Pearson Edexcel

International GCSE Human Biology (2017)

How to use the Scheme of Work

This scheme of work (SoW) has been made available as a word document rather than PDF, allowing you to edit the document in a way that suits your teaching style and student needs.

International GCSEs have 120 - 140 guided learning hours.

**Guidance provided within the course planners, schemes of work and lesson plans are suggested approaches that can be adapted by centres to suit their particular context.**

**The following SoW is based on two hours of teaching time per week over 60 weeks** **and reflects how centres could use time for practical activities; you should edit this planner to suit your teaching approach.**

The course planner, in the *Getting Started Guide,* provides a high level view of how you could approach the topics to cover the specification content across two years.

The columns in this lesson plan indicate:

* an overview of the time allocated to lessons
* which section of the specification this lesson (or group of lessons) relates to
* the learning outcomes of those lessons
* the activities and resources that could be used to support the teaching of this lesson
* transferable skills support, see below for further information.

Why transferable skills?

In recent years, higher education institutions and global employers have consistently flagged the need for students to develop a range of transferable skills to enable them to respond with confidence to the demands of undergraduate study and the world of work.

To support the design of our qualifications, we have mapped them to a transferable skills framework. The framework includes cognitive, intrapersonal skills and interpersonal skills and each skill has been interpreted for each specification to ensure they are appropriate for the subject.  Further information on transferable skills is available on the website.  Pearson materials, including this scheme of work, will support you in identifying and developing these skills in students.

In the final two columns of this scheme of work we have indicated which transferable skills are explicitly assessed, and also where there are opportunities for them to be developed through teaching. Our intention is that teachers can use these columns to increase opportunities for transferable skills development in learners.

Other course planning support

You will find other support for planning the course in the Teacher Support Materials. There are free downloadable resources that you can access [here](https://qualifications.pearson.com/en/qualifications/edexcel-international-gcses-and-edexcel-certificates/international-gcse-human-biology-2017.coursematerials.html#filterQuery=category:Pearson-UK:Category%2FSpecification-and-sample-assessments).

Teaching resource exemplars

The scheme of work contains suggestions for resources that you can use to support your teaching. These are suggestions only of material you may find useful and you are encouraged to use a wide range of resources that suit the needs of your students.

Other teaching resources

* Student Books – full colour textbooks matched to the specification.
* ActiveBook – a digital copy of the Student Book in the back of every copy.

Further details can be found at [www.pearsonschools.co.uk](http://www.pearsonschools.co.uk). Search for this title: Edexcel IGCSE Human Biology Student Book.

Pearson Subject Advisors

Pearson has a team of specialist subject advisors available to help you with the implementation of this specification. You can contact them by:

* Email: [Teaching](mailto:Teaching)Science@pearson.com
* Telephone: UK: 020 7010 2190. International: +44 20 7010 2190
* Twitter: [@PearsonSciences](https://twitter.com/@PearsonSciences)

Health and safety

The practicals and experiments suggested within this scheme of work are those we believe are not banned or restricted in any way and are still currently used in most schools and colleges. The International GCSE encourages experimental work with the assessment of investigative skills being made in the written examinations.

We advise teachers and technicians to discuss the merits of the suggested practicals when deciding which to carry out and how they will be carried out. For example, will it be demonstrated by the teacher or technician, or conducted by students themselves, either individually or in small groups, under the guidance and direction of the teacher?

You may have ideas for practical work that we have not suggested but would work equally well.

As in all practical work, a risk assessment is expected as part of good health and safety practice in all centres and we understand that many schools and colleges refer to the CLEAPSS service: <http://www.cleapss.org.uk/> for guidance and support in conducting science practical work.

Edexcel International GCSE in Human Biology (2017)

