Year 1 SCIENCE LONG TERM PLAN with CURRICULUM STANDARDS

Year 1 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y1/SC 1 (3)	Y1/SC 2 (6)		Y1/SC 3 (12)				Y1/SC4 (3)
	SEASONS I	LIVING THINGS		MYSELF				ANIMALS
	Identify the changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.	B1.1A Know that animals and plants are living things. B1.1B Distinguish between living and nonliving things. B1.1C Understand that animals and plants change as they grow. *Make and record observations of a plant as it grows from a seed; observe changes over time in domesticated animals (secondary sources)* Assessment 1		B1.2A Know that humans need food, water and air to stay alive. B1.2B Know the five senses and link these to the corresponding sense organ. B1.2C Understand that humans use sense organs to detect changes in their surroundings. *Make predictions and use touch to identify objects hidden in feely bags; go on a listening walk around school to record (written or audio record) sounds; create diagram/ map showing location of each sound.* B1.2D Identify external parts of the human body to include head, neck, limbs and digits, skin and other sense organs. B1.2E Compare observable similarities and differences between humans. *Observe and compare photographs of humans.* B1.2F Understand that humans grow and change as they grow older. *Compare and note differences from baby photographs to current appearance.* Assessment 2				B1.3A Describe the key observable features of common animals (vertebrates only).

Year 1 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y1/SC 4 (9)			Y1/SC 5 (12)				
	ANIMALS			PLANTS				REVISION
	B1.3B Group animals by their observable external features. *Create a simple key to sort animals by external features.* B1.3C Understand that movement is a life process and describe ways in which animals move. *Observe and describe movements of local wildlife and domestic animals.* B1.3D Understand that growth is a life process and that all animals grow and change as they become older. B1.3E Describe different ways in which animals change as they grow older (vertebrates only). B1.3F Understand that nutrition is a life process and appreciate that different animals have different diets. Assessment 3			B1.4A Recognise examples of plants in the local and wider environment. B1.4B Know that plants have leaves, stems and roots. B1.4C Understand that some plants have flowers and these can be a variety of shapes and colours. B1.4D Recognise and name plant parts on familiar local examples. *Observe and draw local examples of plants; record the frequency of types of plants and features.* B1.4E Understand that plants can grow from seeds and bulbs. B1.4F Understand that plants need water, air and light to grow well. *Set up a simple practical test to grow suitable plants from seeds and observe the effect of removing first water, and then air, and then light.* *Assessment 4*				Revision for First term exam

Year 1 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TER	Y1/SC 5 (3)	Y1/SC 6 (12)				Y1/SC7 (9)		
	PLANTS	SORTING AND GROUPING MATERIALS				PUSHES AND PULLS		
	B1.4G Understand that plants can provide food for humans and other animals.	C1.1A Recognise that objects can be made from different materials. C1.1B Name and identify some common materials. For eg: wood, fabric, rock/stone, metal, glass and plastic.				P1.2A Observe and describe different ways of moving. *Make simple observations to compare the movement of objects and living things.*		

M 2		C1.1C Understand that different materials have particular properties. C1.1D Describe simple properties of materials using senses. For eg: hard, rough, smooth and shiny. C1.1E Understand that materials can be sorted in a number of ways including colour, texture and hardness. *Identify and classify objects according to colour, texture and hardness; use a simple dichotomous key to identify the materials.* Assessment 5				P1.2B Know that pushes and pulls can make objects start or stop moving. P1.2C Recognise pushes and pulls as forces and classify simple examples of each. For eg: doors, toy cars and rubber balls. Assessment 6		
Year 1 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y1/SC8 (12)				Y1/SC 9 (6)			
	LIGHT AND DARK				SEASONS		REVISION	
	P1.1A Understand that light comes from a source and that shiny objects are not sources of light. P1.1B Identify common sources of light and understand that they can vary in brightness. For example: torches, candles, light bulbs, lamps and strings of lights. P1.1C Know that the Sun is the source of light for the Earth and compare differences between night and day. P1.1D Understand that we need light to see and that darkness is the absence of light. *Set up a simple practical test demonstrating that darkness is the absence of light using a dark room (any room or space with no light source will work).* Assessment 7				Discuss changes in the weather and the seasons. They should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.		Revision for Final exam	

Year 2 SCIENCE LONG TERM PLAN with CURRICULUM STANDARDS

Year 2 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y2 / SC 1 (15)					Y2 / SC 2 (9)		
	HEALTH AND GROWTH					LIVING THINGS IN THE ENVIRONMENT		
	B2.1A Understand that humans need the correct amounts of water and food to stay alive. B2.1B Understand that there are many types of food and humans may have different diets. B2.1C Understand what is meant by a balanced diet. B2.1D Know the main food groups and be able to categorise food by type. *Identify foods and categorise them into the main food groups by type of food.* B2.1E Understand the need for exercise to stay healthy. B2.1F Understand that human and animal offspring need differing types and amounts of parental care while they are growing. B2.1G Understand that personal and food hygiene is important to maintain health. B2.1H Understand why humans take medicines and recognise hazards associated with taking and storing medicines. Assessment 1					B2.2A Understand the term 'habitat' as being the place where animals and plants are found living. B2.2B Understand that within a habitat there may be smaller microhabitats. *Make simple observations to compare living things within a habitat or microhabitat; collect and record data from habitats/microhabitats as tally charts or in simple tables.* B2.2C Recognise that animals and plants may have features that best suit them to a particular habitat in order to survive. B2.2D Understand that living things may be interdependent. Assessment 2		
Year 2 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8

TERM 1	Y2 / SC 2(3)	Y2/SC3(15)						
	LIVING THINGS IN THE ENVIRONMENT	INVERTEBRATES					REVISION	
	B2.2E Understand that environmental factors, such as availability of food, water, light and shelter, may affect the distribution of animals and plants.	B2.3A Identify a variety of common invertebrates using pictures and simple keys. *Use a simple dichotomous key to identify various common invertebrates.* B2.3B Describe the key observable features of common invertebrates. B2.3C Group invertebrates according to shared features. *Make simple observations to identify invertebrates and to classify them in groups based on shared characteristics.* B2.3D Describe how some invertebrates change as they grow using simple life cycles. Illustrate with butterfly or moth and grasshopper or locust. Assessment 3					Revision for First term Examination	
Year 2 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y2 / SC 4 (12)				Y2 / SC 5 (12)			
	MATERIALS: PROPERTIES AND USES				SOUND			
	C2.1A Understand that the same object can be made from a variety of different materials. C2.1B Compare examples of materials that are naturally occurring with those that are not. *Make simple observations to compare the properties of natural and synthetic materials.* C2.1C Understand that particular properties of materials can make them suitable for particular uses. C2.1D Distinguish between the terms 'hard'/'soft', 'stretchy'/'stiff', 'shiny'/'dull', 'rough'/'smooth' and 'bendy'/'not bendy'. C2.1E Group materials according to their properties. *Set up a simple practical test to investigate the physical properties of a variety of materials. Students should group materials according to their properties.* C2.1F Justify the use of a particular material for a particular purpose based on the properties of the material. C2.1G Compare properties of a variety of materials using comparative and fair tests. *Set up a fair test to investigate the best waterproof material to use as a teddy bear's coat. Provide students with a variety of materials to choose from including cling film, paper, cotton, towelling, rock and wood.* *Assessment 4*				P2.1A Understand the term 'source' as the place where a sound originates. P2.1B Recognise and describe sounds made in different ways from a variety of sources. P2.1C Understand that loud sounds may damage hearing. P2.1D Understand that sounds travel from a source to our ears. P2.1E Explain how sounds can be made louder or quieter by changing the distance from the source. *Set up a simple practical test of how sounds can be made louder or quieter by changing the distance from the source. Ask students to suggest a suitable stable sound source. If none suitable, use a ringtone from a phone at a set volume.* Assessment 5			
Year 2 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y2 / SC 6(18)							
	SPACE						REVISION	
	P2.2A Know that the Earth, Sun and Moon are part of our Solar System. P2.2B Describe how the shape of the Moon appears to change over time. Recognise and name some phases of the Moon. *Record observations of the Moon on a calendar.* P2.2C Know that the Sun is one of many stars in space and that stars can form constellations. *Use book research and simple observations of the sky.* P2.2D Understand the term 'astronaut' and describe simple aspects of living in space and space travel. Assessment 6						Revision for Final term Examination	

Year 3 SCIENCE LONG TERM PLAN with CURRICULUM STANDARDS

Year 3 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y3/SC 1 (12)				Y3/SC 2 (12)			
	ANIMAL ADAPTATIONS				TEETH			
	B3.1A Group animals according to observable features. *Make simple observations to classify various animals based on their observable features.* B3.1B Use a simple dichotomous key to identify animals. *Use keys to identify animals in local habitat(s)* B3.1C Describe ways in which animals are suited to the environment in which they are found. B3.1D Compare animals in two contrasting habitats. *Compare local desert habitat(s) with geographically different habitat(s).* B3.1E Predict the likely habitat of a variety of animals from the adaptations that they show. Assessment 1				B3.2A Recognise that human teeth are not all the same size or shape. B3.2B Identify and name the main types of teeth in humans: incisor, canine, premolar and molar. B3.2C Relate the shape of a tooth to its function, for example, slicing, tearing, chewing or grinding food. B3.2D Know that teeth are part of the digestive system and are used to physically break down food for swallowing. B3.2E Compare the basic types of teeth in a variety of animals. *Make simple observations using online research, books or real examples if available.* B3.2F Identify herbivores and carnivores from their dentition and relate the type of teeth in a variety of animals to their diet. B3.2G Distinguish between the terms 'herbivore', 'omnivore' and 'carnivore'. Assessment 2			

Year 3 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y3/SC 3 (12)				Y3/SC 4 (9)			
	FEEDING RELATIONSHIPS				ROCKS AND SOILS			REVISION
	B3.3A Understand that food is a basic need and that the availability of food affects the size of animal populations and their distribution. B3.3B Distinguish between the terms 'producer' and 'consumer'. B3.3C Understand that plants make their own food but animals depend on plants and/or other animals as a food source. B3.3D Distinguish between the terms 'predator' and 'prey'. B3.3E Consider the interrelationship between predators and prey. B3.3F Interpret and construct simple, linear food chains involving three or four organisms. *Construct food chains in local and global habitats.* B3.3G Identify producers, consumers, herbivores, carnivores, predators and prey in a variety of simple food chains and food webs. *Interpret food chains and food webs in local and global habitats.* Assessment 3				C3.1A Understand that different rocks have different physical properties and observable features. C3.1B Compare and contrast the properties and observable features of different rocks. *Investigate with a comparative test.* C3.1C Identify different rocks using research, by comparing to samples and/or from information about their properties (such as a key). *Use or make simple keys for identifying rocks.* C3.1D Describe how sedimentary, igneous and metamorphic rocks are formed. C3.1E Understand that the formation of different types of rocks affects whether they may contain fossils. C3.1F Explain that over time rocks can be broken down into smaller pieces by processes such as weathering. C3.1G Understand that soil contains small parts of rocks and organic matter. C3.1H Compare and contrast the different characteristics of soils such as colour, texture and drainage. *Observe soil around school; collect small samples to examine and contrast.* C3.1I Identify different soils using research by comparing to samples and/or using information about their properties (such as a key). *Use or make simple keys for identifying soils.* *Assessment 4*			Revision for First Term Examination

Year 3 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y3/SC 5 (12)				Y3/SC 6(12)			
	USING AND CHANGING MATERIALS				LIGHT			
	C3.2A Compare a range of materials with different properties. *Investigate the properties of a range of different materials through handling and exposure to forces and liquid.* C3.2B Describe how objects made from some materials can be altered by squashing, bending, twisting and squeezing. C3.2C Understand that some objects can be changed by physical forces but cannot be changed back easily. C3.2D Understand that some materials can change when they are heated and/or cooled and that this can change their properties. C3.2E Distinguish between the terms 'melting', 'freezing', 'evaporating' and 'condensing'. *Observe a teacher-led experiment with water in its different states: melting, freezing, evaporating and condensing. Take notes of results and plot the data using charts.* ***Assessment 5***				P3.1A Understand that we need light in order to see things and that dark is the absence of light. P3.1B Understand that light comes from a source and know some sources of light. P3.1C Understand that some materials block light and are described as being opaque. P3.1D Explain that, although some objects can reflect light, they are not light sources. P3.1E Understand that, when light from a source is blocked by an opaque object, a shadow can form that is the same shape as the object. *Investigate the relationship between light sources, objects and shadows using shadow puppets.* P3.1F Understand patterns in the way that the sizes of shadows change. *Investigate the relationship between the length of an object's shadow and its distance from a light source.* P3.1G Distinguish between the terms 'transparent', 'translucent' and 'opaque'. Assessment 6			

Year 3 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y3/SC 7(3)	Y3/SC 8(6)		Y3/SC 9(9)				
	FORCES	FRICTION		MAGNETS			REVISION	
	P3.2A Understand that a force is needed to make objects move. P3.2B Describe and compare how a range of objects move on different surfaces and slopes. *Design a fair comparison to investigate the movement of a toy car on various surfaces.*	P3.3A Describe friction as a contact force that acts between surfaces to slow down movement. P3.3B Describe some ways in which friction between solid surfaces can be increased and decreased. Assessment 7		P3.4A Describe magnets as having two poles, known as North and South. P3.4B Distinguish between the terms 'attract' and 'repel'. P3.4C Predict whether two magnets will attract or repel each other, depending on which poles are facing. P3.4D Understand that some forces need contact between two objects, but magnetic forces can act at a distance. *Investigate distance between a magnet and a magnetic object before the latter starts to move.* P3.4E Identify materials that are magnetic and those that are nonmagnetic and apply this to practical uses of magnets. *Investigate magnetic and nonmagnetic materials by using a range of different materials (iron, copper, silver, plastic etc.) and testing them with a magnet.* ***Assessment 8***		Revision for Final Examination		

Year 4 SCIENCE LONG TERM PLAN with CURRICULUM STANDARDS

Year 4 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y4/SC 1 (15)					Y4/SC2(9)		

