



Episode 3:

A game of snakes and antlers (Belfast)

Natural History Adventurers' mission

Play a game to learn about various evolutionary and environmental challenges.

Episode journey

By playing *Snakes and Antlers* children understand the impact environmental factors have on evolution, and the impact environmental and human factors have on the survival of species today. Children learn what extinction means and some of the ways species become extinct.

Curriculum learning outcomes

- children learn that living things can be grouped in lots of different ways (**Science**)
- children will understand that changing environments can sometimes pose dangers to living things (**Science**)
- children will understand that living things have changed over time (**Science**)
- children learn that animals and plants adapt to suit their environment (**Science**)
- children learn that adaptation may lead to evolution (**Science**)

The **introductory postcard** both explains why there are no snakes in Ireland and tells the story of the magnificent but extinct giant deer. The curator reveals that members of his team have created a game called *Snakes and Antlers*. The instructions explain how the game is played as traditional snakes and ladders, but that the events of the game (reasons for going down snakes or up antlers, missing a turn or going back or forward) were built around environmental factors that lead to animal extinction or successful population growth. The curator challenges the children to play the game, learning about evolution in the process.

Possible additional activities

- children research what species of animals are at risk of extinction today
- children research what action is being taken by governments and non-governmental organisations to protect wildlife around the world today

Activities

Not all activities will be relevant for all classes. The activities were developed to be broken up and used over a period of time and as is suitable for your particular class.

- Before beginning this activity make sure the game board (**pupil resource 1**) is photocopied and printed on A3 for the number of groups you have, and the pieces (**pupil resource 2**) are cut out and stuck together to form triangular playing pieces. Pupils can do the sticking if teachers prefer.
- Read the **introductory postcard** and discuss it in class, using the **glossary** as required. Ask children to think back to previous challenges (if they undertook them – if not, the discussion can be more general but cover the same points). What caused the giant deer to become extinct? What do they understand by the term extinct? How do species become extinct?
- Read out **lesson script 1**, introducing the game and its rules. In this game the children will be playing different types of creatures: mammals, amphibians, insects, reptiles, birds and fish. Make sure they know that living things can be divided into groups, or classified, and what common features members of each of these groups will have.
- Go over the rules using **lesson script 1** and divide the children into teams of five. Set them off to play the game using A3 copies of the *Snakes and Antlers* game board and playing pieces. See notes on playing the game below.
- After playing the game bring the class together to discuss what they discovered, which they can share with Dippy's friends via email. Can they agree on the three most interesting things that they learned by playing the game?
- Ask the children what species they know about that are endangered today. Why are they endangered? What can we do to look after these species?
- Capture their key observations and, together with the children, write an email to Dippy's team at DippyOnTour@nhm.ac.uk with the subject line **Snakes**. This triggers an automated reply acknowledging receipt.





Notes on playing the game

The game of *Snakes and Antlers* is a version of snakes and ladders, with the positive and negative events linked to the various environmentally driven threats and opportunities faced by species.

Children play in teams of five, the team challenge being that all players must finish the game as quickly as possible. Finishing the game means you have avoided extinction and survived to the modern day. The playing pieces are animals from different groups (birds, fish, mammals etc) that have all evolved different abilities that help them to survive. Each Creature Feature asks if your creature has an ability (such as being able to fly). If your creature has that ability, move forward – if it doesn't, move back. Have a quick conversation as a class now about the different things (called characteristics) that make animal groups such as mammals, birds, insects, fish and reptiles, different from each other.

Younger or less able children might need more help with interpreting or answering the points on the board. You might consider asking the children to raise their hand if they come to a square they need help with, stopping the class and the clock and going over the point for everyone, before resuming play. Younger children might also benefit from playing the game in pairs or threes.

Resources required

Provided in the Natural History Museum package:

- introductory postcard
- lesson scripts 1
- pupil resources 1–2
- glossary

Provided by school:

- photocopying for the game boards (pupil resource 1) and playing pieces (pupil resource 2), playing pieces
- die for the game

English curriculum areas covered by Episode 3 (Key Stage 2)

Playing Snakes and Antlers will cover:

Year 6 Science: Evolution and inheritance

Pupils should be taught to:

- recognise that living things have changed over time and that fossils provide information about living things that inhabited Earth millions of years ago
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Year 4 Science: Living things and their habitats

Pupils should be taught to:

- recognise that living things can be grouped in a variety of ways
- recognise that environments can change and that this can sometimes pose dangers to living things

PSHCE

- taking turns, co-operating, winning and losing with good grace

The follow-up activities would cover:

