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Year 10 Overview 2024-25 – *Subject*

Date	Wk	Week	Units Studied & Learning Outcomes	Key Concepts & Assessment
8 weeks (12 Lessons) (38Days)				
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	**Lesson overview:** Organs and Organ systems in Humans (12 lessons) **Lesson sequence:** 1-2. The Heart and its structure (2 lessons) 3. Blood vessels associated with the heart (1 lesson) 4. Composition of the blood (1 lesson) 5-7. Problems associated with the heart (3 lessons) 8-9. The Digestive system (2 lessons) 10-11. The respiratory system (2 lessons) 12.The function of the brain (1 lesson) 13.The function of the eye (1 lesson) **Prior:** Year 7- Cells, tissues and organs **Current:** Understand specific organ systems in Humans **Next:** Year 12 – Digestion and absorption • GW: Identify the main organs in each system and how they are adapted to function • BI: Cross link these organs to establish a picture of the whole organism. • EW: Evaluate the issues ad treatment surrounding problems with these organs Recall of knowledge, application of knowledge, identify patterns from observations, interpret data. **Assessment**- Quick quiz, Exam questions, end of topic tests, Long answer questions.	**Foundational concepts** Organisation **Outcomes:** • Understand the role of the cells cycle in cell division • Understand the structure of the Heart • Understand the adaptations of the blood vessels associated with the heart • Describe the composition of the blood • Describe and evaluate treatments for problems associated with the heart • Describe the organs in the digestive system and their role • Identify the organs in the Respiratory system and discuss how ventilation occurs. • Understand the function of the Brain • Understand the function of the different parts of the eye **KW**: Interphase, mitosis, cytokinesis, stage, objective lens, eyepiece lens, micrometres, microscope slide, cover slip, **EDI**-Links between increased cell proliferation and certain ethnic groups. Mitosis in specific tissues linked to Cancer rates. **Links to root words (etymology)**: Mitosis is derived from the **Greek** word μίτος (mitos, "**warp thread**"). **Careers:** pharmacologist, biotechnologist, microbiologist, research scientist. **KW**: Coronary, Aorta, Vena Cava, Pulmonary, Artery, Vein, Capillary, Diaphragm, Intercostal, Bile, Enzymes, Peristalsis, soluble. **EDI**-Link ethnicity and metabolism, expand on non-communicable disease and predisposition of certain ethnic groups to CHD, type 2 diabetes. Ageism links with heart transplants. **Links to root words (etymology)**: • Pulmonaria is derived from Latin pulmo **(**lung) • Mitosis is derived from the **Greek** word μίτος (mitos, "**warp thread**"). **Tier 2/3 Vocabulary** • Glossaries, quick quizzes, within exam questions, PowerPoints. **Misconceptions** ventilation and respiration are the same thing. Problems associated with the heart are terminal • Careers links

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

- ***Equality Diversity and Inclusion (EDI) links***

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.)

</td></tr>
<tr><td>Half-Term</td><td colspan="4">7 weeks (10-11 lessons) (35 Days)</td></tr>
<tr><td>4-Nov</td><td></td><td></td><td>

Lesson overview:
Digestive system (7 lessons)

Lesson sequences:
1 & 2. Food test required practical (2 lessons)
3. Enzymes Structure (1 lesson)
4. Enzymes and digestion(1 lesson)
5. Enzymes and pH and temperature (1 lesson)
6-7. Amylase required practical (1-2 lessons)

<table>
<tr><th>Prior</th><th>Current</th><th>Next</th></tr>
<tr><td>Year 7- Digestion topic</td><td>Understand Enzymes and their roles in digestion</td><td>Year 12 – Digestion and Absorption</td></tr>
</table>

- GW: Recall the definition of an Enzyme and describe what factors affects enzyme action
- BI: Describe the main Enzymes involved in digestion
- EW: Evaluate the effect of pH on Amylase.
- Recall of knowledge, application of knowledge, identify patterns from observations, and interpret data.

Recall of knowledge, application of knowledge, identify patterns from observations, interpret data.

Assessment- Quick quiz, Exam questions, end of topic tests, Long answer questions.

</td><td>

Foundational concepts
Bioenergetics

Outcomes:
- Understand the role of specific enzymes in digestion.
- Understand how to test for Glucose, Starch, Protein and Fats.
  Understand the effect of pH on Amylase.
- Understand Enzymes and their structure
- Understand Factors affecting Enzymes

KW: Biological Catalyst, pH, temperature, denatured, active site, substrate, Biuret, Iodine, Benedicts, Sudan 3, ethanol, buffer, protease, amylase, lipase.