| Week | Content coverage | Learning outcomes | Exemplar activities | Exemplar resources | Transferable skills that are explicitly assessed through examination | Transferable skills that could also be  acquired through teaching and delivery |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | **Section 1**  **Cells and Tissues**  Cell structures and functions | Students will be assessed on their ability to:  1.1 recognise cell structures as seen  with a light microscope and electron  microscope (TEM images only),  including nucleus, chromosomes, cell  membrane, mitochondria,  endoplasmic reticulum and ribosomes  1.2 describe the functions of the cell structures:  • nucleus  • chromosomes  • cell membrane  • mitochondria  • endoplasmic reticulum  • ribosomes. | **Activities:**  Look at TEM images and try to identify structures.  Produce a poster labelling structures and annotated with functions of each structure.  Students can research a particular organelle and prepare a PowerPoint presentation to the class.  Look at pre-prepared slides of various cells under a light microscope.  Produce a slide of your own cheek cell or onion cell – compare plant and animal cell structures*. Please consider local Health and safety issues and regulations.*  Squeeze some pond weed between two microscope slides - look at them under a microscope to see how many chloroplasts there are. *Plant cells are outside the specification but this can develop practical skills/illustrate plant cell differences.*  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – What’s In A Cell?**  <http://www.bbc.co.uk/schools/gcsebitesize/science/add_edexcel/cells/cells2.shtml> *(for animal cell components)*  **Video – Electron microscope**  <https://www.youtube.com/watch?v=fToTFjwUc5M>  **BBC – Levels of Organisation**  <http://www.bbc.co.uk/education/guides/zgcxsbk/revision/2> *(for animal cell components)*  **Video – Cell biology under the microscope**  <http://www.dnatube.com/video/2321/Cell-Biology-Under-Microscope> | Critical thinking  Problem solving  Reasoning  Interpretation  Adaptive learning  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Learning  Intellectual Interest and curiosity  Initiative  Self-direction  Responsibility  Perseverance  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership |
| 2 | **Section 1**  **Cells and Tissues**  Structure of DNA and DNA replication | Students will be assessed on their ability to:  1.3 describe the structure of a DNA molecule as:  • two strands coiled to form a double helix  • containing nucleotides  • strands linked by complementary bases, complementary bases linked by hydrogen bonds.  1.4 describe DNA replication as the separation of DNA strands and the formation of a new strand by complementary base pairing of nucleotides, including the role of DNA polymerase. | **Activities:**  Make models of DNA ladder structure using card or even use different coloured jelly babies as the bases.  Make plasticine/play-doh models to show replication.  Download app stop motion animation – use iPhones or iPads to make an animation of DNA replication using plasticine/card etc.  Extension for G&T  Make molymod models of a nucleotide.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson | Edexcel International GCSE student book pages – tbc  **Animations:**  **DNA structure**  <http://highered.mheducation.com/sites/dl/free/0072835125/126997/animation12.html>  **DNA replication**  <http://highered.mheducation.com/sites/dl/free/0072835125/126997/animation16.html> | Critical thinking  Problem solving  Reasoning  Interpretation  Adaptive learning  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative  Self-direction  Perseverance  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership |
| 3 | **Section 1**  **Cells and Tissues**  Protein synthesis and mutations | Students will be assessed on their ability to:  1.5 understand that a gene is a length of DNA containing a sequence of bases that code for a specific protein. **Teaching should be limited to:**  • the order of bases in DNA codes for the order of amino acids in a protein  • 3 bases coding for one amino acid  1.6 know that RNA is a second type of nucleic acid that has the following features:  • single stranded  • contains ribose  • contains uracil and that it is used to take information from DNA in the nucleus to the ribosomes for the synthesis of proteins  1.7 understand that a DNA mutation involves a change in the sequence of bases that could lead to a change in the amino acid sequence and phenotype of an individual  1.8 describe protein synthesis as:  • transcription – the formation of mRNA in the nucleus  • the transfer of mRNA to ribosomes in the cytoplasm  • translation of the genetic code by tRNA from mRNA codons  • the formation of a polypeptide chain using amino acids. | **Activities:**  Make models of DNA/RNA base sequences using different coloured card or even use different coloured jelly babies as the bases and show mutations changing the base sequence.  Make plasticine/play-doh models to show transcription/translation/ protein synthesis.  Download app stop motion animation – use iPhones or iPads to make an animation of transcription/translation using plasticine/card etc.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Animations:**  **Transcription and translation**  <https://www.youtube.com/watch?v=fihDFf2vDrI>  **ABPI interactive activity on protein synthesis**  <http://www.abpischools.org.uk/topic/cellbiology/7> | Critical Thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative  Self-direction  Perseverance  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership |
| 4 | **Section 1**  **Cells and Tissues**  Genetic engineering | Students will be assessed on their ability to:  1.9 outline principles of genetic engineering, including:  • the production of genetically modified bacteria to produce human insulin  • the production of genetically modified plants to produce vaccines (e.g. hepatitis B) and to improve health (e.g. Golden Rice to increase vitamin A in the diet). | **Activities:**  Discuss the ethical issues surrounding genetic engineering. Students could research and/or have a class debate of the pros and cons.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson | Edexcel International GCSE student book pages – tbc  **Video:**  **DNAtube**  <http://www.dnatube.com/video/2310/Bacteria-Genetic-Engineering> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self- presentation |
| 5 | **Section 1**  **Cells and Tissues**  Mitosis, stem cells, Ethics | Students will be assessed on their ability to:  1.10 understand that mitosis occurs during growth, repair, cloning and asexual reproduction  1.11 know the four main stages of mitosis; prophase, metaphase, anaphase and telophase, which results in the production of two genetically identical diploid daughter cells  1.12 know that there are different types of stem cells, including embryonic and adult stem cells that have the ability to develop into other body cells  1.13 describe the advantages, disadvantages and ethics in the research and use of embryonic and adult stem cells. | **Activities:**  Make plasticine/play-doh models to show chromosomes during mitosis.  Download app stop motion animation – use iPhones or iPads to make an animation of mitosis using plasticine, card etc.  Discuss the ethics of using stem cells. Students could research and/or debate the pros and cons.  Investigate cell division using:  <http://multimediasciencesimulations.com/biology.php> | Edexcel International GCSE student book pages – tbc  **Animation:**  **Mitosis**  <http://highered.mheducation.com/sites/dl/free/0072835125/126997/animation2.html>  **Videos:**  **DNAtube**  <http://www.dnatube.com/video/162/Stem-Cells-Part-I>  **ABPI interactive activity on cell division:**  <http://www.abpischools.org.uk/topic/celldivision>  **BBC – Stem Cells and Medicine**  <http://www.bbc.co.uk/education/clips/zqvxcwx>  **ABPI interactive activity on stem cells:**  <http://www.abpischools.org.uk/topic/stem-cells/> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| 6 | **Section 1**  **Cells and Tissues**  Cells tissues and organs, bone and muscle specialised cells | Students will be assessed on their ability to:  1.14 understand that cells are grouped into tissues and that tissues are organised into organs  1.15 describe the structure of bone, muscle (voluntary, involuntary and cardiac, as observed under a light microscope), blood, nervous tissue and epithelium (squamous and ciliated, with reference to cells lining the cheek and trachea)  1.16 describe the structure of cells specialized for reproduction, e.g. egg (ovum) and sperm and relate their structure to function. | **Activities:**  Use a model skeleton to show bones and muscle locations/attachment.  View pre-prepared slides of blood/nervous tissue or other cells under a light microscope.  Locate/download a picture from an online library to observe red blood cells or stained white blood cells.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **DNAtube –Red blood cells**  <http://www.dnatube.com/video/20/Red-Blood-Cells-under-microscope>  **DNAtube – Fusion of sperm and egg**  <http://www.dnatube.com/video/8296/Fusion-of-the-ovum-and-sperm> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability  Intellectual Interest and curiosity |
