	Order	Title and content	Additional Info	Literacy / Numeracy / Scientific literacy / PAT links	Alleynes skills for life
Cells	1	Animal cells	Structure and function of organelle (including a nucleus, cytoplasm, a cell membrane, mitochondria, ribosomes). Draw and label an animal cell	Literacy - use of tier 3 keywords	Literacy
	2	Plant cells	Structure and function of organelles (including vacuole and chloroplasts). Draw and label a plant cell. Compare and contrast animal and plant cells	Literacy - use of tier 3 keywords	Literacy
	3	Specialised cells	Examples and how they are adapted including: sperm cells, nerve cells and muscle cells in animals and root hair cells, xylem and phloem cells in plants.	Literacy - use of tier 3 keywords	Literacy
	4	Eukaryotes, Prokaryotes & Fungi	Draw and label a bacteria cell. Comparing the structures between prokaryotic (bacteria) and Eukaryotic (plant and animal). Demonstrate an understanding of the scale and size of cells	SMSC considering origins of life	Creativity
			Scientific literacy		
	5	Microscopes (theory)	Differences between light and electron microscopes. Describe how microscopy techniques have developed over time. Explain how electron microscopy has increased understanding of sub-cellular structures. Limited to the differences in magnification and resolution	Numeracy-considering scale & size	Numeracy
	6	Microscopes (PRAC)	Use a light microscope to observe, draw and label a selection of plant and animal cells.	Mutual respect and tolerance	Team work
	7	Calculating magnification	Maths based lesson, complete examples. Use magnification = size of image/ size of real object	Numeracy calculation tasks	Numeracy
	8		PEER STAR Aassiment -microscopes	Numeracy calculation tasks	Numeracy
	9	Levels of organisation	Describe the organisation of multicellular organisms (Organelle- Cell-tissue-organ-organ system- organism). Give examples of each.	Literacy - use of tier 3 keywords	Literacy
	10	Organ systems	Different human organ systems and their functions. Focus on Circulatory - heart, blood vessels, Nervous - spine, brain, nerves, Excretory - bladder, kidneys and liver, Respiratory - lungs	Literacy - use of tier 3 keywords	Literacy
	11	Revision	All task followed by Cornwells notetaking		Independence
	12	Test feedback - address misconceptions			Independence
	13				Resilience
	14	Blood	Components of the blood and their roles, recognise different types of blood cells in a photograph or diagram, and explain how they are adapted to their functions. Optional: Observing and drawing blood cells seen under a microscope. Evaluate risks related to use of blood products.	SMSC importance of blood donors	Communication
	15	Blood vessels	Blood vessel structure, their roles and how they are different including capillaries, viens and arteries. Explain how the structure of these vessels relates to their functions.	Literacy - use of tier 3 keywords	Literacy
	16	The Heart (Theory)	Label the Heart, learn structure and function of parts. Knowledge of the blood vessels associated with the heart is limited to the aorta, vena cava, pulmonary artery, pulmonary vein and coronary arteries. Knowledge of the names of the heart valves is not required.	Literacy - use of tier 3 keywords	Literacy
	17	The Heart (PRAC)	Heart dissection - students to bring in their own hearts where possible	SMSC dissect items with respect	Team work
	18	Heart disease - Stents	What is CHD, what are stents used for? Evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices or transplant.	SMSC- Ethics behind devices to treat CHD	Empathy
	19	Pacemakers	What are they? When are they needed? Why. Calculate blood flow. The natural resting heart rate is controlled by a group of cells located in the right atrium that act as a pacemaker. Artificial pacemakers are electrical devices used to correct irregularities in the heart rate.	Numeracy calculation tasks	Numeracy
	20		PEER STAR Aassiment -circulatory system		Independence
	21	The Lungs (Theory)	Label the Lungs, learn structure and function of parts. Knowledge of the lungs is restricted to the trachea, bronchi, alveoli and the capillary network surrounding the alveoli.	Literacy - use of tier 3 keywords	Communication
	22	The Lungs Dissection demo	Dissection of a lung (DEMO) and practice questions	SMSC dissect items with respect	Team work
	23	Effects of exercise on breathing	Theory and practise: During exercise the human body reacts to the increased demand for energy. The heart rate, breathing rate and breath volume increase during exercise to supply the muscles with more oxygenated blood. If insufficient oxygen is supplied anaerobic respiration takes place in muscles. The incomplete oxidation of glucose causes a build-up of lactic acid in the muscles causing pain. After periods of vigorous activity muscles become fatigued and stop contracting efficiently. HIGHER ONLY Blood flowing through the muscles transports the lactic acid to the liver where it is converted back into glucose. Oxygen debt is the amount of extra oxygen the body needs after exercise to react with the accumulated lactic acid and remove it from the cells	Literacy - use of tier 3 keywords	Communication
