Teacher Resource

Science Week 2024

Focus Questions

As a class, discuss the stories featured in the BTN Science Week 2024 Special. Students will then respond to the following focus questions:

Evolution

1. What is a species?
2. The diversity of species came about through the process known as _____.
3. What is evolution?
4. What is the theory of natural selection? Give an example.
5. What questions do you have about the story?

Mass Extinction

1. Give an example of a plant or animal that has become extinct in the past 100 years.
2. What is a mass extinction event?
3. How many mass extinctions has the planet had?
4. Scientists believe we're living through a mass extinction now which is caused by what?
5. Give at least two examples of things being done to protect species from extinction.

Youth Conservation

1. Why is Django's local environment important to him?
2. What does Alice love about her local environment?
3. Explain the conservation project Django has been working on.
4. What advice do Django and Alice give about getting involved in conservation?
5. What did you learn watching this story?

EPISODE 22
13th August 2024

KEY LEARNING
Students will explore the topics explained in the BTN Science Week 2024 Special including evolution, mass extinction and conservation.

CURRICULUM
Science – Year 4
Living things have life cycles.

Science – Year 5
Living things have structural features and adaptations that help them to survive in their environment.

Science – Year 6
The growth and survival of living things are affected by physical conditions of their environment.

Science – Year 7
Classification helps organise the diverse group of organisms.

Science – Years 5 & 6
Scientific knowledge is used to solve problems and inform personal and community decisions.

Science – Year 7
Scientific knowledge has changed peoples' understanding of the world and is refined as new evidence becomes available.

Science – Year 7
People use science understanding and skills in their occupations, and these have influenced the development of practices in areas of human activity.

Activity: What do you see, think & wonder?

After watching the BTN Science Week 2024 Special hold a class discussion, using the following as discussion starters:

- What do you THINK about what you saw in the Science Week special?
- What does this video make you WONDER?
- What did you LEARN from the BTN story?
- Think of three QUESTIONS you have about the BTN Science Week 2024 Special.

Questions and Answers

All scientific discoveries start with a question! As a class, come up with some questions you think scientists ask and solve. Organise the questions into common themes. As a class, make a list of questions that you would like to ask a scientist.

Activity: Evolution Glossary

Students will brainstorm a list of key words that relate to the BTN Evolution story. Here are some words to get them started.

EVOLUTION	SPECIES	SURVIVAL
NATURAL SELECTION	DIVERSITY	DNA

Ask students to write what they think is the meaning of each word (including unfamiliar words). They will swap definitions with a partner and ask them to add to or change the definition. Check these against the dictionary definition.

Activity: Research Inquiry

The KWLH organiser provides students with a framework to explore their knowledge on the topic and consider what they would like to know and learn.

What do I **know**?	What do I **want** to know?	What have I **learnt**?	**How** will I find out?

Questions to research

Students will develop their own question/s to research about evolution. Students will collect and record information from a wide variety of sources. Students may develop their own question for inquiry or select one of the questions below.

Inquiry Questions

- What is evolution and how does it help plants and animals survive in their environments?
- How do fossils provide evidence for evolution?
- What is natural selection?
- What is an adaptation? Give examples of physical and/or behavioural adaptations.
- How have different animals adapted to extreme environments? Explore the adaptations of animals living in extreme conditions, such as deep-sea creatures or desert animals.
- What are some examples of animals that have changed over time?
- Investigate what is meant by evolutionary `fitness'.
- Who was Charles Darwin and why is he important in the study of evolution? (Watch the Science Week biography about Charles Darwin to help with your research).

Activity: Create a new species

Working individually or in pairs, students will use their imagination and create a new species of their own. They will imagine they have discovered a new species which has never been seen before. Use the following as a guide for this activity:

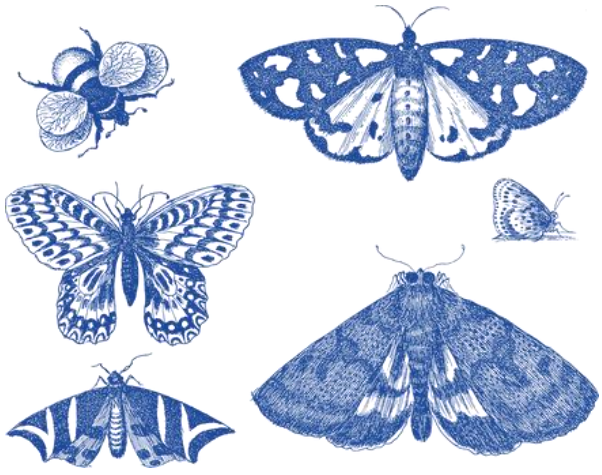
- Illustrate the new species using only a black felt-tip pen on a piece of A4 art paper – include as much detail as you can.
- Give your new species a common and scientific name.
- Describe what it looks like – what are some of its physical features?
- Describe its habitat.
- What does it eat? Does it have any predators?
- Include any adaptations it has that helps it survive in its environment.

Further investigation: Make a model of your new species and present it to your classmates.

