

Curriculum Planning Template

Subject: Biology		Year 7	Ability: Mixed		
Topic	Movement	Cells	Respiration 1	Photosynthesis 1	Interdependence
Topic overview Students will learn...	How the skeletal and muscular system work together to cause movement	How multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes. How specialised cells work together in complex organisms	How to use word equations to describe aerobic and respiration.	The importance of photosynthesis and why other organisms are dependent on photosynthesis How to use word equations to represent photosynthesis	How to describe that a species' population changes as its predator or prey population changes. Explain effects of environmental changes and toxic materials on a species' population.
What Golden Knowledge will pupils learn and remember?	Students will know the parts of the human skeleton in to explain how it provides support and protection for the organs. Students will know how the skeleton works with muscles to allow us to move in order to be able to	Students will be able to list the levels of organisation in an organism. Students will understand the need for a microscope to be able to see cells and then use one to view different types of cells.	Students will know that respiration is a chemical reaction that breaks down glucose to release energy in order to describe the function of the mitochondria. Students will know the reactants and products of respiration in order to understand that new	Students will know that plants and algae do not eat, but use energy from light, carbon dioxide and water Students will learn the reactants and products of photosynthesis and be able to write a word equation. Students will learn that glucose produced in photosynthesis is used either to build new tissue	Students will know how organisms are ordered in a food chain in order to describe and explain how energy is moved through a food chain. Students will learn how materials are passed on in a food chain in order to be able to describe bioaccumulation.

explain how the skeleton and muscles work together to allow us to move. Students will compare the skeletal and muscular systems in a chicken wing with those in humans in order to be able to compare similarities and differences. Students will learn how muscles can contract and exert a force on bones and how muscles move food through the digestive system. This will enable them to explain how unfamiliar muscles might cause an affect. Students will be able to explain why some organs contain muscle tissue and predict the effect of their presence	Students will be able to compare plant and animal cells and explain why there are differences. They will be able to identify the key subcellular structures in each type of cell and link them to their function. Students will be able to prepare slides of cheek cells and use these to identify the principle features of the cell and relate this to their function Students will be able to identify different specialised cells and relate their structure to their function, such as red blood cells and neurons	products are formed in a chemical reaction. Students will learn that aerobic respiration is used when oxygen is present in order to describe that most living organisms use aerobic respiration for most of the time.	or stored in order to describe growth and repair. Students will learn that plants have specially-adapted organs that allow them to obtain resources needed for photosynthesis in order to describe the structure of a leaf. Students will learn that iodine is used to test for starch so they can describe test for nutrients in food and for investigating the rate of photosynthesis in plants.	Students will learn how a change in one population will affect another population in order to understand competition between species, and how this causes fluctuations in population sizes. Students will learn that insects are needed to pollinate food crops so that they can understand the steps that take place in plant reproduction. This will also contribute to students' knowledge of food production. Students will be able to identify how pollution will affect the population size in order to examine the effects that humans can have on a population. Students will be able to use a model to investigate the impact of changes in a population of one organism on others in the ecosystem. Students will learn that the population of a species is affected by predators and prey, disease, pollution and
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	Students can use this knowledge to predict the consequences of damage to a bone, joint or muscle in order to make healthy lifestyle choices. Students will be able to investigate the force exerted by different muscles and suggest why differences may occur Students will consider the risks and benefits of using technology to enhance human movement in order to be able to express opinions about new technologies	Students will be able to explain why multicellular organisms need organ systems to keep their cells alive Students will be able to explain how unicellular organisms are adapted to carry out the same functions Students will make deductions about how medical treatments can affect cells, tissues, organs and systems Students will consider the benefits of, and problems with, organ donation in order to present a justified opinion Students will investigate how recreational drugs affect the body systems in order to			competition between individuals for limited resources such as water and nutrients.
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		be able to make healthy lifestyle choices Students will plan and carry out an investigation in order to demonstrate the effects of caffeine on the body			
What prior knowledge should pupils already know?	Students should know the main body parts and internal organs. They should be able to explain the impact of exercise and diet on the way the body functions (KS 2 NC Animals including humans) Students should be able to describe the basic parts of the digestive system in humans and begin to understand their special functions (KS	Students should be able to recognise the impact of drugs and lifestyle on the way their body functions: they should know how to keep their bodies healthy and be able to make choices about this (Year 7 movement and KS 2 NC Animals including humans)	Students should know that respiration occurs in the mitochondria of a cell and that it is a chemical reaction (Year 7 movement).	Students will know that plants need water, sunlight and carbon dioxide in order to grow and stay healthy (KS 2 NCP plants and Year 7 movement, cells and respiration) Students will know how to do a basic word equation for respiration. Students will know that glucose is used in respiration (Year 7 Respiration).	Students should know that different organisms within a habitat rely on each other (KS2 NC Living things and their habitat) Students should be able to identify a simple food chain using ideas around sources of food. (KS2 NC Living things and their habitat) Students will know that new plants can only grow if they are pollinated and fertilised and that pollination occurs either by wind or insects (KS2 NC Living things and their habitat)