	24	Revision	All task followed by mindmapping		Independence
	25	Test feedback - address misconceptions			Independence
	26				Resilience
Organs	27	Photosynthesis	Basics - The reactants in, and products of, photosynthesis, and a word summary for photosynthesis and uses of glucose. Recognise the chemical symbols. Describe photosynthesis as an endothermic reaction in which energy is transferred from the environment to the chloroplasts by light.	Literacy - use of tier 3 keywords	Literacy
	28	Adaptation of leaves and stomata	The adaptations of leaves and the role of leaf stomata in gas exchange in plants. The leaf is a plant organ. Knowledge limited to epidermis, palisade and spongy mesophyll, xylem and phloem, and guard cells surrounding stomata.	Literacy - use of tier 3 keywords	Literacy
	29	Reproduction in Plants	The importance of plant reproduction through insect pollination in human food security. Name and describe parts of a flower. Label a diagram of a flower. Describe wind and insect pollination	Literacy - use of tier 3 keywords	Communication
	30	Aerobic Respiration (theory)	Aerobic respiration (inc word equation). Describe cellular respiration as an exothermic reaction which is continuously occurring in living cells. The energy transferred supplies all the energy needed for living processes. Respiration in cells can take place aerobically (using oxygen) or anaerobically (without oxygen), to transfer energy. Organisms need energy for: • chemical reactions to build larger molecules • movement • keeping warm. Aerobic respiration is represented by the equation: glucose + oxygen --> carbon dioxide + water Recognise the chemical symbols: C6H12O6, O2, CO2 and H2O.	Literacy - use of tier 3 keywords	Literacy
	31	Aerobic Respiration (PRAC)	Practical investigation (peas, woodlice etc.)	SMSC cooperation with others	Leadership
	32	Anaerobic respiration	Theory and finger cramp practical. Compare the processes of aerobic and anaerobic respiration with regard to the need for oxygen, the differing products and the relative amounts of energy transferred.Anaerobic respiration in muscles is represented by the equation: glucose --> lactic acid As the oxidation of glucose is incomplete in anaerobic respiration much less energy is transferred than in aerobic respiration. Anaerobic respiration in plant and yeast cells is represented by the equation: glucose --> ethanol + carbon dioxide Anaerobic respiration in yeast cells is called fermentation and has economic importance in the manufacture of bread and alcoholic drinks.	Numeracy Graph drawing	Problem solving
	33		PEER STAR Aassiment -photosynthesis vs respiration		Independence
	34	Metabolism	What is metabolism, calculating BMR.Explain the importance of sugars, amino acids, fatty acids and glycerol in the synthesis and breakdown of carbohydrates, proteins and lipids. Metabolism is the sum of all the reactions in a cell or the body. The energy transferred by respiration in cells is used by the organism for the continual enzyme controlled processes of metabolism that synthesise new molecules. Metabolism includes: • conversion of glucose to starch, glycogen and cellulose • the formation of lipid molecules from a molecule of glycerol and three molecules of fatty acids • the use of glucose and nitrate ions to form amino acids which in turn are used to synthesise proteins • respiration • breakdown of excess proteins to form urea for excretion.	Numeracy Calculating BMR	Numeracy
	35	Food groups	Balanced diet & the food groups. Name and describe the 7 main components to a healthy diet including: Carbohydrates, Protein, Fat, Fibre, Vitamins, Minerals and Water . Analyse nutritional information on food labels	SMSC lifestyle & health impact	Problem solving
			Scientific literacy		
	36	Food tests - required prac	Required practical 4	Mutual respect and tolerance	Team work
	37	Revision	All task followed by duel coding (venn diagrams)		Independence
	38		Test feedback - address misconceptions		Independence
Bioenergetics	39				Resilience
	40	Communicable and non-communicable diseases	The difference between communicable and non-communicable. Describe the relationship between health and disease and the interactions between different types of disease. Health is the state of physical and mental well-being. Diseases, both communicable Communicable diseases and non-communicable, are major causes of ill health. Other factors including diet, stress and life situations may have a profound effect on both physical and mental health. Different types of disease may interact. • Defects in the immune system mean that an individual is more likely to suffer from infectious diseases. • Viruses living in cells can be the trigger for cancers. • Immune reactions initially caused by a pathogen can trigger allergies such as skin rashes and asthma. • Severe physical ill health can lead to depression and other mental illness.	SMSC lifestyle & health impact	Literacy
