B2 - Cells and Organs

Number of weeks (between 6&8)	**Content of the unit**	**Assumed prior learning** (tested at the beginning of the unit)
6 weeks 24 lessons	• Plant and animal cells • Cell, tissues and organs • Body systems • Diffusion	• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense • Identify that humans and some other animals have skeletons and muscles for support, protection and movement. • Describe the simple functions of the basic parts of the digestive system in humans • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • Describe the ways in which nutrients and water are transported within animals, including humans.
Assessment points and tasks	**Written feedback points**	**Learning Outcomes** (tested at the end and related to subject competences)
- Pre-unit test (baseline) - B2 GAT (formative) - 6 mark question (formative) - Scientific skills investigation (formative) - End of unit test (summative)	- diagnostic marking on GAT - diagnostic marking on 6 mark question - diagnostic marking on skills investigation - feedback on progress after end of topic test (*these opportunities in AfL column)	I can state that cells are the fundamental unit "building block" of organisms I can name some equipment that may be used to observe cells I can state that the process by which material moves into and out of cells is diffusion I can describe how multi-cellular organisms are organised (ceils, tissues, organs, organ systems, organisms I can list some tissues and organs I can list the main parts of cells I can identify the structural adaptations of some unicellular organisms I can describe the structural adaptations of some animal and plant cells I can describe the process of diffusion I can identify parts of cells from a diagram I can describe the functions of the main parts of cells I can describe a tissue, and organ and an organ system I can compare and contrast animal and plant cells I can suggest how the rate of diffusion may be affected

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Lesson	Clear learning intentions (KQ)	Clear success criteria (Bands) (Keywords)	Hook (starter)	Presentation of content (teacher input)	Guided practice (pupil activities)	Requisition (per group)	Independent practice (homework)	Closure (AfL)
1. Pre unit test	How much do I know from KS2?	To complete exam	Word-search on keywords from KS2	Mind map of what pupils remember from KS2 as refreshers before exam	Pupils complete baseline test in silence		None	Pupil complete sentences: *One thing I know about this topic is…* *One thing I don't understand is…* *One question I have is…*
2. Microscopes	How is a microscope used to observe cells?	I know that microscopes are used to observe cells (G) I can list and identify the different parts of the microscope (F) I can describe what the different parts of the microscope do (E) I can explain what magnification means (D)	Put objects in order of size: Universe, galaxy, cell, planet, football, orange, nucleus, star, grain of sand	Go through hook/starter - use to elicit who has understanding of cell/nucleus and scale of sizes. Demonstrate how to use the microscope - Question what it is used for Go through answers for worksheet	Worksheet on microscope - labelling the different parts and what they are used for Peer assess microscope worksheet		Homework 1 set	Make a quiz with 4 questions on microscope (for partner to complete)
3. Animal cells	What are the main parts of animal cells and what are their functions?	I can state that cells are the fundamental unit "building block" of organisms (H) I can label the main parts of animal cells (F) I can observe cells using a microscope (E) I can describe the functions of the main parts of animal cells (D)	Keywords word search + anagrams	With aid of video explain: • Cells are building blocks • Animal cell organelles Demonstrate how to make slides for cheek cells	With aid of video: • What are cells? • List the organelles Draw an animal cell and label the organelles from cheek cells Using textbook to find the function of organelles	Microscope, slide, swab		Traffic light: True/false
4. Plant cells	What are the main parts of the plant cells and what are their functions?	I can label the main parts of plant cells (F) I can describe the functions of the main parts of plant cells (D) I can explain the role of chloroplasts and the vacuole in a plant cell (C)	Crossword + questions	Show plant cell and as a class - label the nucleus, cytoplasm and cell membrane. Demonstrate how to make a slide of onion cells and how to observe under microscope Explain there are other organelles in plant cells and students will discover what they are and their jobs.	Draw the plant cells from onion slide and label the organelles. *Look out for misconceptions with cell membrane and cell wall* Information grab around room to find functions of organelles	Microscope, slide, onion, white tile, iodine, tweezers		Find the fib