| 7 | **Section 2**  **Biological Molecules**  Elements present, structures of molecules, tests for molecules | Students will be assessed on their ability to:  2.1 know the chemical elements present in carbohydrates, proteins and lipids (fats and oils)  2.2 understand the structure of carbohydrates, proteins and lipids as large molecules made up from smaller basic units:  • starch and glycogen from simple sugars  • protein from amino acids  • lipids from fatty acids and glycerol  2.3 describe the tests for glucose (a reducing sugar), starch, lipid and protein. | **Activities:**  Make models out of card or molymod. Or look at pre-prepared molymod models to work out the elements present in each.  **Class practicals:**  Starch test using iodine  Benedict’s test for sugar  Emulsion test for lipids  Biuret test for proteins.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Protocols for practicals:**  <http://www.biology-resources.com/biology-experiments2.html> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Continuous learning  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 8 | **Section 2**  **Biological Molecules**  Embedded practicals | Students will be assessed on their ability to:  2.4 practical: investigate the qualitative and quantitative content of vitamin C in food  2.5 practical: investigate the energy content of food. | **Class practicals:**   * Vitamin C content * Energy content of a crisp. | Edexcel International GCSE student book pages – tbc  **Protocols for practicals:**  <http://www.biology-resources.com/biology-experiments2.html> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Continuous learning  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 9 | **Section 2**  **Biological Molecules**  Enyzmes as catalysts, factors affecting enzymes | Students will be assessed on their ability to:  2.6 explain the role of enzymes as biological catalysts in metabolic reactions  2.7 explain the action of enzymes and how their activity is affected by:  • temperature  • pH  • substrate concentration  • competitive and non-competitive inhibitors. | **Activities:**  Students can prepare a PowerPoint presentation on how a particular variable affects enzyme action or research a particular inhibitor or type of inhibitor.  **Interactive resource on enzymes**  <http://www.abpischools.org.uk/topic/enzymes_16plus>  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Interactive resource on enzymes**  <http://www.abpischools.org.uk/topic/enzymes_16plus> | Critical Thinking  Problem Solving  Analysis  Reasoning  Interpretation  Decision Making  Adaptive Learning  Creativity  Innovation  Adaptability | Critical Thinking  Problem Solving  Analysis  Reasoning  Interpretation  Decision Making  Adaptive Learning  Executive Function  Innovation  Adaptability  Continuous learning  Intellectual Interest and curiosity  Initiative  Communication  Collaboration |
| 10 | **Section 2**  **Biological Molecules**  Embedded practical | Students will be assessed on their ability to:  2.8 practical: investigate the effect of temperature and pH on enzyme activity. | **Class practicals:**   * Effect of temperature on enzyme activity * Effect of pH on enzyme activity. | Edexcel International GCSE student book pages – tbc  **Protocols for practicals:**  <http://www.biology-resources.com/biology-experiments2.html> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Creativity  Innovation | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Continuous learning  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 11 | **Section 2**  **Biological Molecules**  Immobilised enzymes + embedded practical | Students will be assessed on their ability to:  2.9 describe the advantages of using immobilised enzymes in:  • the production of lactose-free milk  • the conversion of sucrose into glucose and fructose  • glucose testing strips for diabetics  2.10 practical: investigate the action of immobilised enzymes including the preparation of alginate beads | **Class practicals:**  Use glucose test strips to test fake urine (cold tea) for presence of glucose to identify a diabetic patient.  Prepare immobilised enzymes in alginate beads. | Edexcel International GCSE student book pages – tbc  **Interactive resources on enzyme uses**  <http://www.abpischools.org.uk/topic/enzymes/7> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Creativity  Innovation | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Continuous learning  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 12 | **Section 3**  **Movement of Substances**  Definitions + osmosis | Students will be assessed on their ability to:  3.1 know simple definitions of diffusion, osmosis and active transport  3.2 understand that movement of substances into and out of cells can be by diffusion, osmosis (understanding of water potential is required) and active transport. | **Activities:**  Burn an incense stick and time how long it takes for students to smell it – using their distance away work out the rate of diffusion.  Look at diffusion of methylene blue in liquid or agar blocks.  Use Visking tubing to show osmosis.  *Plant cells are not in the specification but are more easily visible if using the following demonstration.* Put rhubarb epidermal cells in sucrose and show under the microscope the cells becoming plasmolysed. Then irrigate with water to show them becoming turgid again.  Investigate diffusion and osmosis using:  <http://multimediasciencesimulations.com/biology.php>  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Protocols for practicals:**  <http://www.biology-resources.com/biology-experiments2.html>  **DNAtube – Diffusion and Osmosis**  <http://www.dnatube.com/video/30098/The-Process-of-Diffusion-Osmosis> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Continuous learning  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 13 | **Section 3**  **Movement of Substances**  Factors affecting movement | Students will be assessed on their ability to:  3.3 understand the factors that affect the rate of movement of substances into and out of cells to include the effects of surface area to volume ratio, temperature and concentration gradient. | **Activities:**  Draw 3 different sized cubes – work out their surface area, volume and SA:Vol ratio.  Research the rough dimensions of a bacterium, a rat and a whale – estimate their surface areas and volumes. Compare the SA:Vol ratio. Now get students to suggest problems for life as larger/multicellular organisms evolved (in terms of heat loss & gas exchange).  Investigate diffusion rates in different sized agar blocks. Work out, for example, time to change colour compared with the surface area:vol ratio. | Edexcel International GCSE student book pages – tbc  **Protocols for practicals:**  <http://www.biology-resources.com/biology-experiments2.html> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Continuous learning  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 14 | **Section 4**  **Bones, Muscles and Joints**  Skeleton, joints, structure of synovial joint | Students will be assessed on their ability to:  4.1 describe the structure and function of the main parts of the skeleton:  • axial skeleton (vertebral column, ribcage and skull)  • appendicular skeleton (scapula, clavicle, pelvis and limbs)  • the structure of a long bone to include the distribution of spongy bone, compact bone and epiphysis  4.2 explain the functions of joints using the elbow, shoulder and a cartilaginous intervertebral joint as examples  4.3 describe the structure of a synovial joint. | **Activities:**  Use a model skeleton to see and name the bones and observe the position of various different joints.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Video:**  <http://www.dnatube.com/video/9237/The-Human-Skeleton> | Critical thinking  Problem solving  Reasoning  Interpretation  Adaptive learning  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity |
| 15 | **Section 4**  **Bones, Muscles and Joints**  Muscles, dietary factors, osteoporosis | Students will be assessed on their ability to:  4.4 explain the relationship between voluntary muscles and bones to bring about movement illustrated by the biceps and triceps muscles and associated bones in the arm and shoulder  4.5 understand the dietary factors controlling the healthy development of muscle and bone  4.6 understand the causes and symptoms of osteoporosis. | **Activities:**  Students could research and prepare posters or PowerPoint presentations on how diet affects muscle and bone development or how poor diet and can lead to problems with bone growth. | Edexcel International GCSE student book pages – tbc  [Sample assessment material – Paper 2, Question 2.](https://qualifications.pearson.com/en/qualifications/edexcel-international-gcses-and-edexcel-certificates/international-gcse-human-biology-2017.coursematerials.html#filterQuery=category:Pearson-UK:Category%2FSpecification-and-sample-assessments)  **BBC –Muscles**  <http://www.bbc.co.uk/education/clips/zmpd2hv> | Critical thinking  Problem solving  Reasoning  Interpretation  Adaptive learning  Adaptability | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| 16 | **Section 5**  **Coordination**  Neurone structure, CNS, main areas of the brain | Students will be assessed on their ability to:  5.1 know the structure of neurones: sensory, motor and relay  5.2 know the basic plan of the central nervous system  5.3 know the main areas of the brain and their functions including the cerebral hemispheres, cerebellum, mid brain, pituitary gland and hypothalamus. | **Activities:**  Students could produce a poster or PowerPoint presentation on areas of the brain and their main functions.  **Interactive resource on the nervous system**  <http://www.abpischools.org.uk/topic/nervoussystem/1/1>  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Video – Neurones and How they Work**  <http://www.dnatube.com/video/1107/Neurons-and-How-They-Work> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Continuous learning  Intellectual Interest and curiosity  Initiative  Communication  Collaboration |
