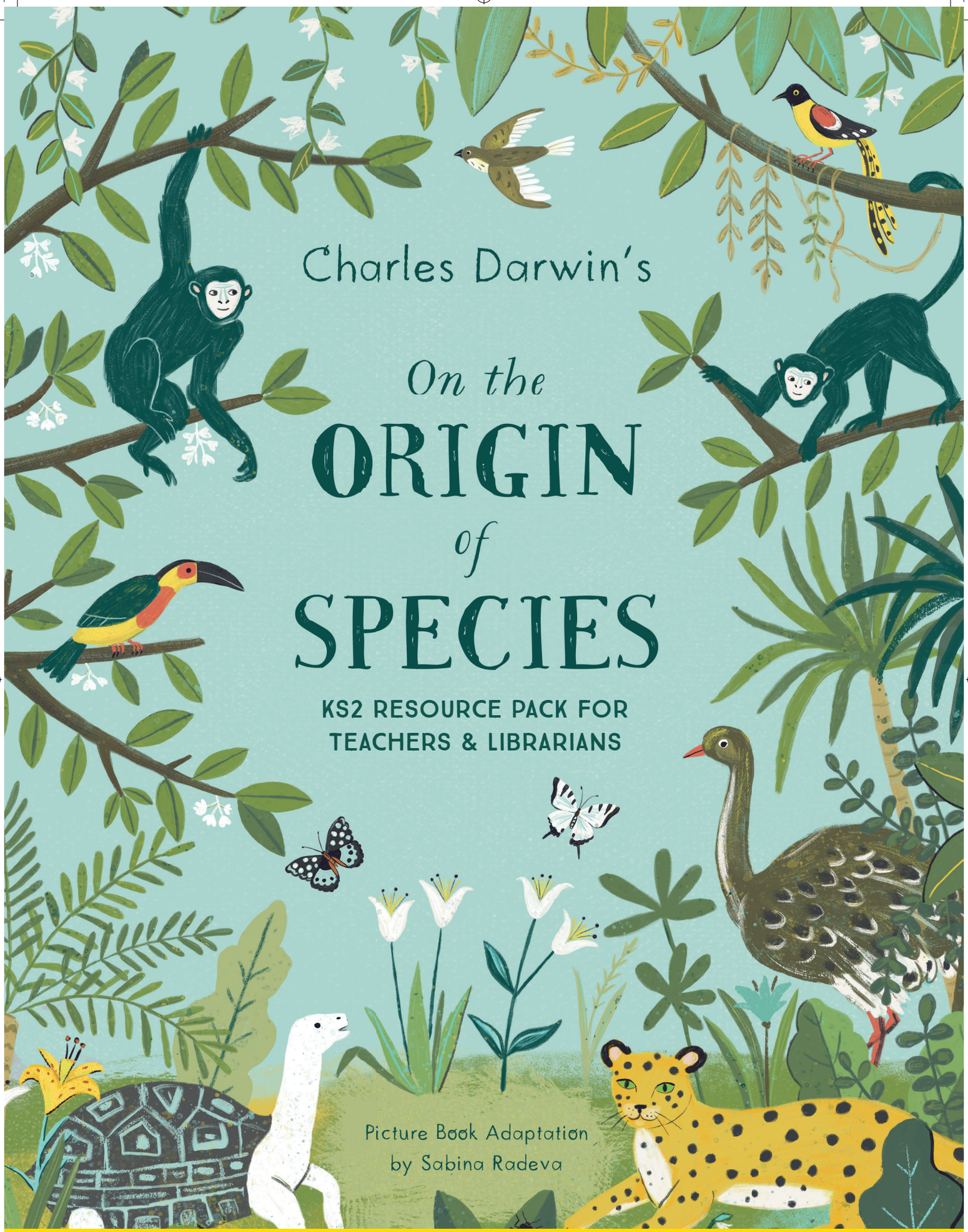


Schools

Inspiring you to share stories

Charles Darwin's
On the ORIGIN of SPECIES

THE AIM

This Resource Pack is based on the first ever picture book retelling of *'On The Origin of Species'*, written and illustrated by Sabina Radeva, and perfect for bringing Charles Darwin into KS2 classrooms (ages 8+).

