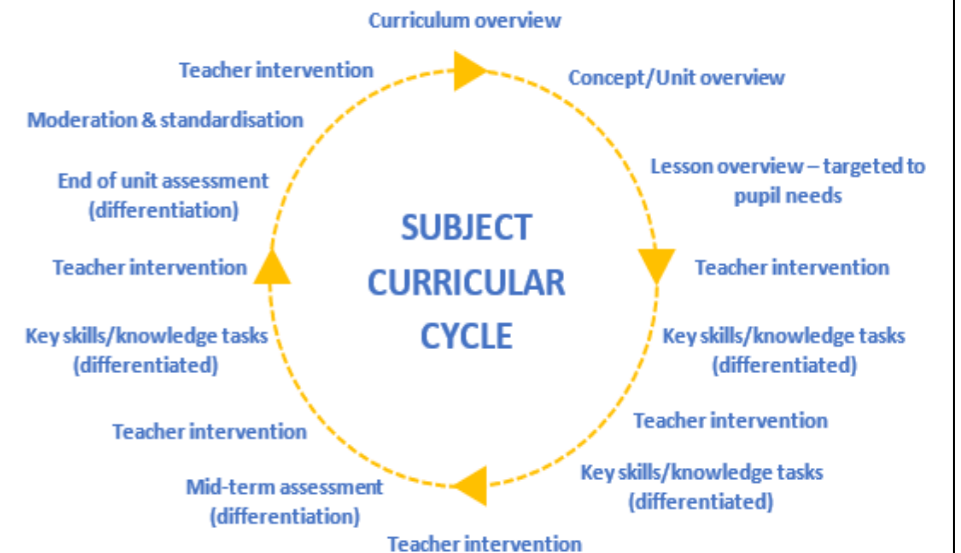


Ian Ramsey CE Academy: **BIOLOGY** Curriculum Progression Model

| CURRICULUM OVERVIEW | Curriculum What we study. Why study it. Why study it now. <i>What we need pupils to have learnt at each point/end of each year and the logical connection and the sequential learning between what is studied in the different terms and between years. This is what is to be covered and when, effectively creating the idea that the intent is the curriculum. The intent is everything up to the point of teaching. The purpose of our curriculum and the knowledge we want our pupils to go away with in their working memory.</i> | | | | How we teach the curriculum <i>How we make learning memorable and how we support our pupils to remember it. How we use rote, retrieval, interleaving, metacognition etc. in our teaching; why we teach in the way we are and justify decisions around how and why it is being taught this way.</i> | What we expect from the curriculum <i>How we make it challenging and ambitious for our pupils. How we assess learning, knowledge and understanding; what have they learnt and how well have they learnt it? Consider what assessments we use, when we use them and how and why we assess this way?</i> |
|---------------------|---|--|---|--|--|---|
| | Setting | Designing | | Planning | Delivering | |
| YEAR 7 | What: Cells What: An understanding of cells is fundamental to the teaching of biology. It is the foundation by which all other biology topics are built. It allows pupils to use microscopy to study the structure and function of cells. | What: Reproduction What: This gives learners the opportunity to apply their knowledge of specialised cells and builds on knowledge of puberty and reproduction taught at KS2 and links to statutory teaching in PSHE to explore the scientific aspects of reproduction. | What: Movement What: This topic allows pupils to apply their knowledge of specialised cells being used to form tissues/organs/systems. | What: Ecosystems What: Ecosystems is a necessary part of understanding the world we live in. It incorporates KS1 and KS2 knowledge about food chains and classification and builds on this knowledge. | The science curriculum at Ian Ramsey looks at the big ideas within science and re-visits each of these underpinning key concepts each year. This allows for a spiralling curriculum which allows for retrieval and practice before deepening the knowledge and understanding of each key concept. During Years 7-9 science is taught as a combination of biology, chemistry, and physics. At GCSE, these specialisms as individual disciplines, however the key concepts continue to underpin the curriculum across the five years. | Assessment for Learning is used in all lessons to provide evidence for use by pupils and teachers to decide where pupils are in their learning, where they need to go and how best to get there. Formative Assessment This is used to provide information about what pupils know, understand and can do. This is used by both the teacher and the pupil to determine where pupils are in their learning and how to continue to develop their knowledge and skills within the subject. This will include: <ul style="list-style-type: none"> • Questioning • Effective teacher feedback (written and verbal) • Peer feedback • Pupil self-assessment Summative Assessment This is also used at key points in each year to evaluation pupils' achievement. These allow a holistic view of pupils' performance and support the identification of areas requiring additional focus to improve learning overall. |
| | Why now: This is needed before any other biology topic to enable pupils to understand systems and environment. This topic allows pupils to revisit KS2 work on life processes and introduce them to knew knowledge needed for all biological study. | Why now: This allows knowledge from the previous topic after cells as retrieval required from cells topic. At KS2 pupils will have learnt simple life cycles and covered basic puberty and relationships. | Why now: This topic allows pupils to build on KS2 knowledge on exercise and healthy choices to stay fit and active. | Why now: Ecosystems build on both KS1 and KS2 knowledge. At KS1, pupils will have studied components of ecosystems and simple food chains. At KS2, pupils will have used identification keys to classify animals/insects into groups. | | |
| YEAR 8 | What: Unicellular organisms What: This topic further builds on the Y7 topic of cells with concepts that overlap into KS4 and prepare a foundation to build on further in their science journey. Pupils consider different forms of unicellular organisms, such as bacteria, and how they are designed to suit their environment. | What: Nutrition and Digestion What: Learning about food and digestion should be an early topic to develop their knowledge and understanding of how the digestive system breaks down food and its absorption into the body. This help pupils understand the effects of different foods on their body and the need to make healthy choices. | What: Breathing and Respiration What: This topic looks at the body's requirement for energy and how oxygen is necessary for the process. Pupils need to be able to identify organs in the breathing system and their role within the body. They will learn the difference between breathing and respiration and the release of energy in the body. | What: Producers What: This topic allows pupils to reflect on prior learning of specialised plant cells and build on this foundation, more complex ideas of tissues and organs in plants. Pupils will be able to apply their knowledge from Y7 topics to link ideas of fertilisation, pesticides/fertilisers on the surrounding environment and plant yield. | Biology: <ul style="list-style-type: none"> • Cells and cellular processes • Biological Systems • Organisms and the Environment | |