EDI- links between enzymes and certain debilitating diseases. Hurler syndrome, mitochondrial disease, PKU

Links to root words (etymology): Catalyst from new Latin or Greek katalusis.

Careers: enzymologist, engineer, protein biochemist, development scientist, chemical engineer

History: Enzymes were discovered by a German chemist called Eduard Buchner near the end of the nineteenth century

Tier 2/3 Vocabulary
- Glossaries, quick quizzes, within exam questions, PowerPoints.
  Misconceptions- enzymes die instead of denatured
- ***Equality Diversity and Inclusion (EDI) links***

</td></tr>
<tr><td></td><td>A</td><td>9</td><td></td><td></td></tr>
<tr><td>11-Nov</td><td>B</td><td>10</td><td rowspan="4">

Lesson overview:
Photosynthesis (4 lessons)

Lesson sequence:
1.Photosynthesis (1 lesson)
2.Testing a leaf for Starch (1 lesson)
3.Limiting factors (1 lesson)
4. Uses of glucose (1 lesson)

</td><td rowspan="4">

Foundational concepts
Bioenergetics & Cell biology

Outcomes:
- Understand Photosynthesis
- Understand how to test a leaf for starch
- Describe the limiting factors for Photosynthesis and explain associated graphs

</td></tr>
<tr><td>18-Nov</td><td>A</td><td>11</td></tr>
<tr><td>25-Nov</td><td>B</td><td>12</td></tr>
<tr><td>2-Dec</td><td>A</td><td>13</td></tr>
</table>

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<table>
<tr><td>9-Dec</td><td>B</td><td>14</td><td></td><td>• Understand how plants use glucose to synthesis materials
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>16-Dec</td><td>A</td><td>15</td><td></td><td></td></tr>
<tr><td colspan="2">Christmas Holiday</td><td colspan="3">6 weeks (9 lessons) (30 Days)</td></tr>
<tr><td>6-Jan</td><td>B</td><td>16</td><td rowspan="6">Lesson overview:
Photosynthesis Continued
5. Optimising food production (1-2 lesson)
6 & 7. Photosynthesis required practical (2 lessons)
8. Plant diseases (1 lesson)
9. Plant defence mechanisms (1 lesson)
10-12. Tropisms and use of plant hormones (3 lessons)

<table><tr><th>Prior</th><th>Current</th><th>Next</th></tr><tr><td>Year 8- Photosynthesis</td><td>Understand Photosynthesis

Understand transpiration and translocation</td><td>Year 12 – Organism exchange and the Environment

Year 12 – Cohesion in the xylem</td></tr></table>• GW: Describe the reactants and products of photosynthesis and the use of these substances. Describe the processes of transpiration and translocation and identify the structures involved.
• BI: Describe which factors affect the rate of photosynthesis and the factors that affect the rate of transpiration.
• EW: Explain how to test for the rate of photosynthesis using different independent variables, and how to use a potometer to measure transpiration rate.

Recall of knowledge, application of knowledge, identify patterns from observations, and interpret data

Assessment: Quick quiz, Exam questions, end of topic tests, Long answer questions.</td><td rowspan="6">Foundational concepts
Bioenergetics & Cell biology

• Understand how food producers manipulate rates of photosynthesis.
• Understand how to measure the rate of photosynthesis
• Understand Inverse square law
• Identification of plant disease
• Explain the effects of plant deficiency diseases
• Understand the role of Plant hormones

KW: Limiting factors, chlorophyll, cellulose, Iodine, nitrates, nutrients, Humidity, wind speed, temperature, root hair, stomata.

Tier 2/3 Vocabulary
• Glossaries, quick quizzes, within exam questions, PowerPoints.

EDI-
• links to plants from the Amazon, epiphytes. Farming practices in other countries that increase crop yield using alternative methods.

Links to root words (etymology): Photo meaning light in Latin.

Careers: horticultural scientist, landscape scientist, environmental scientist, soil scientist, geneticists, biotechnologist.

History:
• Photosynthesis was partially discovered in the 1600's by Jan Baptista van Helmont, a Belgian chemist, physiologist and physician.
• The term xylem was introduced by Carl Nägeli in 1858.
• Transpiration was first measured by Stephen Hales (1677–1761).
• In the early 1600s, Jan van Helmont looked at plant transport systems.

Misconceptions-plants only photosynthesise they do not respire.