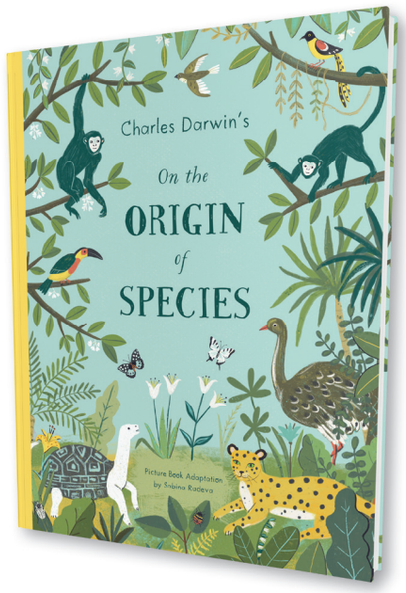
The four lessons and reflection tasks included here have been designed as sequential activities and can be taught as part of a combined Literacy and STEM 'Adaptation, Inheritance and Evolution' unit, or as standalone activities.

Their overall objective is to introduce pupils to Charles Darwin's theories and to give them the opportunity to investigate and appreciate the environment in which they live.

We hope you enjoy!

The Penguin Schools Team

ABOUT THE BOOK



A beautiful retelling of ***Charles Darwin's 'On The Origin of Species'***; this accessible work brings evolution to the younger generation through stylish illustrations and a simple, easy-to-understand text.

'On The Origin of Species' has been the definitive explanation of the theory of evolution since it was first published in 1859. Now molecular biologist and illustrator Sabina Radeva unites her two passions to create a 48-page retelling of this seminal text.

Pulling together Darwin's observations from his travels around the world and his groundbreaking – and controversial – explanation of how species form, develop and change over hundreds of thousands of years, ***'On The Origin of Species'*** is as relevant and important now as it ever was.

Charles Darwin's
On the ORIGIN *of* SPECIES

RESOURCE PACK - OBJECTIVES & OUTCOMES

This Resource Pack provides material for four or more, hour-long lessons that can take place as part of combined Literacy and STEM lessons (in particular during 'Adaptation, Inheritance and Evolution' units), or as extra-curricular activities.

LESSON 1 - DARWIN DETECTIVES!

Objectives: To make inferences about Charles Darwin based on the text; to research and record information about Charles Darwin

Outcomes: A completed 'research sheet' for Charles Darwin; a presentation to show ideas

LESSON 2 - INHERITANCE AND VARIATION: MY PARENTS AND ME

Objectives: To identify inherited characteristics in living things; to understand that variation occurs within offspring as well as across a species; to understand the difference between inherited and environmental characteristics

Outcomes: A completed Inheritance Profile; a list of inherited and environmental characteristics

LESSON 3 - CHARACTERISTICS: ADVANTAGES AND DISADVANTAGES

Objectives: To understand that variations can be an advantage or a disadvantage; to identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Outcomes: A table of advantages of different beak types; a storyboard showing the evolution of the pink-downed peach

LESSON 4 - HOW TO SURVIVE: DIFFERENT HABITATS

Objectives: To identify the challenges of different habitats; to identify advantages and disadvantages of certain characteristics in different habitats

Outcomes: A table of challenges in different habitats; a list of matching habitats and animals; a group presentation on one animal and how it is adapted to its habitat

LESSON ONE - DARWIN DETECTIVES!

LEAD-IN QUESTIONS:

- Why are scientists important?
- What do you know about Charles Darwin's life and discoveries?

TASK 1:

Look at the two extracts from ***Charles Darwin's 'On The Origin of Species'*** – one depicting Charles Darwin as a young man, and one depicting him as an old man. Answer the questions below:

Extract 1

1. What can you **infer** about Charles Darwin from *how* he has been illustrated by Sabina Radeva in both extracts?
2. What facts do you learn about Charles Darwin in Extract 1? List at least three.
3. What do you think the term 'English naturalist' means in Extract 1?
4. What can you guess about Darwin's discoveries from the illustration in Extract 2?
5. What can you **infer** about Charles Darwin from his quote in Extract 2?

Extract 2

TASK 2:

It's time to become Darwin Detectives! Use the following biography headers or 'clues' to carry out research into Charles Darwin. Try to make notes under each header.

