# Episode 2: The big bird watch (Birmingham)

## Natural History Adventurers' mission

**Develop field skills in animal identification and compare extinct animals with their living descendants.**

## Episode journey

**Children take part in a 20-minute birdwatching excursion in their school grounds. Children understand the common features of a group of living things. Children discover how theropod dinosaurs evolved into birds.**

## Curriculum learning outcomes

- children will be able to identify and name a variety of living things in their local and wider environment (**Science**)
- children will learn to make accurate observations and tally their findings (**Science**)
- children will understand that living things produce offspring, but these may not be identical to their parents (**Science**)
- children will respond to a story about extinction by writing haikus (**English/Literacy**)

The **introductory postcard** reveals how birds are a modern kind of theropod dinosaur. The children are asked to first go birdwatching outside and identify common features that birds have. Pupils can compare the annotated diagram of a theropod dinosaur with their bird observations to identify common features.

In a follow-up lesson script the children are introduced to the sad story of the greak auk's extinction and are encouraged to write a haiku about the last auk.

## Possible additional activities

- children watch birds around their own homes over a weekend and see how many different species they observe and what the most frequent visitors are
- children produce graphs and tables as appropriate to show the most frequent bird visitors to their school and home
- children set up a bird-feeding station in a suitable area of the school grounds

## 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.*

- Read the **introductory postcard** to the children and discuss it in class, using the **glossary** as required.
- Read **lesson script 1** to the children and lead an initial discussion about the sorts of birds they are familiar with and those they might observe in or around the school grounds. When would be a good time to observe birds? What behaviours would most likely help the children see as many birds as possible?
- Look at the bird-spotter sheet of common birds sent by the team (**pupil resource 1**) and get to know some likely sightings using the classroom's interactive whiteboard.
- Go through the survey sheet (**pupil resource 2**) with the children, ensuring they understand the different terms.
- Take the children out on their 20-minute big bird watch. Pupils should work in pairs, each pair with a copy of the bird-spotter sheet (**pupil resource 1**) and the survey sheets provided (**pupil resource 2**). Pupils can note the species and physical and behavioural characteristics (such as song or call).
- Bring the children back to the classroom to discuss their observations. What do they think makes a bird a bird? A key aspect of this discussion is to explore whether the characteristics they've observed apply to all birds. Flight, for example, could be challenged as a universal bird characteristic, as some birds have lost ability to fly.
- Read **lesson script 2**. Look at the image of a theropod dinosaur (**image 1**) and the image of a bearded vulture (**image 2**), and discuss visual differences and similarities between the two. Make comparative lists.
- After observing the changes between the theropods and birds, show the children the picture of the *Archaeopteryx* (**image 3**) to identify the features it shares with theropods and those it shares with a modern bird. Explain that scientists actually think of birds as a type of dinosaur.

- Introduce **image 4**, showing the skeletons of a theropod, an *Archaeopteryx* and a pigeon, and encourage pupils to create lists of features that are shared between the three skeletons. Ask children to work in pairs and hand one copy of **image 4** to each pair. Encourage pairs to draw lines onto the image to highlight similarities and differences.
- Read **lesson script 3** to introduce the next activity, about the extinction of the great auk. Show **image 5** (great auks) and read the sad story of the death of the last of its species. Discuss the story. How did it make them feel? *Note: some children may find this story upsetting – you know your children best and whether you need to scale back on the story or how you read it.*
- Ask the children to write their own haikus about the last great auk, displaying the instructions given in **lesson script 3**.
- With the class compose an email summarising their discoveries. Send this to Dippy's team of experts at DippyOnTour@nhm.ac.uk with the subject line **Birds**. This triggers an automated reply acknowledging receipt.

## A note on the birdwatching trip

As with the foliage gathering in **Episode 1**, this can be adapted to meet your class's specific needs. In its simplest form it can consist of a 20- to 30-minute excursion to observe any birds living near or flying over school grounds. This is guaranteed to bring pupils into contact with common birds such as pigeons, crows, gulls, starlings, blackbirds etc. Alternatively, the excursion can be a more fully developed ornithological trip to a local bird reserve. The notes from the team include a checklist of common birds, so you can use your classroom whiteboard to zoom in on birds if close-up views prove tricky in the field.

You could also ask the children what kind of behaviours are likely to make it easier to spot birds? Being quiet and still.