| 17 | **Section 5**  **Coordination**  Reflex arc, receptors, impulse pathway | Students will be assessed on their ability to:  5.4 know the structure and functions of the spinal cord and the structure of a reflex arc  5.5 understand that the body contains receptors that can detect the stimuli for light, temperature, pressure/pain and taste  5.6 describe the pathway taken by a nerve impulse to cause a response to a stimulus. | **Activities:**  Students could use knee-jerk hammers to demonstrate the knee jerk reflex on each other.  In pairs use a torch to show the iris reflex.  Students could investigate their reaction times. E.g. catching a ruler.  **Interactive resource on the nervous system**  <http://www.abpischools.org.uk/topic/nervoussystem/1/1> | Edexcel International GCSE student book pages – tbc  **Reaction time and sensitivity protocols:**  <http://www.biology-resources.com/biology-experiments2.html#Senses>  **BBC – Using Reflexes to Test Senses**  <http://www.bbc.co.uk/education/clips/zv4pvcw> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 18 | **Section 5**  **Coordination**  Initiation of impulses + embedded practical | Students will be assessed on their ability to:  5.7 practical: investigate the number and position of sensory receptors, such as touch and temperature receptors in the skin  5.8 understand how nerve impulses are initiated, the direction of movement of an impulse along a neurone and transmission across a synapse. | **Activities:**  Students could investigate sensitivity of the skin to touch.  **Interactive resource on the nervous system:**  <http://www.abpischools.org.uk/topic/nervoussystem/1/1>  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Sensitivity protocol:**  <http://www.biology-resources.com/biology-experiments2.html#Senses> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 19 | **Section 5**  **Coordination**  Nervous system v hormones, action of various hormones | Students will be assessed on their ability to:  5.9 understand the action of hormones from the pituitary (ADH and gonadotrophic hormones), adrenal (adrenaline) and thyroid glands, the islets of Langerhans in the pancreas (insulin and glucagon) and the gonads, and know the role of hormones in growth and development  5.10 understand the differences between the nervous and hormonal systems | **Activities:**  Students could produce an A3 poster highlighting the major endocrine glands with a summary of the hormones they produce and their function.  Produce a table of differences comparing the nervous with the endocrine system.  Students can investigate how muscles use sugar using online research/textbooks.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **DNAtube video – Overview of the human endocrine system:**  <http://www.dnatube.com/video/11230/Endocrine-System-in-Human>  **Interactive resource - hormones**  <http://www.abpischools.org.uk/topic/hormones> | Critical thinking  Problem solving  Reasoning  Interpretation  Adaptive learning  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative  Self-direction  Responsibility  Perseverance  Productivity |
| 20 | **Section 5**  **Coordination**  Structure and function of the eye, eye defects | Students will be assessed on their ability to:  5.11 explain the structure and function of the eye in:  • focusing on near and distant objects  • responding to changes in light intensity  • stereoscopic vision allowing better judgment of distance.  5.12 understand eye defects and their treatment, i.e. long sight, short sight, astigmatism, and cataracts, and the use of corneal transplants. | **Activities:**  Practical activities might include:   * Investigate the blind spot * Dissection of an eye (various animals possible) * Inversion of image * Perception of distance * Hand-eye coordination.   Research eye defects – produce posters or PowerPoint presentations for the class on a particular defect of interest. | Edexcel International GCSE student book pages – tbc  **Practical protocols:**  <http://www.biology-resources.com/biology-experiments2.html#Senses> | Critical thinking  Problem solving  Reasoning  Interpretation  Adaptive learning  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 21 | **Section 5**  **Coordination**  Structure and function of the ear, noise + embedded practical | Students will be assessed on their ability to:  5.13 explain the structure and function of the ear in balance and hearing  5.14 understand how prolonged exposure to high noise levels affects the functioning of the ear and hearing  5.15 practical: investigate the range of frequency audible to the human ear. | **Activities:**  Produce an annotated poster showing structures of the ear – colour coded to highlight which are involved in hearing v balance.  Research which jobs/careers have problems with noise levels and what is done to prevent hearing damage.  Produce a poster on famous rock stars who have hearing loss/tinnitus due to excessive noise.  Investigate frequencies audible to children v adults.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Science made simple – the amazing ear**  <http://www.sciencemadesimple.co.uk/curriculum-blogs/biology-blogs/the-amazing-ear>  **BBC – Hearing and Balance**  <http://www.bbc.co.uk/education/clips/zyy7tfr> | Critical thinking  Problem solving  Reasoning  Interpretation  Adaptive learning  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative  Communication  Collaboration  Teamwork  Cooperation |
| 22 | **Section 5**  **Coordination**  Legal and Illegal drugs, alcohol | Students will be assessed on their ability to:  5.16 understand the meaning of the term 'drug' and distinguish between legal and illegal drugs, including:  • the dangers of heroin, cannabis and cocaine  • the action of common painkillers such as paracetamol on the nervous system  5.17 describe the damaging effects of alcohol on the nervous system and liver and the behavioural consequences of excessive and long-term drinking. | **Activities:**  Research and produce a poster or PowerPoint presentation on a particular drug and how it affects the nervous system.  Debate the legalisation of drugs – students could research one side of the argument and debate in class.  Students could research or discuss the cost of drugs/alcohol abuse to the NHS. | Edexcel International GCSE student book pages – tbc  **Video: How Drugs Affect the Brain**  <http://www.dnatube.com/video/29546/How-Does-Drugs-Affact-Your-Brain> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| 23 | **Section 5**  **Coordination**  Mental illness | Students will be assessed on their ability to:  5.18 describe the causes, symptoms and treatments of mental illness, including schizophrenia and depression  5.19 describe the causes, symptoms and treatments of Alzheimer's disease, vascular dementia and Parkinson's. | **Activities:**  Students could use an interactive resource such as the website below to produce a poster on the different kinds of mental illness.  <http://www.mind.org.uk/information-support/types-of-mental-health-problems/>  Students could produce a poster on a specific illness in the specification. | Edexcel International GCSE student book pages – tbc | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| 24 | **Section 6**  **Nutrition and Energy**  Balanced diet, variations and sources in diet, deficiency diseases | Students will be assessed on their ability to:  6.1 explain the importance of a balanced diet including the recommended dietary intake of carbohydrates, fats, proteins, vitamins A and C, calcium, iron and fibre  6.2 understand variations in diet related to age, pregnancy, climate and occupation  6.3 know the sources and functions of carbohydrates, proteins, lipids (fats and oils), vitamins A, C and D, and the mineral ions, calcium and iron  6.4 describe the causes and symptoms of deficiency diseases limited to scurvy (lack of vitamin C), anaemia (lack of iron), blindness (lack of vitamin A) and Kwashiorkor (lack of protein). | **Activities:**  Students keep a record of the food they/their family eat for a week then categorise them into the different food groups.  