**Armfield Academy – Department of Science**

**Year 9 Science Curriculum Overview**

**Nb. Please note that depending on your child's understanding of science in Y7 and Y8, they may be taught some bridging units prior to this content being delivered.**

- ✔ Each lesson will start with a series of questions linked to both the previous lesson and topics studied previously.
- ✔ Formative assessment of skills linked to practical work will enable students to demonstrate their acquisition of new skills.
- ✔ Students are encouraged to consolidate learning at least once a week and seek tutor help if unsure on any topics.
- ✔ Within each unit, time will be allocated for consolidation and recall before assessment
- ✔ The following questions will be explored within the units

| **Half Term 1** | |
|---|---|
| Date | **Biology Topic**: Cells **Application Time: End of Unit Assessment** |
| Week 1 | Introduction to science (expectations, standards, health and safety, introduction of key skills and assessing prior knowledge). |
| Week 2 | What types of cells are there? What do we find in cells? |
| Week 3 | **Application time: Knowledge check 1** |
| Week 4 | How do we observe cells? How do we calculate magnification? How do you prepare onion cell slides? |
| Week 5 | **Required practical: Microscopy.** |
| Week 6 | **Application time: Knowledge check 2** |
| Week 7 | Why do cells specialise? How do cells divide? What is cell differentiation? |
| | **Application time: Knowledge check 3** |
| | What are stem cells? How do we use stem cells? |
| | **Application time: Knowledge check 4** |
| | How do substances move through cells? |
| **Half Term 2** | |
| Date | **Biology Topic**: Cells **Application Time: End of Unit Assessment** |
| Week 8 | How do we calculate surface area to volume ratio? |
| Week 9 | How does water move across membranes? **Required practical: Osmosis.** How are substances absorbed against |
| Week 10 | concentration gradients? |
| Week 11 | **Application time: Knowledge check 5** |
| Week 12 | How do bacteria reproduce? **Required practical: Culturing microorganisms** |
| Week 13 | |
| Week 14 | **Chemistry Topic: Atomic structure and the periodic table** |
| | How do elements differ from compounds? How do we represent reactions? How do we balance equations? |
| | **Application time: Knowledge check 1** |
| | How do we separate mixtures? **Required practical: Chromatography** |
| | **Application time: Knowledge check 2** |
| | What does the atom look like? What is an isotope? Why is the mass number of an element always a whole number? |
| | **Application time: Knowledge check 3** |
| **Half Term 3** | |
| Date | **Chemistry Topic**: Atomic structure and the periodic table **Application Time: End of Unit Assessment** |
| Week 15 | How has the atom changed? Where do the electrons go? How are ions formed? |
| Week 16 | **Application time: Knowledge check 4** |
| Week 17 | How has the periodic table changed? What are the differences between metals and non-metals? |
| **Week 18** | How are group 0 different from other elements in the periodic table? Where are alkali metals found and how do they react? |
| Week 19 | Where are the halogens found and how do they react? |
| Week 20 | Where are transition metals found and what are their properties? |
| | **Application time: Knowledge check 5** |
| **Half Term 4** | |
| Date | **Physics Topic**: Energy **Application Time: End of Unit Assessment** |
| Week 21 | Why do we need energy? How is energy transferred? |
| Week 22 | How does energy change in a system? (GPE) How does energy change in a system? (KE) |
| Week 23 | **Application time: Knowledge check 1** |
| Week 24 | How does energy change in a system? (EPE) What does specific heat capacity tell us? |
| Week 25 | How can we measure specific heat capacity? **Required practical: SHC** |
| Week 26 | **Application time: Knowledge check 2** |
| | What is power? What is efficiency? How can we keep our homes warmer? **Required practical: thermal insulation** |
| | **Application time: Knowledge check 3** |
| | How can we generate electricity? How do we keep our lights on? |

| Half Term 5 | |
|---|---|
| Date | **Biology Topic**: Organisation **Application Time: End of Unit Assessment** |
| Week 27 | How are organisms structured? What are enzymes? What factors affect enzymes? **Required practical: Enzymes** |
| Week 28 | **Application time: Knowledge check 1** |
| Week 29 | How do we digest our food? How do we test for key food groups? **Required practical: Food tests** |
| Week 30 | How does our heart work to move blood around our body? |
| Week 31 | What makes up our blood and how does it move around our bodies? |
| Week 32 | **Application time: Knowledge check 2**<br>What is coronary heart disease? What's the difference between communicable and non-communicable disease? Does the way I live my life mean I'm more likely to get a disease? What is cancer and how is it caused?<br>**Application time: Knowledge check 3**<br>How are the structures of plant tissues adapted to their functions? How do water and sugar move through a plant?<br>**Application time: Knowledge check 4** |
| **Half Term 6** | |
| Date | **Physics Topic**: Particle model of matter **Application time: end of topic assessment** |
| Week 33 | How are particles arranged? How do we calculate density? |
| Week 34 | **Application time: knowledge check 1** |
| Week 35 | How do we measure the density of regular shapes, irregular shapes and liquids? **Required practical: Density.** |
| **Week 36** | **Application time: knowledge check 2** |
| Week 37 | What is internal energy? |
| Week 38 | What is specific latent heat? |
| Week 39 | How do particles behave in a gas?<br>**Application time: knowledge check 3**<br>What happens to pressure when volume is changed? How does temperature affect the pressure in a gas |