SCIENCE
CURRICULUM MAP

Our subject vision:

Aspiration	**Mission Statement:** *'We aim to teach students to become scientifically literate and responsible citizens as well as our next generation of inspirational professional scientists. A solid understanding of science is imperative for everyone and we have an aspirational curriculum full of great opportunities for every student.* *As a faculty "we enable all students to **acquire knowledge** that takes them beyond their experience. Access to knowledge is the **right** of all pupils as future citizens'* (Young, 2014). **Knowledge:** In Science we aim to understand the world around us. We look at everything from tiny atoms to enormous stars as well as how our bodies work. We have a spiral curriculum so key ideas are revisited and built-upon such as cells, energy and atomic structure. **Skills:** Students learn how to plan experiments, use laboratory equipment, analyse data and draw valid conclusions. We encourage a deep level of analytical thinking around topical scientific issues and believe that all students should learn to think like scientists. **Understanding:** At the end of students' study of Science they will be able to understand the world around them to be able to make decisions for themselves and their families. They will be prepared to undertake further study and have developed a curiosity for how and why things work.
Opportunity	**Within the classroom:** In Science lessons, students study a range of topics along with developing their practical skills. We ensure that every topic begins with links to relevant careers for students to explore using a research-based homework. Each topic also contains a link to a relevant real-life scientist. **Beyond the classroom:** Beyond the curriculum, students may participate in: • Science club • Eco club • Young researchers • Lots of partnership activities as part of the Abingdon Science partnership • External talks and visits
Integrity	**Knowledge:** Scientific knowledge allows students to engage with the world around them, to be active and knowledgeable citizens. Students are taught key information to help them make life choices such as around reproduction, genetic engineering and climate change. **Skills:** Students often work in pairs or small groups to complete practical work. This allows them to develop team working skills such as negotiation and clear communication. They are encouraged to have a solution-focused approach to problems that arise during the practical. **Understanding:** They demonstrate their character development through their increasing ability to apply real-world knowledge to their work, and through their application of empathy and interpretation skills in discussion and in writing.

SUBJECT CURRICULUM MAP
SCIENCE: Y7/8

Year 7

Introduction

- Hazards in science
- Chemical symbols
- Using a Bunsen burner
- Scientific questions
- Recording and analysing data
- Planning investigations

Cell Structure

- Cell structure
- Movement of substances
- Microscopes
- The skeleton
- Muscles and joints

Forces

- Balanced and unbalanced forces
- Calculating speed
- Distance – time graphs
- Gravity
- Energy in systems
- Pressure
- Moments

Particle Model and States of Matter

- Particle model
- Changes of state

Mixtures and Separation Techniques

- Pure substances and mixtures
- Separating mixtures techniques

Electricity and Magnetism

- Potential difference
- Resistance
- Series and parallel circuits
- Current
- Magnets and magnetic fields
- Electromagnets
- Uses of electromagnets

Reproduction

- Variation
- Adolescence
- Reproductive systems
- The menstrual cycle
- Development of a fetus

Acids and Alkalis

- Acids and alkalis
- Indicators
- Neutralisation and salts

Interdependence

- Food chains and webs
- Competition
- Flowers and pollination
- Germination

Year 8

End of year assessment

Organisation

- Gas exchange and breathing
- Drugs, alcohol and smoking
- Digestive system
- Nutrients and diet

Periodic Table

- Atoms
- Elements
- Compounds
- Periodic table
- Group 1, 7 and 0 elements

Heating and cooling

- Temperature and thermal energy
- Conduction and convection
- Radiation
- Reducing thermal energy transfer
- Investigating thermal energy transfer
- Evaporation

Bioenergetics

- Respiration
- Biotechnology
- Photosynthesis
- Plant minerals

Metal Reactions and Energetics

- Metal reactions
- Combustion and thermal decomposition
- Conservation of mass
- Exothermic and endothermic

Waves

- Wave properties
- Modelling waves
- Sound waves and the ear
- Amplitude and volume
- Frequency and pitch
- Light waves and the eye
- Reflection and refraction
- Colour and filters

Variation and Inheritance

- Natural selection
- Extinction
- Biodiversity
- Inheritance
- Genetics
- Genetic modification

Earth's Structure and Resources

- Earth's structure and composition
- Rocks
- Earth's resources and materials
- Global warming
- The carbon cycle

Space Physics

- The night sky
- Solar system
- Day and night
- Seasons
- Moon and lunar phases
- Eclipses
- Exoplanets

Year 9

End of year assessment

Careers: every topic has a related careers homework task

Throughout year 7 and 8 students have end of unit assessments using exam questions.

