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Year 8 Overview 2024-25 – *Biology*

Date	Wk	Week	Units Studied & Learning Outcomes	Key Concepts & Assessment
8 weeks (?? Lessons) (38Days)				
Tues 2-Sep 9-Sep 16-Sep* 23-Sep 30-Sep 7-Oct 14-Oct 21-Oct	A B A B A B A B	1 2 3 4 5 6 7 8	• <u>Overview of Unit/No. lessons</u> Photosynthesis/12 lessons • <u>Lesson **Sequence** of Content</u>: **Photosynthesis:** Lesson1- What is Photosynthesis Lesson 2- Testing a leaf for starch Lesson 3- Measuring the rate of Photosynthesis Lesson 4- The structure of a leaf Lesson 5- The role of the Stomata in gas exchange Lesson 6- Plant transport systems Lesson 7- Healthy Plant growth Lesson 8- Food Chains and Food Webs Lesson 9- Ecosystems and Biodiversity Lesson 10- The Carbon Cycle Lesson 11- Quick quiz and Application Lesson 12- Long Answer question • <u>Unit Learning Outcomes</u>: • **GW:** Recall the main facts relating to Photosynthesis • **BI:** Describe how food webs are constructed and relate this to energy from the Sun • **EW**: Explain how ecosystems function and the role of biodiversity in maintaining stability. **Assessment** ○ HSW practical task – students should be able to explain findings using their Science knowledge ○ End of unit quiz ○ Long answer extension question at the end of the unit ○ Application task	**Foundational Concepts:** Bioenergetics **Outcomes** • Understand the word equation for Photosynthesis • Describe how to test a leaf for starch • Understand how light intensity affects the rate of photosynthesis. • Understand the role of different parts of a leaf. • Understand how stomata control water loss and gas exchange. • Describe the structure of the xylem and phloem. • Understand what minerals are needed by plants. • Describe the trophic levels in food chains/webs and understand interdependence. • Identify different types of ecosystem and the importance of biodiversity. • Understand the role of Carbon in living organisms and how it is recycled. • **Skills used/learned** ○ Practical skills ○ Method writing ○ Interpretation skills ○ Evaluation skills • **KW:** Epidermis, Palisade, Iodine, Xylem, Phloem, Producer, Consumer, Photosynthesis, Respiration, Decay, Decomposition, Herbivore, Carnivore, Omnivore, Predator, Prey, Biomass, Biodiversity **Tier 2/3 Vocabulary** Referenced on PowerPoint slides, quick quizzes. **Links to root words- Etymology** ○ The word 'photo' derives from the Latin word for light. Epidermis- early 17th century: via late Latin from Greek, from epi'upon' + derma'skin **History** ○ Photosynthesis was partially discovered in the 1600's by Jan Baptista van

Prior	Current	Next
Year 7- Cell structure	Understand the interdependence of organisms and their reliance on Photosynthesis.	Year 10 – Photosynthesis Year 11 – Ecology

				Helmont, a Belgian chemist, physiologist and physician. ○ The term xylem was introduced by Carl Nägeli in 1858. ○ Food chains were first introduced by the Arab scientist and philosopher Al-Jahiz in the 10th century and later popularized in a book published in 1927 by Charles Elton, which also introduced the food web concept. **Links to culture** ○ Links to Environmental conservation ○ Plant propagation, Gardening and horticulture. **Careers:** conservationist, ecologist, environmental scientist, agriculturalist, environmental engineer **EDI links:** • Plants from different parts of the world *Parent and Carers month/Black History month* *3/9 World afro day* *23/9 International day of sign languages* *10/10 world mental health day* *5/10 world teachers day* *6/10 World cerebal palsy day* • **Assessment** (Quiz/Tests/application tasks/ ST: Including foundational concepts, wider disciplinary knowledge, key content.)
Half-Term			**7** weeks (?? lessons) (35 Days)	
4-Nov	A	9	**Overview of Unit/No. lessons** Health: 12 lessons Lesson **Sequence** of Content: Lesson 1- What is a microbe? Lesson 2- How microbes cause illness Lesson 3- Internal and external body defence mechanisms Lesson 4- Practical – Investigating microbial growth Lesson 5- Vaccinations and antibiotics Lesson 6- What is a drug? Lesson 7 & 8- Practical HSW – Investigating caffeine on reaction times Lesson 9- Effects of smoking on the human body Lesson 10- Effects of alcohol on the human body Lesson 11- Quick quiz and Application Lesson 12- Long Answer question	**Foundational Concepts:** Infection & Response **Outcomes** ○ Understand what the word microbe means and be able to state examples – identifying parts of each and comparing with animal and plant cells ○ Identify how microbes infect the body and what happens once they are inside. ○ State ways in which the body prevents microbes from entering and describe the roles of the white blood cells. ○ Know which conditions microbes prefer to grow in, in a laboratory
11-Nov	B	ST1		
18-Nov	A	ST1		
25-Nov	B	12		
2-Dec	A	13		
9-Dec	B	14		
16-Dec	A	15		