Links to root words (etymology): The word "xylem" is derived from the Greek word ξύλον (xylon), meaning "wood"</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>10-Feb</td><td>A</td><td>21</td></tr>
</table>

<table>
<tr>
<td></td>
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<td></td>
<td>Lesson overview:
Transpiration

Transpiration (5 lessons)

1.Transpiration and factors affecting transpiration (1 lesson)
2. Structure of the Xylem and Phloem (1-2 lessons)
2.Using a potometer (1 lesson)
3. Translocation and the phloem (1 lesson)</td>
<td>Careers: horticultural scientist, landscape scientist, environmental scientist, soil scientist, geneticists, biotechnologist, ecologist, conservationist

Foundational concepts
Cell Biology

• Understand how to use and read a potometer
• The role of stomata in transpiration (xylem)
• Understand Translocation (phloem)
• Understand transpiration
• Describe factors that can affect the rate of transpiration
• Understand how to use and read a potometer
• The role of stomata in transpiration (xylem)
• Understand Translocation (phloem)
• Understand transpiration
• Describe factors that can affect the rate of transpiration

• Equality Diversity and Inclusion (EDI) links

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</td>
</tr>
<tr>
<td>Half-Term</td>
<td colspan="3">6 weeks (7-8 lessons) (29 Days)</td>
</tr>
<tr>
<td>25-Feb
3-Mar
10-Mar
17-Mar
24-Mar
31-Mar</td>
<td>B
A
B
A
B</td>
<td>22
23
24
25
26</td>
<td>Lesson overview:
Transport across membranes (8 lessons)

1. Diffusion (1 lesson)
2. Osmosis (1 lesson)
3. Active transport (1 lesson)
4-5. Osmosis required practical (2 lessons)
6,7 & 8. Revision lessons (3 lessons)

<table>
<tr><th>Prior</th><th>Current</th><th>Next</th></tr>
<tr><td>Year 7- Cells topic</td><td>Understand movement of substances in plants and animals</td><td>Year 12 – Transport across cell membranes</td></tr>
</table>

• GW: Describe the processes by which substances move across membranes
• BI: Describe the similarities and differences in each process
• EW: Explain how to interpret data relating to the required practical

Recall of knowledge, application of knowledge, identify patterns from observations, and interpret data.

Assessment- Quick quiz, Exam questions, end of topic tests, Long answer questions.</td>
<td>Foundational concepts
Cell Biology

Outcomes:
• Understand diffusion and the factors that affect it
• Understand diffusion in specific organs (plants and animals)
• Understand Osmosis
• Understand active transport and when it is used
• Understand how to measure osmosis and analyse results of the practical.

KW: Potometer, Transpiration, translocation, xylem, phloem , partially permeable membrane, diffusion pathway, concentration gradient, carrier proteins, passive, respiration, mitochondria.

Links to root words (etymology): Osmosis- Latinized from osmose (1854), a shortened form of endosmose "inward passage of a fluid through a porous septum"

Careers: research scientist, molecular biologist, cellular biologist

History:
• In 1848, the German physiologist Emil du Bois-Reymond suggested the possibility of active transport of substances across membranes</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>ST1</td>
<td></td>
<td></td>
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</table>

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<table>
<tr><td></td><td></td><td></td><td>INSET 24th Feb</td><td>

- The general term osmose (now osmosis) was introduced in 1854 by a British chemist, Thomas Graham.

Tier 2/3 Vocabulary

- Glossaries, quick quizzes, within exam questions, PowerPoints.

Misconceptions- Osmosis is particles, diffusion is water.

- **EDI –** Transpiration differences dependent upon climate.

- ***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
</td></tr>
<tr><td colspan="2">Easter Holiday</td><td colspan="3">5 weeks (7-8 lessons) (23 Days)</td></tr>
<tr><td>22-Apr</td><td>B</td><td>ST1</td><td rowspan="5">Lesson Overview:
Nervous system (7 lessons)

1-2. Feedback and Exam (2 lessons)

Lesson Sequence:
3. The structure of the Nervous system (1 lesson)
4.Testing sensitivity of pressure receptors in the skin] (optional: 1 lesson)
5. Reflex arcs (2 lessons)
6-7.The Nervous system Ruler drop test (2 lessons)

<table>
<tr><th>Prior (Y8)</th><th>Now (Y9)</th><th>Next (Y12)</th></tr>
<tr><td>Year 7- Organ systems

Year 8- Health topic</td><td>Understand how the Nervous system responds to changes</td><td>Year 12 – N/A</td></tr>
</table>

- GW: Identify the main parts of the Nervous system and the role that they play in coordinating a response.
- BI: Describe the difference between voluntary and Involuntary actions.
- EW: Explain how to measure reaction time and predict the effects of external factors on reaction time.

