KS3 – Year 7

Identity

What's the science story?

- heredity as the process by which genetic information is transmitted from one generation to the next
- a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model
- differences between species AND the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation
- changes in the environment which may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction AND the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material

Previous knowledge:

KS2

Yr 4 Living things and their habitats

Yr 6 Evolution and Inheritance

Next steps…

KS3

Organisms

KS4

B1 Cell Biology

B6 Inheritance, variation and evolution

B7 Ecology

Keywords

Variation	Inheritance	
DNA	Environmental	Fossils
Genome	Continuous	Evolution
Chromosome	Discontinuous	Biodiversity
Gene	Adaptation	Extinction
Proteins	Competition	

Working scientifically skills:

WS8 – working with a method

WS10 – using equipment correctly.

Key Skills:

New vocabulary introduced

Group discussions

Summary writing/Note taking

Reading given texts

Problem solving

Graph drawing

Assessments:

Exit tickets x 3

SATs style questions x 8 (linked to National curriculum)

ET Chromosomes

ET Adaptations

ET Extinction

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Assessment grid

Working Towards		Age Related Expectations		At Greater Depth	
State what is meant by the term adaptation		Describe how organisms are adapted to their environments		Explain how organisms are adapted to seasonal changes	
Name an environmental change		Describe how organisms adapt to environmental changes		Explain how competition or long-term environmental change can lead to extinction.	
Give a possible reason for adaptation or extinction		Describe how competition can lead to adaptation		Explain that some variation is affected by both environmental and inherited factors.	
State that variation is caused by the environment or inheritance		Describe the difference between environmental and inherited variation		Explain the causes of continuous and discontinuous variation	
State the two types of graphs that can be drawn when representing the two types of variation.		Represent variation within a species using graphs		Explain the contribution of each team of scientists to the development of the model of DNA.	
State that more than one scientist was involved in discovering the structure of DNA		Describe how scientists worked together to develop the DNA model		Explain how scientists know that organisms have changed over time	
State that organisms have changed over time, giving examples		Describe how organisms evolve over time.		Explain the different types of gene bank	
State how scientists try to prevent extinction		Describe the purpose of gene banks		Explain how organisms are adapted to seasonal changes	

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Lesson No. and Title	Learning objectives	Skills	Practical equipment
1. Cells & Genome	ARE – Identify main structures in the animal cell and where DNA is found. AGD – Explain what the genome is.	Vocabulary	
2. DNA Structure	ARE – To describe the structure of DNA and distinguish between the terms DNA, chromosome, gene and genome. AGD – Evaluate models.	Group discussion Modelling	PRAC – DNA sweet models Cocktail sticks, liquorice laces, gummy bears PRAC – DNA bracelets Metal thread, elastic thread, x4 coloured beads, tongs
3. DNA Discovery	ARE – To describe the contributions of scientists in the discovery of DNA. AGD – To justify the importance of scientists working together.	Reading Note taking	
4. Extracting DNA	ARE – Describe where DNA can be found and follow practical instructions to extract DNA. AGD – Justify method for extraction of DNA.	WS8 – working with a method WS10 – using equipment correctly.	PRAC – Extracting DNA from fruit Fruit, washing up liquid, salt, ethanol, beakers, water bath, pipettes
5. Proteins	ARE – State what DNA codes for and it's significance. AGD – To construct the correct base pairs to order specific amino acids and build a protein.	Problem solving	

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Lesson No. and Title	Learning objectives	Skills	Practical equipment
1. Inheritance	ARE – To describe variation as environmental or inherited. AGD – To compare the characteristics of different types of twins.	Vocabulary	
2. Inheritance 2	ARE – To model inheritance. AGD – To evaluate and identify limitations in the model.	Modelling	
3. Continuous vs Discontinuous Data	ARE – To describe variation as continuous or discontinuous. AGD – To interpret continuous and discontinuous data.	Graphing skills – both drawing and interpreting	PRAC – Measuring height Metre rulers
4. Continuous vs Discontinuous Data			
5. Continuous vs Discontinuous Data			

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Lesson No. and Title	Learning objectives	Skills	Practical equipment
1. Species	ARE – To describe the term species and give examples. AGD – To justify the importance of classifying and naming species.	Group work Summary writing Researching using ipads	
2. Competition	ARE – To describe the different things both animals and plants will compete for. AGD – To explain animals and plants compete for different resources.	Summary/note taking	
3. Adaptations of animals	ARE – To describe how organisms are adapted to their environment. AGD – To explain how organisms are adapted to seasonal changes.	Researching using given information sheets.	
4. Adaptations of plants	ARE – To describe how organisms are adapted to their environment. AGD – To explain how organisms are adapted to seasonal changes.	WS8 – working with a method WS10 – using equipment correctly.	PRAC: Investigating leaf adaptations Rulers, leaves from full sun, leaves from shade
5. Evolution	ARE – To describe how finches helped scientists understand evolution. AGD – To explain what 'survival of the fittest' is with example.	WS8 – following a given method	PRAC: Clippy Islands 5 trays: 1. Sand and a coconut 2. Artificial grass and barley seeds 3. Pebbles and brazil nuts 4. Bark chips/leaves and dried chick peas 5. Volcanic (something with creases and crevices – possible paper mâché something) and dried beans Tweezers, 4 different size bulldog clip, grip clips, plastic cups

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Lesson No. and Title	Learning objectives	Skills	Practical equipment
1. Types of fossils	ARE – To describe the different ways fossils are formed. AGD – To justify the importance of studying the remains of organism from many years ago.	Group work and discussion	PRAC: Fossils Selection of fossils and lenses to view them.
2. Fossils	ARE – To describe how evidence is used to show how an organism used to look. AGD – To explain how scientists know that organisms have changed over time	Group work and discussion Summary/note taking	PRAC: Making fossils Plaster of paris, plasticine, disposable tub, card, paper clips, stirrer, newspaper, gloves, selection of objects to be fossilised (plant matter and/or shells)
3. The fossil record	ARE – To explain how fossils provide evidence for evolution. AGD – To evaluate the limitations of the fossil record.	Class discussion	
4. Extinction	ARE – To describe the factors that may lead to extinction. AGD – To evaluate ways to prevent extinction.	Writing for a purpose - leaflet	
5. Biodiversity and genes banks	ARE – To describe the purpose of gene banks. AGD – To justify the importance of gene banks in maintaining biodiversity.	Summary/note taking	