	14/ SC 1 (15)					14/ SC2(9)		
	VARIATION AND CLASSIFICATION					**GROWING PLANTS**		
T E R M 1	B4.1A Explain how living things can be classified according to shared features. B4.1B Explore and use classification keys to help group, identify and name a variety of living things in the local and wider environment. *Use keys to identify plants in local habitat(s).* B4.1C Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including plants and animals. B4.1D Identify the observable characteristics to classify a specific species of plant, for example, a buttercup. B4.1E Identify the observable characteristics to classify a specific species of animal, for example, an earthworm. Assessment 1					B4.2A Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. *Make observational sketches and see the function of roots using coloured dye.* B4.2B Use a simple dichotomous key to identify a variety of plants. *Use or create a dichotomous key to investigate plants in their habitat(s).* B4.2C Group plants according to observable features. *Decide on sorting criteria for a selection of plants (actual or photographs).* B4.2D Understand the way in which water is transported within plants. *Observe uptake of dye in celery, carnations, etc.* B4.2E Describe the pathway of water as being from the soil into a plant's roots and up through the stem through the plant to the leaves and other parts of the plant. B4.2F Understand that plants need the correct amount of water to grow well. *Observe wilting/ rehydration and effect of overwatering, for example, using a photo diary*. Assessment 2		
Year 4 SCI	**WEEK 1**	**WEEK 2**	**WEEK 3**	**WEEK 4**	**WEEK 5**	**WEEK 6**	**WEEK 7**	**WEEK 8**
	Y4/SC 2 (3)	**Y4/SC 3 (15)**						
	GROWING PLANTS	**SKELETON AND MUSCLES**					**REVISION**	
T E R M 1	B4.2G Understand that plants need the correct amount of light to grow well. *Observe phototropism and etiolated growth, for example, using a photo diary* B4.2H Understand that soil provides minerals to help plants grow and that fertilisers/organic matter can supplement this.	B4.3A Understand that humans have internal skeletons that provide support and protection and allow movement. B4.3B Identify and locate the skull and rib cage and understand their function in protecting vital organs. B4.3C Understand the term 'joint' as a place where bones meet and describe the extent of movement of a variety of joints. *Compare the fixed joint of a skull with the range of movement of shoulder and elbow joints.* *Conduct further research; make model joints.* B4.3D Understand the terms 'contract' and 'relax' in relation to antagonistic muscle action resulting in movement. B4.3E Know that bones are important for producing blood cells. B4.3F Explain the importance of exercise and diet in maintaining healthy muscles and bones. Assessment 3					Revision for First Term Examination	
Year 4 SCI	**WEEK 1**	**WEEK 2**	**WEEK 3**	**WEEK 4**	**WEEK 5**	**WEEK 6**	**WEEK 7**	**WEEK 8**
	Y4/SC 4 (15)					**Y4/SC5 (9)**		
	SOLIDS, LIQUIDS AND GASES					**MAKING AND CHANGING SOUNDS**		

TERM 2	C4.1A Identify materials as solids, liquids or gases and distinguish between them. *Investigate and classify a variety of suitable materials.* C4.1B Describe some common properties of solids, liquids and gases. C4.1C Understand that solids consisting of very small particles can behave as liquids in some ways. *Investigate the properties of sand in a variety of containers and through compression.* C4.1D Understand that temperature is a measure of how hot or cold something is and is measured in degrees Celsius (°C) using a thermometer. *Practise measuring and recording temperatures with a thermometer.* C4.1E Understand that water exists in three states and changes from one to another at different temperatures. C4.1F Understand that different substances change state at different temperatures. Assessment 4					P4.1A Explain that sounds come from a source and can travel through solids, liquids and gases. P4.1B Understand that vibrations from sounds travel through a medium to the ear. P4.1C Understand that some materials are effective in preventing vibrations from sound sources reaching the ear. *Investigate with a comparative test.* P4.1D Understand that volume refers to how loud a sound is and that the volume of a sound can be changed. P4.1E Know that the volume of sounds can be measured with a sound meter (data logger) and the unit is a decibel (dB). *Use a sound meter (if available) to investigate different sounds in the environment.* P4.1F Find patterns between the volume of a sound and the strength of the vibrations that produced it. P4.1G Recognise that there are high- and low-pitched sounds and that the pitch of a sound can be changed. Assessment 5		
Year 4 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y4/SC 5 (3) CHANGING SOUNDS P4.1H Identify and describe features of an object that can be changed to alter its pitch. *Use available musical instruments to investigate or use junk modelling to create own instruments with variable pitch.* P4.1I Find patterns between the pitch of a sound and features of the object that produced it	Y4/SC 6 (15) ELECTRICITY: EVERYDAY USES AND SIMPLE CIRCUITS P4.2A Understand some uses of electricity and identify common appliances that use electricity. P4.2B Understand that some devices use batteries that supply electricity. P4.2C Describe dangers associated with mains electricity. P4.2D Construct simple working series circuits from simple instructions or drawings. *Follow simple instructions and select appropriate equipment to create working circuits and to correct no circuits.* P4.2E Identify and name components in a simple series circuit. Components include: bulb, buzzer, wire, cell, battery and switch. P4.2F Understand that a circuit needs a power source to work. P4.2G Understand that a complete circuit is needed for a device to work and that a switch can be used to break a circuit. P4.2H Understand that some materials conduct electricity better than others using the terms electrical 'conductor' and 'insulator'. P4.2I Understand the use of common electrical conductors and insulators. Assessment 6					REVISION Revision for Final Exam	

Year 5 SCIENCE LONG TERM PLAN with CURRICULUM STANDARDS

Year 5 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y5/SC 1 (16)				Y5/SC 2(16)			
	LIFE CYCLES				PLANT ADAPTATIONS			

TERM 1	LIFE CYCLES				PLANT ADAPTATIONS			
	Describe the life cycles of reptiles, birds, insects, mammals and amphibians. Describe complete metamorphosis and incomplete metamorphosis. Describe the life cycle of flowering and non flowering plants. Describe sexual reproduction in plants. Describe asexual reproduction in plants. Assessment 1				B5.1A Understand that different habitats and microhabitats have different environmental conditions. *Using thermometers and light meters, record patterns of light and shade, and density of tree foliage.* B5.1B Understand that plants obtain water via their roots and that the availability of water may affect the pattern of root growth. *Investigate with a comparative test: provide plants with different amounts of water over a period of time and then observe their roots to look for differences in root growth.* B5.1C Understand that both plants and animals require oxygen from the air for respiration. B5.1D Understand that plants require light and that the availability of light affects their distribution. *Compare two contrasting local habitats and record the extent of plant growth in both.* B5.1E Describe ways in which plants are suited to the environment in which they are found. *Observe local plants' adaptations and compare to plants from other environments using books/the internet.* B5.1F Compare features of plant adaptations in two contrasting habitats. B5.1G Predict the likely habitats of a variety of plants from the adaptations that they show. *Make observations from actual examples from suitable habitats, for example, seashore, aquatic, desert (cactus) etc. and apply these to other plants seen outside of their natural environment(s).* *Assessment 2*			
Year 5 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y5/SC 3 (16)				Y5/SC 4 (12)			
	LIVING THINGS IN DANGER				DIET AND DIGESTION			REVISION
	B5.2A Understand that environments can change and that this can sometimes pose dangers to living things. B5.2B Understand that environments can be changed in positive ways. *Use local knowledge and contacts, books and the internet (if available) to research examples of both.* B5.2C Recognise ways in which living things and the environment need protection, both locally and globally. *Investigate the local environment and make a plan to support a habitat that's in danger.* B5.2D Understand the term 'conservation' and describe examples of ways in which humans can reduce the effects of environmental change. *Use local knowledge and contacts, books and the internet (if available) to research examples of both.* B5.2E Distinguish between the terms 'endangered' and 'extinct'. B5.2F Explain in simple terms how fossils are formed when things that have lived, or parts of living things, are trapped within rock. B5.2G Understand how fossils provide evidence of organisms that are now extinct and information about when/where they may have lived. *Observe and draw actual examples of fossils and discuss what these examples show us.* *Assessment 3*				B5.3A Understand that to stay healthy humans need a balanced diet containing the correct amounts of a range of nutrient groups. B5.3B Describe, in outline only, the main benefits of each food group, with examples. These are: protein, carbohydrate, fats, vitamins, minerals, fibre and water. B5.3C Understand the relationship between diet, lifestyle (for example, sleep), exercise and health. B5.3D Sequence the process of digestion in humans as ingestion, swallowing, digestion, absorption and egestion. B5.3E Describe the simple functions of the basic parts of the digestive system involved in the sequence of digestion. *Assessment 4*			Revision for First Term Examination
Year 5 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y5/SC 5 (16)				Y5/SC6 (16)			
	MIXING AND SEPARATING MATERIALS				EARTH AND SPACE			

	MIXING AND SEPARATING MATERIALS				EARTH AND SPACE			
TERM 2	C5.1A Understand that solids can be mixed and that sieving may be used to separate some mixtures. *Investigate separation using a sieve with a series of mixed solids (for example, flour and nuts; flour and sugar; sand and sugar).* C5.1B Explain how filtration may be used to separate some solids from a liquid. *Predict and investigate separation through filtration with a series of mixtures* C5.1C Understand that when a solid dissolves in water it forms a solution that cannot be separated by filtration. C5.1D Describe ways in which simple substances such as sugar and salt can be dissolved more quickly. *Investigate with a comparative test.* C5.1E Explain that when a solution is left exposed to the air the liquid will evaporate into the air, leaving the dissolved solid behind. *Investigate and observe a solution, such as salt water, left exposed to the air over time. Take water-level measurements and sketch and record results.* C5.1F Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including by sieving, using a magnet, filtering and evaporating. *Investigate different methods using a series of mixtures (for example, solid/solid; solid/liquid).* *Assessment 5*				P5.1A Understand that the Sun is a star and is at the centre of our Solar System. P5.1B Understand that the Earth, Sun and Moon are part of the Solar System and that Earth is a planet with one Moon. P5.1C Understand that planets may be different sizes and some have more than one moon. P5.1D Describe the position and the movement of the Earth, and other planets, relative to the Sun in our Solar System. P5.1E Describe the movement of the Moon relative to Earth, and Earth and other planets relative to the Sun, correctly using the term 'orbit'. P5.1F Understand that ideas about the Solar System have changed and developed over time. P5.1G Explain that Earth spins on its axis causing some parts of Earth to be in daylight when other parts are in darkness. P5.1H Understand how shadow length changes during the course of a day. *Investigate patterns in shadow lengths, using simple sundials or shadow clocks.* P5.1I Use the idea of Earth's rotation to explain the apparent movement of the Sun across the sky. *Assessment 6*			
Year 5 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y5/SC 7 (16)				Y5/SC 8 (8)			
	SEEING AND REFLECTING				SIMPLE MECHANISMS.		REVISION	
TERM 2	P5.2A Understand that light comes from a source and appears to travel in straight lines. *Set up and observe shadow investigations.* P5.2B Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. *Students draw and interpret simple ray diagrams that illustrate the direction of travel of light.* P5.2C Use the idea that light appears to travel in straight lines to explain that objects are seen because they give out or reflect light into our eyes. *Observe small objects from the opposite end of a sealed black tube; discuss and note findings.* P5.2D Understand that light can be reflected from shiny surfaces and, when reflected, the light changes direction. P5.2E Understand that smooth and shiny surfaces reflect light well but light is more scattered when it is reflected off a dull surface. *Plan and carry out an investigation into the best safety clothing to wear at night.* P5.2F Recognise and give simple explanations for differences between shadows and reflections. *Assessment 7*				Realise that some machines, including levers, pulleys and gears, allow a smaller force to have a greater effect. *Assessment 8*		Revision for Final Exam	

Year 6 SCIENCE LONG TERM PLAN with CURRICULUM STANDARDS

Year 6 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y6/SC 1 (16)				Y6/SC 2(16)			
	CLASSIFICATION OF LIVING THINGS				MICRO ORGANISMS			

TERM 1	CLASSIFICATION OF LIVING THINGS				MICRO-ORGANISMS			
	Describe how living things are classified into broad groups according to common observable characteristics. Realise that the living things can be divided into animals, plants and micro organisms. *Assessment 1*				B6.1A Know the term 'micro-organisms' and that these can be bacteria, viruses or microscopic fungi. B6.1B Describe ways in which some micro-organisms can be useful and others can be harmful. B6.1C Explain that micro-organisms grow and reproduce on food and explain some simple food hygiene precautions. *Carry out an investigation into what conditions help mould grow on bread by varying the temperature, light and amount of moisture to which the bread is exposed.* B6.1D Understand the role of decomposers in food chains and the recycling of materials. *Carry out an investigation to create a composter and observe the results in decomposition of materials. Use the resulting compost to grow things in the classroom.* *Assessment 2*			
Year 6 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y6/SC 3 (16)				Y6/ SC 4 (12)			
	PLANT LIFE CYCLES				HEART,LUNGS AND CIRCULATION			REVISION
	B6.2A Understand that some plants have flowers, which produce seeds that grow into new plants. B6.2B Sequence the life cycle of a typical flowering plant using the terms 'germination', 'flowering', 'pollination', 'fertilisation' and 'seed dispersal'. B6.2C Understand conditions required for the germination of seeds. *Compare how successfully seeds germinate in different conditions (e.g. light, water).* B6.2D Explain why seeds need to be dispersed and the ways in which this can occur. B6.2E Define 'pollination' as the transfer of pollen from the anther to the stigma on the same or a different flower. B6.2F Distinguish between the processes of insect and wind pollination. B6.2G Identify the parts of an insect-pollinated flower and explain the function of each part. *Observe, examine and draw suitable examples of real flowers and identify their different parts.* B6.2H Distinguish between pollination and fertilisation in plants. B6.2I Describe different mechanisms by which seeds are dispersed. *Observe different types of local plants and note the different ways in which they disperse seeds.* *Assessment 3*				B6.3A Describe the heart as an organ that pumps blood as part of the circulatory system. B6.3B Understand that water and nutrients are transported around our bodies in blood. B6.3C Describe the circulatory system as comprising the heart and blood vessels containing blood. B6.3D Understand how pulse rate changes with exercise and explain the reason for the change in terms of transporting oxygen and nutrients to muscles. *Investigate own pulse rate and how it changes as a result of exercise.* B6.3E Describe the lungs as being located in the thorax and as the organs used for breathing. B6.3F Understand that air is a mixture of gases, including oxygen. B6.3G Understand that blood picks up oxygen from the lungs and transports it through blood vessels to organs of the body. B6.3H Distinguish between and correctly use the terms 'breathing' (ventilation of the lungs) and 'respiration' (how oxygen is used by the body once it reaches organs). *Assessment 4*			Revision for First Term Examination
Year 6 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM	Y6/SC 5 (16)				Y6/SC 6 (16)			
	REVERSIBLE AND IRREVERSIBLE CHANGE				FORCES IN AIR AND WATER			
	C6.1A Explain, with examples, that mixtures can be separated using a sieve or filter. *Carry out practical experiments to separate various mixtures using a sieve or filtration.* C6.1B Understand the terms 'dissolving', 'solution', 'solvent' and 'solute'. C6.1C Explain how a solute can be recovered from a solution by evaporating the solvent. *Observe a teacher-led practical experiment to separate salt from water using evaporation.* C6.1D Understand that melting, freezing, evaporation and condensation are changes of state. *Observe a teacher-led practical experiment to melt, freeze, evaporate and condense water.*				P6.1A Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. P6.1B Understand that weight is a force and forces are measured in newtons (N). P6.1C Understand that more than one force can act on an object at the same time. P6.1D Know how friction acts on moving objects to slow them down. P6.1E Understand how friction can be used to improve how well an object grips to a surface. *Compare shoe grips practically through an investigation.*			