Activity: Improve biodiversity in your local environment

Students will work together to help and introduce a native animal species into their school yard. Ask them to consider the following:

- What kind of animals could you reintroduce into your school yard? E.g., birds, bees, frogs, butterflies. Research the species native to your local area. Contact a ranger at a park near your school or the local council to learn more about the local species.
- Do you have the right type of habitat in your school yard for the native animal species to survive? Describe the climate and identify the plants in your school yard.
- What are some threats to the species that are caused by humans? How can you reduce these threats in your school yard?
- What materials and tools will you need to build the habitat or introduce new species to your area? Consider writing a guide or procedure manual.



- Build the habitat as a class and present the habitat to your school community. Teach students in other classes about the new habitat and involve them in caring for the new habitat.
- Prepare a map of the habitat which highlights key features. Include information labels in the habitat (for example, QR codes) for other students to learn more about the habitat and the biodiversity of your school yard. Include scientific information about the species.

Activity: Extinction Word Cloud

Students will brainstorm a list of key words that relate to the BTN Extinction story and create a word cloud. A word cloud is a visual made up of important/key words relating to a topic. Ask students to think of words they associate with the extinction of plants and animals. Create a word cloud using a free online word cloud creator such as Word It Out. Working in pairs, students can clarify the meanings of the words included in their word clouds.

Activity: Extinction Research

Discuss the information raised in the BTN Mass Extinction story. What questions were raised in the discussion and what are the gaps in students' knowledge? Students will develop their own question/s to research or choose one or more of the questions below.

- What causes species loss? Explore issues such as habitat loss, introduced species, pollution, population growth and overharvesting/hunting.
- What is a mass extinction? How is it different from the extinction of a single species, or even several different species?
- Which species have become extinct in modern times?
- What are the connections between human activities and species extinctions?
- What happens when an animal becomes extinct? If one species in the food chain becomes extinct, how would it affect the rest of the chain? Choose an endangered species and explore its role in the food chain.
- Who do you think should be responsible for addressing the problem? List some of the responsibilities of individuals, communities and the government. Think of ways you can make a difference at home and at school.
- What are the periods of mass extinction on Earth? Choose one to research in depth, their causes and their impacts.
- What evidence have scientists found to help understand how dinosaurs became extinct?

Activity: Extinct Animal Profile

Students will research and write a profile of an extinct Australian animal. Here is the Australian government's list of extinct animals or the Australian Museum has an extinct Australian animals list. Students can use the animal profile worksheet at the end of this activity to record their findings. Encourage students to use a range of sources to find their information.

Research

Students will research and create a profile of an extinct Australian animal. Students can use the Animal Profile at the end of this activity to record their findings.

- Illustration or photo
- Scientific and common name
- Appearance
- Habitat
- Feeding and diet
- Behaviours and adaptations
- When did it become extinct?
- What were some of the causes of its extinction?
- What were the effects of its extinction? Did it have an impact on humans, plants, or other animals?

Activity: Seed Vault

The Svalbard Global Seed Vault in Norway is a back-up collection of seeds from the world's food and fibre plants. It's known as the 'Doomsday Vault' because if something terrible were to happen and crops were wiped out, humans would be able to feed themselves. Watch the BTN story to learn more about the Doomsday Seed Vault.

Go on a virtual tour of the Svalbard Global Seed Vault to learn more.

Activity: Personal Response

Respond to the Naturalist Profiles featured in the BTN Science Week 2024 Special as a class. Students will choose one or more of the profiles and complete the following incomplete sentences:

- [*Scientist's name*] is an important person because…
- It was interesting to learn…
- These are five words that I would use to describe [*Scientist name*] …
- This story made me feel…
- It is important to celebrate [*Scientist's name*] because…

Activity: Become a Naturalist

Provide students with the opportunity to think and behave like a naturalist, a person who studies and observes nature. In this activity students will explore a natural habitat in their local area, identify plants and animals in the area and document what they find.

Students can work individually or in small groups, using the following as a guide.

Step 1: Plan

Plan a visit to a local nature reserve or your own school yard to explore and identify plants and animals. You will need to write a list of tools you may need for the investigation, for example: pen and paper for taking notes, camera and magnifying glass. Predict what you might see and find. Think about what a naturalist would need on an investigation.

Step 2: Explore

Visit the habitat and carry out an exploration of the area. Choose a spot in the environment to investigate. Consider exploring the area from different angles, closeup or far away. Look and listen for evidence that animals live in the area.

Step 3: Collect

Once you have found an animal in the area, begin to study the animal and the plants around it in more detail. Collect as much data as you can about it and record what you find. You may write notes and sketch what you see to help in your investigation. Record what you see with a stills or video camera.

- What does the species look like? Take photos and draw pictures. Describe its characteristics.
- What is the animal doing? How does it interact with the environment? Record the behaviour of the animal.
- What does the environment look like? Describe. Can you identify any plants?
- Ask one “how” and one “why” question about what you see.

Return to the classroom and share/compare your findings.

Step 4: Analyse

Analyse your findings and write a short summary of your investigation.

- Did you find any animals during your investigation? If yes, identify and describe what you found. If you didn’t see any, did you find any evidence that animals live in the area?
- How could you help protect this habitat?