## Resources required

Provided in the Natural History Museum package:

- introductory postcard
- lesson scripts 1–3
- images 1–5
- pupil resources 1–2
- glossary

Provided by school:

- photocopies of bird-spotting sheet (pupil resource 1)
- copies of image 4 (bird skeletons)
- clipboards and binoculars (if available)

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

*The big bird watch covers:*

### Science Year 4: Living things and their habitats

Pupils should be taught to:

- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

*Birds verses theropods comparison covers:*

### Science Year 6: Evolution and inheritance

Pupils should be taught to:

- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents

*Great auk poem covers:*

### English: Writing – composition Lower Key Stage 2

Pupils should be taught to:

- Plan their writing by:
  - discussing writing similar to that which they are planning to write in order to understand and learn from its structure, vocabulary and grammar
  - discussing and recording ideas
- Draft and write by:
  - composing and rehearsing sentences orally, progressively building a varied and rich vocabulary and an increasing range of sentence structures

### English: Writing – composition Upper Key Stage 2

Pupils should be taught to:

- Plan their writing by:
  - identifying the audience for and purpose of the writing, selecting the appropriate form and using other similar writing as models for their own

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

### The world around us

### Interdependence

Pupils should be enabled to explore:

- how they and others interact in the world
- how living things rely on each other within the natural world

### 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

### Language and literacy

### Talking and listening

Pupils should be enabled to:

- tell, re-tell and interpret stories based on memories, personal experiences, literature, imagination and the content of the curriculum

### Writing

Pupils should be enabled to:

- participate in modelled, shared, guided and independent writing, including composing on-screen
- discuss various features of layout in texts and apply these, as appropriate, within their own writing
- experiment with rhymes, rhythms, verse structure and all kinds of word play and dialect

## Scottish curriculum areas covered by Episode 2 (First and Second)

### Science: Planet Earth

### Biodiversity and interdependence

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**

### Literacy and English: Writing

### Enjoyment and choice

I enjoy creating texts of my choice and I regularly select subject, purpose, format and resources to suit the needs of my audience. **LIT 1-20a / LIT 2-20a**

### Creating texts

I can convey information, describe events, explain processes or combine ideas in different ways. **LIT 2-28a**

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

### 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.**

4. through fieldwork, the plants and animals found in two contrasting local environments, eg identification, nutrition, life cycles, place in environment

### Science: Skills

### Developing

2. make careful observations and accurate measurements, using digital and ICT equipment at times
4. make comparisons and identify and describe trends or patterns in data and information

### English/Welsh

### Strand: Writing

### Organising ideas and information

- meaning, purposes, readers
- structure and organisation

### Writing accurately

- language

### Literacy framework

Reading – use a range of strategies to make meaning from words and sentences, including knowledge of phonics, word roots, word families, syntax, text organisation and prior knowledge of context.

Writing – write for different purposes and readers choosing words for variety and interest.

Oracy – explain, listen, contribute to group discussion.

# Introductory postcard 2

Great auk

Hello,

I'm Arkhat and I'm a Researcher at the Natural History Museum in London.

Today, something extraordinary is going to happen: you're all going to see dinosaurs. Not fossils but living, breathing, squawking dinosaurs. You'll need to go into the playground and look up to the sky. After a minute, you'll see a dinosaur – more commonly known as a bird.

Thomas Huxley, a Victorian Natural History Adventurer, first noticed the similarity between birds and dinosaur fossils. Scientists have since explored the idea that theropod dinosaurs didn't go extinct but evolved into modern birds. Today, all of the evidence suggests that this is true.

Your Natural History Adventurer challenge is to develop your observation skills by spotting as many kinds of birds as you can. Identifying wildlife in the world is a vital skill for Future Scientists.

Good luck!

Arkhat

Natural History Adventurers

Dippy on Tour
Future Scientist Training

School

UK

# Lesson script 1

To prove that you have the nature-spotting skills of a Future Scientist, your challenge is to go into your school playground and spot as many birds as you can.

To get you started, here are some tips on spotting one of the commonest birds in the UK, the feral pigeon.

Note that there are different species of pigeon. The feral pigeon is the most common, but there are also occasional true wood doves, rock doves and turtle doves.

Here's what a feral pigeon looks like:

The pigeon flies with fast flaps of its wings, and makes a noise that sounds like 'coo'. On the ground it is quite brave as it pecks around for food. Humans can get very close to it before it flies away.

Some of you might still be finding it hard to believe that birds really are dinosaurs, but if you look at the feet of this pigeon, you might see some similarity with the feet of a *Tyrannosaurus* or *Allosaurus*.