Lower Key Stage 2 English: Reading

- retrieve and record information from non-fiction

Upper Key Stage 2 English: Reading

- retrieve, record and present information from non-fiction

Northern Irish curriculum areas covered by Episode 3 (Key Stages 1 and 2)

The world around us

Interdependence

Pupils should be enabled to explore:

- how living things rely on each other within the natural world
- the effect of people on the natural and built environment over time

Place

Pupils should be enabled to explore:

- how place influences the nature of life
- ways in which people, plants and animals depend on the features and materials in places and how they adapt to their environment
- features of, and variations in places, including physical, human, climatic, vegetation and animal life

Change over time

Pupils should be enabled to explore:

- how change is a feature of the human and natural world and may have consequences for our lives and the world around us
- ways in which change occurs over both short and long periods of time in the physical and natural world
- the effects of positive and negative changes globally and how we contribute to some of these changes





Scottish curriculum areas covered by Episode 3 (First and Second)

Science: Planet Earth

Biodiversity and interdependence

I can explore examples of food chains and show an appreciation of how animals and plants depend on each other for food.

SCN 1-02a

I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction.

SCN 2-01a

Welsh curriculum areas covered by Episode 3 (Key Stage 2)

Science at Key Stage 2

Activities should foster curiosity and creativity and be interesting, enjoyable, relevant and challenging for the learner. They should enable learners to initiate, explore and share ideas, and extend, refine and apply their skills, knowledge and understanding in new situations. They should allow time for thinking, peer discussion and reflection.

Science: Range

Interdependence of organisms

Pupils should use and develop their skills, knowledge and understanding by investigating how animals and plants are independent yet rely on each other for survival.

5. the interdependence of living organisms in those two environments and their representation as food chains
6. the environmental factors that affect what grows and lives in those two environments, eg sunlight, water availability, temperature

PSE: Skills

Learners should be given opportunities to:

- identify links between cause and effect

Working with others

Learners should be given opportunities to:

- work cooperatively to solve problems
- make and maintain friendships and other relationships

PSE: Range

Sustainable development and global citizenship

Learners should be given opportunities to:

- appreciate the natural world as a source of inspiration
- take an active interest in varied aspects of life in school and the wider environment
- develop a positive attitude on issues of poverty and fairness



Introductory postcard 3



Giant deer antlers on display at Ulster Museum in Belfast

Hello, I'm Dr Mike Simms, Curator of Palaeontology at National Museums Northern Ireland.

Try this: three of you lie down on the floor in a line, head to foot, one after another. The distance from the head of the first person to the feet of the third person is about the width of the incredible antlers of a giant deer!

This beautiful deer went extinct 8,000 years ago, but at least it reached Ireland in the first place. Snakes never lived in Ireland at all. Scientists believe that slithering snakes were just too slow. Britain and Ireland were once joined by a bridge of land, but the sea level rose and covered the bridge before snakes could wriggle across.

This story gave us an idea for a game called *Snakes and Antlers*.

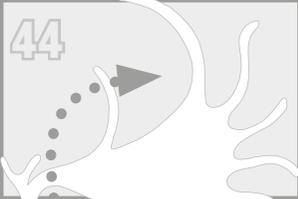
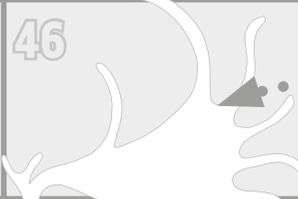
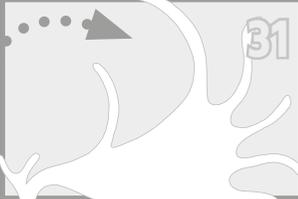
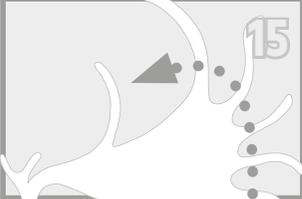
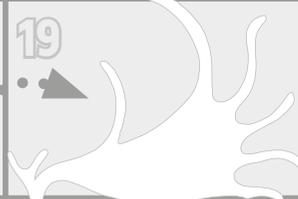
Your Natural History Adventurer challenge is to play our game and discover how difficult it is for animals to survive on Earth.

Good luck!