M 2	C6.1E Explain that changes of state require changes of temperature. C6.1F Describe the role of evaporation and condensation in the water cycle. C6.1G Understand that dissolving, mixing and changes of state are reversible changes. C6.1H Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible. C6.1I Describe simple irreversible changes. C6.1J Describe observable changes when acid and bicarbonate of soda are mixed, as evidence that new materials are formed. *Observe a practical experiment in which acid and bicarbonate of soda are mixed together; note findings.* *Assessment 5*				P6.1F Understand that friction can act between solid surfaces and air and water. P6.1G Understand that air resistance and water resistance are forces that reduce the speed at which objects move. P6.1H Identify the effects of air resistance, water resistance and friction acting between moving surfaces. *Research ice/water sports.* P6.1I Describe how the shape of objects can be used to reduce the effects of water and air resistance, including the term 'streamlined'. *Investigate time taken for objects of different shapes to fall through a viscous medium, for example, wallpaper paste.* *Assessment 6*			
Year 6 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 2	Y6/SC7 (16) ELECTRICITY: CHANGING CIRCUITS P6.2A Understand the need for universally recognised symbols for electrical components. P6.2B Draw and identify recognised electrical-component symbols for a bulb, buzzer, battery (cell), wire, switch and motor. P6.2C Use and interpret recognised symbols for components when drawing or designing simple series circuits. *Design, build and draw simple circuits, using the correct symbols.* P6.2D Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. *Practically investigate the effect of the number of cells in the circuit.* P6.2E Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches and the speed of motors. *Assessment 7*				GL-PRACTICE Revise all concepts from year 3 to year 6 (KS2)		REVISION Revision for Final Exam	

Year 7 SCIENCE LONG TERM PLAN with CURRICULUM STANDARDS

Year 7 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 1	Y7 /SC 1 (12) CELLS AND ORGANISATION Recall the life processes. *Understand cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope.* Know the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts. Describe the similarities and differences between plant and animal cells. Explain the role of diffusion in the movement of materials in and between cells. Identify some specialised cells and describe their functions Describe the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. Identify the reactants in, and products of, photosynthesis. Describe the use of sunlight in photosynthesis to build			Y7 /SC 2 (8) MIXTURES AND SEPARATION Know the concept of a pure substance and mixtures and explain dissolving. *Know how Bunsen burner is used. Identify hazards and know how to reduce risks. Know and explain simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography. Know the effects of different variables on solubility.* Understand conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving.		Y7 /SC 3 (12) ENERGY Explain why different people need different amounts of energy from food. Comparing energy values of different foods (from labels) (kJ) Know the different ways in which energy is transferred and stored. Identify work done and energy changes on deformation of elastic maetrial. Recall the law of conservation of energy. Compare the starting with the final conditions of a system and describe changes in the amounts of energy associated. Explain why fossil fuels are described as nonrenewable. Give examples of fossil fuels.Give some examples of renewable energy resources. Know how sun is the original source of energy for most of our energy resources. Know the advantages and disadvantages of different energy resources. Know some	

	organic molecules. Explain the adaptations of leaves for photosynthesis. Assessment 1			Give examples of where chromatography and distillation is used. Assessment 2		ways of using less fossil fuels. Explain what is efficiency. Assessment 3		
Year 7 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y7 /SC 4 (8)		Y7 /SC 5 (10)			Y7/SC 6 (10)		
	MUSCLES AND BONES		THE PARTICLE MODEL			CURRENT ELECTRICITY		REVISION
	Know how muscles in the gas exchange system allow ventilation. Understand the mechanism of breathing to move air in and out of the lungs,using a pressure model to explain the movement of gases. Describe the role of muscles in the heart. Know the structure and functions of the human skeleton. Know some different types of joint. Explain how antagonistic pair of muscle operate and are controlled to allow movement. Recall how different drugs affect the body. Assessment 4		Describe the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure. Know the similarities and differences, including density differences, between solids, liquids and gases. Identify scientific questions, hypothesis and predictions. Know how evidence and observations are used to develop into a theory and evidence is used to support a theory. Explain how Brownian motion supports particle theory. Use particle theory to explain diffusion in liquids and gases. Assessment 5			Define electric current. Measure current in series and parallel circuits. Know how switches can control different kinds of circuit. Know how changing the number or type of component in circuit affects the current. Define potential difference. Explain why the current increases when the voltage of supply is increased. Know the relationship between resistance as the ratio of potential difference (p.d.) to current. Know differences in resistance between conducting and insulating components (quantitative).Understand the use of fuses and circuit breakers. Know how the different wires are connected in plug. Assessment 6		Revision for First Term Exam
Year 7 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y7 /SC 7 (10)		Y7 /SC 8 (10)			Y7 /SC 9 (12)		
	ECOSYSTEM		ATOMS, ELEMENTS AND MOLECULES			FORCES		
	Recall what a species is. Know continuous or discontinuous variation. Know some adaptations for different habitats. Know how inherited variation is caused. Identify causes of environmental variation. Know the adaptation to daily and seasonal changes. Know ways in which organisms affect their habitat and communities. Use food web to make predictions.Use pyramid of numbers to describe how energy is lost. Explain why pesticide need to be used carefully. Assessment 7		Know what kinds of particles are found in air.Know why different elements are used for different purposes.Know what the difference between metals and non metals is. Relate the use of an elements to its properties Know how do elements form compounds.Know how can we use chemical reactions.Use and understand word equations for chemicals reactions.Describe example and uses of decomposition reactions. Assessment 8			Recall forces as pushes or pulls, arising from the interaction between two objects. Use force arrows in diagrams, for adding forces in one dimension, balanced and unbalanced forces. Know the effects of forces on an object. Name forces and classify them as contact or non-contact forces. Describe how the extension of a spring depends on the force applied. *Investigate force-extension linear relation-Hooke's Law.* Know the effects of frictions. Explain some ways in which friction can be changed. Know the situation in which friction is helpful or not helpful. Know what is pressure and describe the effects of high and low pressure in simple situations. Explain effects of balanced and unbalanced forces. Assessment 9		
Year 7 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T	Y7 / SC 10 (10)		Y7 /SC 11 (10)				Y7 /SC 12(4)	
	ACIDS AND ALKALIES		SOUND			Simple machine	REPRODUCTION	REVISION
	Know why hazard symbols are necessary. Know some common examples of acids and alkalis. *Investigate how indicators can*		Know the cause of sounds and how to make louder sounds. Know link between frequency and pitch. Know how sound			Understand that simple machines give bigger	Describe the reproduction in humans,	

E R M 2	*be used to test for acidic, alkaline or neutral solutions.* Know the pH scale and how it is useful. Describe neutralizations. Explain the pH changes taking place during neutralization. Describe and explain every day neutralization reactions- reactions of acids with alkalis to produce a salt plus waterreactions of acids with alkalis to produce a salt plus water Assessment 10	moves through materials. Explain why sounds get fainter further from their source. Know the part of the ear and their functions. Know how microphones convert sound into electric signals. Be aware of the auditory range of frequencies in humans and animals. Know some uses of ultrasound - use for cleaning and physiotherapy by ultra-sound; waves transferring information for conversion to electrical signals by microphone. Explain how sonar and eco location work. Compare longitudinal and transverse waves. Know that all waves can be reflected. Explain what super positions means. Assessment 11	force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged. Describe moment as the turning effect of a force.	including the reproductive systems, menstrual cycle, gametes, fertilisation, gestation and birth and the effect of maternal lifestyle on foetus. Assessment 12.	Revision for Final Exam

Year 8 SCIENCE LONG TERM PLAN with CURRICULUM STANDARDS

Year 8 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 1	Y8 /SCI 1 (12)			Y8 /SCI 2 (8)		Y8 /SCI 3 (12)		
	FOOD AND NUTRITION			COMBUSTION		LIGHT		
	Know the the nutrients we need in our diets and its sources. Calculate energy requirements in a healthy daily diet. *Identify the types of nutrients present in food substances.* Describe what each nutrient does in the body. Realise the benefits of a balanced diet. Know the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. Identify organs of the human digestive system, including adaptations to function and describe how the digestive system digests food. Know that enzymes act as biological catalysts. Explain the importance of bacteria in the human digestive system. Understand the role of diffusion in the movement of materials in and between cells. Assessment 1			Know the reactions of hydrogen and hydrocarbons with oxygen. Know the oxidation reactions of metals and non-metals. Explain change in mass seen in oxidation reactions. Understand difference exothermic and endothermic reactions.Use the fire triangle to explain how to control a fire. Identify hazard symbols for substances likely to cause fires. Know the pollutant that are formed by burning fuels and how these pollutants cause problems and how their effects can be reduced. Describe the greenhouse effect and how it is caused. Realise how human activity may cause global warming. *Investigate the amount of oxygen needed for burning.* Assessment 2		Know the similarities and differences between light waves and waves in matter. Realise that light waves can travel through vaccuum. Describe the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. Use of ray model to explain imaging in mirrors. Discuss some uses of lenses. Define refraction of light and describe action of convex lens in focusing. Investigate refraction of light in glass slab. List the parts and state their functions in human eye. Realise that light transfer energy from source to absorber, leading to chemical and electrical effects. Identify the colours and different frequencies of light when white light pass through a prism. Know the differential colour effects in absorption and diffuse reflection. Assessment 3		

Year 8 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R	Y8 /SC 4 (8)			Y8 /SCI 5 (16)				
	PLANTS AND THEIR REPRODUCTION			THE PERIODIC TABLE				REVISION
	Interpret scientific organism names. Describe how organisms are classified. Explain the importance of biodiversity. Know the asexual and sexual reproduction in plants. Describe reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation			Describe Dalton's atomic model. Know difference between atoms and molecules. Identify elements, mixtures and compound from descriptions and particle diagrams. Know the differences between metal and non metats. Describe chemical changes and compound formation. Know the name of some simple compounds. Use and understand word equations for chemicals reactions. Use the periodic table to find				

M 1	and dispersal, including quantitative investigation of some dispersal mechanisms. Know about seed germination. Realise the importance of plant reproduction through insect pollination in human food security Assessment-4			elements with similar properties. Know some typical properties of alkali metals halogens and noble gases. Know melting, freezing and boiling points and use them to predict the state of a substance. Identify trends in physical properties within the periodic table. Identify the position of metals and non metals in the periodic table by their properties. Describe the reactions of some elements with water and oxygen. Identify trends and make predictions about chemical properties using the periodic table. Describe the chemical properties of metal and non-metal oxides with respect to acidity. Assessment-5				Revision for First Term Exam
Year 8 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y8 /SCI 6 (8)		Y8 /SCI 7 (12)			Y8 /SCI 8 (12)		
	BREATHING AND RESPIRATION		METALS AND THEIR USES			FLUIDS		
	Know the structure and functions of the gas exchange system in humans, including adaptations to function. Understand the mechanism of breathing. Recognize the the impact of exercise, asthma and smoking on the human gas exchange system. Know the composition of air. State a word summary for aerobic respiration. Know the causes and effects of reduced oxygen supply on the body. Know the process of anaerobic respiration and its effects during and after hard exercise. Know the gas exchange in different organisms. Assessment - 6		Know some common properties and uses of metals. Write word equations for the reactions of metals and non-metals. Describe what a catalyst is and some uses of catalysts. Know what happens during corrosion and rusting. Explain how metals can be protected from corrosion. Know the reactions of metals with water and acid. Place metals and carbon in order of reactivity. Write word and symbol equations for reactions. Explain how to improve the quality of data collected during an investigation. Explain what alloys are and why they are used. Use models to explain the properties of alloys. Identify pure substances by their melting points and boiling points. *Explain how to improve the quality of data collected during an investigation.* Assessment-7			Recall the properties of matter in terms of particle model (the differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition). *Measure the density of substance by different method.* Know what is pressure and the effects of high and low pressure in simple situations. Realise that pressure is defined as ratio of force over area acting normal to any surface. Know that pressure in liquids increases with depth -upthrust effects, floating and sinking. Understand that atmospheric pressure decreases with increase of height as weight of air above decreases with height. Describe ways in which drag forces can be incresased or reduced. Know the causes of drag forces and describe how drag changes with speed. Assessment 8		
Year 8 SCI	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y8 /SCI 9 (8)		Y8 /SCI 10 (6)		Y8/SC 11 (4)	Y8 /SCI 12 (10)		
	UNICELLULAR ORGANISMS		ROCKS		MAGNETIC EFFECT OF CURRENT	EARTH AND SPACE		REVISION
	Use cell features to identify members of different kingdoms. Differentiate between unicellular and multi cellular organisms. Explain how yeasts are used in brewing and baking. Describe how yeasts reproduce and the limiting factors. Describe the process of anaerobic respiration in microorganisms, including fermentation. Know the functions of the parts of a bacterial and protoctist cells. Know how algae make their own food and explain its importance. Explain the importance of decomposers. Model the recycling of carbon in an ecosystem using carbon cycle. Assessment-9		Explain how some of the properties of rocks are related to their texture. Recall some uses of rocks. Know the structure of the Earth and the composition of atmosphere. Know the formation of igneous, sedimentary and metamorphic rocks. Use the rock cycle model to link the three types of rocks. Explain how the grain size is evidence for the speed of cooling. Describe weathering and erosion. Know how metals are obtained and some advantages of recycling metals. Assessment-10		Explain the magnetic effect of a current. Describe the use electromagnets and the principle of D.C. motors.	Recall the model of solar system. Use the model to explain the change in seasons the pattern of light and dark at the Earth's poles. Know about properties of magnets, magnetic fields and Earth's magnetic field. Calculate 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. Know the factors that affect the strength of gravity. Know about stars, galaxies and constellations. Explain what a light year is. Assessment-11		Revision for Final Exam