Extra opportunities
RAF workshop
Science club
Eco club

Year 8

1 Organisation

Why this?	Students will learn about breathing and the effect of drugs as well as the digestive system and diet.
Why now?	This topic builds on the year 7 topic, their knowledge of cells, transport and movement are integral to their understanding.

2 Periodic Table

Why this?	Students learn about atomic structure and compounds. They look at the periodic table and the properties of key groups.
Why now?	Building on the Y7 topic students will take their understanding of particles further looking at their interactions.

3 Heating and cooling

Why this?	Students learn about thermal energy and how it is transferred through a substance and how the transfer of energy can be reduced
Why now?	Students have looked at energy transfers in Year 7. In this topic they will apply this to think critically about reducing thermal energy transfers.

4 Bioenergetics

Why this?	Students will learn about key reactions - respiration and photosynthesis.
Why now?	Students have looked at breathing In organisms as well as cell structure in year 7. this topic builds on this knowledge to explain the key reactions photosynthesis and respiration.

5 Metal Reactions and Energetics

Why this?	Students will learn about key reactions and the energy involved in these reactions.
Why now?	Students have looked at atoms and their properties in matter. In this topic they explain the key reactions these atoms are having.

6 Waves

Why this?	Students learn about waves and wave properties. They will investigate light, sound and water waves.
Why now?	Students have looked at energy in Year 7 and this topic builds on this and applies this knowledge of energy transfer to waves.

7 Variation and Inheritance

Why this?	Students learn about how variation is inherited and the impact a lack of diversity can have on our world.
Why now?	Students have looked at variation in year 7. in this topic they take this further and look at the biological basis for this variation.

8 Earth's Structure and Resources

Why this?	Students learn about the Earth, rocks, the atmosphere, materials, and global warming. These topics help understand today's world.
Why now?	Students through chemistry and physics have looked at particles and energy. This topic requires both of these ideas to explain these real world impacts.

9 Space Physics

Why this?	Students learn about the Earth and its place in the solar system and the Universe.
Why now?	Students have looked at light and thermal energy in Year 8 and this topic uses this and applies this knowledge to day and night and seasonal changes.

Year 7

1 Introduction

Why this?	In this topic students will learn key practical and investigational skills as well as how to be safe in a laboratory.
Why now?	The skills learnt in this unit are integral for all future practical investigations.

2 Cell Structure

Why this?	Students will learn the basic structure of cells and how these then bring about movement in organisms.
Why now?	The skills learnt in this topic form the foundation for all future biology studies at KS3.

3 Forces

Why this?	Students will learn about forces and their effects on objects. They will also consider transfers of energy in systems.
Why now?	The skills learnt in this topic form the foundation knowledge for all future physics topics at KS3.

4 Particle Model and States of Matter

Why this?	Students will learn about the particle model as well as the states of matter.
Why now?	The skills learnt in this topic form the foundation for all future chemistry studies at KS3

5 Mixtures and separation techniques

Why this?	Students will learn key techniques to separate substances.
Why now?	Students have been introduced to particles, in this topic they will use their knowledge to see how substances can be separated.

6 Electricity and Magnetism

Why this?	Students will begin to explore the properties of circuits and key ideas of potential difference, current and resistance as well as magnetism.
Why now?	Students have already considered forces and energy and can now apply this to the context of electricity and circuits.

7 Reproduction

Why this?	Students will learn they key topic of reproduction and how the body changes in adolescence.
Why now?	This topic will build on knowledge of cell structure. Students will apply this knowledge to explain the biology of fertilisation.

8 Acids and Alkalis

Why this?	Students will learn about acids and alkalis, and they are introduced to some of their reactions.
Why now?	Students have been introduced to particles, now they will use their knowledge to see how particles behave in reactions.

9 Interdependence

Why this?	Students will learn how organisms interact and the integral part plants play in the biological world.
Why now?	The cell structure topic gives the foundation knowledge to then allow students to apply their knowledge to interactions of organisms.