| | Why now: In KS2 pupils have covered the life processes and built on this knowledge in the Y7 cells topic. Pupils begin to develop and build on their knowledge of cells and consider their biological functions. | Why now: This topic links to the Y7 concept of movement (organs and systems). It also retrieves information from the previous topic of unicellular organisms as pupils consider how the cells and bacteria in our bodies help in the digestion process. | Why now: It incorporates knowledge from the previous topic of unicellular organisms and links to the previous topic of respiration. Pupils need to recognise that the two systems are working together to produce energy. | Why now: This topic reviews the Y7 topic of cells and organs. It requires learners to retrieve information on specialised plant cells and links in the Y7 topic ecosystems and how external factors can affect environments. This topic is taught at the end of Y8 to ensure that pupils have the maths skills required for sampling techniques. | | |
| YEAR 9 | What: Health, Disease, and Infection What: This topic identifies the structure and function of microbes. It progresses to the human body's defences and the role of the immune system. | What: Circulatory System What: Pupils will be looking at the organs which make up the circulatory system. Pupils will study the structure of the heart and diseases that can occur that affect the efficiency of the heart, and why. | What: Nervous System What: This nervous system topic will look at the principles of coordination, reflexes, and reflex arcs. It will look at the anatomy of the human eye and other receptors that detect changes in environment. | What: Photosynthesis What: In the topic of photosynthesis, pupils will look at all aspects of the reaction. | | |
| | Why now: Pupils will build on Year 8 about prokaryotic cells and will understand their structure and function. This topic is best taught in Y9 as it has close links with GCSE. | Why now: This topic develops pupils' knowledge of digestive and respiratory systems which is taught in Year 8. This topic is building the foundation to GCSE. | Why now: This allows for the retrieval from the Year 7 topic of cells. The nervous system is a more complex system and this unit, establishing a clear foundation for GCSE. | Why now: Pupils will retrieve learning from Year 7 of specialised cells and Year 8 knowledge of processes such as osmosis and diffusion and apply them to this process. | | |



| CURRICULUM OVERVIEW | Curriculum What we study. Why study it. Why study it now. | | | | | How we teach the curriculum | What we expect from the curriculum | |
|---------------------|--|--|---|--|--|--|--|---|
| | Setting | | Designing | | Planning | Delivering | | |
| Year 10 and Year 11 | What: Key concepts in Biology What: This topic includes the fundamentals of the biology GCSE across both paper 1 and paper 2. It reviews KS3 topic such as microscopy, cells, bacteria, enzymes and transporting substances. | What: Cells and control What: This subject includes cell division of differentiated cells. It leads onto stem cells and the advantages and disadvantages of their use in modern day medicines. This topic also builds on the work done in Y9 regarding the nervous system. | What: Genetics What: This topic allows pupils to further secure their knowledge, understanding and application of cells and reproduction. This topic permits students to learn about meiosis, DNA, alleles, inheritance, and variation. | What: Natural selection Genetic Modification What: This topic complements the previous as a follow on from learning about genetics. It investigates the idea of evidence to support Darwin's theory of evolution. It continues to engage pupils in the processes of genetic modification in agriculture and medicines. | What: Health, disease, and development of medicine What: A topic that investigate health and disease. It encourages pupils to study communicable and non-communicable diseases in society, the pathogens that cause them and the human defence systems against them. The treatments and medicines for these diseases are also examined throughout the topic. | What: Plant structures and function What: This topic builds on KS3 knowledge addressing the programme of study which involves photosynthesis as the key process for food production and therefore biomass for life, the process of photosynthesis and the factors affecting the rate of photosynthesis as well as the need for a transport system in plants. | The science curriculum at Ian Ramsey looks at the big ideas within science and re-visits each of these