YEAR 9 PHYSICS LONG TERM PLAN with CURRICULUM STANDARDS

YEAR 9 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y9/P1 (3)	**Y9/P2(15)**					**Y9/P3(6)**	
	Key concepts of Physics	**Conservation of energy**					**Waves**	
	Use of the SI unit for physical quantities. Use multiples and sub-multiples of units and conversions. Use of significant figures and standard form where appropriate	Use diagrams to represent energy transfers. Explain that there are energy transfers in a system and describe the concept of conservation of energy for different situations. Identify how energy become wasteful when there is rise in temperature leading to dissipating energy to the surroundings. Explain ways of reducing unwanted energy transfer. Calculate efficiency and explain how efficiency can be increased. Use the equation $\Delta GPE = m \times g \times \Delta h$ and $KE = 1/2\ mv^2$. Describe the main energy sources available for use on Earth (including fossil fuels, nuclear fuel, bio-fuel, wind, hydroelectricity, waves, tides and Sun) and compare the ways in which both renewable and non-renewable sources are used. Assessment 1					Explain that waves transfer energy and information without transferring matter. Use the terms frequency, wavelength, amplitude, period, wave velocity and wavefront as applied to waves. Explain the difference between longitudinal and transverse waves. Use the equations: wave velocity $v = f\lambda$ and $v = x/t$. Describe how to measure the velocity of sound in air and ripples on water surfaces. Calculate depth or distance from time and wave velocity. Assessment 2	

YEAR 9 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	**Y9/P4(9)**			**Y9/P5(9)**				
	Reflection and Refraction			**Sound Waves**			**Earth Science**	**REVISION**
	Recall reflection and laws of reflection. Explain how waves will be refracted at a boundary in terms of the change of speed and direction. Describe that different substances may absorb, transmit, refract or reflect waves in ways that vary with wavelength. Assessment 3 *CORE PRACTICAL 2 - Investigate refraction in rectangular glass blocks in terms of the interaction of electromagnetic waves with matter*			Describe the propagation of sound waves in different medium in terms of changes in velocity, frequency and wavelength.Explain the way the human ear works. Describe the features and uses of infra sound and ultra sound waves including sonar, fetal scanning and study of earth's structure. Assessment 4 *CORE PRACTICAL 1: Investigate the suitability of equipment to measure the speed, frequency and wavelength of a wave in a solid and a fluid*			Explain plate tectonics and consequences of different types of plate movements near the boundaries. Differentiate between types of seismic waves. Identify different layers of atmosphere.	Revision for First Term Exam

YEAR 9 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM	**Y9/P6(12)**				**Y9/P7(12)**			
	Light				**Electromagnetic spectrum**			
	Explain, with the aid of ray diagrams, reflection, refraction and total internal reflection (TIR) of light, including the law of reflection and critical angle. Describe and explain differential absorption of light by different materials. Describe the transmission of light through filters.Describe the refraction of light by converging and diverging lenses. Explain the effects of different types of lens in producing real and				Describe the continuous electromagnetic spectrum including (in order) radio waves, microwaves, infrared, visible (including the colours of the visible spectrum), ultraviolet, X-rays and gamma rays within it can be grouped in order of decreasing wavelength and increasing frequency. Identify common properties of electromagnetic waves. Describe the absorption and emission of thermal radiation.			

2	virtual images. Relate the power of a lens to its shape. Assessment 5				Assessment 6			
YEAR 9 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 2	Y9/P8 (9)			Y9/P9 (9)				
	Electromagnetic spectrum - Uses and dangers			Forces and Motion			REVISION	
	Identify the harmful effects, to life, of excessive exposure to the electromagnetic radiations. Describe characteristic properties and uses of each electromagnetic radiation. Identify the characteristic property of the radiation involved in each application or danger. Describe the effects of radiations on atoms. Assessment 7 *CORE PRACTICAL 3 - Investigate how the nature of a surface affects the amount of thermal energy radiated or absorbed.*			Explain the difference between vector and scalar quantities Define displacement, speed, velocity and acceleration of an object. Draw and interpret d - t and v - t graphs. Analyse distance/time graphs including determination of speed from gradient. Describe a range of laboratory methods for determining the speeds of objects such as the use of light gates. Use the equations $a = (v - u) / t$ and $v^2 - u^2 = 2 \times a \times x$ to determine acceleration. Analyse velocity/time graphs to compare acceleration from gradients qualitatively and to calculate acceleration and to determine the distance travelled. Recall some typical speeds encountered in everyday experience. Assessment 8			Revision for Final Exam	

Year 9 CHEMISTRY LONG TERM PLAN with CURRICULUM STANDARDS

Year 9 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 1	Y9/ CHE 1 (9)			Y9/ CHE 2 (15)				
	States of Matter (SC 1a)			Methods of Separating and Purifying Substances (SC 2a-2d)				
	Recall the arrangement, movement and the relative energy of particles in each of the three states of matter: solid, liquid and gas. Name the interconversions between the three states of matter. Explain the changes and conditions in arrangement, movement and energy of particles during these interconversions.State the meaning of the terms 'sublimation'and 'deposition'. Analyse the heating and the cooling curves. Identify melting point/boiling point from the graphs. Assessment 1			Identify the differences between a pure substance and a mixture.Discuss the experimental techniques for separation of mixtures by simple distillation, fractional distillation, filtration, crystallisation, paper chromatography.Draw a neat labelled diagram for simple distillation and fractional distillation. Describe an appropriate experimental technique to separate a mixture knowing the properties of the components of the mixture. Describe paper chromatography, interpret a paper chromatogram to distinguish between pure and impure substances, identify substances by comparison with known substances and identify substances by calculation and use of R_f values. *CORE PRACTICAL 1 : Investigate composition of inks using simple distillation and paper chromatography.* Assessment 2				
Year 9 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M	Y9/ CHE 3 (9)			Y9/ CHE 4 (12)				
	Atomic Structure (SC 3a-3c)			The Periodic Table (SC 4a-4c)				REVISION
	Describe the Dalton's model of atom, structure of atom in terms of protons, electrons, neutrons and nucleus. Predict the mass and the charge for the sub-atomic particles. Calculate the number of protons, electrons, neutrons in an atom of an elements and ions. Draw shell diagram for the structure of atom			Explain how Mendeleev arranged the elements in a periodic table by using properties of these elements and their compounds.Discuss how he used his table to predict theexistence and the properties of some elements not then discovered. Compare the similarities and the diferences between Mendeleev's and modern periodic tables.Spot out the pair reversals from the periodic table.Use the Periodic Table to				

M 1	and ions. Define electronic configuration. Compare the relative mass and charge for proton, electron, neutron. Define isotopes as atoms of the same element with different number of neutrons and same number of protons. Calculate the RAM of elements based on their percentage abundance and relative masses. Assessment 3			obtain the names, symbols, relative atomic masses and proton numbers of elements. Predict the electronic configurations of the first 20 elements in the periodic table as diagrams and in the form 2.8.1. Explain how the electronic configuration of an element is related to its position in the periodic table. Identify the group and the period of an element using electronic configuration. Assessment 4 and 5				REVISION FOR FIRST TERM EXAM
Year 9 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 2	Y9/ CHE 5 (15)					Y9/ CHE 6 (9)		
	Ionic Bonding (SC 5a-5c)					Covalent Bonding (SC 6a)		
	Demonstrate how ionic bonds are formed by the transfer of electrons to produce cations and anions. Define ion as a charged particle. Draw dot and cross diagrams to explain how an atom donates / transfers electron to another atom to achieve noble gas electronic structure.Define ionic bond.Draw the electronic structure of atoms and ions.Calculate the numbers of subatomic particles in an atom and an ion.Define ionic lattice. Write the formulae of different ionic compounds.Explain the use of the endings –ide and –ate in the names of compounds.Discuss which particles and forces are present in ionic compounds.Predict why ionic compounds have high melting points and boiling points.Predict the shapes of crystals are determined by the structure of the lattice.Identifying the compounds that have ionic bonding and explain your reasoning.Giving reasons why the other compounds do not have ionic bonding. Assessment 6,7					Explain how a covalent bond is formed when a pair of electrons is shared between two atoms.Write the names of some covalent molecules. Draw the dot cross diagrams for molecules.Use of dot and cross diagrams to explain the formation of covalent molecules.Discuss the bonding in a molecule of water,ammonia,methane,fluorine,carbon dioxide,oxygen,nitrogen, and carbon tetrachloride.Discuss the properties of covalent compounds like low boiling points and melting points, poor conductor of electricity. Assessment 8		
Year 9 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 2	Y9/ CHE 7 (18)							
	Types of substances and balancing equations (SC7a-7d)						REVISION	
	Define polymers and explain how properties if propene molecules are added together to form a chain.Differentiate between simple molecular structures and giant covalent structures.Discuss the structure and properties of different allotropes of carbon-diamond,graphite,fullerenes and graphene. List the typical physical properties of metals and non metals.Discuss the arrangement of particles in a metal.Explain the bonding in metals and their properties.Explain most metals as shiny solids which have high melting points, high density and are good conductors of electricity whereas most nonmetals have low boiling points and are poor conductors. Predict the different types of structure and bonding models used to describe substances.Demonstrate the use of models like dot and cross,3D space filling,ball and stick to explain the properties of substances.List the limitations of bonding models to show structure and bonding. Write word and balanced chemical equations for the different types of neutralisation reactions. Assessment 9,10						REVISION FOR FINAL EXAM	

Year 9 BIOLOGY LONG TERM PLAN with CURRICULUM STANDARDS

Year 9 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M	Y9 /B1 (24)							
	Key Biological Concepts							
	Explain how the sub-cellular structures of eukaryotic and prokaryotic cells are related to their function-animal cells, plant cells & bacteria. Compare structure of animal, plant and bacteria. Draw & label drawings of a typical			Understand how changes in microscope technology, including electron microscopy, have enabled us to see cell structures with more clarity and detail. Compare the use of light & electron microscope. Do calculations based on magnification & scale bar concept. Write measured length /diameter of measured objects in standard form. *Investigation 1: Produce labelled scientific*				

1	plant, animal & prokryote cell. Assessment 1			*drawings from observations of biological specimens using microscopes.* Assessment 2				
Year 9 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y9/B1 (24)							
	Key Biological Concepts							
	Explain the structure, properties and role of enzymes. Describe factors affecting enzyme activity. Plan experiments linked with factors affecting enzyme activity. Analyse & interpret graphs related to enzyme action. *Investigation 2: Factors affecting enzyme activity.*			Explain various tests used to detect presence of starch, protein, fat & sugars. Understand how the energy in food can be measured using calorimetry. *Investigation 3: Use of chemical reagents to identify starch, reducing sugars, proteins and fats in food substances*		Explain how substances are transported by diffusion, osmosis and active transport. Compare process of diffusion, osmosis & active transport. Enlist uses of diffusion,osmosis & active transport in living organisms. Interpret Ficks law & factors affecting diffusion *Investigation 4: Investigate diffusion in agar and osmosis in potatoes.* Assessment 3		
Year 9 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y9/B2(24)							
	Cells & Control							
	Describe mitosis as part of the cell cycle including the stages interphase, prophase, metaphase, anaphase and telophase and cytokinesis.Understand the importance of mitosis in growth, repair and asexual reproduction.		Describe cancer as the result of changes in cells that lead to uncontrolled cell division. Explain growth in organisms, including cell division and differentiation in animals & cell division, elongation and differentiation in plants. Demonstrate an understanding of the use of percentiles charts to monitor growth. Identify types of stem cells and its significance. Assessment 4			Explain the structure and function of sensory neurones, motor neurons and synapses in the transmission of electrical impulses including the axon, dendron, myelin sheath and the role of neurotransmitters. Differentiate between different types of neurones and their roles in reflex action.		
Year 9 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y9/B2(15)					Y9/B2(9)		
	Cells & Control					Genetics		
	Describe the structures and functions of spinal cord and brain including the cerebellum, cerebral hemispheres and medulla oblongata. Understand various brain imaging techniques. Discuss some of the limitations in treating damage and diseases in the brain and other parts of the nervous system, including spinal injuries. Assessment 5			Explain the structure and function of the eye as a sensory receptor. Describe defects of the eye. Explain how cataracts, long-sightedness and short-sightedness can be corrected.		Discuss advantages and disadvantages of asexual reproduction and sexual reproduction. Explain the role of meiotic cell division in the formation of genetically different haploid gametes. Assessment 6		Revision for Final Exam

YEAR 10 PHYSICS LONG TERM PLAN with CURRICULUM STANDARDS

YEAR 10 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y10/P1 (4)	Y10/P2 (12)			Y10/P3 (16)			