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Prior	Current	Next
Year 6 – Microbes, lifestyle and health Year 7- Organ systems, Cell organelles	KS3 NC - Understand the effects of recreational drugs on behaviour, health and life processes Understand structural adaptions of some unicellular organisms.	Year 10 – Nervous system, pathogens and health

- **GW:** State types of microbes that exist and identify ways that they can infect us. State ingredients in a cigarette and organs affected by alcohol
- **BI:** Compare parts of microbes with other cell types. Explain how white blood cells perform their roles
- **EW:** Can consider the impact of alcohol and cigarettes on human health and how they affect wider society. Consider potential issues with antibiotics and vaccinations.

Assessment

- HSW practical task – students should be able to explain findings using their Science knowledge
- End of unit quiz
- Long answer extension question at the end of the unit
- Application task

and evaluate the effects of handwashing.

- Understand that we can prevent infection with vaccines and treat some infections with antibiotics. Be able to explain how vaccines work.
- Define the meaning of the word drug and understand some of the different ways drugs can be grouped. Know why they are grouped in these ways.
- Plan and carry out practical work to compare the effects of caffeine/absence of caffeine on human reaction time. Identify key variables.
- Identify the 3 main ingredients in cigarettes and how each ingredient affects the body
- Describe some of the short and long-term effects of alcohol on the body and identify organs affected by alcohol

Skills used/learned

- Practical skills
- Method writing
- Interpretation skills
- Evaluation skills

KW: Micro-organism, Plasmid, Flagellum, Protein coat, Pathogen, Infection, Symptom, Antibody, Antitoxin, Phagocytosis, Antibiotic, Antiseptic, Painkiller, Vaccine, Cirrhosis, Cancer, Stimulant, Depressant, Bronchitis, Emphysema.

Links to root words- Etymology

- The word 'phagocytosis' derives from the Greek stem ephagon, meaning 'I devour'
- The word 'cirrhosis' comes from the Greek 'kirrhos' meaning tawny – this describes the colour of the damaged liver.
- The word 'vaccine' derives from the Latin vaccinus, which refers to cows

				– relating to the cowpox virus used as a vaccine against smallpox. **Tier 2/3 Vocabulary** Referenced on PowerPoint slides, quick quizzes. **History** o Links to history – discovery of antibiotics and vaccinations. o Evidence exists that the Chinese employed smallpox inoculation as early as 1000 CE. It was practiced in Africa and Turkey as well, before it spread to Europe and the Americas. o Edward Jenner's innovations, begun with his successful 1796 use of cowpox material to create immunity to smallpox, quickly made the practice widespread. His method underwent medical and technological changes over the next 200 years, and eventually resulted in the eradication of smallpox. o Louis Pasteur's 1885 rabies vaccine was the next to make an impact on human disease. And then, at the dawn of bacteriology, developments rapidly followed. Antitoxins and vaccines against diphtheria, tetanus, anthrax, cholera, plague, typhoid, tuberculosis, and more were developed through the 1930s. o In the 1920s, British scientist Alexander Fleming was working in his laboratory at St. Mary's Hospital in London when almost by accident, he discovered a naturally growing substance that could attack certain bacteria. **Links to culture** o Links to social and economical impacts of tobacco and drugs on society. Links to different cultural attitudes towards smoking/drinking. **Careers:** microbiologist, immunologist, pharmacist, clinical laboratory scientist, food scientist **EDI links:** o Scientists that contributed to studies in microbiology from different nationalities o Microbes & diseases present in different parts of the world. o Smallpox- vaccine for public health improvement for lower/working class o Effects of nutrient deficiencies

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<table>
<tr><td></td><td></td><td></td><td></td><td>

Susumu Tonegawa is a Japanese scientist who was the sole recipient of the Nobel Prize for Physiology or Medicine in 1987 for his discovery of VJ recombination, the genetic mechanism which produces antibody diversity.
Elizabeth Blackwell is one of Bristol's most influential women. She was the first female to qualify as a doctor in America and the first woman to have her name entered in the British General Medical Council's medical register in 1859. She was a pioneer, instrumental in many campaigns for reform, launching numerous innovative health schemes and a tireless worker for health care.