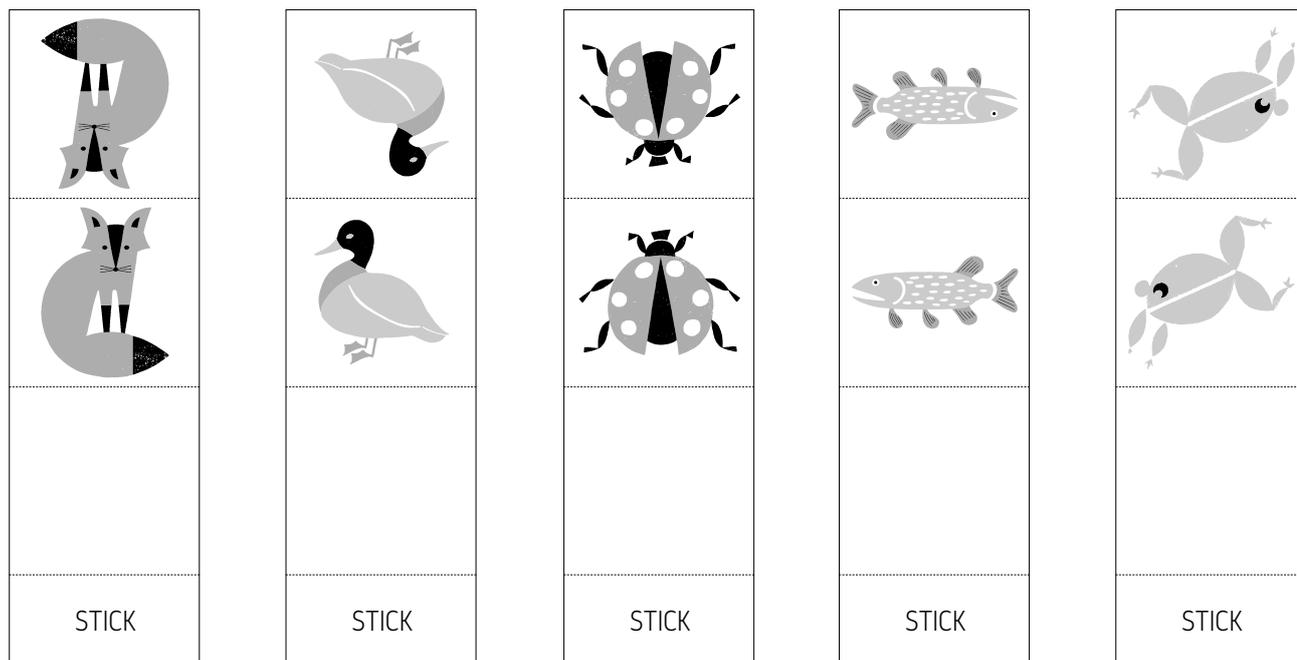
Mike



Natural History Adventurers
Dippy on Tour
Future Scientist Training
School
UK

43	44 	Oh no! Your species is hunted by a newly evolved creature: humans. Move down to 32.	46 	47	Oh no! Global warming caused by humans means your favourite food disappears! Miss a turn.	Finish 49 Congratulations! Your species has survived without going extinct – yet.
Oh no! A new animal arrives in your habitat and starts eating your food. Move down to 27.	42 41	40	39 	Meteorite Strike! Many species go extinct. Your species survives – just. Miss a turn.	37 	Creature Feature! Can your creature fly? If so, move forward three spaces. If not, move back three spaces.
Hooray! Your main predator goes extinct, so your population grows quickly! Move up to 44.	30 	31 	32 	Hooray! Your species survives a supervolcano and your population grows when the ash cloud clears. Move up to 46.	33 34	Supervolcano! Ash from the huge eruption blocks out the Sun for two years! Miss a turn.
Creature Feature! Can your creature breathe underwater? If so, move forward three spaces. If not, move back three spaces.	27 	Oh no! You run out of food due to a freezing winter. Move down to 11.	25	Ice Age Miss a turn	Oh no! You fail to reach a new home before the sea levels rise and cover the land bridge. Move down to 8.	Hooray! You become immune to a disease. Move up to 37.
15 	Hooray! A new type of food arrives in your habitat. Move up to 31.	17	Creature Feature! Does your creature have a backbone? If it does, move forward three spaces. If it doesn't, move back three spaces.	19 	20	21 
14	13	12	11 	10	Creature Feature! Is your creature covered in fur? If so, move forward three spaces. If not, move back three spaces.	9 8
Start 1	Hooray! Your species travels to a new land by crossing the ocean on a raft made from plants. Move up to 15.	Ice Age Miss a turn	Hooray! The sea level is rising, but your species reaches a new home before the sea covers the land bridge. Move up to 19.	5	6	Creature Feature! Does your creature lay eggs? If so, move forward three spaces. If not, move back three spaces.

pupil resource 2: Counters



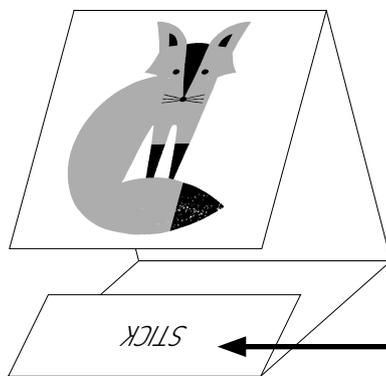
Fox
(mammal)

Duck
(bird)

Ladybird
(insect)

Pike
(fish)

Frog
(amphibian)



- cut along solid lines
- fold along dotted lines
- add glue to flap and stick to reverse of the icon

Lesson script 1

Hello teacher, please display this on the whiteboard.

