

## Curriculum progression overview – Science department

### **Vision:**

We aim to encourage a thirst for learning and love for Science through a broad, contextualised and practical based curriculum with a keen focus upon developing pupils' confidence with experimental techniques and key scientific skills, providing regular opportunities for discussions and debating of relevant scientific topics. Fundamental scientific content is taught through a spiral learning model that enables students to build upon their prior knowledge, encourage deeper learning and allow students to make concrete links between different strands of the Science curriculum. Through the teaching of our curriculum, we provide our students with key transferable skills integral to modern careers and with the ability of excelling within potential future Science education pathways.

### **Why study Science?**

Science enables us to develop our understanding of the world around us and to explain complex phenomena that at first appear difficult to understand. Everything that we now know about the natural world and universe have been developed through scientific research and experimentation.

Through scientific advancement we can now explain how the universe has developed, how humans have evolved to become the most intelligent organisms on the planet, as well as enabling us to create the most advanced civilizations with high-tech inventions such as: spaceflight, mobile-phone communication and the internet.

Science is one of the oldest academic disciplines and covers a wide variety of subjects and topics. It is one of the STEM subjects (Science, Technology, Engineering and Mathematics), that are widely appreciated as being key subjects for students to study to prepare themselves for the high-tech world and careers of the future.

### **What powerful knowledge will you gain in Science?**

Students will gain a full understanding of the following powerful ideas and concepts:

At KS3:

How are new scientific discoveries made?

How do our bodies work?

What is matter really made of?

How do forces affect our everyday lives?

What impacts are humans having on the environment and what are we doing to reduce the effects?

How was the universe created and why is it the way that it is?

How do animals, plants and micro-organisms reproduce?

What is energy and how do we utilise energy to benefit us?

At KS4:

How have all the species on Earth come to be the way they are?

Why is climate changing happening and what can we do to solve it?

How do electrical circuits work?

Why understanding chemical reactions is so important in industry?

How do modern technologies work (e.g., mobile phones networks, fibre optic cables and electric cars)?

Why are so many species going extinct in the world today and what can we do to prevent this?

How do we use waves for communication?

Why is biodiversity important?

## **How does studying Science support your studies in other subjects?**

### Mathematics:

- Graph skills
- Rearranging equations
- Standard form
- Significant figures
- Handling data
- Statistics
- Unit conversions

### Geography:

- The water cycle
- Causes of and solutions for tackling pollution
- Causes of and solutions for tackling global warming

### Physical Education

- Anatomy – respiratory system and muscles
- The body's responses to exercise
- Homeostasis – how our bodies maintain themselves

### Technology

- Problem solving
- Logical and creative thinking
- Data interpretation

### History

- Critical thinking and enquiry skills
- Development of arguments and reasoning skills
- Independent enquiry

## **How are you assessed in Science?**

### AT KS3

- Regular Key Indicator pieces of work to highlight students' areas for development and enable for these to be addressed swiftly.
- Termly summative assessments to enable student progress to be measured.

### AT KS4:

- Regular Key Indicator pieces of work.
- End-of-unit formative assessments to highlight students' areas for development and enable for these to be addressed swiftly.
- Termly summative assessments to enable student progress to be measured.

## **How can Science support your future progression?**

Science provides students with key skills that applicable across a wide range of careers and job prospects including data handling and analysis, reasoning skills, creative and logical thinking, evaluation skills and problem solving.

Key careers that require pupils to study Science include psychology, sports science, veterinary science, ecology, climate science, biochemistry, pharmacology, data analysis, economy, engineering, meteorology, nanotechnology, and oceanography, amongst many others.

Science is also seen as a key subject study to prepare students for the high-tech world and careers of the future.

**What enrichment opportunities are there in Science?**

- Y7 and Y8 STEM club provides our students with the opportunity actively take part in scientific discovery through project and practical based learning.
- Visits to The Big Bang Fair, TeenTech and STEM events are offered to support with increasing engagement and curiosity within Science, improve pupils' scientific understanding, boost personal development and enhance cultural awareness.