CHILDHOOD	EDUCATION	HMS BEAGLE

GALÁPAGOS ISLANDS	FINCHES	NATURAL SELECTION

Remember, when you are carrying out your research, keep a look out for the key words that we'll be looking at in this Charles Darwin Resource Pack: **Adaptation** **Inheritance** **Evolution**

TASK 3:

Now that you have gathered some information on Charles Darwin, work together in pairs to fill in the following research sheet:

CHARLES DARWIN RESEARCH SHEET

DRAWING OF CHARLES DARWIN

Birthplace:

Education:

Important work:

Theory of natural selection:

INFORMATION RELATING TO KEY WORDS:

- **Adaptation**
- **Inheritance**
- **Evolution**

TASK 4:

Present your Charles Darwin Research Sheets to the whole class, explaining the facts that you find the most interesting and why.

LESSON TWO – INHERITANCE AND VARIATION: MY PARENTS AND ME

Note, for this lesson, children need to bring in photos of themselves, their siblings and their parents. Some could bring in pictures of their parents when they were the age the children are now.

LEAD-IN QUESTIONS:

- What does the word 'inheritance' mean to you?
- What **characteristics** do you think offspring can inherit from their parents?
- Can you identify any of your classmates' parents by looking at their photographs? How?

TASK 1:

Look at the extract from ***Charles Darwin's 'On The Origin of Species'*** and answer the questions below:

1. Which **species** is being shown here?
2. Are all animals belonging to the same series *exactly* the same?
3. What sorts of **differences** or **variations** are listed here?

TASK 2:

With your partner, look at the photographs of your parents. Discuss which characteristics you have inherited from your parents.

DID YOU KNOW?

A characteristic is a feature of any organism – either 'seen' (like hair colour) or 'hidden' (like blood group). All humans look similar and may share certain characteristics because various combinations of characteristics result in what we call 'variation'.

Do you share any characteristics with your siblings, or do they look different to you?

Use the following categories as starting points:

EYE COLOUR

HAIR COLOUR

FACE SHAPE

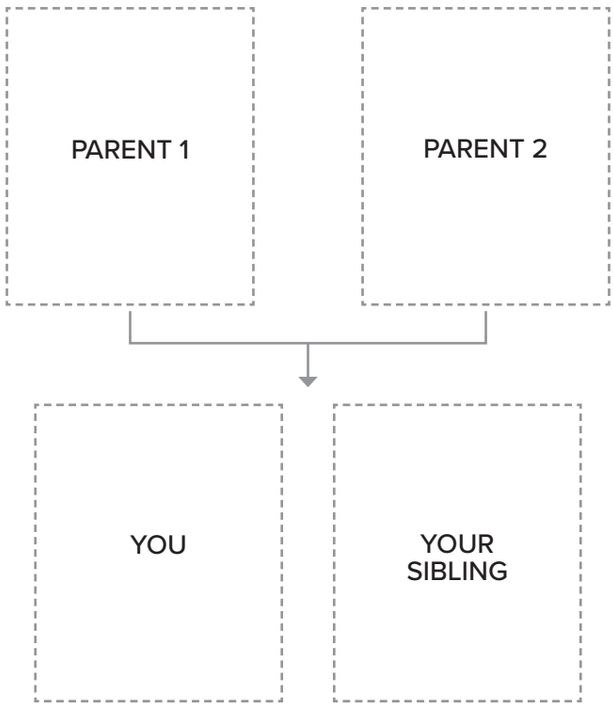
EAR LOBES
(ATTACHED OR NOT)

Share your findings with the class.

TASK 3:

Complete the Inheritance Profile below by inserting images and notes to show the things that you and any of your siblings have **inherited** from your parents.

INHERITANCE PROFILE



INHERITED:

INHERITED:

Extension: What are the **differences** or **variations** between you and your siblings?

DID YOU KNOW?

Some characteristics are **inherited** (come from our parents) through our 'genes' (e.g. eye colour and attached or unattached ear lobes), while other characteristics come from the life choices we make and the way that we live, such as where we live, the food we eat and the exercise we take. These are called **environmental characteristics**.