underpinning key concepts each year. This allows for a spiralling curriculum which allows for retrieval and practice before deepening the knowledge and understanding of each key concept. During Years 7-9 science is taught as a combination of biology, chemistry, and physics. At GCSE, these specialisms as individual disciplines, however the key concepts continue to underpin the curriculum across the five years. | Assessment for Learning is used in all lessons to provide evidence for use by pupils and teachers to decide where pupils are in their learning, where they need to go and how best to get there. Formative Assessment This is used to provide information about what pupils know, understand, and can do. This is used by both the teacher and the pupil to determine where pupils are in their learning and how to continue to develop their knowledge and skills within the subject. This will include: <ul style="list-style-type: none"> • Questioning • Effective teacher feedback (written and verbal) • Peer feedback • Pupil self-assessment Summative Assessment This is also used at key points in each year to evaluation pupils' achievement. They allow a holistic view of pupils' progress and support the identification of areas requiring additional focus to improve learning overall. |
| | Why now: It is vital to start the GCSE with this topic, in order to revisit KS3 concepts and allow pupils to progress and build on these foundations. The concepts taught here are used throughout the GCSE course. | Why now: Following from the key concept's topic, it allows pupils to build on their understanding of KS3 topics such as the nervous systems. It incorporates aspects of the first GCSE topic, securing knowledge on cells and their organelles. | Why now: This topic consolidates the KS3 topic inheritance and variation in Year 9 and build on the foundations from the unicellular topic in Year 8. It is uniquely placed to complement the two previous GCSE topics which both include cells. | Why now: A natural continuation from the previous topic, it not only consolidates work done from previous topic, but also work done in the Y9 inheritance, variation, and evolution topic. It allows pupils to apply knowledge from all these different subjects. | Why now: This topic is placed here to allow pupils to apply their knowledge and understanding from their Y9 topic health, disease, and infection. It also involves pupils accessing prior knowledge on unicellular organisms from Year 8 prokaryotic cells. | Why now: This topic is taught now to allow pupils to have developed the appropriate maths skills for some of the necessary calculations. Pupils will consolidate and further develop pupils' knowledge and understanding of photosynthesis from KS3 topic. | Biology: <ul style="list-style-type: none"> • Cells and cellular processes • Biological Systems • Organisms and the Environment | |
| | What: Animal Coordination, Control and Homeostasis What: This topic involves the principles of hormonal coordination and control in humans, hormones in human reproduction, hormonal and non-hormonal methods of contraception and homeostasis. Students will also develop an understanding of kidney function and gain further insight into the control of blood glucose. | What: Exchange and Transport in Animals What: Included in this topic is the heart, circulatory system, and cellular respiration. The content in this topic revolves around many previous ones, including cells, systems and chemical transportation and reactions. It allows prior learning to be drawn together an consolidate the understanding. | What: Ecosystems and material cycles What: This is a large section of the programme of study and incorporates many ecological factors such as: <ul style="list-style-type: none"> • biotic and abiotic environmental factors • parasitic relationships • biodiversity • material cycles | What: CORE PRACTICAL and CONSOLIDATION What: Re-visiting each core practical to re-enforce practical skills but also re-visit key knowledge and understanding. | Separate Biology units to be within SOL: <ul style="list-style-type: none"> • The Brain • The Eye • Defence against disease in plants • Plant adaptations and hormones • Indicator species • ADH regulation • Genetic Engineering | | | |
| | Why now: This topic links several KS3 topics together. Including the nervous system in Y9, which should create a solid foundation for this unit. It also will allow pupils to revisit other KS3 topics such as reproduction in Year 7 and digestion in Year 8. | Why now: Exchange and transport interlink several topics taught, including consolidation of the Year 9 topic on the circulatory system and the Year 8 topic of respiration. It is taught close to the end of the GCSE as it incorporates early topics of key concepts as well as health and disease. | Why now: It is taught towards the end of the GCSE to allow pupils to reflect and consolidate the KS3 of ecosystems delivered in Year 7. It is usually a topic that is taught in either spring/summer terms, allowing for any outdoor investigation to take place. | Why now: Allows opportunity to review and practise key practical skills prior to examination and ensures all pupils have completed core practical activities. | | | | |