	41	Risk factors and causal mechanisms	Understanding the difference & knowing examples. Discuss the human and financial cost of these noncommunicable diseases to an individual, a local community, a nation or globally. Explain the effect of lifestyle factors including diet, alcohol and smoking on the incidence of non-communicable diseases at local, national and global levels. Risk factors are linked to an increased rate of a disease. They can be: • aspects of a person's lifestyle • substances in the person's body or environment. A causal mechanism has been proven for some risk factors, but not in others • The effects of diet, smoking and exercise on cardiovascular disease. • Obesity as a risk factor for Type 2 diabetes. • The effect of alcohol on the liver and brain function • The effects of smoking on the lungs and lung cancer. • The effects of smoking and alcohol on unborn babies. • Carcinogens, including ionising radiation, as risk factors in cancer. Many diseases are caused by the interaction of a number of factors.	SMSC lifestyle & health impact	Empathy
	42	PEER STAR Aassiment - disease data			Independence
	43	Cancer theory	What is Cancer? Understanding key terms. describe cancer as the result of changes in cells that lead to uncontrolled growth and division. Benign tumours are growths of abnormal cells which are contained in one area, usually within a membrane. They do not invade other parts of the body. Malignant tumour cells are cancers. They invade neighbouring tissues and spread to different parts of the body in the blood where they form secondary tumours. Scientists have identified lifestyle risk factors for various types of cancer. There are also genetic risk factors for some cancers.	SMSC considering sensitive topics	Empathy
	44	Cancer research lesson (optional)	Research a specific type of cancer	SMSC Considering sensitive topics	Independence
	45	Revision	All task followed by cathers flashcards		Independence
	46	Test feedback			Independence
Non communicable	47	Test feedback - address misconceptions			Resilience
Genetics and ecosystems	48	DNA and Chromosomes	Define Chromosomes, genome, genes and DNA . Describe where DNA is found. State how many chromosomes a human has. Discuss the importance of understanding the human genome for: • search for genes linked to different types of disease • understanding and treatment of inherited disorders • use in tracing human migration patterns from the past.	Literacy - use of tier 3 keywords	Literacy
	49	History of the DNA model	Watson, Crick, Wilkins and Franklin in the development of the DNA model. Describe the structure of DNA including nucleotides	SMSC - british scientists	Communication
	50	Inheritance	Heredity as the process by which genetic information is transmitted from one generation to the next. Pedagree diagrams. Describe recessive and dominant genes.	Numeracy- use of diagrams to represent data	Numeracy
	51	PEER STAR Aassiment -DNA			Independence
	52	Species and Classification	Differences between species and how do we group animals together . Traditionally living things have been classified into groups depending on their structure and characteristics in a system developed by Carl Linnaeus. Linnaeus classified living things into kingdom, phylum, class, order, family, genus and species. Organisms are named by the binomial system of genus and species. This is covered in more detail in Yr 11	Numeracy: identifying patterns	Numeracy
	53	Variation	Continuous and discontinuous Variation between individuals within a species (inc drawing graphs)	Numeracy: Graphs	Numeracy
	54	Natural selection	Variation between species and between individuals of the same species meaning some organisms compete more successfully, which can drive natural selection. Basics of Darwins theory of natural selection. This is covered in more detail in year 11. Optional practical idea: Darwins finches.	SMSC understanding and respecting others beliefs	Problem solving
			Scientific literacy		
	55	Competition and Extinction	Changes in the environment which may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. Look at examples of animals which have gone extinct such as the dodo and why. Optional: Students may wish to research some animals that are close to extinction and how we can help to prevent this. This is covered in more detail in Yr 11	SMSC: Impact humans can have on the extinction of animals	Empathy
	56	Biodiversity	Biodiversity is the variety of all the different species of organisms on earth, or within an ecosystem. The importance of maintaining biodiversity and the use of gene banks (cryobanks and seedbanks) to preserve hereditary material. This is covered in more detail in Yr11	SMSC: Impact humans can have on preventing the extinction of living organisms	Empathy
	57	Revision	All task followed by Blurting		Independence
	58		Test feedback - address misconceptions		Independence
	59				Resilience
	60	Revision	Students can use a mixture of the metacognative strategies they have used throughout the year		Independence
	61		MOCK Teacher Grade		Independence
Mocks	62		PEER STAR Aassiment -project		Team work