy, other galaxies. The light year as a unit of astronomical distance. Numeracy – Data handling – – -
12	Hydrocarbons and fuels – knowledge - Importance of future fuels. Numeracy – Data handling/ estimation – – -	Climate change and protecting the environment-knowledge- The importance of protecting the environment and influential people and movements. Numeracy – Data handling/ graphs – – -	Galaxies and the universe Observing space -knowledge- What is an eclipse? What are galaxies and universes? Life outside of out universes. Other stars in our galaxy. Numeracy – Data handling – – -

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SUBJECT_____ SCIENCE _____

Yr 10	Autumn Term 1	Spring Term 1	Summer Term 1
1	Cells – knowledge - Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope. The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts; the similarities and differences between plant and animal cells. Numeracy – shape and measure	Speed distance and time – knowledge – recognise speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time). Numeracy – Handling data, plotting graphs/charts – – -	Reactivity of metals – knowledge – understand the reactivity series and how it is used as a guide to predict what metals do when they interact with other substances. Identifying differences and changes. Numeracy – Calculations and measure – – -
2	Bacteria/ Cell division – knowledge- Chromosomes The role of diffusion in the movement of materials in and between cells. Numeracy – Shape and measure –	Speed distance and time graphs – knowledge – understand the representation of a journey on a distance–time graph; relative motion: trains and cars passing one another. Numeracy – Calculations and measure	Atomic structure - Understanding atoms and how they react in different situations. Understanding how to balance equations. Numeracy – Number and algebra
3	Diffusion – Knowledge - The role of diffusion in the movement of materials in and between cells. The structural adaptations of some unicellular organisms. Numeracy – sequencing/ data handling – – - The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms.	Representing data – knowledge – understand the representation of a journey on a distance–time graph; relative motion: trains and cars passing one another. Understand how to read graphs and interpret data. Numeracy – Calculations and measure – – -	Identifying when a reaction has happened- knowledge - Understanding the differences in chemical reactions. Identifying the ways energy is impacted when a reaction happens. Numeracy – Handling data – – -

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4	Genetic engineering/ Stem cells – knowledge- Homeostasis. Advances in stem cell research and genetic engineering. Understand what Homeostasis is. Numeracy – sequencing/ data handling – – -	Forces – knowledge – Understand forces as pushes or pulls, arising from the interaction between two objects; using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces; forces measured in newtons. Numeracy – Calculations and measure, fractions and percentages. – – -	Reactions – Understand exothermic reactions give out heat energy, understand endothermic reactions take in heat energy. Combustion burning in the air. Numeracy – Calculations and measure – – -
5	Vaccines and antibiotics – knowledge - Understanding immunity and recognising how a vaccine works. Understanding white blood cells and antibiotics their roll and the dangers that they face. Numeracy – sequencing/ data handling/ ratio – – -	Acceleration – knowledge – understand forces as pushes or pulls, arising from the interaction between two objects; using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces; forces measured in newtons. Numeracy – Calculations and measure – – -	Oxidation and combustion – knowledge - Understanding what is needed to burn something. Why is combustion important? Fuels Hydrocarbons , controlling combustion and corrosion. Numeracy – calculations and symbols – – -
6	Heart – knowledge - Understanding the functions of the heart and its role in circulation. Compare veins and arteries. Numeracy – sequencing/ data handling / shape and measure – – -	Gravity and friction – knowledge -understand non-contact forces: gravity forces acting at a distance on Earth and in space Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). Numeracy – Handling data, number, Carrying out calculations –	

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7	Lungs – knowledge – to understand what Respiration is in animals. Understand the benefits of exercise, long and short term. Understand the digestive system and the digestive process. Numeracy – Volume/ data handling –	Air and water resistance – knowledge – understand the impact that non contact forces have on surfaces. Numeracy – shape, space and measure –	
	Autumn Term 2	**Spring Term 2**	**Summer Term 2**
7	Particles – knowledge – Understand the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure. Numeracy – sequencing/ data handling – – -	Diet – knowledge – understand the content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed. Numeracy – Calculate number in standard form – – -	Pressure – knowledge - understanding what pressure is. Understanding high and low pressure. How is pressure defined and calculated. Liquids and pressure. Numeracy – Handling data – – -
8	Features of a s/l/g/ Knowledge – understand the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure; changes of state in terms of the particle model. Numeracy – sequencing/ data handling – – -	Human digestion – knowledge – understand the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts) Numeracy – Ordering and sequencing – – -	Force – knowledge - Newtons of force and how they press on each other. Pressure = force over Density = mass over volume Numeracy – Understand size and scale – – -
9	Expansion and Contraction – knowledge – Understand that solids have a fixed shape at room temperature. Understand how Expansion and contraction occur. Numeracy – Proportion	Bacteria and the Digestive system – knowledge – understand the importance of bacteria in the human digestive system Numeracy – Ratio, number/algebra	Gases – knowledge – understand how gases exert pressure? Understanding the weather and how pressure can influence storms and heatwaves. Numeracy – space, shape and measure

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10	Diffusion – Understand that the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure. Diffusion in terms of the particle model Numeracy – Data handling – – -	Content of a healthy human diet – knowledge – understand carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed Numeracy – Handling data – – -	Liquid and pressure – knowledge -Understand how hydraulic machines work and their uses. Pressure in fluids including submarines. Numeracy – calculations – – -
11	Brownian motion – knowledge -Brownian motion in gases; similarities and differences … between solids, liquids and gases; diffusion in liquids and gases driven by differences in concentration. Numeracy – sequencing/ data handling – – -	Diet imbalances – understand the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. Numeracy – Handling data – – -	Magnetism – knowledge – understand magnetic materials and their uses. Understand that North and South poles have magnetism. Appreciate that materials attract or repel. What are the poles of a magnet? Earths poles an how magnetic fields protect our planet. Numeracy – Number and algebra – – -
12	Substances and mixtures – Understand the concept of a pure substance; mixtures, including dissolving; simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography; the identification of pure substances. Numeracy – Number/ measure/ data handling – – -	Diet imbalances – knowledge – be able to calculate energy requirements in a healthy daily diet. To be able to make informed decisions regarding lifestyle choices. Numeracy – Number, space shape and measure – – -	Electromagnetics – knowledge – Consider what is an electromagnetic field? Electromagnets and their uses. Explain how a coil can enhance the strength of a force. Numeracy – Space, shape and measure – – -