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5. 6 Mark Question	What are the similarities and differences between plant and animal cells?	I can label the parts of a plant and animal cell (F) I can describe the differences between plant and animal cells (E) I can explain the reason for differences between plant and animal cells (D) I can compare and contrast animal and plant cells (C)	Anagrams of organelles. Extension question - what does each organelle do?	Introduce role play - one pupil is a plant cell, one is an animal cell Explain how to use a Venn diagram for similarities and differences in animal and plant cells 6MQ: **Silver**: Compare and contrast plant and animal cells **Gold**: Compare and contrast plant and animal cells, explaining the reasons for differences.	<u>In pairs:</u> Pupils role play being a plant (higher ability) or animal cell (lower ability). Describe themselves to each other and explain the function of their parts. Venn diagram on similarities and differences in animal and plant cells	A3 paper		Exam-style question on plant and animal cells Peer-assess
6. Specialised cells 1	What are the different types of specialised cells?	I can list different specialised cells (G) I can define a specialised cell (F) I can describe the function of different specialised cells (E)	Ask pupil to name as many cells as they can (Anagrams fro low ability)	Explain what specialised cells are (question students for prior knowledge) Explain on each table there are fact sheets on different specialised cells. Students will fill in their tables (cell drawing, cell function, special features) in a carousel.	Student input on what specialised cells are Carousel around the classroom in order to fill in table Answer AFL question from board/ w/sheet		Homework 1 due Homework 2 set	Guess the cell on mini white boards, pictures/ description will be shown on main board
7. Specialised cells 2	Why are specialised cells good at their job?	I can describe the functions of different specialised cells (E) I can explain how a specialised cell carries out its function (D) I can analyse how specialised cells are adapted to carry out their functions (C)	Pupils identify specialised cells from diagrams Extension: What is the cells function?	Show video/animation of the functions of 3 specialised cells (sperm, root hair, red blood). Discuss as a class why that cell is good at its function - how is adapted?	Pupils choose one specialised cell and make a poster including: - labelled diagram - description of function - explanation of how it carries out function - analyse adaptations that make it good at function			Peer-assessment of SPAG on poster WWW/EBI based on success criteria
9&10. **Badger Assessment –** Making a model cell	Can I make a model cell using the instructions on the APP grade ladder?	I can make my own cell model using the APP level ladder (G - C)	Which cell interests you and why?	Go through the level ladder and what is expected of students	Students to make own model cell using resources and level ladder available			Peer-assess SPAG

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11. Cells, tissues, organs and organ systems	How are multi-cellular organisms organised?	I can list some tissues and organs (F) I can describe how multi-cellular organisms are organised (cells, tissues, organs, organ systems, organisms) (E) I can describe the structure of a tissue, and organ and an organ system (D)	List as many cells and organs as possible Extension: Any idea which body system they may work as a part of? E.g. lungs are a part of respiratory system	Show video explaining cell, tissues, organs, organ systems. Question understanding of video	Fill in worksheet related to video/ write interesting notes on video Answer questions Worksheet – place organs on body outline, check with partner and then glue in			True/ false – traffic light
12. Organ systems	What do organs and organ systems do?	I can identify different organ systems (G) I can name the organs of an organ system (F) I can describe the function of organs in the organ system (E) I can explain the function of the organs in an organ system (D)	Name as many organs as you can - can you say what the function of the organ is?	Give a brief overview of some organ systems: • circulatory system • respiratory system • digestive system • nervous system • reproductive system • leaf canopy Discuss the function of each	Carousel of organ systems. Pupils complete table including information on: • Functions of system • organs involved • Function of organs •		Homework 2 due Homework 3 set	
13. Modelling organs and organ systems	Can I model organs and organ systems?	I can name an organ/ organ system I want to model (G) I can name the correct organs for my organ system (F) I can describe what each part of my model represents (E) I can analyse the effectiveness of my model (C)	Mini white boards – explain what your model will be about	Instruct and explain students will make models of their chosen organs/ organ systems Assist with modelling/ supervise	Research on laptops/ make models Prepare & deliver presentation on models			Reflection of model – what is done and what needs to be done Exit pass – what they learnt from others presentation
14. Diffusion	How can substances pass into and out of cells?	I can state that the process by which substances move into and out of cells is diffusion (F) I can describe the process of diffusion (E) I can suggest how the rate of diffusion may be affected (D)	How can a shark find an injured prey so fast? Pupils discuss ideas	Go through examples, show video, explain what diffusion is. Demo and assist with practical on how potassium permanganate diffuses after 1 minute and 5 minute Discuss observations in terms of concentration of particles. What could increase the rate of diffusion?	Class discussion on shark and perfume smell Linking above examples to diffusion Pupils define diffusion Practical on potassium permanganate Pupils list factors that could increase the rate of diffusion	Potassium permanganate, spatula, 250ml beaker		Explain shark or perfume example in terms of particles and concentration