Enjoy your bird spotting!

*Hello teacher, please distribute* ***pupil resources 1*** *(****bird ID card****) and* ***2*** *(****bird spotter****) to pairs of pupils – one set of resources per pair.*

# Pupil resource 1: Bird ID card

**Blackbird**

**Blue tit**

**Chaffinch**

**Great tit**

**Greenfinch**

**Robin**

**Starling**

**House sparrow**

**Wood pigeon**

# Pupil resource 2: Bird spotter

| What bird did you see? | What did it look like? | What did it sound like? | What did it do? |
|---|---|---|---|
| Blackbird | Smallish black bird with an orange beak. | It made a quiet squawk as it took off. | It pecked at the ground and then flew away. |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## Image 1: Theropod dinosaur (*Oviraptor*)

© The Trustees of the Natural History Museum, London. All rights reserved.

## Image 2: Bearded vulture

© The Trustees of the Natural History Museum, London. All rights reserved.

## Image 3: *Archaeopteryx*

© The Trustees of the Natural History Museum, London. All rights reserved.

# Lesson script 2

I hope you spotted lots of interesting birds. If you spotted a white-tailed sea eagle you should drop everything and phone the Royal Society for the Protection of Birds right away. The Royal Society for the Protection of Birds is a charity that works to protect birds and all wildlife, and they love to hear about people spotting rare birds.

Some of you might still be finding it hard to believe that some dinosaurs really did evolve to become birds, so here's some more evidence. Evidence is information that scientists use to form their ideas about how the world works. Your teacher will now show you some pictures.

*Hello teacher, please ask two pupils to hold up* ***images 1*** *and* ***2****, showing a theropod dinosaur and the bearded vulture.*

These pictures show a theropod dinosaur and a modern bird called a bearded vulture. Take a look at the two images and see if you can come up with a list of all the differences and similarities between these creatures.

*Hello teacher, please have that discussion now.*

Here is a third picture that shows a creature called *Archaeopteryx*, which scientists believe was one of the earliest birds.

*Hello teacher, please ask a pupil to hold up* ***image 3****, standing between the other two.*

*Archaeopteryx* is in the middle. It evolved some of the features of a modern bird, but still has some features of a dinosaur. This shows us how species change very slowly over time. Now here is a picture of three skeletons: a theropod dinosaur, *Archaeopteryx* and a modern bird.

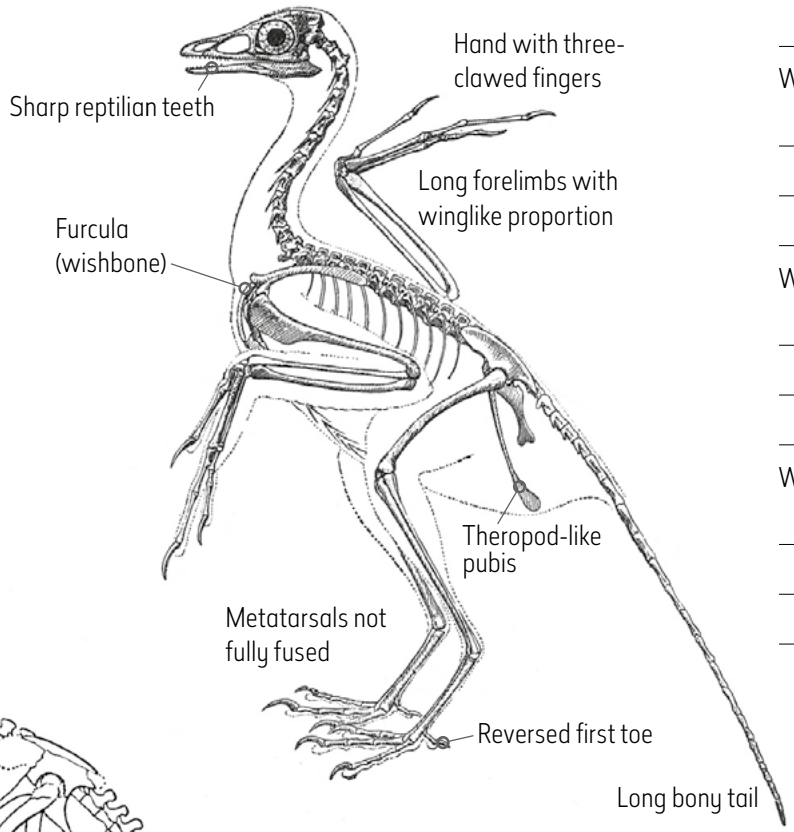
*Hello teacher, hand out* ***pupil resource 3****, the image with the the skeletons.*

Either working in pairs or as a class, your challenge is to identify features that are the same and those that have changed. To get you started, one feature is whether all three creatures had teeth.