Step 5: Research

Respond to one or more of the following:

- What is the scientific name of the species?
- Explore the taxonomy of the species and categorise the information you find using the classification system.
- Why is this animal or plant important?
- Investigate what citizen science projects are happening to help monitor or protect this species.
- What might you notice if you visit this animals' habitat at different times of the day or year?
- How has this species adapted over time to survive in their environment? Research some specific adaptations they have made to survive in their habitat.
- Where is this species on the food chain? Predict what might happen if they are removed from the food chain.
- Are there any examples of a conservation project helping this species?

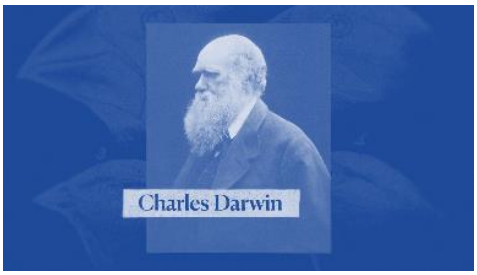
Step 6: Reflect

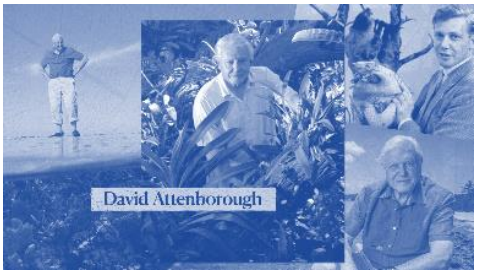
Reflect on the investigation by responding to one or more of the following questions:

- What did you enjoy about this investigation?
- What did you find surprising?
- What would you do differently next time?

Activity: Scientist Profiles

Students will research the life and achievements for one of the naturalists featured in the BTN Science Week 2024 Special, Jane Goodall, Charles Darwin, Mary Anning or David Attenborough. Students will create a timeline poster and prepare an oral presentation summarising key events in their life and their contributions to science. Alternatively, students can choose another scientist that has contributed to the survival and thriving of different species.





Timeline Poster

Your students' task is to create a timeline poster, responding to the following areas of research.

Research

- Early Life - Information about your significant person's parents. When/where was your significant person born? What type of education did your significant person receive?
- Family - Personal information; Was your significant person married? Did they have children?
- Legacy - What event and/or action led to them becoming a significant person? What did they do that had an impact on the lives of others?
- 'Where are they now?' If your significant person has died, you can outline where they are buried. If they are still alive you can outline what their life looks like now.
- 2 x 'Interesting Facts' and 2 x 'Did You Know?'
- A minimum of 6 and a maximum of 10 photos with captions.
- Include a bibliography on the back of your poster.

Oral Presentation

Students will prepare a short oral presentation, speaking in 'first person'. They will speak about their life, their family, character, the decisions they made and why, and their impact and influence on society. Students are encouraged to dress up in-character and bring along 3-4 'props'/artefacts to support their presentation.

Further Research

Students will choose one of the activities to further investigate their significant person.

Interview

- Imagine you could sit down and talk to them.
- What questions would you ask about their life and achievements?
- Find answers to your questions.

Portrait

- Plan and create a portrait.
- Explore and experiment with different techniques and mediums to produce a portrait.
- Organise a class exhibition of your artworks.

5 w's

- What are some of the key events in their life?
- Write a summary for one key event, which answers the 5 W's – Who, What, Where, When and Why?

Activity – Choose a Project

Individually or in small groups, students will choose one of the following projects to work on and then present their findings to the class.

How do Bees Communicate?
Why is it important for bees to communicate? Watch this ABC Education video Why do bees' boogie? to find out more.

Bird Calling
Do you know what a king parrot sounds like? What about a turtle dove? Or a barking owl? Watch this BTN story to learn more about bird calling.

Bee Friendly Garden
Design a honeybee garden for your school. Include a map, special features and make a list of the top 10 honeybee attracting plants.

Citizen Science
Become a citizen scientist and take part in a koala survey! There are various koala surveys, including these in NSW.

Useful Websites

Evolution

- Species Survival Teacher Resource – National Science Week 2024
- Evolution Resources – ABC Education
- What is evolution? – BBC Bitesize
- Human Evolution – BTN
- Charles Darwin Day – BTN

Mass Extinction

- Extinction Report – BTN
- Insect Extinction – BTN
- Doomsday Seed Vault - BTN
- What's happening to Australia's biodiversity? – Australian Museum
- Mass Extinctions - Australian Environmental Education

Zoos and Conservation

- Conservation – Zoos SA

Scientist profiles

- Who was fossil hunter Mary Anning? – BBC Bitesize

- Mary Anning: the unsung hero of fossil discovery - Natural History Museum
- Charles Darwin Day – BTN
- Charles Darwin: History's most famous biologist – Natural History Museum
- David Attenborough – Britannica Kids
- Jane Goodall – National Geographic

ANIMAL PROFILE

Scientific Name

Common Name

APPEARANCE

ADAPTATIONS

Unique Features or Interesting Facts

HABITAT

THREATS