They could also estimate the energy content of a meal or investigate their nutrient intake v RDA using:  <http://multimediasciencesimulations.com/biology.php>  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Interactive resources on balanced diet**  <http://www.abpischools.org.uk/topic/balanced-diet/1/1>  **Video – History of Vitamin C and Scurvy**  <http://www.dnatube.com/video/25163/Lec-22--Vitamin-C-and-the-Limeys> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity  Innovation  Adaptability | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 25 | **Section 6**  **Nutrition and Energy**  Alimentary canal, peristalsis, digestive enzymes | Students will be assessed on their ability to:  6.5 know the structures of the human alimentary canal and describe the functions of the mouth, oesophagus, stomach, small intestine, large intestine and pancreas in digestion  6.6 explain how food is moved through the gut by peristalsis including the role of dietary fibre in the process  6.7 understand the role of digestive enzymes including:  • their site of production and action  • the digestion of starch to glucose by amylase and maltase  • the digestion of proteins to amino acids by proteases (pepsin, trypsin)  • the digestion of lipids to fatty acids and glycerol by lipases. | **Activities:**  Produce an annotated poster labelling the alimentary canal and the function of each section.  Interactive resources on the digestive system  <http://multimediasciencesimulations.com/biology.php>  Investigate the effect of amylase on starch <http://www.abpischools.org.uk/topic/dietanddigestion>  Practical – model gut using Visking tubing.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Practical protocols**  <http://www.biology-resources.com/biology-experiments2.html#Enzymes>  **Interactive resource on digestion**  <http://www.abpischools.org.uk/topic/dietanddigestion/7> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 26 | **Section 6**  **Nutrition and Energy**  Bile, structure of villus | Students will be assessed on their ability to:  6.8 know that bile is produced by the liver and stored in the gall bladder and understand the role of bile in neutralising stomach acid and emulsifying lipids  6.9 understand how the structure of the villus helps absorption of the products of digestion in the small intestine. | **Activities:**  Investigate the presence/absence of bile on lipase activity.  Interactive resource on digestion  <http://multimediasciencesimulations.com/biology.php>  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Interactive resources on digestion**  <http://www.abpischools.org.uk/topic/dietanddigestion/7>  <http://multimediasciencesimulations.com/biology.php> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 27 | **Section 6**  **Nutrition and Energy**  Teeth | Students will be assessed on their ability to:  6.10 know the types, structure and functions of teeth, the factors that affect their growth and how to care for teeth and gums. | **Activities:**  Research careers in biology – different specialist areas in dentistry.  Produce a poster on the different types of human teeth and their functions. This can be extended *(beyond the specification)* for a comparison of different teeth of carnivores, herbivores and omnivores.  Research the evolution of teeth – what did our ancestors’ teeth look like? Or how can we learn so much from fossil teeth? Or how do we know what Australipithecus ate from fossils?  Produce a poster on gum disease or how to prevent tooth decay.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize - Teeth**  <http://www.bbc.co.uk/education/guides/zwqycdm/revision/2> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 28 | **Section 6**  **Nutrition and Energy**  BMI, obesity, food hygiene | Students will be assessed on their ability to:  6.11 understand BMI, including the calculation of BMI, and the role of obesity as a risk factor in early onset of diabetes and the significance of high cholesterol levels in atherosclerosis.  6.12 explain the importance of hygienic methods of food preparation, cooking, storage and preservation. | **Activities:**  Interactive resource on diabetes  <http://www.abpischools.org.uk/topic/diabetes>  Students could research and produce a poster on risk factors for diabetes or atherosclerosis.  Students could produce posters or PowerPoint presentations on food poisoning as a result of poor food hygiene. | Edexcel International GCSE student book pages – tbc | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self presentation |
| 29 | **Section 7**  **Respiration**  Respiration + embedded practical | Students will be assessed on their ability to:  7.1 know that the process of respiration releases energy in living organisms  7.2 practical: investigate the difference between inspired and expired air for carbon dioxide concentration  7.3 know the word equation and the balanced chemical symbol equation for aerobic respiration in living organisms. | **Activities:**  Practical activities could include:   * Use limewater to investigate carbon dioxide when exhaling. Alternative use of hydrogen carbonate as an indicator. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – Respiration**  <http://www.bbc.co.uk/education/topics/zw22pv4>  **Practical protocols**  <http://www.biology-resources.com/biology-experiments2.html#Respiration> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 30 | **Section 7**  **Respiration**  Anaerobic respiration, ATP | Students will be assessed on their ability to:  7.4 know the word equation for anaerobic respiration  7.5 explain the differences between aerobic and anaerobic respiration  7.6 understand the role of ATP in energy transfer (addition and removal of a phosphate group and associated energy requirement and release). | **Activities:**  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Videos – ATP**  <http://www.dnatube.com/video/3421/ATP-cycle>  <http://www.dnatube.com/video/29866/All-About-ATP-Molecules> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 31 | **Section 8**  **Gas Exchange**  Gas exchange system, ventilation, diffusion | Students will be assessed on their ability to:  8.1 know the structure of the thorax including the ribs, intercostal muscles, diaphragm, trachea, bronchi, bronchioles, alveoli and pleural membranes  8.2 explain the role of the intercostal muscles and the diaphragm in ventilation  8.3 explain how the lungs are adapted for gas exchange by diffusion. | **Activities:**  Produce an annotated poster labelling the breathing system with the functions of each part.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Interactive resource on breathing**  <http://multimediasciencesimulations.com/biology.php>  **BBC Bitesize – Breathing** <http://www.bbc.co.uk/education/clips/zwrtfg8> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 32 | **Section 8**  **Gas Exchange**  Vital capacity, tidal volume, spirometer + embedded practical | Students will be assessed on their ability to:  8.4 understand the terms lung capacity, vital capacity, tidal volume and interpret spirometer traces showing breathing movement  8.5 practical: investigate the effect of exercise on the rate of breathing and measure lung capacity. | **Activities:**  Measure each student’s vital capacity.  Use a data logger and breathing sensor/spirometer to show data such as: tidal volume, vital capacity etc.  Interactive alveoli & diffusion  <http://multimediasciencesimulations.com/biology.php> | Edexcel International GCSE student book pages – tbc | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 33 | **Section 8**  **Gas Exchange**  Chemoreceptors, aerobic exercise, pulse rate and heart rate | Students will be assessed on their ability to:  8.6 describe the regulation of carbon dioxide content in the blood including the role of chemoreceptors in the aorta and carotid arteries  8.7 understand the term aerobic exercise  8.8 understand the long-term benefits of exercise on the cardiovascular system  8.9 understand the pulse rate as a measure of heart rate and explain why resting pulse can be used as a measure of physical fitness. | **Activities:**  Research and produce a poster on aerobic v anaerobic exercise programmes. Compare the training programmes for marathon runners v sprinters, for example.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 34 | **Section 8**  **Gas Exchange**  Heart rate and adrenaline + embedded practical | Students will be assessed on their ability to:  8.10 explain why the heart rate changes during exercise and the influence of adrenaline  8.11 practical: investigate the effect of exercise on the pulse rate. | **Activities:**  Practical – investigate the effect of exercise on pulse rate – could be kept simple, e.g. rate of sitting-standing-sitting  Investigate the effect of holding your breath for different lengths on heart rate. | Edexcel International GCSE student book pages – tbc  **Interactive resources on the heart**  <http://multimediasciencesimulations.com/biology.php>  <http://www.abpischools.org.uk/topic/heartandcirculation/9> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity |
| 35 | **Section 8**  **Gas Exchange**  Oxygen debt, smoking | Students will be assessed on their ability to:  8.12 understand how an oxygen debt arises and how it is repaid after exercise  8.13 understand the damage to the respiratory and cardiovascular system caused by smoking | **Activities:**  Produce posters ‘for a doctor’s surgery’ warning patients on how smoking affects the lungs and heart.  Students could debate the ethical issues of smoking and its cost to society/NHS and should smoking be someone’s right. | Edexcel International GCSE student book pages – tbc  **Interactive resources on the heart**  <http://multimediasciencesimulations.com/biology.php>  <http://www.abpischools.org.uk/topic/heartandcirculation/9>  **BBC Bitesize – Smoking**  <http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway/understanding_organisms/fitness_healthrev3.shtml>  **Video – Smoking and Alcohol**  <http://www.dnatube.com/video/8200/Effects-of-Smoking-and-Drinking-on-Your-Body> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| 36 | **Section 8**  **Gas Exchange**  Gas exchange, exercise, oxygen debt, smoking | Consolidation and assessment | **Activities:**  During any consolidation and assessment slot available here or throughout the course introduce SAM questions wherever possible – there are many past paper questions from previous years in the previous specification that are useful.  Games such as: ‘We Say You Pay’ with biology words can add variety to a test.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc |  |  |
| 37 | **Section 9**  **Internal Transport**  Composition of the blood, role of plasma, tissue fluid | Students will be assessed on their ability to:  9.1 know the composition of the blood: red blood cells (erythrocytes), white blood cells (phagocytes and lymphocytes), platelets and plasma  9.2 understand the role of plasma in the transport of carbon dioxide, digested food, urea, hormones and heat energy  9.3 know the role of tissue fluid and explain how this arises as a result of pressure differences and its subsequent drainage into the lymphatic system. | **Activities:**  Look at pre-prepared slides of blood cells under the microscope.  Use downloaded/projected images of various cells found in blood.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Interactive resource on circulation**  <http://www.abpischools.org.uk/topic/heartandcirculation>  **BBC Bitesize – Blood**  <http://www.bbc.co.uk/schools/gcsebitesize/science/add_gateway_pre_2011/living/movingrev1.shtml> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 38 | **Section 9**  **Internal Transport**  Red blood cells, ABO blood groups, white blood cells | Students will be assessed on their ability to:  9.4 explain how red blood cells are adapted for oxygen transport  9.5 understand the role of ABO blood groups and their importance in blood transfusions  9.6 understand the role of white blood cells including phagocytosis and antibody production (details of plasma cells are not required)  9.7 describe the importance of blood clotting and the role of enzymes in causing the conversion of fibrinogen into fibrin (the names of other intermediates and enzyme names are not required). | **Activities:**  Students could research different blood groups and how their frequencies vary in different parts of the world.  Produce a table showing donors and recipients for each blood type  Extension work – students could research or make a PowerPoint presentation on the rhesus or other blood type systems.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – The Immune System**  <http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/ourselves/2_keeping_healthy3.shtml>  **DNAtube – Determining Blood Types**  <http://www.dnatube.com/video/1965/Determining-Blood-Types>  **BBC Bitesize – Blood Clotting**  <http://www.bbc.co.uk/schools/gcsebitesize/science/triple_ocr_gateway/the_living_body/running_repairs/revision/2/> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and Social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self- presentation |
| 39 | **Section 9**  **Internal Transport**  Blood vessel structure, plan of circulatory system | Students will be assessed on their ability to:  9.8 compare the structures of arteries, veins and capillaries, and understand their roles including the pulse  9.9 know the general plan of the circulatory system to include the blood vessels to and from the heart, the lungs, the liver and the kidneys. | **Activities:**  Dissect a heart – identify the aorta leaving the heart and pulmonary vein or vena cava returning blood to the heart. Remove small hoops from each and suspend weights from them to investigate the elasticity of arteries compared to veins.  Look at pre-prepared slides of arteries and veins under a microscope.  Produce an annotated poster of the main arteries and veins in the body and the organs they serve.  Produce a summary table of the main differences between arteries, capillaries and veins.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – Arteries and Veins**  <http://www.bbc.co.uk/schools/gcsebitesize/science/21c_pre_2011/disease/heartdiseaserev2.shtml>  **Interactive resource on circulation**  <http://www.abpischools.org.uk/topic/heartandcirculation> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 40 | **Section 9**  **Internal Transport**  Heart structure, heart disease, heart transplants | Students will be assessed on their ability to:  9.10 know the structure of the heart and how it functions  9.11 describe the causes, prevention and treatment of heart disease including:  • the effect of diet and exercise  • the use of stents, artificial hearts and transplants.  9.12 understand the problems associated with heart transplants. | **Activities:**  Dissect a heart – use an iPad to photograph and annotate the sections of the heart that you can identify.  Students could research how artificial hearts work.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Interactive resource on circulation**  <http://www.abpischools.org.uk/topic/heartandcirculation>  **How stuff works – how artificial hearts work**  <http://science.howstuffworks.com/innovation/everyday-innovations/artificial-heart.htm>  **Video – Stent Deployment**  <http://www.dnatube.com/video/1343/Stent-deployment-Medical-Animation-Scientific-animation>  **BBC Bitesize – Heart and Lung Transplants** <http://www.bbc.co.uk/education/clips/z6sjxnb> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 41 | **Section 9**  **Internal Transport**  Treatment and prevention, hypertension, ACE inhibitors | Students will be assessed on their ability to:  9.13 describe the use of statins and plant stanol esters in the treatment and prevention of circulatory disorders  9.14 understand the role of beta-blockers in the treatment of circulatory disorders, e.g. heart failure and angina  9.15 explain the terms systolic and diastolic blood pressure  9.16 describe the causes, prevention and treatment of hypertension  9.17 understand the role of ACE inhibitors in the treatment of high blood pressure. | **Activities:**  Use this video to suggest drugs have side effects  <http://www.dnatube.com/video/27858/Side-effects-of-cholesterol-drugs>  Students could then investigate a particular drug and produce a poster or PowerPoint showing the positive effect but also the side effects of their particular drug.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – Blood Pressure**  <http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/ourselves/0_fit_for_life1.shtml>  **Video – ACE Inhibitors**  <https://www.youtube.com/watch?v=7ZLfYhguNVg> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| 42 | **Section 9**  **Internal Transport**  Monoclonal antibodies | Students will be assessed on their ability to:  9.18 describe how monoclonal antibodies are produced  9.19 understand how monoclonal antibodies work to detect and treat diseases such as cancer. | **Activities:**  Produce a poster or cartoon showing the stages of production of monoclonal antibodies. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – Monoclonal Antibodies**  <http://www.bbc.co.uk/schools/gcsebitesize/science/triple_edexcel/control_systems/microorganisms_immunity/revision/6/>  **Videos**  **Producing monoclonal antibodies**  <https://www.youtube.com/watch?v=I36-1OQLZ28>  **Monoclonal Antibodies and Medicine**  <https://www.youtube.com/watch?v=ACxmsMmo9hU> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Intellectual Interest and curiosity  Initiative  Self-direction |