		Year 7		Year 8	
		7 East 1 and 2	7 West 1 and 2	8 East 1 and 2	8 West 1 and 2
Date	Week number	7 West 3, 4 and 5	7 East 3, 4 and 5	8 West 3, 4 and 5	8 East 3, 4 and 5
31/8/20	Week 1	Work Like a Scientist	Work Like a Scientist	Maths Skills	Maths Skills
7/9/20	Week 2	Work Like a Scientist	Work Like a Scientist	Maths Skills	Maths Skills
14/9/20	Week 3	Work Like a Scientist	Work Like a Scientist	Maths Skills	Maths Skills
21/9/20	Week 4	Organisms	Earth	Ecosystems	Ecosystems
28/9/20	Week 5	Organisms	Earth	Ecosystems	Ecosystems
5/10/20	Week 6	Organisms	Earth	Ecosystems	Ecosystems
12/10/20	Week 7	Organisms	Earth	Ecosystems	Ecosystems
19/10/20	Week 8	Organisms	Earth	Ecosystems	Ecosystems
	HT	Organisms	Earth		
2/11/20	Week 9	Organisms	Earth	Ecosystems	Ecosystems
9/11/20	Week 10	Organisms	Earth	Ecosystems	Ecosystems
16/11/20	Week 11	Earth	Organisms	Reactions	Electromagnets
23/11/20	Week 12	Earth	Organisms	Reactions	Electromagnets
30/11/20	Week 13	Earth	Organisms	Reactions	Electromagnets
7/12/20	Week 14	Earth	Organisms	Reactions	Electromagnets
14/12/20	Week 15	Earth	Organisms	Reactions	Electromagnets
	XMAS	Earth	Organisms	Reactions	Electromagnets

5/1/21	Week 16	Earth	Organisms	Reactions	Electromagnets
11/1/21	Week 17	Earth	Organisms	Electromagnets	Reactions
18/1/21	Week 18	Forces	Matter	Electromagnets	Reactions
25/1/21	Week 19	Forces	Matter	Electromagnets	Reactions
1/2/21	Week 20	Forces	Matter	Electromagnets	Reactions

8/2/21	Week 21	Forces	Matter	Electromagnets	Reactions
	HT	Forces	Matter	Electromagnets	Reactions
22/2/21	Week 22	Forces	Matter	Electromagnets	Reactions
1/3/21	Week 23	Forces	Matter	Genes	Waves
8/3/21	Week 24	Matter	Forces	Genes	Waves
15/3/21	Week 25	Matter	Forces	Genes	Waves
22/3/21	Week 26	Matter	Forces	Genes	Waves
	EASTER				
	EASTER				
12/4/21	Week 27	Matter	Forces	Genes	Waves
19/4/21	Week 28	Matter	Forces	Genes	Waves
26/4/21	Week 29	Matter	Forces	Genes	Waves
3/5/21	Week 30	Energy	Energy	Waves	Genes
10/5/21	Week 31	Energy	Energy	Waves	Genes
17/5/21	Week 32	Energy	Energy	Waves	Genes
24/5/21	Week 33	Energy	Energy	Waves	Genes
	HT	Energy	Energy	Waves	Genes
7/6/21	Week 34	Energy	Energy	Waves	Genes
14/6/21	Week 35	Energy	Energy	Waves	Genes
21/6/21	Week 36	Energy	Energy	Waves	Genes
28/6/21	Week 37	Science project weeks	Science project weeks	Science project weeks	Science project weeks
6/7/21	Week 38	Science project weeks	Science project weeks	Science project weeks	Science project weeks

13/7/21	Week 39	Science project weeks	Science project weeks	Science project weeks	Science project weeks
	SUMMER				

