



Subject: Science

Year Group: 8

Curriculum Intent:

The intent of our Science curriculum is to encourage our students in developing a sense of excitement, exploration and investigation, a love of the subject and of learning. As well as deepening their understanding of science, they can apply their knowledge to the world around them. Science equips students with an ability to use literacy, numeracy and practical techniques interchangeably and bridges the gap between theory and application. This enables students to make the link between science and technology and the impact they both have on our everyday lives. Throughout their Science education, students work independently and in groups to help them develop their individual learning skills and their ability to communicate and share new ideas and methodology with peers.

College Values:

Science equips students with the ability to take stewardship of their learning using investigations and research to draw conclusions. By working in groups students are encouraged to cooperate and collaborate allowing them to engender respect for their own techniques and knowledge as well as that of others. By encouraging a love of both content and scientific methods, Science equips students with transferable skills which will apply to service within their communities.

Knowledge and Skills:

Food and digestion – food groups, calculations of energy requirements, dietary deficiency diseases, human digestive system.

Combustion reactions. Fire safety. Production of carbon dioxide by human activity and the impact on climate.

Our Sun as a star, other stars in our galaxy, other galaxies. The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.

The light year as a unit of astronomical distance. "

Respiration – gas exchange system in humans, extension of the mechanism of breathing, word equations for aerobic and anaerobic respiration, the impact of exercise, asthma and smoking on lungs,

Atoms and molecules. A simple (Dalton) atomic model. Atoms, elements and compounds. Chemical vs Physical changes. Chemical symbols and formulae. Physical and chemical properties of different elements.

Periodic Table: periods and groups. Conservation of mass in chemical reactions.

Light waves can travel through a vacuum; speed of light. Absorption, diffusion, scattering and reflection. Ray model to explain imaging in mirrors and pinhole cameras, refraction and lenses including the human eye. Colours and frequencies of light, white light and prisms (qualitative).

Microbes - Recap of cells, extended to yeast and algae, fungi, bacteria in the human digestive system, anaerobic respiration in humans and microorganisms, including fermentation, harmful bacteria.

Rocks and minerals, Physical weathering, Chemical and biological weathering

Acids revisit, Transport and sedimentation (optional), Metamorphic and sedimentary rock, Igneous rock, The rock cycle, Chocolate rocks, The structure of the Earth

Density Floating and sinking, Changing density, Pressure in solids, Pressure in liquids, Atmospheric Pressure





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Drag and air resistance, Hydraulics"

Plant reproduction "Uses of plants other than for food, plant classification and biodiversity. Recap of sexual reproduction and inherited variation, and introduces different types of reproduction in plants (asexual and sexual). Pollination in flowering plant, fertilisation and the production of seeds, use of fruits in the dispersal of seeds. Germination and growth, life cycle of a flowering plant.

Metals and non metal Review the physical properties of metals and non-metals. Simple reactions of metals and non-metals. The link between properties and uses, catalysts. Corrosion, rusting Reactivity Series, alloys

Skills

Examination of nutritional content, use of energy data

Modelling of a digestive system

Lab skills, using word and symbol equations

Research skills :Investigation of planets/stars

Examine healthy lifestyles, design and exercise plan, gather data on how different activity affects heart rate

Looking at means and ranges

Data interpretation, forming word and symbol equations

Lab skills, using word and symbol equations

Using Physics apparatus, drawing ray diagrams, working with light filters, construct a pinhole camera

Plating techniques, comparison of cleaning techniques

Real world diseases and causes and treatment.

Useful bacteria

Analysis of rock types, interpretation of data

Theories of geology

Modelling structure of rocks

Calculations and rearranging equation (density)

Classification of organisms, Accuracy and estimations, sampling biodiversity

Use of symbol and word equations to represent chemical changes.

Drawing conclusions

Reading scientific instruments, using models, designing models, experimental testing

Assessment:

Students will be assessed during lessons both verbally and with the work they complete. Formal assessment will take place roughly once every three weeks and students will have a test each term (Autumn/Spring and Summer).

Homework:

Homework will consist of glossary (keyword and definitions) learning for each topic. Activities will be set on Seneca (for content coverage) and in the form of homework research tasks and projects.

Cultural Capital:

<https://www.pearsonactivelearn.com/app/Home>

<https://www.bbc.co.uk/bitesize/subjects/zng4d2p>

<https://senecalearning.com/en-GB/>

<https://www.s-cool.co.uk/>





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