KS4 Biology – Environment - Evolution and Inheritance

Subject curriculum intent:	To develop in our students: • An enjoyment of Science by providing relevant, interesting and challenging experiences and activities. • Observational skills, by looking for patterns and contrasts. • An inquiring mind and a logical approach to problem solving. • The ability to draw conclusions from simple experiments and, where appropriate, to devise suitable experiments for further investigations. • Communication skills in speaking and listening, written, diagrammatic and symbolic forms. • Co-operation and a respect for others by being able to work as part of a team – the development of appropriate social skills. • Confidence in their own abilities. • A respect for the environment and a careful use of resources. • An interest in the world about them and a greater understanding of it.

End of KS3 intent/outcome	End of KS4 intent/outcome	End of KS5 intent/outcome
Students will build on their knowledge of science through the different areas – biology chemistry and physics. Students will 'work scientifically' to achieve the goals of each topic area they encounter.	Students will continue to develop their scientific knowledge through the different areas – biology, chemistry and physics. Students will 'work scientifically' to achieve the goals of each topic area they encounter. Students will be able to relate their scientific experiences to everyday life and have an understanding that science is all around them.	N/A

Intent for this topic:	Students will be able to explain how living things have changed over time. Students will be able to identify the features of different environments and describe how living things have adapted to their environment. Students will understand how different features are inherited from parents to their offspring. Students will understand how fossils contribute to scientific research to explain how animals and plants have evolved over time. Students will 'work scientifically' to achieve these goals, learning the key features of scientific enquiry; observing over time, pattern seeking, identifying, classifying, investigating (fair tests) and researching.
Core vocabulary needed for this subject/topic:	**Subject:** Biology, Chemistry, Physics Observe, pattern, identifying, classifying, investigating, fair test, researching

	Topic: Old, new, past, present, plants, animals, habitat, rocks Evolution, inheritance, fossil, adaptation, organisms
Vocabulary pupils will have accessed in other topics or subject areas:	Old, new, past, present, plants, animals, habitat, rocks
Key vocabulary taught within this topic:	Evolution, inheritance, fossil, adaptation, organisms

Prior knowledge: what pupils may already have studied

Key stage	Subject	Topic title	Term/year taught	Content/What might pupils already know?
KS3	Science	Plants	Autumn 1/Year 3	Pupils are able to identify a plant and name different parts of a plant.
KS3	Science	Living things and their environment	Autumn 1/Year 1	Pupils will be able to identify what a living thing is and the different habitats they live in.
KS3	Science	Rocks and their properties	Spring 2/Year 1	Pupils will be aware of different types of rocks and their properties.

Links to other subjects: Grow it, history, geography

Equality, Diversity and Inclusion:
Mary Anning - supplied fossils to palaeontologists, collectors and museums, as well as to the visitors to her shop in.

	OU Progression Steps 5-6	OU Progression Steps 7-8	OU NC Step 1	OU NC Step 2	OU NC Step 3
Subject specific knowledge	Can identify things that are old and new.	Can identify things from the past and present.	Know that things can change over time. Can identify changes to themselves over time.	Understand that evolution is adaptation over a long period of time. Can explain how living organisms have changed over time.	Can explain how humans have evolved over time. Can make links between evolution and natural selection e.g. giraffes having shorter necks and have evolved

					through natural selection to reach the top leaves on trees.
	Can sort animals into the correct habitat e.g. camel lives in the desert. Can describe the features of different animals and how they move e.g. a bird has a beak and can fly.	Can identify key features of an environment e.g. hot/cold, dry/wet. Know that different animals live in different habitats. Know that different plants can be found in different habitats. Know some of the characteristics of different animals to explain why they are suited to their environment.	Can describe an environment using its key features. Know the names of different habitats and names of some animals and plants that can be found in those habitats. Know that animals have adapted to suit their environment e.g. camel has wide feet to walk on sand.	Can identify different types of environments from around the world e.g. rainforest, polar regions, deserts. Can explain why different animals and plants are suited to their environment. Know that animals and plants have adapted to suit their environment e.g. camel has wide feet to walk on sand.	Knows the names of different environments from around the world and what habitats are found and the animals and plants that live in those habitats, giving a reason why. Know that adaptive traits are characteristics that are influenced by the environment. Know that adaptive traits can be a result of their environment e.g. food and climate.
	Know that animals have babies. Know people are different.	Know animals and humans can be different.	Knows animals can belong to different species. Know that animals in the species have different characteristics.	Know that variation is the difference between individuals within a species. Know that animals and plants produce offspring that are similar but not the same as their parents.	Know that inheritance is when characteristics are passed on to offspring from their parents. Know some of the traits offspring can inherit from their parents e.g. eye colour.
	Know that a fossil is old.	Know that a fossil is from the past.	Know that fossils are remains of animals and plants from the past.		

	Can suggest what a fossil may have been e.g. fish, leaf	Can identify what the fossil is from.	Can describe a fossil.	Know that fossils are remains of animals and plants from the past. Can make comparisons between fossils. Know that fossils are found in rocks.	Know that fossils are remains of animals and plants from the past. Know that fossils can prove things have changed over time. Know that fossils are found under layers of rocks.
Subject specific skills	Is able to identify differences between themselves and a peer. Is able to classify animals into 2 groups. Follow a set of demonstrations to carry out a simple investigation.	Is able to identify similarities and differences between animals. Is able to classify animals into 2 or more groups. Is able to identify similarities and differences between themselves and a peer. Follows a picture method to carry out a simple investigation.	Is able to identify similarities and differences between animals and plants. Is able to classify animals into their different species. Follows a word and picture method to carry out a simple investigation.	Is able to identify similarities and differences within a species. Is able to classify animals and plants using different criterion. Follows a written set of instructions to carry out a simple investigation. Records results in a suitable table.	Is able to give reasons why when identifying similarities and differences. Is able to classify animals and plants using their own criterion. Follows a written set of instructions to carry out a simple investigation. Records results in a suitable table. Is able to draw conclusions from their results.
Personal development	**Problem solving** Investigations and matching exercises **Communication skills** Working as pairs in investigations, asking and answering questions **Self-belief** Learning new skills, practising them and demonstrating them.				

	Self-management Working with new equipment **Teamwork** Working as groups to solve problems or find out new information
Suggested activities	Research Charles Darwin and his Theory of Evolution. Explore & compare how different animals and plants have adapted to their environment. Explore characteristics off different animals and how it helps them survive their environment. Identifying inherited traits between parents and their offspring. Similarities and differences between peers. Inherited traits and environmental traits. Animal and plant classification. Comparing animals and plants. Make fossils. Explore & compare different fossils – use microscopes. Explore how humans have evolved over time. Explore how animals have evolved over time e.g. history of the giraffe's neck.
Possible Investigations	Huddling experiment. Investigating why birds have different shaped beaks.
Key Words	Offspring, inheritance, variations, characteristics, adaptation, habitat, environment, natural selection, evolution, fossil, adaptive traits, inherited traits.
Online resources Twinkl CLEAPPS for risk assessments BBC bitesize for video resources.	
Evidencing Work All work / evidence sheets need to be printed off, annotated by staff, self-assessed by pupils and stored in student folders.	

RRS Articles:
This unit of work is linked to Articles of the UN Convention on the Rights of the Child.
Article 13 (freedom of expression)
Article 29 (goals of education)