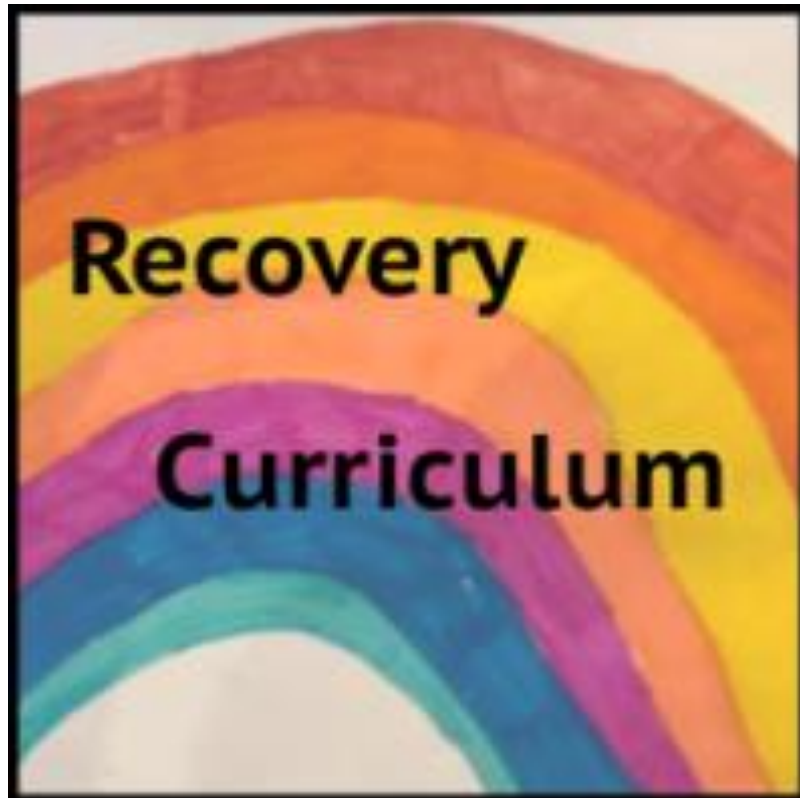


RECOVERY CURRICULUM

Subject: Science



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| Subject: | Science | Teacher: | |
| Year: | 10 | Class: | |
| Unit title: | B1 – Cell Biology | | |
| Duration: | 2 weeks – 9 lessons | | |

Intent

Intent Statement - at Landau Forte Amington, we believe learning powerful knowledge helps students achieve and creates a fairer society. How are you trying to accomplish this, with this unit/topic?

This topic will focus on student recovery following the pandemic, which has resulted in students experiencing the following possible losses: routine, structure, friendship, opportunity and freedom. It will support students academically, socially and emotionally, in order to transition students back to Academy life and support with the issues resulting from loss.

Aims - what do you want pupils to be able to know and do by the time they finish this unit/topic?

- To be able to build on their KS3 knowledge on cells and be confident with labelling the organelles of a plant and animal cell
- To know the different methods about how substances travel within cells
- To be able to build their confidence with reading, writing and numeracy skills.

Academy values – at Landau Forte Amington, we want students to be ambitious, brave and kind. How are these values promoted in this PoS?

- Ambitious - Students are able to access the content and their appropriate level and the content allows for all students to be stretched in their development of new skills, knowledge, and application. Students learn through a range of activities, including practical work where possible. All students will be stretched through the various forms of new learning and assessment.
- Brave – Student will have to be brave and feel confident about using skills that haven't been used for a long period of time, and not be afraid to get things wrong.
- Kind – Students will have to be kind to themselves about reintegrating themselves back into learning and using skills again that they may struggle with.

Content – what is being covered, ensuring breadth & depth?

National Curriculum/Exam Specification - how does the content link to the NC or Exam Spec?

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| <ul style="list-style-type: none"> • Structure of plant and animal cells • Cell specialisation and differentiation • Microscopes • Cell division • Transport in cells | <ul style="list-style-type: none"> 4.1.1.1 Eukaryotes and prokaryotes 4.1.1.2 Animal and plant cells 4.1.1.3 Cell specialisation 4.1.1.4 Cell differentiation 4.1.1.5 Microscopy 4.1.2.1 Chromosomes |
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| | 4.1.2.2 Mitosis and the cell cycle 4.1.2.3 Stem cells 4.1.3.1 Diffusion 4.1.3.2 Osmosis 4.1.3.3 Active transport |
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Powerful Knowledge - what powerful knowledge is included in this SoW? Consider what knowledge is it important for our students to know, so that when they leave school they can engage in and lead discussions, with people from the most advantaged backgrounds?