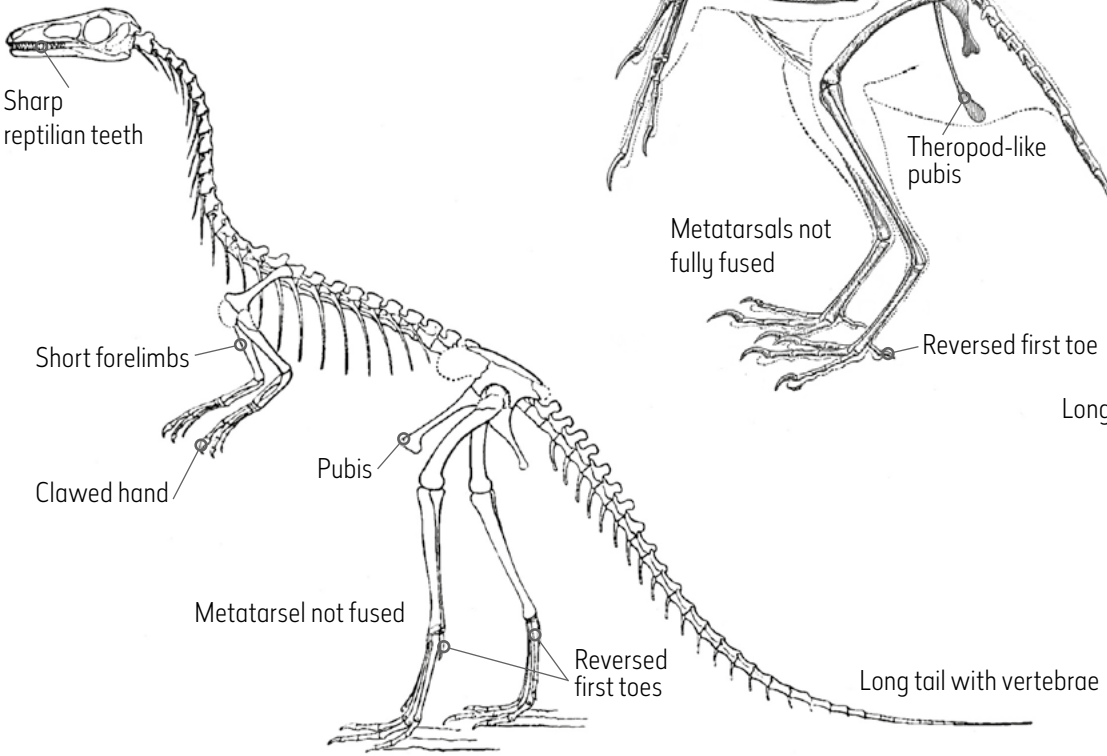
Looking at the skeletons of these creatures can help us discover that over millions of years theropod dinosaurs really did evolve into modern birds, one tiny change at a time.

## Pupil resource 3: Link up the matching words

**Ancesteral bird-like dinosaur**
*Archaeopteryx*




**Dinosaur**
*Compsognathus* (theropod)



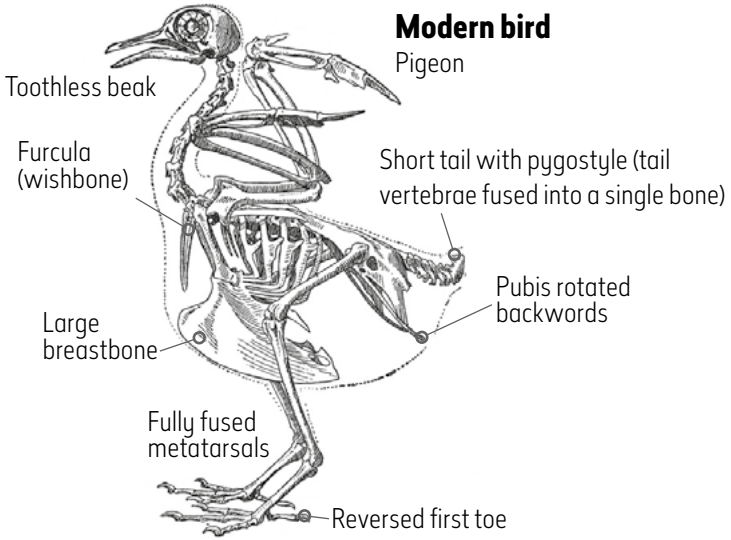

What is similar between the non-avian (non-bird) dinosaur and ancestral avian (bird-like) dinosaur?