Welcome to the game of *Snakes and Antlers*. If you've played snakes and ladders before, you might find this familiar. This is a game of adaptation and survival. To win, your creature will need to reach square 49 without going extinct.

Individual play: The first player in your group to reach square 49 is the Creature Champion.

Team play: Your whole class will be playing this game in teams of five and your teacher will give you 25 minutes to play. The team with the most players at square 49 by the end of the 25 minutes will be Class Champions.

You will each use a playing token featuring a creature from a different group of animals.

The creatures are:

- fox (mammal)
- duck (bird)
- ladybird (insect)
- pike (fish)
- frog (amphibian)

Along the way, different events will happen to you. Some events will help you survive and some will make things more difficult.

Antlers: When you land on an antler, something happens to help your species survive. This means you go up another level of the game board.

Snakes: When you land on a snake, something happens that makes it harder for your species to survive. This means you drop to a lower level of the board.

Extinction Events: Ice ages, supervolcanoes and meteorite strikes are major events that threaten extinction. You'll have to miss a turn if you land on one of these events, but your species will survive (but only just). Take a moment now to talk with your teacher to make sure you know what each event means.

Creature Features: Different groups of animals have different strengths and weaknesses. Mammals, birds, insects, fish and reptiles have all evolved different abilities that help them to survive. Each Creature Feature asks if your creature has an ability (such as being able to fly). If your creature has that ability, move forward – if it doesn't, move back. Have a quick conversation as a class now about the different things (called characteristics) that make animal groups, such as mammals, birds, insects, fish and reptiles, different from each other.

How to play:

1. Each player selects a creature token.
2. The youngest player goes first.
3. Players take it in turn to roll the dice.
4. If you roll a six, you get to roll again.
5. Players take turns to move around the board.
6. Your teacher will set a timer to 25 minutes. Your team's aim is to get as many of your creatures to square 49 before the time is up. The team with the most players on square 49 by the end of the 25 minutes wins.

When you have finished playing, please email the most interesting things you discovered to Dippy's team at DippyOnTour@nhm.ac.uk with the subject line **Snakes**. Good luck!

Episode 3 glossary

Adaptation

The process by which living things change over time to become better suited to where they live. For example, amphibians, such as frogs, are born in the water. When they are born, they breathe with gills, like a fish. But as they grow up they develop lungs and can live on land.

Antlers

The branching horns that grow from the heads of animals such as deer. Antlers fall off and grow again each year.

Backbone

Also called a spine, this is the bone that runs down the back of mammals, reptiles, fish, birds and amphibians.

Bird

A warm-blooded animal with feathers, wings and a beak. Birds lay eggs and most species of bird are able to fly.

Disease

A condition that stops the body of a plant or animal from working as usual. A disease can often be recognised by signs and symptoms. For example, a cold is a common disease and its symptoms include coughing and sneezing.

Evolution/to evolve

The process by which different kinds of living organisms developed from earlier forms during the history of Earth.

Extinct

No longer existing, died out.

Habitat

The natural home of a living thing.

Ice age

A time in Earth's history when temperatures were colder and large areas of land were covered with ice.

Immune

An animal is immune if it has high levels of resistance to a disease. This means it is hard, or maybe impossible, for the animal to catch that disease.

Insect

A small animal with no backbone but six legs. Many insects have wings.

Land bridge

A piece of land that connects two larger pieces of land.

Mammal

A warm-blooded animal with hair or fur. Most mammals give birth to live young that are fed on milk produced by the female.

Meteorite strike

When a meteorite (a piece of rock from outer space) crashes into Earth's surface.

Raft

A floating object that animals can use to travel across water.

Reptile

A cold-blooded animal with a backbone. It has dry, scaly skin and lays shelled eggs on land. Examples include snakes, lizards and tortoises.

Species

A group of living things that can breed together. For example, a robin is a species of bird.

Survival

Staying alive through dangers and challenges.

Supervolcano

A very powerful type of volcano that can cause animals and plants to go extinct.