- Plant and animal cells (eukaryotic cells) have a cell membrane, cytoplasm and genetic material enclosed in a nucleus.
- Bacterial cells (prokaryotic cells) are much smaller in comparison. They have cytoplasm and a cell membrane surrounded by a cell wall. The genetic material is not enclosed in a nucleus. It is a single DNA loop and there may be one or more small rings of DNA called plasmids.
- Students should be able to demonstrate an understanding of the scale and size of cells and be able to make order of magnitude calculations, including the use of standard form.

Implementation

GAPS

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| Identification – how are you going to identify the gaps in knowledge/skills? | Triage – how are you going to rank order these gaps in knowledge/skills and ‘fill’ them, in order of importance? |
| <ul style="list-style-type: none"> • DNA activities to assess prior knowledge • Quick quizzes • General questioning • Use activities that require reading, writing and numeracy skills to assess their skills | <ul style="list-style-type: none"> • Assess student progress via numerous different activities, and prioritise skills that students struggle with • Ensure that the basics of cells are understood before moving on to further content |

KEY CONCEPTS

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| Key Concepts – what are the key concepts being taught? | Progression – how will studying these key concepts support progression to the traditional curriculum that has been planned? |
| <ul style="list-style-type: none"> • Structure of plant and animal cells • Cell specialisation and differentiation • Microscopes • Cell division • Transport in cells | <ul style="list-style-type: none"> • Cell biology is the basic building blocks of life, which underpins the majority of the Biology topics. |

| WELLBEING | |
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| Lockdown – how will students share their experiences of lockdown? | Social and Emotional – how will student social and emotional health be supported? |
| <ul style="list-style-type: none"> • Within group discussion – this could be the very first discussion within a live lesson • Analogies within the content | <ul style="list-style-type: none"> • Letting students know that it is important to talk about anything that they are struggling with, giving them options of how they can do this |
| RE-ESTABLISH | |
| Learning Skills – how are you going to re-establish the skills for learning? | Relationships – how are you going to re-establish classroom relationships? |
| <ul style="list-style-type: none"> • Use activities within the content that require students to use reading, writing and numeracy skills | <ul style="list-style-type: none"> • Use the first session to discuss experiences during lockdown, introductions and an icebreaking activity. |
| OPPORTUNITIES | |
| Discussion – what are the discussion based opportunities? | Group – what are the group work based opportunities (while still ensuring social distancing)? |
| <ul style="list-style-type: none"> • Many opportunities throughout the topic, including a debate about stem cells | <ul style="list-style-type: none"> • Stem cell debate • Transport in cells presentation |

| Delivery | | | | | | | | |
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| 1 – 4.1.1 Cell Structure | 3 | 1) Lesson Type (classroom or blended for remote homework) | | 2) DNA (Do Now Activity/Reading) | | 3) Learning Intentions (what, why & how) | | |
| | | Classroom (whole sequence completed) | <input checked="" type="checkbox"/> | <ul style="list-style-type: none"> • Read information about an animal and plant cell. Highlight key words within text, then label a diagram of and animal and plant cell • Watch a video clip on specialised cells. Write down 5 new learning points • Label a microscope (labels and descriptions given) | What | <ul style="list-style-type: none"> • Describe the structure and function of plant, animal and bacterial cells • Explain how specialised cells are adapted for their function. • Understand how to calculate magnification or the actual size of an image | Why | Cells are the building blocks of life |
| Blended (live and remote as independent study) | <input type="checkbox"/> | | | | | | | |

