

**SUBJECT: Science**

| YEAR GROUP | Year Nine                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| Rationale  | In year nine pupils will begin to cover the fundamental ideas needed for GCSE science. During the year students will reinforce the knowledge that they have gained in years 7 and 8 and focus on building on these key ideas to ensure a good foundation for the Key Stage 4 GCSE in the combined or separate sciences. Pupils will study biology, chemistry and physics with the skills of working scientifically embedded throughout.               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|            | Autumn Term 1                                                                                                                                                                                                                                                                                                                                                                                                                                         | Autumn Term 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Spring Term 1                                                                                                                                                                                                                                                                                                                                                                                                                                           | Spring Term 2 | Summer Term 1                                                                                                                                                                                                                                                                                    | Summer Term 2                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Topic/Unit | Biology Unit 1 – Cells                                                                                                                                                                                                                                                                                                                                                                                                                                | Chemistry Unit 1 – Atomic Structure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Physics Unit 1 – Energy                                                                                                                                                                                                                                                                                                                                                                                                                                 |               | Biology Unit 2 – Infection                                                                                                                                                                                                                                                                       | Physics Unit 2 – Particle Model                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Knowledge  | 1 – What is the difference between a prokaryotic cell and a eukaryotic cell?<br>2 – Why are cells specialised?<br>3 – How do you use a light microscope?<br>4 – What can we learn from microscopes?<br>5 – What happens when cells divide?<br>6 – What are stem cells?<br>7 – What happens in diffusion?<br>8 – Why doesn't the oxygen we need diffuse in through our skin?<br>9 – What happens in osmosis?<br>10 – What happens in active transport? | 1 – What are atoms and elements?<br>2 – How do you draw atoms?<br>3 – What does the periodic table tell us?<br>4 – What are compounds and how are they formed?<br>5 – What are isotopes and how do you find their mass?<br>6 – What are ions and how are they formed?<br>7 – What is ionic bonding?<br>8 – How was the periodic table developed?<br>9 – How was the model of the atom developed?<br>10 – How do group 1 metals react and why?<br>11 – What is covalent bonding?<br>12 – How do group 7 elements react and why?<br>13 – What happens in a group seven displacement reaction?<br>14 – What are mixtures and how do we separate them?<br>15 – How can we separate a mixture of liquids with different boiling points?<br>16 – How can we separate a soluble solid and a liquid? | 1 – What happens when energy is transferred?<br>2 – What is dissipated energy?<br>3 – What is power?<br>4 – How do you calculate efficiency?<br>5 – How do you calculate gravitational potential energy?<br>6 – How do you calculate kinetic energy?<br>7 – How do you calculate elastic potential energy?<br>8 – What are non-renewable energy resources?<br>9 – What are renewable energy resources?<br>10 – How can we measure thermal conductivity? |               | 1 – What are the effects of communicable diseases?<br>2 – How does the body defend itself against disease?<br>3 – How does vaccination protect us against disease?<br>4 – What is cancer?<br>5 – What is the difference between antibiotics and painkillers?<br>6 – How are new drugs developed? | 1 – How do you find the density of a regular object?<br>2 – How do you find the density of an irregular object?<br>3 – What is the particle model?<br>4 – What happens during a change of state?<br>5 – What is internal energy?<br>6 – What is specific heat capacity?<br>7 – How do you measure specific heat capacity?<br>8 – What is specific latent heat?<br>9 – How does temperature effect gas pressure?<br>10 – How does volume effect gas pressure? |



|                               | Autumn Term 1                                                                                                                                                                                                                                                                                                                                                          | Autumn Term 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Spring Term 1                                                                                                                                                                                                                                                                                                                  | Spring Term 2 | Summer Term 1                                                                                                                                                                                                                                                                         | Summer Term 2                                                                                                                                                                                                                                      |
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| <b>Skills</b>                 | Pupils will continue to develop their working scientifically skills through carrying out investigative work to help them describe how microscopes are used and what happens in osmosis. Pupils will develop their numeracy skills through developing their understanding of the use of the prefixes milli- and micro- and how to convert between units of measurement. | Pupils will continue to develop their working scientifically skills through carrying out investigative work to help them separate mixtures through the processes of distillation, filtration, crystallisation and chromatography and by describing and explaining the reactivity of group one metals. Pupils will develop their numeracy skills through developing their understanding of what ions are and how they are formed and by balancing symbol equations. Pupils will also be able to relate an atom's position in the periodic table to its electronic structure. | Pupils will continue to develop their working scientifically skills through carrying out work to investigate different energy resources. Pupils will develop their numeracy skills as they develop their use of some of the key physics equations and carry out calculations involving energy transfers, power and efficiency. |               | Pupils will continue to develop their working scientifically skills through carrying out work to investigate how communicable diseases are spread and how new drugs are developed. Pupils will develop their numeracy skills through analysis of data and describing what data shows. | Physics will continue to develop their working scientifically skills through carrying out investigations to determine the densities of regular and irregular solid objects and liquids and by determining the specific heat capacity of materials. |
|                               | Autumn Term 1                                                                                                                                                                                                                                                                                                                                                          | Autumn Term 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Spring Term 1                                                                                                                                                                                                                                                                                                                  | Spring Term 2 | Summer Term 1                                                                                                                                                                                                                                                                         | Summer Term 2                                                                                                                                                                                                                                      |
| <b>Assessments: Formative</b> | Formative assessment will regularly take place during science lessons. Once a fortnight pupils will complete a learning check activity based on previously taught content. This activity will be teacher assessed and feedback will be provided.                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                |               |                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                    |
| <b>Assessments: Summative</b> |                                                                                                                                                                                                                                                                                                                                                                        | Assessment Window 1<br>- Assessing Biology unit 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                |               | Assessment Window 2 (KS3 Assessment Week)<br>- Assessing Biology unit 1<br>Chemistry unit 1<br>Physics unit 1                                                                                                                                                                         |                                                                                                                                                                                                                                                    |
| <b>Homework</b>               | Pupils in year nine will be set one piece of Sparx Science homework each week. To help support pupils to develop a good routine in relation to home learning this science homework will always be set on a Friday and due in the following Thursday. Pupils are expected to spend approximately 60 minutes on each piece of Sparx Science homework.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                |               |                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                    |