3.7 Extinction

Biology NC link:

- changes in the environment 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
- the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.

Working Scientifically NC link:

- understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review.

Band	Outcome	Checkpoint	
		Question	Activity
Developing	State what is meant by the term extinct (Level 3).	A, 1, 3	Lit, Starter 2, Main
	State how scientists try to prevent extinction (Level 3).	1, 2	Starter 1, Starter 2, Main, Plenary 1, Homework
	Extract information from scientific text about a possible theory for dinosaur extinction (Level 4).		Main
Secure	Describe some factors that may lead to extinction (Level 5).	B, 1, 3	Lit, Starter 1, Starter 2, Main
	Describe the purpose of gene banks (Level 6).	D, 1, 2	Starter 1, Starter 2, Main, Plenary 1, Homework
	Interpret evidence provided in scientific texts to explain the most likely theory for dinosaur extinction (Level 6).		Main
Extending	Explain some factors that may have led to extinction (Level 7).	3	Lit, Starter 2, Main
	Explain the different types of gene bank (Level 7).	2	Starter 1, Main, Plenary 1, Homework
	Interpret evidence provided in a range of scientific texts to explain the most likely theory for dinosaur extinction (Level 7).		Main

Literacy
Students read scientific information, interpret evidence provided for one possible theory for dinosaur extinction, and listen to the viewpoints of others when discussing other possible theories to draw conclusions.

APP
Students use secondary information to explain different pieces of evidence that science cannot fully answer (AF1).

Key Words
extinct, gene bank

Answers from the student book

In-text questions	**A** An extinct species is one that has completely died out; no new organism can be created. **B** Any three from: changes to the organism's environment, destruction of habitat, outbreak of a new disease, introduction of new predators and competitors **C** dinosaur, dodo **D** The storage of genetic samples of different species.

Activity	**Extinction** Newspaper article describes how the organism they have chosen became extinct. Students should use scientific terminology, but also show an awareness of their audience.
Summary Questions	**1** extinct, anywhere, environment, predators, research (5 marks) **2** Gene banks store genetic samples from many different species. These samples can be used for research. These samples can be used to create new individuals. (3 marks) **3** 6 mark question. Example answers: Species live in habitats where they are successfully adapted. Changes to the habitat (e.g., climate change or introduction of a disease) can cause individuals to die/become less well adapted. This could lead to more competition for food/food sources become more scarce. Disease may also kill organisms. Fewer/no offspring are produced as a result. Population of the species decreases. Extinction occurs when all individuals of a species, throughout the world, have died.

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Starter	Support/Extension	Resources
Gene banks (10 min) Introduce the idea of gene banks. Discuss the different types of gene banks and their purpose. Students then apply this knowledge to categorise statements as being true or false. **Extinct or endangered?** (5 min) Show students images on the board of extinct and endangered animals, for example, Siberian tigers, giant pandas, dinosaurs, and dodos. Ask students to suggest ways to separate these animals into two groups. Students should then offer suggestions to the definition for the words endangered and extinct.	**Extension**: Students should discuss the ethical implications of gene banks. **Extension**: Students should consider what factors contribute to organisms becoming extinct or endangered, and what humans can do to stop this.	**Interactive**: Gene banks
Main	**Support/Extension**	**Resources**
Extinction of the dinosaurs (40 min) Introduce possible factors leading to the extinction of certain species, and explain the importance of human intervention (such as gene banks) in reducing the risks of future extinction of endangered species. Students then read about three possible theories to explain the extinction of dinosaurs using a home and an expert group format by working in groups of three. They must teach each other about the different theories suggested, decide on the theory that seems most credible, and answer the questions. Please note that the three information sheets provided are ramped and should be allocated accordingly.	**Support**: The information card about climate change contains text that is easily accessible. **Extension**: The information sheet on the super-volcano theory is most conceptually challenging, and contains a mixture of evidence supporting and refuting the theory for students to evaluate.	**Activity**: Extinction of the dinosaurs
Plenary	**Support/Extension**	**Resources**
Why bother with gene banks? (10 min) Ask students to explain what the term gene bank means and give examples of the gene banks available. Students should explain why gene banks are necessary, and why humans want to safeguard endangered species. **Fact or theory?** (5 min) Discuss as a class the conclusions from the dinosaur extinction activity. Ask students to explain the differences between fact and theory. Students should suggest reasons why it is difficult to prove which of the three theories is actually true.	**Support**: Different facts and theories can be provided to students for them to categorise. **Extension**: Students should give the types of evidence required by scientists to prove a theory.	
Homework		
Students write a paragraph to explain in detail how scientists could have used gene banks to save the dinosaurs. Students should also research the importance of biodiversity in organisms in order to prevent extinction. An alternative WebQuest homework activity is also available on Kerboodle where students research an extinct organism.		**WebQuest**: Extinction