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| | Number of lessons in cycle: | 4) New Material (previous learning/ new material) | | 5) Check for Understanding (questioning/checking) | 6) Prepare for Practice (model/ scaffold) | Synchronous (live) | |
| | | <ul style="list-style-type: none"> Introduce the terms eukaryotic and prokaryotic Specialised cells – text book page/website to read Video of microscopes practical | | <ul style="list-style-type: none"> True or false quiz Fill in the gaps activity Labelling diagrams Calculating magnification | <ul style="list-style-type: none"> Scaffold a 6 mark exam question on the structure of animal and plant cells – supply a range of different responses and get students to mark answers using a mark scheme. Encourage discussion about what is good and what needs to be improved. Model a magnification calculation using the equation triangle to help | | |
| | | 7) Deliberate Practice (guided/ independent) | | 8) Feedback (light/deep) | 9) Review (daily/monthly) | Asynchronous (remote) | |
| <ul style="list-style-type: none"> Attempt 6 mark exam question independently Create a plant/animal cell model using different materials Magnification calculations | | <ul style="list-style-type: none"> Use mark scheme to assign a mark to the exam question. Students to write down corrections from mark scheme | <ul style="list-style-type: none"> Quick quiz Exam questions | | | | |
| 2 – 4.1.2 Cell division | 3 | 1) Lesson Type (classroom or blended for remote homework) | | 2) DNA (Do Now Activity/Reading) | | 3) Learning Intentions (what, why & how) | |
| | | Classroom (whole sequence completed) | X | <ul style="list-style-type: none"> Read about the cell cycle, then estimate how many cells die every minute (fun fact) (300 million) What are stem cells? Where can they be found? How can they be used? Read a piece of text to answer questions | | What | <ul style="list-style-type: none"> Know that body cells divide by mitosis, which is a stage of the cell cycle State what a stem cell is and describe how they could be used to treat medical conditions |
| | | Blended (live and remote as independent study) | <input type="checkbox"/> | | | Why | <ul style="list-style-type: none"> Without the process of mitosis we would not be able to survive. It occurs in every living organism Stem cells can be used to cure certain diseases. |
| | | | | How | You will be able to describe how body cells grow, and evaluate the risks and benefits, as well as the social and ethical issues concerning the use of stem cells | | |

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| | Number of lessons in cycle: | 4) New Material (previous learning/ new material) | | 5) Check for Understanding (questioning/checking) | 6) Prepare for Practice (model/ scaffold) | Synchronous (live) | | |
| | | <ul style="list-style-type: none"> Explain the process of mitosis Stem cells – Evaluate risks and benefits, as well as the social and ethical issues concerning the use of stem cells from embryos | | <ul style="list-style-type: none"> True or false quiz Fill in the gaps activity Key words match up e.g. DNA, Chromosome, Nucleus, Gene, Cell Draw a simple diagram to describe the cell cycle | <ul style="list-style-type: none"> Breakdown the steps in mitosis, and match to diagram Scaffold exam questions Partial answer | | | |
| | | 7) Deliberate Practice (guided/ independent) | | 8) Feedback (light/deep) | | 9) Review (daily/monthly) | | Asynchronous (remote) |
| | | <ul style="list-style-type: none"> Research the advantages and disadvantages of stem cells using given websites. Summarise information Worksheet on mitosis | | <ul style="list-style-type: none"> SPAG/Vocab review How to improve answers | | <ul style="list-style-type: none"> Quick quiz Exam questions | | |
| 3 – 4.1.3 Transport in cells | 3 | 1) Lesson Type (classroom or blended for remote homework) | | 2) DNA (Do Now Activity/Reading) | | 3) Learning Intentions (what, why & how) | | |
| | | Classroom (whole sequence completed) | X | <ul style="list-style-type: none"> Looking at a picture about diffusion - How does the smell spread? What is the name of this process? Can you think of anymore examples? Writing task Read a text book page about the three processes, spot the difference by underlining key information | | What | <ul style="list-style-type: none"> Define the term diffusion and explain the factors that affect the rate of diffusion Describe how water moves into or out of a cell by osmosis Describe how substances move in and out of a cell by active transport | |
| | | Blended (live and remote as independent study) | | | | Why | Diffusion, Osmosis and active transport are important processes that allow vital substances to get to where they are needed in cells | |
| | | | | How | You will be able describe what diffusion is and explain how what affect the rate of diffusion, apply osmosis to unfamiliar situations and make predictions, and explain where and when active transport occurs | | | |

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| Number of lessons in cycle: | 4) New Material (previous learning/ new material) | 5) Check for Understanding (questioning/checking) | 6) Prepare for Practice (model/ scaffold) | Synchronous (live) |
| | <ul style="list-style-type: none"> • Explain the process of diffusion, osmosis and active transport – video/diagrams/at home practical | <ul style="list-style-type: none"> • True or false quiz • Fill in the gaps activity • Key words match up with definition • Draw a diagram represents three processes | <ul style="list-style-type: none"> • Scaffold a 6 mark exam question on the structure of animal and plant cells – supply a range of different responses and get students to mark answers using a mark scheme. Encourage discussion about what is good and what needs to be improved. | |
| | 7) Deliberate Practice (guided/ independent) | 8) Feedback (light/deep) | 9) Review (daily/monthly) | Asynchronous (remote) |
| | <ul style="list-style-type: none"> • Use books and website to produce a summary table about diffusion, osmosis and active transport • Attempt 6 mark exam question independently | <ul style="list-style-type: none"> • How to improve answers • Mark exam question using mark scheme and write down improvements | <ul style="list-style-type: none"> • Quick quiz • Exam questions | |