Mens health awareness month/disability confident month
1/11 Diwali
12/11 Remembrance Sunday
13/11-19/11 Transgender awareness week
14/11 World Diabetes Day
1/12 World AIDS day
25/12 Christmas Day
</td></tr>
<tr><td colspan="2">Christmas Holiday</td><td colspan="2">6 weeks (?? lessons) (30 Days)</td><td></td></tr>
<tr><td>6-Jan</td><td>B</td><td>16</td><td rowspan="8"><u>Overview of Unit/No. lessons</u>

Respiration: 9 lessons

<u>Lesson Sequence of Content</u>:

Lesson 1- Aerobic Respiration
Lesson 2- Anaerobic Respiration
Lesson 3- Fermentation
Lesson 4- The Lungs and Breathing
Lesson 5- Changes during Exercise
Lesson 6- Skeleton
Lesson 7- Muscles
Lesson 8- Quick quiz and Application

Lesson 9- Long Answer question

<table>
<tr><th>Prior</th><th>Current</th><th>Next</th></tr>
<tr><td>Year 7 topic- Cell structure</td><td>Understand respiration and the function of some Organ systems linked to this process</td><td>Year 10 – Respiration in Humans and Plants</td></tr>
</table>

• GW: Recall the main facts about aerobic and anaerobic respiration</td><td rowspan="8">Foundational Concepts:

Infection & response and organisation

Outcomes
• Identify what is needed for Aerobic respiration to occur and use of products of respiration.
• Understand anaerobic respiration and how it affects the Human body.
• Understand Fermentation and its uses in food/ beverage production.
• Identify the parts of the Respiratory System and their role in gas exchange.
• Describe short term changes in the Human body due to exercise.
• Understand the role of the Human skeleton and its composition.
• Understand the role of muscles, tendons and ligaments in movement of the Skeleton.

• Skills used/learned
○ Practical skills
○ Method writing
○ Interpretation skills
○ Evaluation skills</td></tr>
<tr><td>13-Jan</td><td>A</td><td>17</td></tr>
<tr><td>20-Jan</td><td>B</td><td>18</td></tr>
<tr><td>27-Jan</td><td>A</td><td>19</td></tr>
<tr><td>3-Feb</td><td>B</td><td>20</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>10-Feb</td><td>A</td><td>21</td></tr>
</table>

			• **BI:** Describe the role of respiration in plants and animals • **EW:** Explain the role of the Skeleton and muscles and how energy released during respiration is utilised. **Assessment** ○ HSW practical task – students should be able to explain findings using their Science knowledge ○ End of unit quiz ○ Long answer extension question at the end of the unit Application task	• **KW:** Aerobic, Anaerobic, Lactic acid, Ethanol, Toxic, Skeletal, Endoskeleton, Exoskeleton, antagonistic. **Links to root words- Etymology** ○ Aerobic-"able to live or living only in the presence of oxygen, requiring or using free oxygen from the air," 1875, after French *aérobie* (n.), coined 1863 by Louis Pasteur in reference to certain bacteria; from Greek *aero-* "air" (see **aero-**) + *bios* "life," from PIE root ***gwei-** "to live." *Aerobian* and *aerobious* also were used in English. Hence *aerobe* "type of micro-organism which lives on oxygen from the air." **Tier 2/3 Vocabulary** Referenced on PowerPoint slides, quick quizzes. **History** • Cellular respiration (aerobic and anaerobic respiration) was discovered by Sir Thomas Adams • French chemist, Louis Pasteur. Pasteur originally defined fermentation as respiration without air. • One of the earliest instances of documentation about the muscular system was "Commentary on the Anatomy of Mondino," written by Jacopo Berengario da Carpi in 1521. *LGBT+ History month* *27/1 Holocaust memorial day* *1/2 World Hijab Day* *6/2-12/2 Children's mental health week.* *7/2 Safer internet day* *10/2 Chinese New Year* **Links to culture** ○ Links to Physical Education and body physiology