TASK 4:

Sort the cards below into '**inherited characteristics**' and '**environmental characteristics**':

EYE COLOUR	TANNED SKIN FROM THE SUN
EAR LOBES	SCAR FROM ACCIDENT
SHAPE OF NOSE	HEIGHT
LANGUAGE	GENERAL HEALTH
MIGRAINES	WEIGHT
BLOOD GROUP	SPORTING ABILITY
TONGUE ROLLING	INTELLIGENCE
HAIR COLOUR	SKIN COLOUR

Extension: Which characteristics might be considered a mixture of the two types?

LESSON THREE - CHARACTERISTICS: ADVANTAGES AND DISADVANTAGES

LEAD-IN QUESTIONS:

- Why do you think some animals become extinct?
- What do animals compete for in the wild? What do they need?
- What does the term 'survival of the fittest' mean?

TASK 1:

Look at the extract from ***Charles Darwin's 'On The Origin of Species'*** and answer the questions below:

1. Which **variation** or difference is identified here as 'not helpful at all'? Why do you think this is?
2. What did Darwin identify as being a useful variation for Galápagos finches?
3. Which four different beaks are described here?

DID YOU KNOW?

Natural Selection is the process whereby organisms better adapted to their environment tend to survive and produce more offspring

Some differences help animals survive in the wild. Some help them to hide, to hunt, to live longer or have lots of babies. Those babies will then grow to benefit from the helpful differences that have been passed down from their parents. The species is adapting to the world around it.

Extract from ***Charles Darwin's 'On The Origin of Species'***

TASK 2:

What is **useful** about each of the four different beaks of the finches? How do they make the finches **better adapted** to their environment in order to survive? Fill in the table below:

BEAK TYPE	ADVANTAGE
1.	
2.	
3.	
4.	

DID YOU KNOW?

Adaptation is when certain characteristics become more common because they are more likely to help living things survive!

TASK 3:

What is happening in the image below? What is a threat to the yellow smooth peach? Which peach is more likely to survive because it is better adapted to its environment? Imagine this is the first panel of a storyboard. Draw the next panel based on what you have learned about Natural Selection. Give reasons for your choices.

2

Extension: What is '**genetic mutation**'? How can genetic mutation be beneficial for a plant or animal?

LESSON FOUR - HOW TO SURVIVE: DIFFERENT HABITATS

RE-CAP QUESTIONS:

- What is 'Natural Selection'?
- What is 'variation'?
- What is 'adaptation'?
- Can you put the words 'variation', 'adaptation' and 'evolution' into one sentence?

TASK 1:

Imagine each table in your classroom is a different habitat. Travel to each table and discuss the **challenges** that you would face if you lived in each habitat. Use the cards on page 14.

DID YOU KNOW?

If plants and animals are well-suited to their environment they are more likely to survive long enough to pass their changes to their offspring.

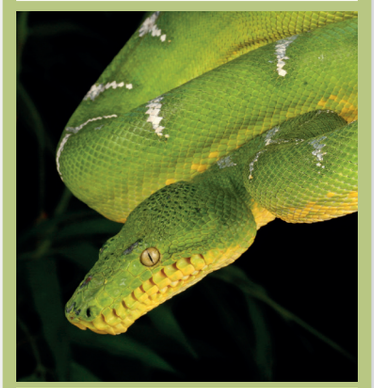
TASK 2:

Look at the animals below and the adaptations for each. Match each animal to one of the habitats from Task 1. Explain why each animal's adaptation makes it easier for it to survive in its habitat.

ARCTIC FOX

thick fur

EMERALD TREE BOA CONSTRICTOR



vivid green bodies

CAMEL

long eyelashes

RED SQUIRREL

sharp claws

RED FOX

broad diet

SHARK

streamlined body

TASK 3:

In your groups from Task 1, carry out more research into your habitat and matching animal. Can you be more specific about where you can find your animal in the world?

Find out more about the animal's characteristics and how it is adapted to its environment. Consider the following things:

- How does it find food?
- How does it find shelter?
- How does it avoid predators?
- How does it find water?
- How does it find space in which to live?

Present your findings back to the class.

REFLECTION ACTIVITIES

Take a moment to think about the work that you have completed in these lessons.

Finish the following sentences:

My **favourite piece of work** is...

One thing I learned about **Inheritance** is...

One thing I learned about **Adaptation** is...

One thing I learned about **Natural Selection** is...

I have enjoyed the book ***Charles Darwin's 'On the Origin of Species'*** because...