	2 NC Animals including humans)				
What skills will pupils learn and apply? (disciplinary knowledge)	Know the features of muscle cells and be able to use this to explain cell specialisation and adaptation An understanding of how different systems in the body work together in humans in order to be able to explain why humans need a range of different systems Be able to describe how muscles exert a force and use this to explain forces on the body Be able to explain how to maintain a healthy body and use this to evaluate the effect of lifestyle on disease Investigate the force applied by different	Know the function of subcellular structures so they deduce the function of an unknown specialised cell from its structure Know how to use a microscope effectively and prepare slides for observation. Plan and carry out an investigation into the effects of caffeine and collect reliable data in order to justify a hypothesis Evaluate evidence and present an opinion about controversial issues such as organ donation	Know what the reactants and products of a reaction are in order to be able to write word equations for chemical reactions. Students will know that respiration is a vital reaction to support life.	Know what the reactants and products of a reaction are in order to be able to write word equations for chemical reactions. Students will know that photosynthesis is how a plant makes its own food, therefore making them producers in food chains. Students will know that plants use energy from light, carbon dioxide and water so they can describe the law of conservation of energy. Students will know what is required for photosynthesis, so will be able to describe adaptation in plants that enable them to obtain different levels of each resource and how they travel through the plant.	Students will be able to produce a food web from a group of species. Students will know how to draw a food chain in order to describe how energy is transferred through organisms, linking with the law of conservation of energy.

	muscles in the body to be able to explain the differences				
Key vocabulary students will know and learn	Joints Bone Ligament Tendon Cartilage Antagonistic muscle	Cell Tissue Organ Organ system Unicellular Multicellular	Aerobic respiration Anaerobic respiration Mitochondria Yeast Fermentation	Photosynthesis Chloroplast Chlorophyll Stomata	Food web Ecosystem Population Producer Consumer Decomposer
How will pupil understanding be checked &/or assessed?	Each school in the Trust follows the same assessment cycle process. All students will complete an informal key piece assessment every half term (at least) which take a variety of formats to assess golden knowledge learnt over the previous lessons. The key piece assessments are either retrieval-based questions to help students retrieve their prior golden knowledge, scientific literacy questions where students have to practice applying their golden knowledge to exam style questions in different contexts or exam style questions using a variety of command words such as describe, explain and evaluate. Students will then complete a short improvement activity based on gaps identified in the informal key piece and teachers will check these to ensure gaps have closed. In addition to these informal key piece assessments, all students complete a formal assessment at least every term which synoptically assess their retention and application of key golden knowledge learnt in Biology, Chemistry and Physics. Teachers will then use the Science Trust QLA tracker to identify gaps in knowledge; reteach accordingly and then students will complete a range of improvement style activities to close those gaps which are then checked by the teacher either through live marking or collection of books. Further details of the Science SHARE Assessment and Feedback policy can be found here: Q of E				
Resources available	Each school has their own shared area for each year group in each key stage. Lessons are planned to follow the SHARE Science lesson structure guidance document which can be found here: SCIENCE SHARE MAT lesson structure guidance.docx In summary: 1. First 5/Do Now to retrieve prior learning needed for the foundations of new learning. 2. I do/explicit instruction/guided explanation/teacher input through expert curriculum delivery. 3. We do/modelling where appropriate to show students how to remember and apply the key golden knowledge to different contexts. 4. You do/Independent practice to retrieve and practice applying the key golden knowledge to a variety of contexts. 5. Final 5 to retrieve key golden knowledge learnt in the lesson.				