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13	Chromatography – knowledge - Separating mixtures: filtration, evaporation, distillation and chromatography; the identification of pure substances Numeracy – Charts/ data handling – – -	Drugs – knowledge – understand the effects of recreational drugs (including substance misuse) on behaviour, health and life processes. Numeracy – Handling data – – -	Electricity – knowledge - explain what a static charge is and some of its uses. What is lightning and how is it used? Numeracy – Handling data – – -
14	Filtration and evaporation – knowledge - Using evaporation and filtration techniques to separate mixtures. Numeracy – sequencing/ data handling – – -		

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SUBJECT_____SCIENCE_____

Yr 11	Autumn Term 1	Spring Term 1	Summer Term 1
1	Cells – knowledge - Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope. The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts; the similarities and differences between plant and animal cells. Numeracy – Space, shape and measure	Speed distance and time – knowledge – recognise speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time). Numeracy – Handling data, space, shape and measure – – -	1 Biology revision sheets – Exam preparation to include questions and timed scenarios.
2	Bacteria/ Cell division – knowledge- Chromosomes The role of diffusion in the movement of materials in and between cells. Numeracy – Space shape and measure	Speed distance and time graphs – knowledge – understand the representation of a journey on a distance–time graph; relative motion: trains and cars passing one another. Numeracy – Handling data, space, shape and measure	1 Chemistry revision sheets - Exam preparation to include questions and timed scenarios.
3	Diffusion – Knowledge - The role of diffusion in the movement of materials in and between cells. The structural adaptations of some unicellular organisms. The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. Numeracy – Space, shape and measure. – –	Representing data – knowledge – understand the representation of a journey on a distance–time graph; relative motion: trains and cars passing one another. Understand how to read graphs and interpret data. Numeracy – Handling data – – -	1 Physics revision sheets - Exam preparation to include questions and timed scenarios.

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4	Genetic engineering/ Stem cells – knowledge- Homeostasis. Advances in stem cell research and genetic engineering. Understand what Homeostasis is. Numeracy – Number and algebra	Forces – knowledge – Understand forces as pushes or pulls, arising from the interaction between two objects; using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces; forces measured in newtons. Numeracy – Number	2 Biology revision sheets – Exam preparation to include questions and timed scenarios.
5	Vaccines and antibiotics – knowledge - Understanding immunity and recognising how a vaccine works. Understanding white blood cells and antibiotics their roll and the dangers that they face. Numeracy – Space, shape and measure	Acceleration – knowledge – understand forces as pushes or pulls, arising from the interaction between two objects; using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces; forces measured in newtons. Numeracy – Shape, space and measure	2 Chemistry revision sheets - Exam preparation to include questions and timed scenarios.
6	Heart – knowledge - Understanding the functions of the heart and its role in circulation. Compare veins and arteries. Numeracy – Volume and measure – – -	Gravity and friction – knowledge -understand non-contact forces: gravity forces acting at a distance on Earth and in space Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). Numeracy – Number, shape and measure	2 Physics revision sheets - Exam preparation to include questions and timed scenarios.
	Lungs – knowledge – to understand what Respiration is in animals. Understand the benefits of exercise, long and short term. Understand the digestive system and the digestive process. Numeracy – Volume and measure, data handing – – -	Air and water resistance – knowledge – understand the impact that non contact forces have on surfaces. Numeracy – Handling data – – -	[redacted]

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7	Autumn Term 2	Spring Term 2
8	Particles – knowledge – Understand the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure. Numeracy – Handling data, proportion, ratio	Diet – knowledge – understand the content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed. Numeracy – Number
9	Features of a s/l/g/ Knowledge – understand the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure; changes of state in terms of the particle model. Numeracy – Proportion, ratio	Human digestion – knowledge – understand the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts) Numeracy – Ratio and proportion
10	Expansion and Contraction – knowledge – Understand that solids have a fixed shape at room temperature. Understand how Expansion and contraction occur. Substances and mixtures – Understand the concept of a pure substance; mixtures, including dissolving; simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography; the identification of pure substances. Numeracy – Handling data	Bacteria and the Digestive system – knowledge – understand the importance of bacteria in the human digestive system. Numeracy – Number
11	Diffusion – Understand that the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure. Diffusion in terms of the particle model. Filtration and evaporation – knowledge - Using evaporation and filtration techniques to separate mixtures. Numeracy – Handling data	Content of a healthy human diet – knowledge – understand carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed Numeracy – Number and data handling

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12	Brownian motion – knowledge -Brownian motion in gases; similarities and differences … between solids, liquids and gases; diffusion in liquids and gases driven by differences in concentration. Chromatography – knowledge - Separating mixtures: filtration, evaporation, distillation and chromatography; the identification of pure substances Numeracy – Number – – -	Diet imbalances – understand the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. Diet imbalances – knowledge – be able to calculate energy requirements in a healthy daily diet. To be able to make informed decisions regarding lifestyle choices. Drugs – knowledge – understand the effects of recreational drugs (including substance misuse) on behaviour, health and life processes. Numeracy – Handling data, number and algebra – – -	[redacted]