TERM 1	Mathematical Physics	Motion			Forces and motion			
	Recall standard form, multiplication and division of numbers with indices. Revise changing the subject of a formula and substitution. Construct and interpret linear graphs.	Explain the difference between vector and scalar quantities Define displacement, speed, velocity and acceleration of an object. Draw and interpret *d - t* and *v - t* graphs. Analyse distance/time graphs including determination of speed from gradient. Describe a range of laboratory methods for determining the speeds of objects such as the use of light gates. Use the equations $a = (v - u) / t$ and $v^2 - u^2 = 2 \times a \times x$ to determine acceleration. Analyse velocity/time graphs to compare acceleration from gradients qualitatively and to calculate acceleration and to determine the distance travelled. Recall some typical speeds encountered in everyday experience. Assessment 1			State and explain Newton's three laws of motion. Draw and interpret free body diagram and find resultant force. Explain that inertial mass is a measure of how difficult it is to change the velocity of an object. Use the equations $F = m \times a$ and $W = m \times g$. Introduce the term 'action-reaction' pairs. Explain how for motion in a circle there must be a resultant force known as a centripetal force that acts towards the centre of the circle. Explain that an object moving in a circular orbit at constant speed has a changing velocity (qualitative only) Define momentum and use the equation $p = m \times v$. State and explain the conservation of linear momentum. Apply Newton's third law to collision interactions and relate it to the conservation of momentum in collisions. Define Newton's second law as rate of change of momentum. Use the concept of momentum to explain the role of crumple zone and other safety features of the car. Identify factors affecting stopping distance of a vehicle. Estimate how the distance required for a road vehicle to stoping an emergency varies over a range of typical speeds. Carry out calculations on work done to show the dependence of braking distance for a vehicle on initial velocity squared(qualitative). Assessment 2 *CORE PRACTICAL 4: Investigate the relationship between force, mass and acceleration*		
YEAR 10 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y10/P4 (8)		Y10/P5 (8)		Y10/P6 (12)			
	Atom Model (6a-6c)		Radioactivity (6d-6f)		Radioactivity(6g-6m)			REVISION
	Describe an atom and nuclei of isotopes. Explain how ions are formed. Identify different types of ionising radiations and state their properties. Explain what is meant by background radiation. Describe methods for measuring and detecting radioactivity. Describe the plum pudding model and Rutherford alpha particle scattering leading to the Bohr model. Assessment 3		Describe the process of radioactive decays. Write balance nuclear equations for each decay. Describe the random and exponential decay of radioactive nuclei and define half life. Draw decay graphs and determine half life. Identify the suitability of different radioactive sources depending on half life and the type of emission. Assessment 4		Describe the uses and dangers of radioactivity. Describe the differences between contamination and irradiation effects. Explain some of the medical uses (PET and tracers). Describe nuclear fission and working of nuclear power stations. Discuss environmental and social impact of nuclear power stations. Describe nuclear fusion and discuss the difficulty in attaining the conditions for fusion. Assessment 5			Revision for First Term Exam
YEAR 10 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y10/P7 (20)					Y10/P8(12)		
	Astronomy					Energy- Forces doing work		
	Explain how and why the value of g differs in different bodies in space. Recall our Solar System and describe the orbits of moons, planets, comets and artificial satellites. Explain centripetal force in circular orbits. Relate the radius and orbital speed. Compare the Steady State and Big Bang theories. Describe evidence supporting the Big Bang theory-red shift and CMBR. Explain why the red-shift of galaxies provides evidence for the Universe expanding. Describe the evolution of stars. Describe how methods of observing the Universe have changed over time. Assessment 6					Define work as energy transferred. Define and calculate kinetic and potential energy of a body. Express power as the rate of doing work and identify the factors affecting power. Recall that one watt is equal to one joule per second, J/s . Assessment 7		

YEAR 10 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y10/P9 (16)				Y10/ P10(8)			
	Forces and their Effects				Static Electricity		REVISION	
	Describe, with examples, how objects can interact. Draw and use free body force diagrams and calculate resultant forces. Identify situations where forces can cause rotation. Recall and use the equation: *moment of a force = force × distance* normal to the direction of the force. Recall and use the principle of moments. Explain how levers and gears transmit the rotational effects of forces. Assessment 8				Explain how an insulator can be charged by friction. Recall that like charges repel and unlike charges attract. Explain how earthing removes excess charge. Explain some of the uses and dangers of electrostatic charges in everyday situations. Define an electric field Describe the shape and direction of the electric field around a point charge and between parallel plates and relate field strength to the concentration of lines. Explain static electricity using electric field. Assessment 9		Revision for the Final Exam	

Year 10 CHEMISTRY LONG TERM PLAN with CURRICULUM STANDARDS

Year 10 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y10 /CHE 1 (20)					Y10 /CHE 2 (12)		
	Acids and Alkalis (SC 8a - 8g)					Calculations involving masses (SC 9a-c)		
	Differentiate acids as a source of H^+ and alkalis as a source of OH-, strong and weak, concentrated and dilute acids. Explain how the changes in the H^+ affects the pH of a solution. Explain the reactions of acids with metals, metal oxides, carbonates, hydroxides, tests for gases, salt preparation and solubility rules. Write the word and balanced chemical equations for the reactions of acids with metals, alkalis, metal carbonates and hydrogen carbonates. Identify the colour changes for the different acid base indicators.Carry out experiments for the titration and know how to use a pipette,burette and indicator solution while doing titration. Use the solubility rules to prepare insoluble salts.Write a word and a balanced chemical equation for the precipitation reactions including state symbols. *CORE PRACTICAL 2 : Investigate the change in pH on adding powdered calcium hydroxide or calcium oxide to a fixed volume of hydrochloric acid.* *CORE PRACTICAL 3 : Investigate the preparation of pure, dry hydrated copper sulfate crystals starting from copper oxide including the use of a water bath.* Assessment 1, 2					Calculate relative formula mass given relative atomic masses.Define empirical formula and molecular formula of a compound.Deduce the empirical formula when percentage mass of each element is given and deduce molecular formula of a compound from emprical formula and the molecular mass.Calculate the concentration of solutions in gram per decimeter cube.Define limiting reactant. Deduce a balanced chemical equations from the masses of reactants and products.Define Avogadro's constant.Apply the law of conservation of mass to calculate the mass of reactants or products in a chemical reaction.Calculate loss in mass from the given data. Calculate moles from the mass of a substance and vice versa. Assessment 3		

Year 10 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TE	Y10 /CHE 3 (16)				Y10 / CHE 4 (12)			
	Electrolytic Processes (SC 10a-c)				Obtaining and using metals (SC 11a- d)			REVISION
	Explain the movement of the ions and predict the products formed during electrolysis of molten compounds like sodium chloride,potassium bromide,calcium oxide and aqueous solutions of				Discuss the similarities and differences in the way different metals react with water, acids and salt solutions. Explain displacement reactions as redox			

R M 1	copper(II) chloride,sodium chloride,sodium sulfate, acidified water, molten lead (II) bromide using inert electrodes.Define the terms oxidation and reduction in terms of electrons.Compare the electrolysis of aqueous copper (II) sulfate using inert and copper electrodes.Explain how copper can be purified using electrolysis using a neat labelled diagram. Predict how anode sludge is formed during the purification of copper.Write ionic half equations at cathode and anode. *CORE PRACTICAL 4: Investigate the electrolysis of copper (II) sulfate solution with inert electrodes and copper electrodes.* Assessment 4,5				reactions. Predict word and balanced chemical equations of displacement reactions.Write ionic equations with state symbols for displacement reactions. Suggest how the method of extraction of a metal is related to its position in the reactivity series. Summarize extraction of metals as reduction of ores by heating with carbon,biological methods like bacterial and phytoextraction, recycling of metals.List the factors to consider in a life cycle assessment of a product. Assessment 6			REVISION FOR FIRST TERM EXAMINATION
Year 10 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 2	Y10 /CHE 5 (16)				Y10/ CHE 6 (16)			
	Transition Metals, Corrosion (SC 13a-b)				Electroplating & Alloying (SC 13c-d)			
	Understand that most metals are transition metals, recall their typical physical and chemical properties. Cite some examples of transition metals from the periodic table. Discuss their position in the periodic table and what properties of iron make it a typical transition metal. Give the tests, observations for iron (II), iron(III) and write their chemical equations. Reason out why metals corrode. Explain rusting of iron and methods of preventing it by exclusion of oxygen and sacrificial protection. Investigate the effect of the dissolved salt on the rate of rusting.Evaluate the suitability of sodium for the sacrificial protection of an offshore oil rig. Assessment 7				Explain how electroplating can be used to improve the appearance and resistance to corrosion of metal objects.Define alloy.Reason out why iron is alloyed with other metals to produce alloy steels, relate uses of metals to their properties including aluminium, copper and gold and their alloys including magnalium and brass. Evaluate the use of electroplating for jewellery and for metal bathroom fittings. Suggest a reason that explains why a surgical instruments.Explain why wrought iron is an alloy. Evaluate the statement 'alloys are stronger than the individual metals they contain'. Reason out why car parts are made from alloy steels. Assessment 8			
Year 10 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 2	Y10/ CHE 7 (16)				Y10/ CHE 8 (8)			
	Quantitative Analysis, Calculations involving volumes of gases (SC 14a - e)				Qualitative Analysis, Nanoparticles (SC 25a-26c)		REVISION	
	Calculate the concentration of solutions in mol dm^{-3} and convert concentration in g dm^{-3} into $moldm^{-3}$, calculations to find the concentration of an acid/ alkali solution using acid-base titration, percentage yield, atom economy, molar volume of gases, use Avogadro's law to calculate volumes of gases involved in a gaseous reaction, given the relevant equation. Reason out why the actual yield is less than the theoretical yield in some cases. Explain how the data is used to decide on the best way to manufacture a product. *CORE PRACTICAL 5: Carry out an accurate acid-alkali titration, using burette, pipette and a suitable indicator.* Assessment 9				Discuss the tests and reactions to identify cations and anions. Explain what are nanoparticles, how they are different from bulk materials, their uses and the risks associated with these nanoparticles. *CORE PRACTICAL 7:Identify the ions in some unknown salts, using the tests for the specified cations and anions.* Assessment 10		REVISION FOR FINAL EXAMINATION	

YEAR 10 BIOLOGY LONG TERM PLAN with CURRICULUM STANDARDS

YEAR 10 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T	Y10 /BIO 1 (12)			Y10 /BIO 2 (20)				
	DNA & Protein Synthesis			Genetics				
	Describe DNA as a polymer made up of two polynucleotide chains in the			Describe the work of Mendel in discovering the basis of genetics and recognize the difficulties of understanding inheritance				

TERM 1	form of a double helix Differentiate gene & genome.Explain how the order of bases in a section of DNA decides the order of amino acids in the protein. Understand the stages of protein synthesis, including transcription and translation.Describe how genetic variants in the coding & non coding DNA of a gene can affect phenotype by influencing the binding of RNA polymerase , altering the quantity & activity of protein produced. Understand the significance of HGP & cause of gene mutation with specific examples. Assessment 1			before the mechanism was discovered.Understand that characteristic features are controlled by genes- dominant/recessive and homozygous/heterozygous. Analyse and interpret patterns of monohybrid inheritance using a genetic diagram, Punnet square and family pedigree. Describe the inheritance of the ABO blood groups with reference to codominance and multiple alleles.Understand the cause, symptoms and cure for sex linked diseases .Identify types and cause of variation in organisms. Assessment 2 *Investigation 1: Use of chemical reagents to identify starch, reducing sugars, proteins and fats in food substances*				
YEAR 10 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y10 /BIO3 (24)							
	Natural Selection & Selective Breeding						REVISION	
	Explain work of Wallace& Darwin to explain theory of evolution by natural selection.Understand emergence of resistant organisms to support Darwin's theory. Describe the evidence of human evolution based on fossil records & stone tools.Interpret how pentadactyl limb provides evidence for evolution.Understand how genetic analysis had led to the suggestion of three domain rather than five kingdom method .Understand selective breeding & its impact on food plantsand domesticated animals. Assessment 3						REVISION FOR FIRST TERM EXAM	
YEAR 10 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y10/B4 (12)			Y10/ B5(20)				
	Cloning & Genetic modification			Health & Disease				
	Describe the process of tissue culture& genetic engineering and its advantages & disadvantages in medical research & plant breeding programmes.Evaluate the benefits & risks of selective breeding,tissue culture & genetic engineering in modern agriculture & medicine. Assessment 4			Differentiate infectious & non infectious disease in humans.Describe the cause, spread and control of infectious diseases in humans. Explain the lifecycle of a virus and spread & control of sexually transmitted viral infections. *Investigation 2 : Factors affecting enzyme activity .*		Describe the link of non infectious disease with CVD,cancer,lung& liver disease and malnutrition.Explain the effect of lifestyle factors of non communicable diseases.Evaluate treatments for CVD.Assessment 5		
YEAR 10 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM	Y10/B6(24)							
	Health, Disease and the development of medicines						REVISION	
	Describe the physical barriers & chemical defences of the human body. Explain the specific immune responses in the human body. Understand immunisation & evaluate the various immunisation techniques.		Understand the bacetricidal & bacteriostatic action of antibiotics.Explain the aseptic techniques used in culturing microorganisms .Identify and explain the various phases in drug trialling done in human .Evaluate each phase of drug trialling .Assessment 6			Describe plant defence mechanisms.Evaluate the use of plant chemicals, antibiotics and antiseptics to favour	REVISION FOR FINAL	

2			cure and avoid spread of diseases. *Investigation 3 : Effect of antibiotics*	EXAMINATION			

YEAR 11 PHYSICS LONG TERM PLAN with CURRICULUM STANDARDS

YEAR 11 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y11/P1 (20)				Y11/P2 (5)	Y11/P3 (15)		
	Electricity and Circuits				Electrical Safety	Force doing work and their effects		
	State explain Ohm's law and define resistance. Analyse series and parallel circuits. Develop an understanding of components with changing resistances. Investigate IV graphs of different ohmic and non-ohmic conductors like metal wire, filament lamp,LDR and semi conductor diode. Explain the energy transfer as the result of collisions between electrons and the ions in the lattice. Explain the heating effect of an electric current and calculate electrical power. Describe the advantages and disadvantages of the heating effect of an electric current. Assessment 5 *CORE PRACTICAL 2 - Construct electrical circuits to Investigate IV graphs and test series and parallel circuits using resistors and filament lamps* Assessment 1				Explain the difference between ac and dc. Recall the p.d between the live, neutral and earth mains wires Explain the function of an earth wire and of fuses or circuit breakers for safety.	Define work and determine kinetic and potential energy of a body. Identify the factors affecting power. CORE PRACTICAL 1- Investigate the relationship between force, mass and acceleration. Describe how objects can interact. Draw and use free body force diagrams and resultant forces. Identify situations where forces can cause rotation. Recall and use the equation: moment of a force = force × distance normal to the direction of the force. Recall and use the principle of moments. Explain how levers and gears transmit the rotational effects of forces. Assessment 2		