	All schools have these SHARE Science curriculum plans, delivery plans which sit underneath these to guide staff on when to deliver each section of the curriculum and then schemes of learning and lesson resource folders to adapt in order to meet the unique needs of the students and classes they teach. All shared resources which are common across all schools can be found in the SHARE Science folder here: Home (click on the documents tab at the top of the page) All QA including lesson visits, work scrutiny and student voice will prioritise the SHARE Science Q of E Non-Negotiables Checklist which can be found here: SCIENCE SHARE MAT Non negotiables Q of E QA check list.docx All lesson resources are focussed on retrieval (through the Retrieve to Remember strategy) and practice, and this is built into these curriculum plan through effective sequencing of golden knowledge components. There are also KS3 and KS4 Golden Knowledge booklets for staff which outline the key golden knowledge linked to the exam specifications and National Curriculum at KS3 and KS4. These can be found here: Golden Knowledge If staff can't get access to any of the folders above, please request access through joanna.richards@sharemat.co.uk				
Notes Why this topic is important...	This topic will allow students to understand how different systems in the body work together to allow us to complete complicated tasks. This will lead into helping understand why cells need to be specialised and are organised in a hierarchy in complex organisms like humans.	This topic introduces the concept of cells as the smallest part of living organisms. This will allow students to understand how different living organisms can survive. Knowing the hierarchy will give perspective to the complexity of organisms.	An understanding of aerobic respiration will lead students to learning about anaerobic respiration and the benefits and drawbacks of each type. Students will also learn where anaerobic respiration is used in different organisms.	An understanding of photosynthesis will lead students to be able to understand how plants compete with each other for limited resources and how plants are adapted in order to out compete other plants, as well as ensure that their offspring survive too. An understanding of the photosynthesis chemical equation will allow students to see the presence of carbon and then link that with the carbon cycle.	An understanding that organisms compete for limited resources will lead students to learn about evolution and survival of the fittest. Students will be able to transfer knowledge to describe how adaptations have enabled species to change to their environment in order to survive. An understanding of food webs will enable students to understand that organisms also rely on each other in order to survive and that maintaining

	Students will use the skills of evaluating lifestyle choices to understand how different body systems contribute to our overall health and so predict the outcome of some decisions When considering forces in physics, students will be able to use their knowledge of muscles to explain how force can be applied in different situations. Knowledge of the effects of muscles will help students understand the role of muscle tissue in body systems such as the circulatory or digestive system	An understanding of how to use a microscope will allow students observe cells Knowledge of how drugs can affect organs will allow students to explain why some diseases develop and how they can be treated Researching information and developing opinions will allow students to evaluate data and present this in a logical way		Students' knowledge of how plants make their own food will enable students to understand the role of plants in food webs and will lead students to understand how living organisms are interdependent on each other within a habitat. Students' knowledge of the photosynthesis chemical equation will help students understand how and why chemical equations need to be balanced.	biodiversity is a crucial element in sustaining life on Earth. Further to this, a knowledge of food webs will allow students to understand a variety of different habitats and that organisms are interdependent on each other. Students will be able to explain the effects of environmental changes in order to explain how human intervention is affecting population numbers and how humans can reduce the impact that they have on the environment.
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