| 43 | **Section 10**  **Homeostatic Mechanisms**  Skin and thermoregulation | Students will be assessed on their ability to:  10.1 know the structure and functions of the skin and explain the role of sweat glands, vasoconstriction, vasodilation and shivering in temperature regulation. | **Activities:**  Monitor a student’s skin (using a data logger) and core temperature (ear thermometer) during exercise and plot a graph of both showing core temperature remaining relatively constant.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – Thermoregulation**  <http://www.bbc.co.uk/schools/gcsebitesize/science/edexcel/responses_to_environment/homeostasisrev4.shtml>  **Interactive resource – thermoregulation**  <http://www.abpischools.org.uk/topic/homeostasis-sugar> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| **44** | **Section 10**  **Homeostatic Mechanisms**  Excretion, renal system, urine composition | Students will be assessed on their ability to:  10.2 know the definition of excretion; the removal of metabolic waste, including urea, carbon dioxide and water  10.3 know the structure and functions of the renal system  10.4 explain why the composition of urine may vary. | **Activities:**  Kidney dissection – take a photograph of the finished dissection and annotate the structures visible such as ureter, renal artery etc.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Interactive resource – the kidney**  <http://multimediasciencesimulations.com/courseware.php>  **BBC Bitesize – Kidney**  <http://www.bbc.co.uk/bitesize/standard/biology/animal_survival/water_and_waste/revision/3/> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| **45** | **Section 10**  **Homeostatic Mechanisms**  Osmoregulation | Students will be assessed on their ability to:  10.5 describe the role of the hypothalamus and pituitary gland in osmoregulation  10.6 explain the role of ADH in regulating the water content of the blood. | **Activities:**  Research the death of Leah Betts and how this is connected to the kidney  <https://www.youtube.com/watch?v=ZzVqHCfLhPo>  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Interactive resource – the kidney**  <http://www.abpischools.org.uk/topic/homeostasis-kidneys> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| **46** | **Section 10**  **Homeostatic Mechanisms**  Insulin, glucagon, homeostasis and negative feedback | Students will be assessed on their ability to:  10.7 understand the roles of insulin and glucagon in maintaining blood glucose levels  10.8 understand the concept of homeostasis and the role of negative feedback, with particular reference to temperature control and blood glucose concentration. | **Activities:**  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Interactive resource on blood sugar**  <http://multimediasciencesimulations.com/biology.php>  **BBC Bitesize – Controlling Blood Sugar**  <http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway/understanding_organisms/staying_in_balancerev4.shtml> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning |
| **47** | **Section 10**  **Homeostatic Mechanisms**  Transplants, dialysis, liver + embedded practical | Students will be assessed on their ability to:  10.9 describe the advantages and disadvantages of:  • kidney transplants  • kidney dialysis  10.10 practical: investigate diffusion using a partially-permeable membrane such as Visking tubing  10.11 describe the functions of the liver in bile production, regulation of blood sugar, urea formation and detoxification including the breakdown of alcohol. | **Activities:**  Produce a table comparing kidney transplants v dialysis and their pros and cons.  Practical – use Visking tubing to show small molecules can pass through as in dialysis.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **Video – kidney transplant**  <http://www.bbc.co.uk/education/clips/zh4c87h>  **BBC Bite size – Dialysis**  <http://www.bbc.co.uk/schools/gcsebitesize/science/triple_aqa/homeostasis/removal_waste_water_control/revision/4/> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning |
| **48** | **Section 10**  **Homeostatic Mechanisms**  Homeostasis, thermoregulation, osmoregulation, negative feedback | Consolidation and assessment | **Activities:**  During any consolidation and assessment slot available here or throughout the course introduce SAM questions wherever possible – there are many past paper questions from previous years in the previous specification that are useful.  Games such as ‘We Say You Pay’ with biology words can add variety to a test.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc |  |  |
| 49 | **Section 11**  **Reproduction and Hereditary**  Fertilisation, division of zygote, meiosis, variation | Students will be assessed on their ability to:  11.1 know that the process of fertilisation involves the fusion of a male and female gamete to produce a zygote  11.2 describe how a zygote divides to form an embryo  11.3 know the stages of meiosis allowing the production of haploid gametes and its significance in bringing about variation in a species  11.23 understand that random fertilisation produces genetic variation of offspring  11.24 understand that variation within a species can be genetic, environmental or a combination of both. | **Activities:**  **Interactive resource on meiosis**  <http://multimediasciencesimulations.com/biology.php>  Students could research variation within the class – categorise the variation as environmental or genetic or both.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **DNAtube – Fusion of sperm and egg**  <http://www.dnatube.com/video/8296/Fusion-of-the-ovum-and-sperm>  **Animation – Comparison of mitosis and meiosis**  <http://novella.mhhe.com/sites/0070070017/student_view0/biology_1/chapter_13/comparison_of_meiosis_and_mitosis__quiz_2_.html>  **BBC Bitesize – Meiosis**  <http://www.bbc.co.uk/bitesize/higher/biology/genetics_adaptation/meiosis/revision/1/> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive earning |
| **50** | **Section 11**  **Reproduction and Hereditary**  Structure of reproductive systems, menstrual cycle, pregnancy, secondary sexual characteristics | Students will be assessed on their ability to:  11.4 know the structure and function of the male and female reproductive systems  11.5 understand the roles of oestrogen, progesterone, FSH and LH in the menstrual cycle  11.6 explain the role in pregnancy of the:  • hormone progesterone  • placenta  • amniotic fluid  • umbilical cord  11.7 know the roles of oestrogen and testosterone in the development of secondary sexual characteristics. | **Activities:**  Students could produced labelled and annotated diagrams of the male and female reproductive systems.  Pupils could produce posters, PowerPoint presentation or stop-motion animations of the menstrual cycle and how the 4 hormones control it.  Produce a table summarising the different secondary sexual characteristics in males and females.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – Hormones and the Menstrual Cycle**  [http://www.bbc.co.uk/schools/gcsebitesize/science/aqa\_pre\_2011/human/hormonesrev3.shtml l](%20http://www.bbc.co.uk/schools/gcsebitesize/science/aqa_pre_2011/human/hormonesrev3.shtml%20l)  **BBC Bite size – Reproduction**  <http://www.bbc.co.uk/bitesize/ks3/science/organisms_behaviour_health/reproduction/revision/1/> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self presentation |
| **51** | **Section 11**  **Reproduction and Hereditary**  Birth, growth curves, contraception, IVF | Students will be assessed on their ability to:  11.8 describe the birth process and explain the advantages of breast feeding  11.9 describe an outline of growth and development to maturity, to include growth curves for humans  11.10 describe the methods of contraception by hormonal, barrier and natural methods, intra-uterine devices and sterilisation  11.11 describe the advantages and disadvantages of each contraceptive method  11.12 describe the process of IVF and how it can improve the chances of pregnancy. | **Activities:**  Investigate and produce a poster or PowerPoint presentation on the advantages and disadvantages of breast feeding v bottle feeding.  Investigate and produce a poster or PowerPoint presentation on the advantages and disadvantages of various types of contraception.  Investigate and produce a poster or PowerPoint presentation on how we can now use our knowledge of reproductive hormones to improve the chances of pregnancy.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bite size – Growth Curves**  <http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/living_growing/growthdevrev4.shtml>  **BBC Bitesize – Contraceptives**  <http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/nervesandhormones/controlinthehumanbodyrev4.shtml>  **DNAtube – Inserting and IUD**  <http://www.dnatube.com/video/9598/Insertion-of-an-IntraUterine-Device>  **Video - IVF**  <http://www.dnatube.com/video/2166/In-vitro-fertilization> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Creativity | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self presentation |