YEAR 11 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y11/P4 (15)			Y11/P5(15)			Y11/P6(5)	
	Forces and Matter			Particle model			Gas Laws	REVISION
	Describe the difference between elastic and inelastic distortion. Use the equation to calculate the spring constant: $F = kx$. Use the equation $E = 1/2\ kx2$ to calculate the work done in stretching a spring. Describe the pressure in a fluid as being due to the fluid and atmospheric pressure. Explain how pressure is related to force and area, $P = F/A$. Describe and explain how pressure in fluids increases with depth and density. Use the equation $P = h \times \varrho \times g$. Recognise that upthrust is equal to the weight of fluid displaced. Explain how the factors upthrust and weight determine whether an object will float or sink. Assessment 3 *Core Practical 5: Investigate the extension and work done when applying forces to a spring*			Use a simple kinetic theory model to explain the different states of matter. Define density of a material. Explain how heating a system will change the energy stored within the system and raise its temperature or produce changes of state. Explain how heating a system will change the energy stored within the system and raise its temperature or produce changes of state. Define specific heat capacity and describe how to determine the specific heat capacity of materials including water and some solids. Use the equation $\Delta Q = m \times c \times \Delta\theta$. Define specific latent heat and use the equation $Q = m \times L$. Assessment 4 *Core Practical 3: Investigate the properties of water by determining the specific heat capacity of water and obtaining a temperature-time graph for melting ice.*			Explain what causes the pressure of a gas. Recognize absolute zero as the lowest possible temperature. Describe the effect of changing the temperature of a gas on the speed of its particles and pressure. Use equation $P1 \times V1 = P2 \times V2$ to calculate pressure or volume for gases of fixed mass at constant temperature. Assessment 5	Revision for First term exam

YEAR 11	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8

PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y11/P5 (13)		Y11/P6 (12)					
	Magnetism and motor effect		Electromagnetic induction			REVISION		
	Differentiate between permanent and induced magnets. Describe the shape and direction of the magnetic field around bar magnets and for a uniform field. Relate field strength to the concentration of lines. Describe how a current can create a magnetic effect around a long straight conductor and relate the field strength to the current and distance from the conductor. Explain that magnetic forces are due to interactions between magnetic fields. Use Fleming's left-hand rule to show directions of the force, current and magnetic field. Use the equation $F = BIl$. Explain how the force on a conductor in a magnetic field is used to cause rotation in electric motors. Assessment 6		Describe the production of electric current by the relative movement of a magnet and a conductor. Explain how electromagnetic induction is used in alternators (a.c.) and in dynamos (d.c.) Explain the action of the microphone in converting the pressure variations in sound waves into variations in current in electrical circuits, and the reverse effect as used in loudspeakers and headphones. Explain how a transformer can change the size of an alternating voltage. Use the turns ratio equation for transformers to calculate voltage. Explain where and why step-up and step-down transformers are used in the transmission of electricity in the national grid. Assessment 7 *Core Practical 4: Investigate the densities of solid and liquids*			REVISION FOR MOCK EXAMINATION		

Year 11 CHEMISTRY LONG TERM PLAN with CURRICULUM STANDARDS

Year 11 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y11/ CHE 1 (25)					Y11/ CHE 2 (15)		
	Quantitative Analysis (SC 14 a-e)					Dynamic equilibrium and Cells(SC 15,16)		
	Calculate the concentration of solutions in mol dm^{-3} and convert concentration in g dm^{-3} into mol dm^{-3}. Calculations to find the concentration of an acid/ alkali solution titration, percentage yield, atom economy, molar volume of gases in a reaction, given the relevant equation. Give a reason that explains why it is desirable to have a high percentage yield in a reaction.Reason out why the actual yield is less than the theoretical yield in some cases. Explain how the data is used to decide on the best way to manufacture a product. Compare the two methods of making ethanol in terms of raw materials,atom economy and energy consumption. *CORE PRACTICAL 5: Carry out an accurate acid-alkali titration, using burette, pipette and a suitable indicator*. Assessment 1,2					Define dynamic equilibrium, describe the formation of ammonia as a reversible reaction between nitrogen and hydrogen for Haber process, predict how the position of a dynamic equilibrium is affected by changes in temperature, pressure, concentration. Compare the similarities and differences of making fertiliser in laboratory and factory.Describe how ammonium nitrate is manufactured using Haber process . Assessment 3		

Year 11 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y11 /CHE 3 (10)		Y11 /CHE 4 (20)					
	Groups in the Periodic Table (SC 17a- d)		Rates of Reaction, Heat Energy Changes in Chemical Reactions (SC18a-19b)				REVISION	
	Write the observations and equations for the reactions of group 1 metals with water. Explain the displacement reactions as redox reactions. Relate uses of noble gases with their properties like inertness and low density. Assessment 4		Explain methods to investigate rate of reactions and factors affecting the rates of reactions. Draw graphs to determine the rate of a reaction. Discuss how catalysts work to speed up reactions. Define exothermic and endothermic reactions. Calculate the energy changes in reactions from bond energy data. *CORE PRACTICAL 6: Investigating the effects of changing the conditions of a reaction on the rates of chemical reactions.* Assessment 5,6				REVISION FOR FIRST TERM EXAM	

Year 11 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y11 /CHE 5 (20)				Y11 /CHE 6 (20)			
	Fuels, Earth and Atmospheric Science (SC 20a - 21d)				Hydrocarbons, Alcohols, Carboxylic acids and Polymers (SC 22a- 24d)			
	Identify crude oil as a non renewable finite resource, names and uses of the main fractions of crude oil. Discuss the features of a homologous series and predict the products of complete & incomplete combustion of hydrocarbons. Predict the harmful effects of carbon monooxide and soot produced. Explain the advantages and disadvantages of hydogen and petrol as fuels. Compare early atmosphere and atmosphere today and explain how human activities influence the climate. Describe how scientist would collect evidence to support a casual link between carbon dioxide levels and global temperatures. Assessment 7,8				Identify functional groups present in alkanes, alkenes, alcohols and carboxylic acids. Predict reactions of carboxylic acids.Define momomers and polymers.Discuss the different types of polymers.Define addition and condensation polymerisation with examples, problems with disposal of polymers. Give the tests, observations and reactions to identify cations and anions. CORE PRACTICAL: Identify the ions in some unknown salts, using the tests for the specified cations and anions. *CORE PRACTICAL 8: Investigate temperature rise in water by combustion of alcohols.* Assessment 9,10			

Year 11 BIOLOGY LONG TERM PLAN with CURRICULUM STANDARDS

Year 11 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y11/B1(25)					Y11/B2(15)		
	Plant structures and their functions					Animal Coordination & Control		
	Identify and describe how the various parts of the leaf adapted for photosynthesis. Explain the role of photosynthesis in plants, factors affecting photosynthesis and analyzing the limiting factors. Understand mechanisms of transport of nutrients in plants & factors affecting transpiration linked with transport. Know how plants are adapted to survive in extreme environments. Explain how plant hormones control & coordinate plant growth. Understand tropic responses involved in plant growth. Describe the commercial uses of auxins, gibberelins & ethene in plants.Explain how structure of root hair cell, xylem & phloem are adapted for transport in plants. Describe plant defence mechanisms,their role in curing diseases & methods to investigate plant diseases.Assessment 1 *Investigation 1: Factors affecting photosynthesis.*					Identify various endocrine organs in human beings and explain their roles. Differentiate between type 1 and type 2 diabetes. Identify the cause and cure of diabetes. Recall and describe the stages of menstrual cycle. Interpret the role of hormones and negative feedback mechanism involved in menstrual cycle. Evaluate the advantages disadvantages of infertility treatment. Assessment 2 *Investigation 2 : Factors affecting enzyme activity.*		

Year 11 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y11/B2(20)				Y11/B3(20)			
	Animal Coordination & Control				Exchange & transport in organisms			
	Describe the role of skin and negative feedback mechanism in thermoregulation. Understand the general structure and functions of urinary system. Describe the possible treatments for kidney failure. Role of nephron in urine formation. Demonstrate an understanding of the role of ADH and negative feedback mechanism. *Investigation 3 : Effect of antibiotics, antiseptics & plant extract on bacterial growth.* Assessment 3				Recall factors affecting diffusion .Interpret Ficks law.Identify and explain the structure and functions of blood, heart, blood vessels and describe its role in transport of nutrients and wastes in the human body.Explain Physical & chemical barriers in human.Describe the role of white blood cells in body defence .Evaluate the uses & production of monoclonal antibodies. Understand and differentiate aerobic and anaerobic respiration and its significance during exercise. Investigate changes taking place during exercise. Calculate breathing rate, pulse rate, cardiac output and stroke volume. Assessment 4 *Investigation 4: Factors affecting the rate of respiration in living organisms.*			

Year 11 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y11/B4(40)							
	Ecosystem & material cycles							
	Demonstrate an understanding of how energy is transferred along a food chain and use of ecological pyramids. Explain biotic relationships of organisms in an ecosystem. Analyze, interpret and evaluate data related to air pollution and water pollution. Investigate effects of pollutants on germination and plant growth and describe remedial measures for air and water pollution. Assessment 5				Understand the various processes involved in cycling of water,carbon and nitrogen within an ecosystem and know the significance of carbon and nitrogen in living organisms. Identify &explain the various stages involved in water treatment. Discuss concepts of fish farming. Describe various food processing techniques. Evaluate ways of controlling biodiversity & maintaining sustainability. Assessment 6 *Investigation 5: Investigate the relationship between organisms and their environment using field-work techniques, including quadrats and belt transects.*			

YEAR 12 PHYSICS LONG TERM PLAN with CURRICULUM STANDARDS

YEAR 12 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y12/PHY 1(6)	Y12/PHY 2(27)				Y12/PHY 3(15)		
	Working as a Physicist	Mechanics I				Fluid and Solids		
	Distinguish between base and derived quantities and their SI units. Understand the measurements and techniques for both familiar and unfamiliar experiments. Estimate values for physical quantities.	Use the equations for uniformly accelerated motion in one dimension. Draw and interpret displacement-time, velocity-time and acceleration-time graphs. Know the physical quantities derived from the slopes and areas of displacement-time, velocity-time and acceleration-time graphs, including cases of non-uniform acceleration and understand how to use the quantities. Understand scalar and vector quantities and know examples of each type of quantity and recognise vector notation. Resolve a vector into two components at right angles to each other by drawing and by calculation. Find the resultant of two coplanar vectors at any angle to each other by drawing, and at right angles to each other by calculation. Draw and interpret free-body force diagrams to represent forces on a particle or on an extended but rigid body. Use the equation $\Sigma F = ma$ and Newton's first law of motion where a = 0, objects at rest or travelling at constant velocity. Use of the term terminal velocity is expected. Use the equations for gravitational field strength $mg = F$ and weight $W = mg$. Know and understand Newton's third law of motion and know the properties of pairs of forces in an interaction between two bodies. Assessment 1 Understand how to make use of the independence of vertical and horizontal motion of a projectile moving freely under gravity. Understand that momentum is defined as $p = mv$. Know the principle of conservation of linear momentum, understand how to relate this to Newton's laws of motion and understand how to apply this to problems in one dimension. Assessment 2 *CORE PRACTICAL 1: Determine the acceleration of a freely-falling object.*				Use the equation density $\varrho = m/V$. Use the relationship upthrust = weight of fluid displaced. Use Stokes' Law, $F = 6\pi\eta rv$. Understand that this equation applies only to small spherical objects moving at low speeds with laminar flow and that viscosity is temperature dependent. Assessment 3 Use the Hooke's law equation, $\Delta F = k\Delta x$, where k is the stiffness of the object. Use the relationships *stress* $= F/A$, *strain* $= e/L$ and *Young modulus = stress/strain.* Draw and interpret force-extension and force- compression graphs. Define limit of proportionality, elastic limit, yield point, elastic deformation and plastic deformation and apply them to graphs. Draw and interpret tensile or compressive stress-strain graphs, and define breaking stress. Calculate the elastic strain energy in a deformed material sample and from the area under the force-extension graphs for both linear and non-linear force-extension graphs. Assessment 4 *CORE PRACTICAL 4: Use a falling-ball method to determine the viscosity of a liquid.* *CORE PRACTICAL 5: Determine the Young modulus of a material.*		

YEAR 12 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y12 /PHY 4(33)						Y12 /PHY 5(15)	

	Y12/PHY 4(33)	Y12/PHY 5(15)
TERM 1	**Mechanics II**	**Electric Circuits I**
	Use the equation for the moment of a force, *moment of force = Fx* where x is the perpendicular distance between the line of action of the force and the axis of rotation. Use the concept of centre of gravity of an extended body and apply the principle of moments to an extended body in equilibrium. Use the equation for work $\Delta W = F\Delta s$, including calculations when the force is not along the line of motion. Use the equation $kE = 1/2\ mv^2$ for the kinetic energy of a body. Use the equation $\Delta Egrav = mg\Delta h$ for the difference in gravitational potential energy near the Earth's surface. Know, and understand how to apply, the principle of conservation of energy including use of work done, gravitational potential energy and kinetic energy. Use the equations relating power, time and energy transferred or work done $P = E/t$ and *efficiency = useful energy output/total energy input*. Assessment 5	Understand that electric current is the rate of flow of charged particles. Define Ohm's law. Interpret VI graphs of ohmic and non ohmic conductors. Define resistivity and investigate the electrical resistivity of a material. Use $I = nqvA$ to explain the large range of resistivities of different materials. Analyse series and parallel circuits. Define electromotive force (e.m.f.) and internal resistance. Distinguish between e.m.f. and terminal potential difference. Assessment 6 *CORE PRACTICAL 2: Determine the electrical resistivity of a material.*