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15. Diffusion investigation	What affects the rate of diffusion?	I can **describe** some safety precautions during scientific investigations (H) I can **identify** the independent and dependent variables in an investigation (F) I can **identify** the control variables in an investigation (E)	Match up investigation definitions: Independent Dependent Control Hypothesis Risk assessment Method Prediction	Introduce investigation. Come up with hypothesis as a class. Demo method.	Pupils write plan including: Hypothesis Variables Prediction Equipment Method Risk assessment Extension: Why must we control variables?	Demo: measuring cylinder test tube stop clock A large gelatine cube containing indicator and NaOH Hydrochloric acid ranging from 1-3 molars scalpel http://www.123helpme.com/view.asp?id=148185		Pupils tell teacher how to carry out experiment step-by-step to check their methods.
16. Diffusion investigation	What affects the rate of diffusion?	I can **apply** mathematical concepts to calculate results (average) (H) I can **present** observations and data using an appropriate table (F) I can **present** observations and data using an appropriate line graph (D)	Show a poorly drawn results table – pupils need to find mistakes and improve for their results	Demonstrate method. Discuss risk assessment. Discuss how to calculate average and draw a graph.	Pupils carry out experiment. Pupils repeat readings and find average. **Extension**: Pupils draw graph of results.	Class practical: measuring cylinder test tube stop clock A large gelatine cube containing indicator and NaOH Hydrochloric acid ranging from 1-3 molars scalpel Graph paper, rulers	Homework 3 due Homework 4 set	What did we find out? Class collation and discussion of results.
17. Diffusion investigation	What affects the rate of diffusion?	I can **interpret** observations and data to identify simple patterns of correlation (G) I can **draw** more complex conclusions from the interpretation of data (D) I can **present** reasoned explanations of conclusions from data, in relation to predictions and hypotheses (C)	Show a poorly drawn graph – pupils spot mistakes	Demonstrate how to draw graph Discuss what should be included in evaluation and conclusion.	Pupils draw graph Pupils write evaluation and conclusion	Graph paper, rulers		Peer-assess entire investigation.
18. Microbes	What are microbes?	I can name the four different types of microbes (G) I can identify microbes from labelled diagrams (F) I can describe features of each type of microbe (E)	Why should you wash your hands after going to the toilet?	Show video on microbes, discuss what they are, explain there are four types (fungi, bacteria, protozoa, virus) Go through summary table	Watch video and discuss Research the four microbes and fill in summary table Peer mark table			Worksheet on matching pictures of microbes to their names/ function

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19. Useful Microbes	How are microbes used to make food and other products?	I know that some microbes are useful (F) I understand some of the uses of these microbes (E) I can describe the roles of microbes in making bread, wine, cheese and yoghurt (D)	Mini white boards: students to write name of microbe when description/ picture shown on board	Demo practical for using yeast to make dough rise Introduce a range of uses of microbes	Carry out practical on using yeast to make dough rise Information grab on uses of microbes	Flour, yeast, sugar, large measuring cylinder, small measuring cylinder		Choose one use of microbes and describe to a partner how they are used
20. Harmful microbes	How can microbes make you sick?	I can name some diseases caused by microbes (G) I can state how different microbes cause different disease (F) I can describe how microbes can spread. (E) I can explain how the body defends itself against microbes (D)	'What have you had?' starter worksheet from Fusion sow. – a table to summarise what illnesses students have had in the past and how may have been caught. List three things you have learnt from the previous lesson	Squeeze glitter on the hands of a few students as they walk in, ask these students to help and assist with handing out resources etc As a class, discuss various diseases that the pupils have had and how they might have caught these diseases. Generate a list of methods of transmission. Instruct: find out which microbes can cause illnesses (Fusion 1 books) Demonstrate transmission by contact using glitter gel on students hands – how the glitter marks are on books/ resources etc Instruct: worksheet on barriers (fusion 1 sow)	Selected students to help out with glitter on hands Discussion of diseases and transmissions Research transmission, summarise in a table Watch and discuss how the glitter has been spread Worksheet on barriers Literacy based task on yellow fever (fusion 1sow)		Homework 4 due Homework 5 set	Question board with different questions and students to choose 1 (or more)question to answer
21. Spreading diseases	How do diseases spread?	I can state the 6 methods of transmitting diseases (G) I can describe how each method allows the disease to be transmitted (E) I can develop a solution to help prevent the spread of diseases (D)						

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22. Vaccinations	How do vaccinations protect me from diseases?	I can state 2 ways that white blood cells can fight infection (F) I can describe how the body can become immune to a disease (E) I can explain how vaccination can make an individual immune (D) I can evaluate the use of vaccines (C)						
23. Antibiotics	How do antibiotics work?	I can describe how disinfectants, antiseptics and antibiotics are used (F) I can describe how resistance to antibiotics can occur (E) I can explain how 'superbugs' such as MRSA are caused and why they are such an issue (D) I can evaluate the use of antibiotics (C)						
24. Revision	How much do I know from this unit?	I can recall and revise the unit for the end of unit test	What have we covered in this entire unit? What was easy? Hard?	Revision maps	Students to fill in revision maps and revise		Homework 5 due Revision homework set	What things I need to revise when I go home?
25. End of unit test	Can I apply my knowledge from this unit in the test?	I will complete the end of unit test	What skills will I use in the test?	Explain rules of test Supervise and assist test	Do test under exam conditions			Exit pass – what was hard? What was easy in the test?