Recall of knowledge, application of knowledge, identify patterns from observations, interpret data.

Assessment- Quick quiz, Exam questions, end of topic tests, Long answer questions.

Easter Monday 21st
Early May bank hol 6/5</td><td rowspan="5">Foundational Concepts
Homeostasis and Response

Outcomes:

- Understand what makes up the nervous system and the role of each component.
- Understand that different areas of the body have different sensitivity based on nerve endings.
- Understand Voluntary and Involuntary reactions and their importance in preventing harm.
- HA- Identify the changes that occur in the message at the synapse.
- Understand how reaction time can change based on various external factors.

KW: Stimulus, Receptor, Sensory, Relay, Motor Neuron, sense organ, effector, synapse, neurotransmitter.

Links to root words (etymology):

- neuron is from the **Greek** word **neûron sinew,** cord, **nerve.**
- Synapse originates form the Greek word to mean 'junction'

History & Culture:

- Links to reaction times and alcohol consumption
- In the fourth century B. C., the Greek philosopher Aristotle believed firmly that the nerves were controlled by and originated in the heart because it was, in his interpretation, the first organ of the body and the seat of all motion and sensation.

Careers:

- neurology, physical therapy

EDI: links of social deprivation to non-communicable diseases and gender differences of impact.

Tier 2/3 Vocabulary

- Glossaries, quick quizzes, within exam questions, PowerPoints.

Misconceptions- all neurons are the same</td></tr>
<tr><td>28-Apr</td><td>A</td><td>ST1</td></tr>
<tr><td>5-May</td><td>B</td><td>30</td></tr>
<tr><td>12-May</td><td>A</td><td>31</td></tr>
<tr><td>19-May</td><td></td><td></td></tr>
<tr><td></td><td>B</td><td>32</td><td></td></tr>
</table>

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- ***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
</td></tr>
<tr><td>Half-Term</td><td colspan="4">7 weeks (10-11 lessons) (34 Days)</td></tr>
<tr><td>2-Jun</td><td>A</td><td>33</td><td rowspan="8">Lesson overview
Hormones (10-11 lessons)

Lesson sequence:
1.What is a Hormone and where is it secreted from (1 Lesson)
2.The events of the Menstrual cycle (1 lesson)
3.Hormones involved in the menstrual cycle (1 lesson)
4-5. Artificial control- Hormones and Contraception (1-2 lessons)
6. How do different contraceptive work (1 lesson)
7. Homeostasis (1 lesson)
8 & 9. Glucose levels and Diabetes (2 lessons)
10. Thyroxine and adrenaline (1 lesson)
11. The Kidneys and Osmoregulation (2-3 lessons)
12. Monoclonal Antibodies (1 lesson)

<table>
<tr><th>Prior (Y8)</th><th>Now (Y9)</th><th>Next (Y12)</th></tr>
<tr><td>Year 7- Organ systems

Year 8 – Health and Disease

Year 9 – Health and disease</td><td>Understand the role of Hormones in coordinating the body.

Understand Homeostasis

Understand specific examples of Homeostasis</td><td>Year 12- Biological molecules</td></tr>
</table>

• GW: Recall the names of Hormones and the glands that they are secreted from. Recall the definition of Homeostasis and list some examples
• BI: Describe how Hormones control fertility/ conception and the Menstrual cycle. Describe how the body regulates its blood glucose levels and what happens in the case of Diabetes</td><td rowspan="8">Homeostasis and response

Outcomes:
• Understand the role of the endocrine system and its components.
• Understand what occurs during the menstrual cycle
• Understand the Hormones involved with each stage and how they interact with each other.
• Describe how fertility can be controlled and list the stages of IVF (HA).
• Describe the three main types of contraceptives and how they protect against pregnancy.
• Understand Homeostasis
• Understand how bloods glucose levels are controlled (HA-Glucagon)
• Understand Diabetes
• HA- Understand negative feedback
• Separate- Thermoregulation
• Thyroxine and Adrenaline
• Understand the function of the kidneys

• Understand what Monoclonal Antibodies are

KW: Endocrine, Pituitary, Oestrogen, Progesterone, FSH,LH, Ovaries, Insulin, Pancreas, Thyroid, Adrenal, Hormonal, Barrier, Surgical, In vitro Fertilisation, Homeostasis, Insulin, Glucagon, Glycogen, Thermoregulation

Links to root words (etymology):
• endocrine is Greek for secreting internally.
• In vitro means In glass in Latin.