What is different?

What is similar between the ancestral avian (bird-like) dinosaur and modern bird?

What is different?

**Modern bird**
Pigeon



# Lesson script 3

Our natural world has always inspired artists to create extraordinary stories, poems and illustrations. It's important for Future Scientists to understand how nature can inspire us, so your next challenge is to take the following true story from nature and create some art of your own.

## The last great auk

In June 1840, three Scottish sailors landed on the craggy edge of a rock known as Stac an Armin in Scotland. As they climbed it they spotted a peculiar bird that stood head and shoulders above the puffins, gulls and other seabirds.

The sailors watched as the bird, a great auk, waddled clumsily along. Even though it was elegant and quick in the water, it was slow on the land. When humans chased it, it wasn't able to fly away.

Perhaps the men enjoyed the thrill of the hunt, or perhaps they realised that the auk's meat and feathers were incredibly valuable. In any case, they kidnapped the bird and took it back to their ship. For three days, the sailors kept the great auk alive, but on the fourth day, during a terrible storm, they grew fearful and superstitious. Thinking the auk was a witch who was conjuring the storm, they killed it.

The great auk was the last of its kind ever to be seen on the British Isles. Four years later, the species vanished from the world entirely when fishermen hunted down the last pair on the shores of an island near Iceland. The men spotted the two great auks in the distance and attacked them, catching and killing the fleeing birds. The female had been protecting her nest and before leaving, the fisherman crushed the last great auk egg with his boot.

Great auk specialist John Wolley interviewed the two fishermen who killed the last great auks, and this is what they said:

'The rocks were covered with guillemots and there were the great auks… they walked slowly. Jón crept up with his arms open. The bird that Jón got went into a corner but mine was going to the edge of the cliff. It walked like a man… but moved its feet quickly. I caught it close to the edge – a precipice many fathoms deep. Its wings lay close to the sides – not hanging out. I took him by the neck and he flapped his wings. He made no cry. I strangled him.'

# Haiku challenge

*Hello teacher, please display this sheet on the class whiteboard.*

The story of the death of the last great auks is very sad. It inspired Dippy's team to write a special poem called a haiku. What makes haikus interesting is that they don't rhyme, but are always written the same way:

The first line has five beats,

The second line had seven beats,

The third line has five beats.

Here's a great auk haiku, though surely you will be able to do much better.

The last great auk waits.

When the fishermen approach,

She stays by her nest.

Your final challenge today is to write your own haiku about the death of the last great auks.

Remember, here's how to write a haiku:

The first line has five beats,

The second line had seven beats,

The third line has five beats.

# Episode 2 glossary

### *Archaeopteryx*

*Archaeopteryx* means ancient wing. It is a type of bird-like dinosaur that is transitional between non-avian feathered dinosaurs and modern birds. *Archaeopteryx* is considered the first bird even though it still had teeth, a snout and claws in its wings. This means that birds can have those reptilian features.

### Bearded vulture

A strange and beautiful bird that feeds on dead animal bones.

### Evolution

The process by which different kinds of living things developed from earlier forms during the history of Earth. The changes between earlier and later forms result from tiny changes happening over a very long time.

### Extinct

No longer existing, died out.

### Great auk

The great auk (*Pinguinus impennis*), also called garefowl, was a flightless seabird that became extinct in 1844. It bred in colonies on rocky islands off North Atlantic coasts (St Kilda, the Faroe Islands, Iceland and Funk Island off Newfoundland). Its remains have been found as far south as Florida, Spain and Italy.

### Guillemot

A small black-and-white seabird that looks a little like a penguin. It is very quick in the water but very slow on land.

### Puffin

A small black-and-white sea bird with a large, brightly coloured beak.

### Theropod

Theropods were a group of dinosaurs that had short forelimbs and grasping hands, and walked or ran on hind legs. Most of them were carnivorous. Many had feathers. *Tyrannosaurus* and *Velociraptor* were both theropods.

### White-tailed sea eagle

The largest eagle living in the UK. Its wings can measure 2.5 metres from tip to tip.