The Talentum LEARNING TRUST

Learning journey map
Key stage 3 Science

KS4 Science curriculum intents:

Waves
how different types of waves transfer energy from place to place; the motion of particles within water and sound waves and how waves superimpose one each other; the reflection and refraction of light and the applications of mirrors and lenses; how sound is transmitted and heard along with the applications of sound waves.

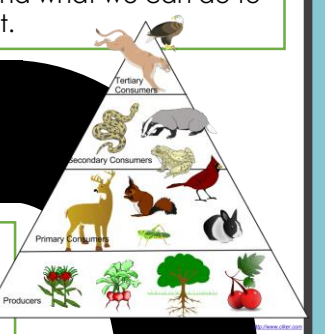
Space
he place of the Earth within the Solar System and the Universe as a whole; the properties of stars and the behaviours of the planets held in orbit around them by gravity forces; the structure of the Universe and the technology used to gather evidence about it.

Year 9

Reproduction
study the differences between sexual and asexual reproduction, pollination, fertilisation and seed dispersal in flowering plants, human reproduction, the menstrual cycle and pregnancy.

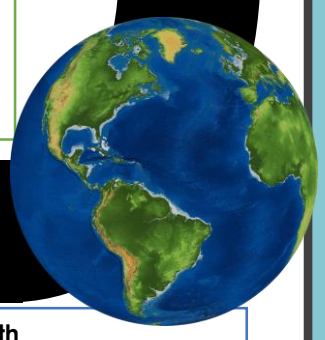
Photosynthesis, Respiration and Circulation
study photosynthesis in plants, gas exchange systems in plants and in animals (including the structure and function of the lungs and the circulatory system in humans) and the similarities and differences between aerobic and anaerobic respiration.

Ecosystems and Interdependance
study what an ecosystem is, food chains, food webs and pyramids of numbers, populations and how to use sampling to measure them, how humans are damaging the environment and what we can do to protect it.



Energy
study a wide range of energy transfers and energy resources with a particular focus on heating and cooling. They explore the advantages and disadvantages of different energy resources, evaluating their suitability for production of electricity. Students then investigate the various methods of heating and cooling, finding ways to control energy transfer. Finally students look at the calculations involved with energy transfer including work done, power and the costs of domestic electricity

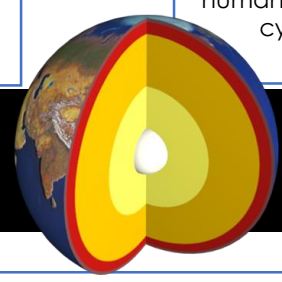
Reactions of Acids and Alkalis
study the pH scale, the strength of acidity and alkalinity and the names of some everyday acids and alkalis. Strong acids and alkalis are very corrosive and students will learn how these substances are dealt with in the laboratory as well as the associated hazard symbols and the risks involved in using these substances. Students will study neutralisation reactions of both strong and weak acids, developing their skills in both word and symbol equations. These reactions will be put into the context of neutralisation reactions and their importance to the environment and health.



Year 8

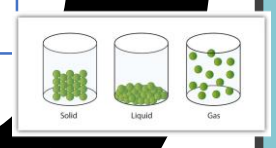
Atoms and the Periodic Table
study and use the particle model to describe elements and compounds. They understand that the smallest particles of elements are actually atoms and learn the basic Dalton model for an atom. Students understand how elements exhibit patterns and trends in their properties, and how the Periodic Table represents these patterns and trends visually. This develops into how to name compounds and interpret formulas. Students learn how to observe chemical reactions and describe them in word equations.

The Earth
the composition and structure of the Earth, including the inner core, outer core, mantle and crust, the processes of the rock cycle and the characteristics of igneous, sedimentary and metamorphic rock. The focus then moves to the Earth as a source of resources, and evaluating humanity's impact on the environment, including how human activities have affected the carbon cycle and the composition of the atmosphere



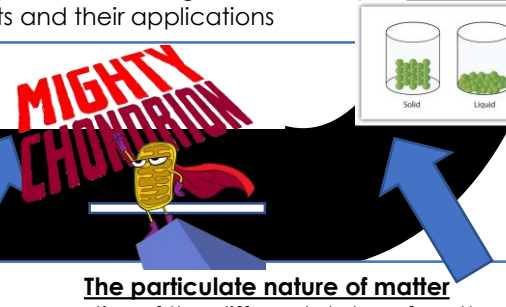
Forces and Motion
the motion of objects and how this can be represented graphically. They then analyse a range of forces acting on objects, including the concept of pairs of forces, contact forces and non-contact forces. They then go on to measure frictional forces and the behaviour of materials when forces act on them.

Electricity and Electromagnetism
study the nature and effects of static electricity followed by current, voltage and resistance in circuits and, finally, magnetism and electromagnetism. The essential points to cover are: charges and charging by friction, electrostatic effects, current in circuits and at junctions, voltage and energy, resistance, simple magnetism and magnetic fields and, finally, electromagnets and their applications



Year 6

Year 7



Our Science curriculum will give students the opportunity to:

- Develop practical skills by working scientifically;
- Discuss and explain scientific concepts clearly and precisely;
- Unpick and remedy misconceptions;
- Understand the uses and implications of Science historically, today and for the future;
- Accurately read and interpret scientific vocabulary;
- Challenge what they see or hear in the world by taking into account new evidence and ideas;
- See connections between subject areas and become aware of the 15 big ideas underpinning scientific knowledge and understanding;
- To use problem solving and numeracy skills to solve scientific problems

Cells and organisation
the cell is the unit of living organisms; there are similarities and differences between plant cells, animal cells and unicellular organisms;

The skeletal and muscular systems
the function of the human skeleton and how movement is brought about via joints and muscles.

The particulate nature of matter
-the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
-changes of state in terms of the particle model

Pure and impure substances
-the concept of a pure substance
-mixtures, including dissolving
-diffusion in terms of the particle model
-simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography
-the identification of pure substances

Churnet View's Science curriculum:

The vision of the Science Team at Churnet View Middle School is to continually strive for development of excellent teaching and learning in Science, incorporating a wide range of approaches to ensure pupils enjoy and succeed in Science and appreciate the universe around them. A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics.

We believe that students deserve a broad and ambitious Science curriculum, rich in skills and knowledge, which ignites curiosity and prepares them well for future learning or employment. Through building up a body of key foundational knowledge and concepts, pupils will be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

KS3 Science curriculum intents:

Students will experience transition from KS2 into KS3 through a spiral based curriculum which is based on the 15 Big Ideas in Science. We also being preparing the students for transition to KS4 by our discriminating use of scientific language and embedding key techniques and processes which underpin the Scientific Method.

Biological Concepts

Students will explore the foundations of life, from the sub-cellular level through to the interdependence of Ecosystems and human impacts on these.

Chemical Processes

The basics of Atomic structure, bonding and reactions are visited and phenomena explained through the study of the Periodic Table. Students are taught to critically select and use key separation techniques to solve problems and will begin to use and predict chemical names and formulae.

Physics Phenomena

Students will study the concept of energy, and how this is conserved and transferred through changes of state to astronomical scales and also explore the forces which may cause or influence these transfers. They will learn about the Electromagnetic field for the first time in detail and draw links between the spectrum and the phenomena rising from electrical current.