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				○ Food production and origins of fermentation. ○ The word 'respiration' derives from late middle English word to Breathe out. • **Career ideas:** athletic trainer, exercise physiologist, occupational therapist, physical therapist **EDI links:** • Sporting activities and exercise regardless of gender, age, race, religion or sexual orientation • Sporting activities inclusive of disabilities
Half-Term			6 weeks (?? lessons) (29 Days)	
25-Feb	B	22	INSET 24th Feb	• ***Equality Diversity and Inclusion (EDI) links?*** *Women's history month* *Ramadhan begins 1/3* *21/3 World Down Syndrome day* *31/3 Transgender day of visibility*
3-Mar	A	23		
10-Mar	B	24		
17-Mar	A	25		
24-Mar	B	ST2		
31-Mar	A	ST2		
Easter Holiday			5 weeks (?? lessons) (23 Days)	
22-Apr	B	28	Easter Monday 21st Early May bank hol 6/5	• ***Equality Diversity and Inclusion (EDI) links?*** *Good Friday 18/4* *Easter Sunday 20/4* *Autism and stress awareness month.* *25/4 World Malaria Day* *26/4 Lesbian visibility day* *UK national walking month.* *1/5-7/5 Deaf awareness week* *23/05 Vesak*
28-Apr	A	29		
5-May	B	30		
12-May	A	31		
19-May	B	32		
Half-Term			7 weeks (?? lessons) (34 Days)	
2-Jun	A	33	SJBF INSET 4/7	• ***Equality Diversity and Inclusion (EDI) links?*** *LGBTQ+ pride month.* *Gypsy, Roma and Traveller history month.* *12/6 world day against child labour* *18/6 autistic pride day* *20/6 World refugee day*
9-Jun	B	34		
16-Jun	A	35		
23-Jun	B	36		
30-Jun	A	37		
7-Jul	B	38		
14-Jul	A	39		
(Total: 189 Days)				

Overview of Year 8	
Based on your Flight Path	**By the end of Year 8, students will have learned**
GW:	• Identify products and reactions of Photosynthesis • Know the structure of a plant • Describe how to test a leaf for starch • Recall what minerals are needed by plants. • Identify different types of ecosystem • Understand what the word microbe means and be able to state examples • Identify how microbes infect the body and what happens once they are inside. • State ways in which the body prevents microbes from entering. • Define the meaning of the word drug and understand some of the different ways drugs can be grouped. • Identify what is needed for Aerobic respiration to occur and use of products of respiration. • Identify the parts of the Respiratory System and their role in gas exchange. • Understand the role of the Human skeleton and its composition.
BI:	• Describe how to test a leaf for starch • Understand the role of different parts of a leaf. • Understand how stomata control water loss and gas exchange. • Describe the structure of the xylem and phloem. • Describe and the importance of biodiversity. • Describe parts microbes and compare with animal and plant cells • Describe the roles of the white blood cells. • Know which conditions microbes prefer to grow in, in a laboratory. • Understand that we can prevent infection with vaccines and treat some infections with antibiotics. • Understand anaerobic respiration and how it affects the Human body. • Describe short term changes in the Human body due to exercise.
EW:	• Understand how light intensity affects the rate of photosynthesis. • Understand how stomata control water loss and gas exchange. • Describe the trophic levels in food chains/webs and understand interdependence. • Understand the role of Carbon in living organisms and how it is recycled. • Evaluate the effects of handwashing. • Be able to explain how vaccines work. • Plan and carry out practical work to compare the effects of caffeine/absence of caffeine on human reaction time. Identify key variables. • Understand Fermentation and its uses in food/ beverage production. • Understand the role of muscles, tendons and ligaments in movement of the Skeleton.

Prompt Questions

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Please revisit the prompts from last year:

- What are the Key concepts for this unit?
- How will it link to wider disciplinary knowledge/cultural capital: history, culture, authentic artefacts, music, art, literature?
- How does it build on prior knowledge and link to other units, concepts, years, GCSE?
- What is it intended students will have learned?
  - For each Unit? By the end of the Year?

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    - GW: ; BI: ; EW
- Is it worth summarising in a knowledge organiser?
- **Assessment: how do you know they have learned the foundational concepts, curriculum and wider disciplinary knowledge? Does assessment look like GCSE light? Should it?**
- Skills used/learned
- Tier 2/3 vocabulary ((Etymology e.g. of Greek/Latin)