History and Culture:
• Cultural differences in contraceptive uses, development of early hormonal contraceptives, impacts of fertility treatments
• Around 3000 BCE Ancient societies, including Crete and Egypt, made from animal and fish bladders or intestines and linen sheaths.
• Around 1850 BCE Egypt develops one of the first spermicides by combining crocodile dung and fermented dough. The low pH of the dung may have had a spermicidal effect.

Careers</td></tr>
<tr><td>9-Jun</td><td>B</td><td>34</td></tr>
<tr><td>16-Jun</td><td>A</td><td>35</td></tr>
<tr><td>23-Jun</td><td>B</td><td>36</td></tr>
<tr><td>30-Jun</td><td>A</td><td>37</td></tr>
<tr><td>7-Jul</td><td>B</td><td>38</td></tr>
<tr><td>14-Jul</td><td></td><td></td></tr>
<tr><td></td><td>A</td><td>39</td></tr>
</table>

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			• EW: Discuss the ethics surrounding IVF. Apply knowledge of Negative feedback to specific examples Recall of knowledge, application of knowledge, identify patterns from observations, interpret data **Assessment:** Quick quiz, Exam questions, end of topic tests, Long answer questions. SJBF INSET 4/7	Nursing, endocrinology, **EDI:** Understanding from all students of the importance of understanding the menstrual cycle and the equal responsibility of all to understand and implement contraceptives effectively. • Jean Purdy – pioneer in fertility treatment **Links to root words (etymology):** • Thermo from the Latin word for heat. Homeostasis from the Latin to remain in a constant state. **History and Culture:** Differences in type II diabetes prevalence based on geographical/culture location, early development of **Tier 2/3 Vocabulary** • Glossaries, quick quizzes, within exam questions, PowerPoints. **Misconceptions**- homeostasis is a stand-alone topic. Hormonal control is instantaneous. • ***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*
(Total: 189 Days)				

Prompt Questions

Now that the revised curriculum has been taught, please consider the Implementation and Impact of the curriculum you taught. What changes might need to be made to the Curriculum Intent (See Curriculum Map and Overviews) in light of this year's experiences?

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?
    - 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)

GW: *(E.g. Grade 1)*	Recall the main parts of the circulatory system Recall the main components of the blood Recall some issues that could occur within the circulatory system. Recall the main organs in the digestive system. Recall the main parts of the respiratory system.

	Identify the main parts of the Nervous system and the role that they play in coordinating a response Recall the names of Hormones and the glands that they are secreted from. Recall the definition of an enzyme. Recall the main types of enzymes involved in digestion and the substrates that they act upon. Recall the difference between aerobic and anaerobic respiration. Recall the word equation for Photosynthesis Recall some factors that could affect the rate of photosynthesis. Recall what we mean by transpiration. Recall what we mean by diffusion, osmosis and active transport.
BI: *(E.g. Grades 2-3M)*	Describe what is meant by a double circulatory system. Describe the main blood vessels associated with the heart. Describe the components of the blood. Describe the treatments for issues surrounding the heart and circulatory system. Describe the difference between voluntary and Involuntary actions. Describe how Hormones control fertility/ conception and the Menstrual cycle. Describe how Hormones control fertility/ conception and the Menstrual cycle. Describe how the body regulates its blood glucose levels and what happens in the case of Diabetes Describe the lock and key hypothesis and how enzymes can become denatured. Describe how to test the effect of pH on enzyme action. Describe the limiting factors for photosynthesis. Describe how to use a potometer to measure the rate of transpiration. Describe how different factors affect the rate of transpiration. Describe the roles of diffusion, osmosis and active transport in allowing substances to move across membranes.
EW: *(E.g. Grades 3U-4L)*	Evaluate the different treatments for problems associated with the heart and circulatory system. Explain how to measure reaction time and predict the effects of external factors on reaction time. Discuss the ethics surrounding IVF. Apply knowledge of Negative feedback to specific examples Evaluate how limiting factors can be used in crop production. Explain how inverse square law can be used in predicting the effect of light intensity on the rate of photosynthesis. Apply knowledge of active transport to movement of substances against the concentration gradient. Analyse Osmosis data and interpret results.