Year 9		Year 10		Year 11	
9 East 1 and 2	9 West 1 and 2	10 East 1 and 2	10 West 1 and 2	11 East 1 and 2	11 West 1 and 2
9 West 3, 4 and 5	9 East 3, 4 and 5	10 West 3, 4 and 5	10 East 3, 4 and 5	11 West 3, 4 and 5	11 East 3, 4 and 5
Energy	Atomic structure (Chemistry)	Chemical changes	Electricity	Waves	Organic chemistry
Energy	Atomic structure (Chemistry)	Chemical changes	Electricity	Waves	Organic chemistry
Energy	Atomic structure (Chemistry)	Chemical changes	Electricity	Magnetism and electromagnetis	Chemical Analysis
Energy	Atomic structure (Chemistry)	Chemical changes	Electricity	Magnetism and electromagnetis	Chemical Analysis
Particle model of matter	Bonding	Chemical changes	Electricity	Organic chemistry	Waves
Particle model of matter	Bonding	Electricity	Chemical changes	Organic chemistry	Waves
Particle model of matter	Bonding	Electricity	Chemical changes	Chemical Analysis	Magnetism and electromagnetis
Particle model of matter	Bonding	Electricity	Chemical changes	Chemical Analysis	Magnetism and electromagnetis
Atomic structure (Chemistry)	Energy	Electricity	Chemical changes	Quantitative chemistry	Quantitative chemistry
Atomic structure (Chemistry)	Energy	Electricity	Chemical changes	MOCKS	MOCKS
Atomic structure (Chemistry)	Energy	Quantitative chemistry	Atomic structure (Physics)	MOCKS	MOCKS
Atomic structure (Chemistry)	Energy	Quantitative chemistry	Atomic structure (Physics)	Quantitative chemistry	Quantitative chemistry
Bonding	Particle model of matter	Quantitative chemistry	Atomic structure (Physics)	Homeostasis	Homeostasis
Bonding	Particle model of matter	Atomic structure (Physics)	Quantitative chemistry	Homeostasis	Homeostasis
Bonding	Particle model of matter	Atomic structure (Physics)	Quantitative chemistry	Homeostasis	Homeostasis
Cellular biology	Cellular biology	Inheritance, variation and	Rates of reaction	Homeostasis	Homeostasis
Cellular biology	Cellular biology	Inheritance, variation and	Rates of reaction	Chemistry of atmosphere	Using resources
Cellular biology	Cellular biology	Inheritance, variation and	Rates of reaction	Chemistry of atmosphere	Using resources
Cellular biology	Cellular biology	Rates of reaction	Inheritance, variation and	Using resources	Chemistry of atmosphere

Cellular biology	Cellular biology	Rates of reaction	Inheritance, variation and	Using resources	Chemistry of atmosphere
Cellular biology	Cellular biology	Rates of reaction	Inheritance, variation and	MOCKS	MOCKS
Genes	Genes	Forces	Forces	MOCKS	MOCKS
Genes	Genes	Forces	Forces	Ecology	Ecology
Genes	Genes	Forces	Forces	Ecology	Ecology
Genes	Genes	Forces	Forces	REVISION	REVISION
Genes	Genes	Forces	Forces	REVISION	REVISION
Genes	Genes	Homeostasis	Homeostasis	REVISION	REVISION
Waves	Waves	Homeostasis	Homeostasis	REVISION	REVISION
Waves	Waves	Homeostasis	Homeostasis	REVISION	REVISION
Waves	Waves	Homeostasis	Homeostasis	REVISION	REVISION
Waves	Waves	Homeostasis	Homeostasis	REVISION	REVISION
Waves	Waves	Chemistry of atmosphere	Using resources	REVISION	REVISION
Waves	Waves	Chemistry of atmosphere	Using resources		
Human Health	Human Health	Using resources	Chemistry of atmosphere		
Human Health	Human Health	Using resources	Chemistry of atmosphere		
Space Science	Space Science	Using resources	Chemistry of atmosphere		
Space Science	Space Science	Ecology	Ecology		
Space Science	Space Science	Ecology	Ecology		
Science project weeks	Science project weeks	Ecology	Ecology		