YEAR 12 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8

	Y12/PHY 6(33)	Y12/PHY 7(15)
TERM 2	**Waves**	**Electric Circuits II**
	Define amplitude, frequency, period, speed and wavelength. Use the wave equation $v = f\lambda$. Describe longitudinal waves in terms of pressure variation and the displacement of molecules. Describe transverse waves. Draw and interpret graphs representing transverse and longitudinal waves including stationary waves. Know and understand what is meant by wavefront, coherence, path difference, superposition, interference and phase. Relate phase difference and path difference. Know what is meant by a standing/stationary wave and understand how such a wave is formed, know how to identify nodes and antinodes. Use the equation for the speed of a transverse wave on a string $v = \sqrt{(T/\mu)}$. Assessment 7 Understand that waves can be transmitted and reflected at an interface between media. Understand how a pulse-echo technique can provide information about the position of an object and how the amount of information is limited by the wavelength or by the duration of pulses. Understand what is meant by plane polarisation, diffraction and use Huygens' construction to explain what happens to a wave when it meets a slit or an obstacle. Use $n\lambda = d\sin\theta$ for a diffraction grating. Assessment 8 *CORE PRACTICAL 6: Determine the speed of sound in air using an oscilloscope, signal generator, speaker and microphone.* *CORE PRACTICAL 7: Investigate the effects of length, tension and mass per unit length on the frequency of a vibrating string* *CORE PRACTICAL 8: Determine the wavelength of light from a laser or other light source using a diffraction grating.*	Analyse complex voltage divider circuits involving LDRs and thermistors to design heat and light sensors. Know the definition of electromotive force (e.m.f.) and internal resistance and know how to distinguish between e.m.f. and terminal potential difference. Explain semi - conductor theory and use transport equation. Understand how changes of resistance with temperature and illumination may be modelled in terms of lattice vibrations and number of conduction electrons and understand how to apply this model to metallic conductors, negative temperature coefficient thermistors and LDR. Assessment 9 *CORE PRACTICAL 3: Determine the e.m.f. and internal resistance of an electrical cell.*

YEAR 12 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8

	Y12/PHY 8(33)	Y12/PHY 9(15)
TERM 2	**Nature of Light**	**Refraction**
	Use the equation intensity of radiation $I = P/A$. Understand how the behaviour of electromagnetic radiation can be described in terms of a wave model and a photon model, and how these models developed over time. Use the equation $E = hf$, that relates the photon energy to the wave frequency. Understand that the absorption of a photon can result in the emission of a photoelectron. Understand the terms threshold frequency and work function and use the photoelectric equation $hf = \varphi + KE$. Use the electronvolt (eV) to express small energies. Understand how the photoelectric effect provides evidence for the particle nature of electromagnetic radiation. Understand atomic line spectra in terms of transitions between discrete energy levels and understand how to calculate the frequency of radiation that could be emitted or absorbed in a transition between energy levels. Use de Broglie equation $\lambda = h/p$. Understand how diffraction experiments provide evidence for the wave nature of electrons. Assessment 10	Explain refraction and use $n1\sin\theta1 = n2\sin\theta2$ where n is the refractive index of the material. $n = c/v$. Calculate critical angle using $n = 1/\sin C$. Understand how to measure the refractive index of a solid material. Use ray diagrams to trace the path of light through a lens and locate the position of an image. Use the equation power of a lens $f = 1/P$. Understand that for thin lenses in combination $P = P1+P2+P3+..$ Use the lens equation with the real is positive convention. Understand

	that *magnification = image height/object height* and *m = v/u.* Assessment 11

Year 13 PHYSICS LONG TERM PLAN with CURRICULUM STANDARDS

Year 13 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y13/PHY 1 (33)						Y13/PHY 2 (15)	
	Electric and Magnetic Fields						Further Mechanics	
	Use Coulomb's law, define electric field strength. Draw and interpret diagrams using field lines and equipotentials to describe radial and uniform electric fields. Know and understand the relation between electric field and electric potential. Define capacitance, determine the energy and charge stored, analyse series and parallel combinations of capacitors. Able to draw and interpret charge and discharge curves for resistor capacitor circuits and understand the significance of the time constant RC. Use related equations for exponential discharge in a resistor-capacitor circuit, $I = I_0\ e^{(-t/RC)}$, and $V = V_0\ e^{(-t/RC)}$ and the corresponding log equations. Assessment 1 Define the terms magnetic flux density, flux and flux linkage. Describe magnetic effect of current and describe the working of a motor. Explain electromagnetic induction and describe working of generator and transformer. Understand what is meant by the terms frequency, period, peak value and root mean square value when applied to alternating currents and potential differences. Assessment 2 *CORE PRACTICAL 11: Use an oscilloscope or data logger to display and analyse the potential difference (p.d.) across a capacitor as it charges and discharges through a resistor.*						Define Impulse. Apply conservation of momentum in two dimensions, and analyse elastic and inelastic collisions. Define angular displacement and angular velocity. Understand that a resultant force (centripetal force) is required to produce and maintain circular motion. Recognize the forces involved in circular motion of different objects and investigate different applications of examples of circular motion. Assessment 3 *CORE PRACTICAL 9: Investigate the relationship between force and its change of momentum.* *CORE PRACTICAL 10: Use ICT to analyse collisions between small spheres, e.g. ball bearings on a table top.*	

YEAR 13 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y13/PHY 3 (15)			Y13/PHY 4 (21)				
	Thermodynamics			Nuclear radiations			REVISION	
	Define specific heat capacity. State, explain and use kinetic theory of gases. Use the equations $\Delta E = mc\Delta\theta$ and $\Delta E = L\Delta m$. Define internal energy. Understand the concept of absolute zero and how the average kinetic energy of molecules is related to the absolute temperature. State, explain and use gas laws. Derive and use the equation $PV = 1/3\ Nmc^2$ using the kinetic theory model. Use the equation $pV = NkT$ for an ideal gas. Derive and use the equation $1/2\ mc^2 = 3/2\ kT$. Understand what is meant by a black body radiator and be able to interpret radiation curves for such a radiator. Use the Stefan-Boltzmann law equation $L = \sigma AT^4$ for black body radiators. Use Wien's law equation $\lambda_{max}\ T = 2.898 \times 10^{-3}$ m K for black body radiators. Assessment 4 *CORE PRACTICAL 12: Calibrate a thermistor in a potential divider circuit as a thermostat.* *CORE PRACTICAL 13: Determine the specific latent heat of a*			Describe the properties and uses of nuclear radiations. Define half life, decay constant and activity of a source. Investigate decay graphs. Determine the half-lives of radioactive isotopes graphically and use the equations for radioactive decay. Derive and use the corresponding log equations. Assessment 5 *CORE PRACTICAL 15: Investigate the absorption of gamma radiation by lead.* Define binding energy and use it to describe stability of nuclei. Investigate nuclear fission and fusion in detail. Define binding energy and use it to describe stability of nuclei. Understand the processes of nuclear fusion and fission with reference to the binding energy per nucleon curve. Assessment 6			Revision for the First Term Exam	

	phase change. *CORE PRACTICAL 14: Investigate the relationship between pressure and volume of a gas at fixed temperature.*							
YEAR 13 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R M 2	Y13/PHY 5 (21)				Y13/PHY 6 (6)	Y13/PHY 7(12)		Y13/PHY 8 (9)
	Particles				Gravitational Field	Oscillations		Space
	Understand what is meant by nucleon number and proton number. Understand how large-angle alpha particle scattering gives evidence for a nuclear model of the atom and how our understanding of atomic structure has changed over time. Understand that electrons are released in the process of thermionic emission and how they can be accelerated by electric and magnetic fields. Understand the role of electric and magnetic fields in particle accelerators (linac and cyclotron) and detectors (general principles of ionisation and deflection only). Derive and use the equation $R=p/BQ$ for a charged particle in a magnetic field. Apply conservation of charge, energy and momentum to interactions between particles and interpret particle tracks. Understand why high energies are required to investigate the structure of nucleons. Use the equation $\Delta E = c^2 \Delta m$ in situations involving the creation and annihilation of matter and antimatter particles. Use MeV and GeV (energy) and MeV/c2, GeV/c2 (mass) and convert between these and SI units. Understand situations in which the relativistic increase in particle lifetime is significant (use of relativistic equations not required). Know that in the standard quark-lepton model particles can be classified as baryon, mesons, leptons and photons which are fundamental particles and that the symmetry of the model predicted the top quark. Know that every particle has a corresponding antiparticle and be able to use the properties of a particle to deduce the properties of its antiparticle and vice versa. Understand how to use laws of conservation of charge, baryon number and lepton number to determine whether a particle interaction is possible. Write and interpret particle equations given the relevant particle symbols. Assessment 7				Define gravitational field. Understand that gravitational field strength is defined as $g=F/m$. Define Newton's law of universal gravitation). Use the equation $V=Gm/r$ for a radial gravitational field. Compare electric fields with gravitational fields. Apply Newton's laws of motion and universal gravitation to orbital motion.	Know that the condition for simple harmonic motion is $F=-kx$, and hence identify situations in which SHM will occur. Use the equations $a=-\omega^2 x$, $x=A\cos\omega t$, $v=-A\omega\sin\omega t$, $a=-A\omega^2\cos\omega t$, and $\omega=2\pi f$. Use equations for a loaded spring and a simple pendulum. Draw and interpret d–t and v–t graphs. Define resonance. Understand how to apply conservation of energy to damped and undamped oscillating systems. Understand the distinction between free and forced oscillations. State how the amplitude of a forced oscillation changes at and around the natural frequency of a system and know how damping affects resonance. Explain how damping and the plastic deformation of ductile materials reduce the amplitude of oscillation. Assessment 8 *CORE PRACTICAL 16: Determine the value of an unknown mass using the resonant frequencies of the oscillation of known masses.*		Use the equation, intensity $I=L/4\pi d^2$ where L is luminosity and d is distance from the source. Understand how astronomical distances can be determined using trigonometric parallax and using intensity received from standard candles. Sketch and interpret a Hertzsprung-Russell diagram. Understand how to relate the HR diagram to the life cycle of stars. Understand how the movement of a source of waves relative to an observer/detector gives rise to a shift in frequency. Use the equations for redshift and $v=H_0 d$ for objects at cosmological distances. Understand the controversy over the age and ultimate fate of the universe associated with the value of the Hubble constant and the possible existence of dark matter. Assessment 9

Year 12 CHEMISTRY LONG TERM PLAN with CURRICULUM STANDARDS

Year 12 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T E R	Y12 /CHE 1 (18)			Y12 /CHE 2 (18)			Y12 /CHE 3 (12)	
	Atomic structure and periodic table			Bonding and structure			Redox I	
	Define relative molecular mass and suggests why compared to an atom of Carbon 12. Analyse and interpret data from mass spectrometry to calculate			Predict the properties of ionic compound and explains the idea of regular crystalline structure. Draw dot and cross diagrams to show electrons in			Calculate the oxidation number in terms of electron transfer. Identify the disproportionation	

M 1	relative atomic mass from relative abundance of isotopes. Reason out for the general increase in first ionization energy across the period. Predict the electronic configurations using 1s notation and electrons- in-boxes notation of atoms. Illustrate periodicity using data, atomic radii, melting and boiling points and first ionisation energies. Assessment 1			covalent substances including molecules with single, double and triple bonds and for species exhibiting dative bonding. Predict the bond angles,shapes of simple molecules and ions using electron pair repulsion theory. Predict the nature of intermolecular forces resulting from London forces, permanent dipoles and hydrogen bonds. Assessment 2			reaction. Apply that oxidation number is a useful concept in terms of the classification of reactions as redox and as disproportionation. Write ionic half equations and use them to construct full ionic equations. Assessment 3	
Year 12 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y12 /CHE 4 (18)			Y12 /CHE 5 (24)				
	Inorganic Chemistry			Formulae, Equations and amounts of substance				REVISION
	Predict the reactions of the elements magnesium to barium in group 2 with oxygen and chlorine. Interpret the trend in reactivity of group 2 and group 7 elements.Reason out the trends in thermal stability of the nitrates and carbonates of group 1 and 2.Understand, in terms of changes in oxidation number, the disproportionation reaction of chlorine with water and the use of chlorine in water treatment, the reaction of chlorine with cold, dilute aqueous sodium hydroxide, the disproportionation reaction of chlorine with hot alkali. Assessment 4			Calculate moles in reactions involving mass, volume of gas, volume of solution, concentration of solutions in mol dm-3 and g dm^{-3}, including simple acid-base titrations using a range of acids, alkalis and indicators,percentage yields and percentage atom economies using chemical equations. Calculate measurement uncertainties, measurement errors in experimental results and comment on sources of error in experimental procedures and experimental results. *CORE PRACTICAL 1: Measure the molar volume of a gas.* *CORE PRACTICAL 2: Prepare a standard solution from a solid acid and find concentration. CORE PRACTICAL 3: Find the concentration of a solution of hydrochloric acid.* Assessment 5				REVISION FOR FIRST TERM EXAMINATION
Year 12 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y12 /CHE 6 (30)					Y12/ CHE 7 (18)		
	Organic Chemistry					Modern analytical techniques		
	Define hydrocarbons as compounds of carbon and hydrogen, the different types of formulae. Explain the terms homologous series, functional groups, apply the IUPAC rules to name compounds. Classify reactions as addition, elimination, substitution, oxidation, reduction, hydrolysis or polymerisation. Explain substitution reactions of alkanes and addition reactions of alkenes with mechanisms, substitution and hydrolysis reactions of halogenoalkanes, oxidation reactions of alcohols. *CORE PRACTICAL 4: Investigation of the rates of hydrolysis of some halogenoalkanes.* *CORE PRACTICAL 5: The oxidation of ethanol* *CORE PRACTICAL 6: Chlorination of 2-methylpropan-2-ol using concentrated hydrochloric acid.* Assessment 6					Identify the species respnsible for the peaks for chlorine and bromine molecule. Predict possible structures of a simple organic compound from the mass/charge ratio of the molecular ion and fragmentation patterns from mass spectrum. Deduce functional groups for alcohols, carboxylic acids, aldehydes, ketones and esters present in organic compounds using infrared spectra. Predict the use of fingerprint region in an infrared spectra. Assessment 7 *CORE PRACTICAL 7: Analysis of inorganic and organic unknowns.*		
Year 12 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y12 /CHE 8 (18)			Y12 /CHE 9 (12)		Y12 /CHE 10 (12)		
	Chemical Energetics			Reaction Kinetics		Chemical Equilibrium		REVISION
	Construct and interpret enthalpy level diagrams showing enthalpy change for exothermic and endothermic reactions. Define standard enthalpy changes of reaction, formation, combustion, neutralisation and do calculations from given experimental results. construct enthalpy cycles using Hess's Law. Calculate an enthalpy change of reaction using mean bond enthalpies and explain the limitations of this method of calculation.			Describe that reactions only take place when collisions take place with sufficient energy, known as activation energy, draw the reaction profiles for uncatalysed and catalysed reactions, interpret Maxwell-Boltzmann distribution of molecular energies, explain the economic benefits of the use		Predict and justify the qualitative effect of a change of a temperature,concentration, pressure on a homogenous system in equilibrium.Evaluate data to explain the necessity, for industrial processes, to reach a compromise between the yield and the rate of reaction. Deduce an expression for Kc in		REVISION FOR FINAL EXAMINATION

