Curriculum Planning Template

Subject: Biology	Year 7	Ability: Mixed

Topic	Movement	Cells	Respiration 1	Photosynthesis 1	Interdependence	Variation	Human Reproduction
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.	That there is variation between individuals of the same species and the effect of this.	About the process of the menstrual cycle and pregnancy.
What Golden Knowledge will pupils learn and remember?	Students will know the parts of the human skeleton in to explain how it	Students will be able to list the levels of organisation in an organism.	Students will know that respiration is a chemical reaction that breaks down glucose to release	Students will know that plants and algae do not eat, but use energy from light, carbon dioxide and water	Students will know how organisms are ordered in a food chain in order to describe and explain	Students can explain whether characteristics are inherited, environmental or both in order to	Students will be able to describe puberty in order to explain how male and female reproductive systems

	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 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 understand the need for a microscope to be able to see cells and then use one to view different types of cells. 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	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 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.	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 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.	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. 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.	explain variation between individuals of the same species. Students can plot bar charts or line graphs to show continuous or discontinuous variation in order to analyse data Students can describe variation and how we represent data in order to describe trends. Students can describe how variation helps a particular species in a changing environment in order to link this to evolution. Students can describe the process of natural selection and extinction by linking this to adaptation and	are adapted for reproduction. Students will be able to describe the main events of pregnancy and development of a foetus using diagrams. So that they can describe how lifestyle during pregnancy is important. Students can explain whether substances are passed from the mother to the foetus or not in order to describe how lifestyle affects foetus development Students can describe the key events menstrual cycle so that they are able to link this to the events of fertilisation. This also links to specialised cells. Students will be able to use independent

	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 can use this knowledge to predict the	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 Students will be able to explain why multicellular organisms need organ systems to keep their cells alive Students will be able to explain how			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 competition between individuals for limited resources such as water and nutrients.	survival of the fittest in particular environmental conditions, to understand how beneficial traits are passed through inheritance.	research skills in order to present ideas about fertility treatments and describe causes of low fertility. This also links to developing critical thinking through designer babies.

	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	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 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	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	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 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	Students should recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago (KS2 NC Evolution and Inheritance) Students should recognise that living	Students should know the changes in the body as humans develop to old age (KS2 NC Animals, including humans) Students may know stages in the growth and development of humans (including gestation) and about the changes

	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 2 NC Animals including humans)	healthy and be able to make choices about this (Year 7 movement and KS 2 NC Animals including humans)		Students will know that glucose is used in respiration (Year 7 Respiration).	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)	things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (KS2 NC Evolution and Inheritance) Students can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. (KS2 NC Evolution and Inheritance)	experienced in puberty (KS2 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	Know the function of subcellular structures so they deduce the function of an unknown specialised cell from its structure Know how to use a	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 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.	They will learn that genes are passed from parents to offspring during reproduction in order to describe inheritance. They will learn that some features are inherited from parents and this leads to variation within a population	Students will be able to describe changes during puberty in order to link this to their wellbeing and their learning in SMSC. Students will be able to link lifestyle to health in order to describe correlations in graphs showing

	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 muscles in the body to be	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		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.		so that students are able to understand evolution. Students will be able to analyse a range of data in order to describe trends.	data on lifestyle and health. Students will be able to find valid sources of information by carrying out independent research in order to present their own findings within a context. Students will be able to make predictions of the effect of lifestyle on the developing foetus.

	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	Genes Offspring Species Variation Continuous variation Discontinuous variation	Pregnancy Gamete Fertilisation Uterus Ovulation Menstrual cycle
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	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.	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	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 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 this topic will allow students to describe different types of variation and identify them from graphs. This will help to develop their interpretation and describing of graphs across many scenarios.	This topic will allow students to understand changes that happen during puberty which links to SMSC and their wellbeing. This topic will also help students to understand the menstrual cycle and develop their own knowledge of the

	why cells need to be specialised and are organised in a hierarchy in complex organisms like humans. 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	Knowing the hierarchy will give perspective to the complexity of organisms. An understandin g 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	in different organisms.	An understanding of the photosynthesis chemical equation will allow students to see the presence of carbon and then link that with the carbon cycle. 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.	An understanding of food webs will enable students to understand that organisms also rely on each other in order to survive and that maintaining 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.	Students can apply their knowledge of variation to describe how this can lead to evolution by natural selection in future evolution topics.	body, this links to SMSC. Students can apply their knowledge of health to pregnancy as well as their wider wellbeing.

	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	opinions will allow students to evaluate data and present this in a logical way					