| **52** | **Section 11**  **Reproduction and Hereditary**  Genetic terms, XX & XY, sex determination, random fertilisation | Students will be assessed on their ability to:  11.13 know that genes exist in alternative forms called alleles which give rise to differences in inherited characteristics  11.14 know the meaning of the terms dominant, recessive, homozygous, heterozygous, phenotype, genotype, co-dominance, diploid and haploid  11.15 know that the sex of a person is controlled by one pair of chromosomes, XX in a female and XY in a male  11.16 explain how the sex of offspring is determined at fertilisation using a genetic diagram  11.17 understand that random fertilisation produces genetic variation of offspring. | **Activities:**  **Interactive inheritance resource**  <http://multimediasciencesimulations.com/biology.php>  Demonstrate the ability to taste PTC – an example of inheritance.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC – Mutations and Genetic Disease**  <http://www.bbc.co.uk/education/clips/zgd8q6f>  **BBC – Dominant and Recessive**  Mendel’s classic research into pea plant genetics<http://www.bbc.co.uk/education/clips/zjyfb9q>  Genetics deciding eye colour <http://www.bbc.co.uk/education/clips/z62r87h>  **BBC – Sex Chromosomes**  <http://www.bbc.co.uk/education/clips/z3k9wmn>  **BBC Bitesize – Variation and Inheritance**  <https://www.youtube.com/watch?v=Wp_CsMe9xU0> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| **53** | **Section 11**  **Reproduction and Hereditary**  Multiple alleles, monohybrid inheritance, pedigree charts | 11.18 understand the role of multiple alleles in the inheritance of ABO blood groups  11.19 understand patterns of monohybrid inheritance using a genetic diagram and the probabilities of outcomes  11.20 understand how to interpret family pedigrees. | **Activities:**  **Interactive inheritance resource**  <http://multimediasciencesimulations.com/biology.php> | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – Pedigree Charts**  <http://www.bbc.co.uk/schools/gcsebitesize/science/edexcel/classification_inheritance/genesandinheritancerev6.shtml> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| 54 | **Section 11**  **Reproduction and Hereditary**  Dominant, recessive and sex linked conditions | Students will be assessed on their ability to:  11.21 describe the causes and effects of inherited conditions such as haemophilia and red-green colour blindness (sex-linked inheritance), polydactyly (dominant allele) and cystic fibrosis (recessive allele) | **Activities:**  View a colour blind test chart to show how we test for colour-blindness.  Research and produce a poster of how we think colour blind people see compared with normal vision’.  Research different forms of colour-blindness.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC – Mutations and Genetic Disease:**  <http://www.bbc.co.uk/education/clips/zgd8q6f> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| **55** | **Section 11**  **Reproduction and Hereditary**  Gene therapy | Students will be assessed on their ability to:  11.22 describe how gene therapy with viruses can be used to treat cystic fibrosis. | **Activities:**  Students write/film a brief newspaper article/presentation about what gene therapy is and how it can be used to treat diseases such as cystic fibrosis. | Edexcel International GCSE student book pages – tbc  **BBC – Mutations and Genetic Disease**  <http://www.bbc.co.uk/education/clips/zgd8q6f>  **BBC – Gene Therapy and Cystic Fibrosis**  <http://www.bbc.co.uk/education/clips/zpdyr82> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Innovation  Adaptability  Intellectual Interest and curiosity  Initiative |
| **56** | **Section 12**  **Disease**  Disease, pathogens, viruses and HIV | Students will be assessed on their ability to:  12.1 understand the general course of a disease as: infection, incubation and symptoms  12.2 know that diseases are caused by pathogenic microorganisms  12.3 describe the structure and reproduction of viruses  12.4 describe methods of transmission, treatment and prevention of the spread of Ebola and HIV (human immuno-deficiency virus), the virus that causes AIDS. | **Activities:**  Ask students to define what a ‘disease’ is…pool ideas to try to come up with a definition.  Research and produce a poster or PowerPoint on the various type and structures of viruses.  Research and produce posters or PowerPoint on the various ways HIV can be transmitted and ways that transmission can be prevented.  Research and produce a poster on the history of Ebola outbreaks.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize**  **Disease**  <http://www.bbc.co.uk/schools/gcsebitesize/science/21c_pre_2011/disease/diseaseresistancerev1.shtml>  **Viruses**  <http://www.bbc.co.uk/bitesize/higher/biology/cell_biology/viruses/revision/1/>  <http://www.bbc.co.uk/schools/gcsebitesize/science/aqa_pre_2011/human/defendingagainstinfectionrev2.shtml>  **Video – How HIV Replicates**  <https://www.youtube.com/watch?v=odRyv7V8LAE>  **Video – Transmission and prevention of HIV**  <https://www.youtube.com/watch?v=Eqxu3jjh3LE>  **The EBOLA virus**  <https://www.youtube.com/watch?v=sRv19gkZ4E0>  **BBC News - Ebola**  <https://www.youtube.com/watch?v=RUuRqa-XU8A> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Ethics | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| **57** | **Section 12**  **Disease**  Bacteria and disease, cholera, gonorrhoea, ORT | Students will be assessed on their ability to:  12.5 describe the structure, nutrition and reproduction of bacteria including the interpretation of bacterial growth curves  12.6 investigate the effects of antibacterial agents and antibiotics on the growth of bacterial culture  12.7 know the methods of transmission, treatment and prevention of the spread of cholera and gonorrhoea  12.8 explain the importance of oral rehydration therapy. | **Activities:**  **Interactive resource – bacteria**  <http://www.abpischools.org.uk/topic/bacteria>  Research and produce a poster or PowerPoint on the structure of a bacterium.  Practical – use agar plates to show or compare the effectiveness of disinfectants or acid or antibiotic discs in killing bacteria.  Research and produce posters or PowerPoint on a chosen antibiotic, or a summary of the different ways antibiotics work.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – Bacteria**  <http://www.bbc.co.uk/schools/gcsebitesize/science/aqa_pre_2011/human/defendingagainstinfectionrev1.shtml>  **BBC – Growth of Bacteria**  <http://www.bbc.co.uk/education/clips/zj6kq6f>  **BBC – Skin – Defend and Protect**  <http://www.bbc.co.uk/education/clips/zx69jxs> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Ethics | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| **58** | **Section 12**  **Disease**  Fungal diseases, malaria | Students will be assessed on their ability to:  12.9 know the methods of transmission, treatment and prevention of the spread of athlete’s foot  12.10 explain the role of the mosquito (malaria) and housefly (typhoid) in transmitting causative agents of disease  12.11 describe the treatment and prevention of the spread of malaria and typhoid. | **Activities:**  Use agar plates with nutrient medium – leave them open to the air then incubate and see what grows.  Research and produce posters or PowerPoint on a chosen fungal disease and the different ways it is spread and/or prevented.  Research and produce posters or PowerPoint on the life cycle of Plasmodium.  Research and produce posters or PowerPoint on the various ways we try to prevent malaria.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC – Malaria**  <http://www.bbc.co.uk/education/clips/z97xyrd>  **Life Cycle of the Malaria Parasite**  <http://www.dnatube.com/video/32422/Malaria-Plasmodium-Life-Cycle> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Ethics | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| **59** | **Section 12**  **Disease**  Vaccines, Immunity, antibiotics, resistant pathogens | Students will be assessed on their ability to:  12.12 understand the antibody-antigen reaction  12.13 explain how vaccines work to prevent the spread of disease  12.14 understand the differences between natural and artificial immunity and active and passive immunity  12.15 know the sources and role of antibiotics  12.16 explain how resistant pathogens such as MRSA arise and why they are a cause for concern. | **Activities:**  Produce a table comparing active and passive immunity and artificial and natural immunity.  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC Bitesize – Vaccination**  <http://www.bbc.co.uk/schools/gcsebitesize/science/aqa_pre_2011/human/defendingagainstinfectionrev5.shtml>  **BBC Bitesize – Antibiotics**  <http://www.bbc.co.uk/schools/gcsebitesize/science/21c_pre_2011/disease/antibioticsdrugtestingrev1.shtml>  **BBC Bitesize – Immunity**  <http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/ourselves/2_keeping_healthy3.shtml> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Ethics | Critical thinking  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning  Executive function  Personal and social responsibility  Intellectual Interest and curiosity  Initiative  Self-direction  Ethics  Integrity  Communication  Collaboration  Teamwork  Cooperation  Interpersonal skills  Leadership  Responsibility  Assertive Communication  Self-presentation |
| **60** | **Section 12**  **Disease**  Non-pathogenic bacteria, sewage | Students will be assessed on their ability to:  12.17 understand the role of non-pathogenic bacteria and fungi (decomposers) useful to humans in the decomposition of organic matter  (details of other bacteria in the nitrogen and carbon cycles are not required)  12.18 know the processes of sewage treatment in modern sewage works and a pit latrine. | **Activities:**  Use an internet programme to make a word search or crossword – perhaps for homework and students can swap in pairs and try to do them in the next lesson. | Edexcel International GCSE student book pages – tbc  **BBC – Bacteria and Sewage Treatment**  <http://www.bbc.co.uk/education/clips/z7h87ty> | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning | Critical thinking  Problem solving  Analysis  Reasoning  Interpretation  Decision making  Adaptive learning |