	CORE PRACTICAL 8: To determine the enthalpy change of a reaction using Hess's Law. Assessment 8	of catalysts in industrial reactions. Assessment 9	heterogenousequilibria. Assessment 10	EXAMINATION

Year 13 CHEMISTRY LONG TERM PLAN with CURRICULUM STANDARDS

Year 13 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y13/ CHE 1 (12)		Y13 / CHE 2 (24)				Y13 / CHE 3 (12)	
	Equilibrium II		Acid - base equilibrium				Kinetics II	
	Deduce an expression for Kp, for homogeneous and heterogeneous system.Calculate a value with units for Kc and Kp. Discuss the effect of temperature on the position of equilibrium. Understand that the value of K is unaffected by changes in concntration or pressure. Predict the direction of change by applying the concepts of rate and equilibrium. Assessment 1		Identify Brønsted–Lowry conjugate acid-base pairs, define 'pH', do pH calculations with $[H^+]$, understand the difference between a strong acid and a weak acid in terms of degree of dissociation. Calculate the pH of a strong acid and a weak acid. Predict the equilibrium expression for the auto-ionisation of water. Define Kw, 'pKa' and 'pKw'.Calculate Ka for a weak acid from experimental data given the pH of a solution. Interpret titration curves for strong acid with strong base,weak acid with a strong base and strong acid with a weak base. Define the term 'buffer'. Explain the action of an acidic and an alkaline buffer. Calculate the pH of a buffer solution from the given data. *CORE PRACTICAL 9: Finding the Ka value for a weak acid.* Assessment 2 and 3				Describe experimental technique to obtain rate data by titration and volume of gas evolved. Define order of a reaction.Derive units for zero,first and second order reactions.Deduce rate equation by finding the order with respect to each reactant. *CORE PRACTICAL 13a and 13b: Rates of reaction : iodine-propanone reaction by a titrimetric method and 'clock reaction' CORE PRACTICAL 14: Finding the activation energy of a reaction.* Assessment 4	

Year 13 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y13/ CHE 4 (36)							
	Transition metals						REVISION	
	Explain transition metals are d-block elements and shows variable oxidation number. Define ligands and co- ordination numbers.Predict that transition metal ions form tetrahedral and octahedral complexes. Explain conversion of dichromate(VI) ion, $Cr_2O_7^{2-}$ into chromate(VI). Write the observations and equations for the reactions of transition metal ions with aqueous NaOH and aqueous ammonia.Compare ligand substitution and disproportionation reactions.Describe how complexes show colour. Explain that transition metals and their compounds can act as heterogeneous and homogeneous catalysts. Assessment 5 *CORE PRACTICAL 12: Preparation of a transition metal complex*.						REVISION FOR FIRST TERM EXAM	

Year 13 CHE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
T	Y13 / CHE 5 (12)		Y13 / CHE 6 (24)		Y13 / CHE 7 (12)	Y13 / CHE 8 (12)	Y13 / CHE 9 (12)	
	Energetics II		Redox II		Organic Chemistry II	Organic Chemistry III	Modern Analytic Techniques II	
	Define lattice energy.Compare experimental values with theoretical values.Construct Born-Haber cycles.Define the term polarisation as		Define redox reactions in terms of oxidation number. Combining ionic half equations to get full equation. Explain 'standard electrode potential'. Discuss the term standard hydrogen electrode and		Define the term 'chiral' and enantiomers. Draw the optical isomers of some compounds. Know that optical activity is the ability of a	Discuss bonding in benzene and its reactions. Explain the mechanism of the electrophilic substitution. Discuss the reactions of amines, amides.	Discuss the term nuclear magnetic resonance.Explain how mass spectra and NMR ^1H and ^{13}C data is used to find the structures of organic	

E R M 2	applied to ions. Define the terms 'enthalpy change of solution, and 'enthalpy change of hydration'. Use Gibb's free energy equations to find whether the reaction is thermodynamically feasible.Calculate Gibb's Free energy and find out whether the reaction is feasible or not Assessment 6	explain how it is used. Use Eo to calculate the cell potential. Carry out titrations between Fe2+/MnO_4^- and $I_2/S_2O_3^{2-}$with suitable indicator solution. Calculates the uncertainities in the measurements.Compare the advantages and disadvantages of different electrochemical cells. *CORE PRACTICAL 10: Investigating some electrochemical cells* *CORE PRACTICAL 11: Redox titration.* Assessment 7	single optical isomer to rotate the plane of polarisation. Define 'racemic mixture' and its effect on the plane of polarised light. Discuss the reactions of aldehydes, ketones,carboxylic acids and esters. Discuss how polyesters are formed by polymerisation reactions. Assessment 8	Discuss the techniques in preparation & purification of organic compounds. Assessment 9 *CORE PRACTICAL 15: Analysis of some inorganic and organic unknowns.* *CORE PRACTICAL 16: The preparation of aspirin*	compounds.Deduce the splitting patterns of adjacent, non-equivalent protons using the (n+1) rule.Use of thin layer chromatography to identify the different aminoacids in a mixture. Explain high performance liquid chromatography and gas chromatography. Assessment 10

Year 12 BIOLOGY LONG TERM PLAN with CURRICULUM STANDARDS

Year 12 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y12/B1(24)				Y12/B1(24)			
	Biological Molecules				Biological Molecules			
	Identify, describe and explain the structure, properties, formation and role of carbohydrates, fats and proteins. Distinguish monosaccharide, disaccharide & polysaccharide. Distinguish between the primary, secondary, tertiary & quartenary structure. Discuss the physical & chemical properties of water. Assessment 1 *Investigation : Detection of carbohydrates, fats & proteins using Iodine test, Benedict test, Biuret test & Emulsion test.*				Describe properties of enzymes & explain factors affecting enzyme action. Interpret and explain the structure and roles of nucleic acids in a cell and DNA replication. Understand and describe the process of protein synthesis and significance of genetic code. Understand the role of inorganic ions in plants. Assessment 2 *CORE PRACTICAL 1: Investigate a factor affecting the initial rate of an enzyme– controlled reaction.*			

Year 12 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y12/B2(24)				Y12/B3(24)			
	Cells, Viruses and Reproduction of Living Things				Cells, Viruses and Reproduction of Living Things			
	Identify and understand the ultra structure of organelles in prokaryotes and eukaryotes. Evaluate various techniques used in cell study . Describe structure, life cycle & harmfulness of virus particles. Identify various levels of organization in organisms - cells, tissues, organs& organ system with examples. Assessment 3 *CORE PRACTICAL 2: Use of the light microscope, including simple stage and eyepiecemicrometers and drawing small numbers of cells from a specialised tissue.*				Explore stages of cell cycle, mitosis and meiosis and its role in sexual and asexual reproduction in animals and plants. Compare asexual reproduction to sexual reproduction *CORE PRACTICAL 3: Make a temporary squash preparation of a root tip to show stages of mitosis in the meristem under the light microscope.* *CORE PRACTICAL 4: Investigate the effect of sucrose concentrations on pollen tube growth or germination.* Assessment 4 REVISION FOR FIRST TERM EXAM			

Year 12 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y12/B4(24)				Y12/B4(24)			

TERM 2	**Exchange and Transport**				**Exchange and Transport**			
	Explain the structure of cell membrane, gas exchange surfaces and exchange of substances. Differentiate diffusion, active transport,osmosis & bulk transport of substances. Compare gas exchange in insects, fish ,plant & humans. Assessment 5. *CORE PRACTICAL 5: Investigate the effect of temperature on beetroot membrane.* *CORE PRACTICAL 6: Determine the water potential of a plant tissue.* *CORE PRACTICAL 7: Dissect an insect to show the structure of the gas exchange system, taking into account the safe and ethical use of organisms.*				Identify and understand the ultra structure of human heart, blood vessels, blood and cardiac cycle. Analyze and interpret causes and correlation of heart diseases related to life style factors and diet. Identify the structural details of plant tissues (xylem & phloem) and its role in transport of nutrients. Corelate the role of transpiration in transport of nutrients. Assessment 6 *CORE PRACTICAL 8: Investigate factors affecting water uptake by plant shoots using a potometer.*			
Year 12 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	**Y12/B5(30)**					**Y12/B5(18)**		
	Classification and Biodiversity					**Energy for Biological Processes**		
	Explain the hierarchy of classification & three domain concept. Describe how gel electrophoresis can be used to separate DNA fragments of different length.Recall evolution by natural selection and understand the types of natural selection, speciation and isolation mechanisms with examples. Understand techniques in measuring biodiversity, concepts of niche and adaptation in organisms. Know the role of extinction in conservation of organisms and evaluate in situ and ex situ conservation techniques. Assessment 7 *Investigation : Assess species diversity by calculating the simpsons diversity index of the area sampled.*					Recall structure of mitochondria. Distinguish aerobic and anaerobic respiration in living organisms. Describe glycolysis,kreb cycle & oxidative phosporylation. Distinguish yeast fermentation & lactate fermentation. Significance of EPOC. Assessment 8 . *CORE PRACTICAL 9: Investigate factors affecting the rate of aerobic or anaerobic respiration using a respirometer, taking into account the safe and ethical use of organisms.*		

Year 13 BIOLOGY LONG TERM PLAN with CURRICULUM STANDARDS

Year 13 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	**Y13/B1(30)**					**Y13/B2(18)**		
	Energy for Biological processes					**Modern Genetics**		
	Recall structure of mitochondria. Distinguish aerobic and anaerobic respiration in living organisms. Describe glycolysis,kreb cycle & oxidative phosporylation.Distinguish yeast fermentation & lactate fermentation .Significance of EPOC. *CORE PRACTICAL 9: Investigate factors affecting the rate of aerobic or anaerobic respiration using a respirometer, taking into account the safe and ethical use of organisms.* Assessment 1 .Recall structure of chloroplast Discuss the role of photosynthetic pigments in plants.Analyse & interpret absorption spectra & action spectra . Explain the light and dark reactions of photosynthesis, concepts of limiting factors affecting photosynthesis. *CORE PRACTICAL 10: Investigate the effects of different wavelengths of light on the rate of photosynthesis.* *CORE PRACTICAL 11: Investigate presence of different chloroplast pigments using chromatography.* Assessment 2					Explain PCR technique, DNA fingerprinting, gel electrophoresis.Significance of cell determination and cell differentiation and evaluate the role and use of stem cell research. Understand interactions between genes and the environment in organisms. Discuss role of spliceosome & epigenetics. Describe thevarious techniques used in production of GMO. Evaluate the advantages & disadvantages in the production of GMO. Assessment 3		
Year 13 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
	Y13/B3(33)					**Y13/B4(15)**		
	Microbiology and pathogens					**Origins of genetic variation**		

TERM 1	Identify the principles and techniques involved in culturing microorganisms.Understand the different methods of measuring the growth of a bacterial culture & the different phases of a bacterial growth curve and calculate exponential growth rate constants. Describethat bacteria can be agents of infection, invading and destroying host tissues and producing toxins. *CORE PRACTICAL 12: Investigate the rate of growth of bacteria in liquid culture taking into account the safe and ethical use of organisms.* Describe and explain the action of bactericidal and bacteriostatic antibiotics, the methods and difficulties of controlling the spread of antibiotic resistance in bacteria. Explain transmission, mode of infection and pathogenic effect of the stem rust fungus, influenza virus, the malarial parasite. Analyse the social and economic and ethical implications of different control methods for endemic malaria and the role of the scientific community in validating these methods. Explain the mode of action of macrophages, neutrophils and lymphocytes.Identify and explain the role of T and B memory cells in the secondary immune response,active and passive immunity. Assessment 4 *CORE PRACTICAL 13: Isolate individual species from a mixed culture of bacteria using streak plating taking into account the safe and ethical use of organisms.*				Identify and explain that mutations are the source of new variations and that the processes of random assortment and crossing over during meiosis give rise to new combinations of alleles in gametes.Describe sex linkage on the X chromosome, including haemophilia in humans. Apply and analyse chi squared tests to test the significance of the difference between observed and expected results. Assessment 5			
Year 13 BIO	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	Y13/B5(24)				Y13/B6 (24)			
	Control Systems				Ecosystems			
	Understand the principles of homeostasis. Explain the mechanism of hormone action. Know photoreception and flowering in plants and details of human nervous system & nerve impulse transmission. Understand photoreception in animals & discuss effects of drugs in humans. Explain control of heart rate, osmoregulation & thermoregulation in humans. Assessment 6 and 7 *CORE PRACTICAL 14: Investigate the effect of gibberellin on the production of amylase in germinating cereals using a starch agar assay.*				Identify, describe and explain the terms ecosystem, trophic level, pyramids, energy transfer and ecological techniques. Analyse and interpret the data using statistical tests.(t-test and spearman's test). Calculate the efficiency of energy transfer between trophic levels. Describe the process of succession, effects of biotic and abiotic factors. Explain and analyse the human effects on ecosystem, how scientific community validating evidences related to climate change. Assessments 8 & 9 *CORE PRACTICAL 15: Investigate the effect of different sampling methods on estimates of the size of a population taking into account the safe and ethical use of organisms.* *CORE PRACTICAL 16: Investigate the effect of one abiotic factor on the distribution or morphology of one species taking into account the safe and ethical use of organisms.*			