

### **Q** Focus Questions

### **Aussie Scientists**

- 1. What Australian scientist developed penicillin?
- 2. Penicillin was the first ever antibiotic to be developed. True or false?
- 3. Why was penicillin so important during World War II?
- 4. Ruby Payne-Scott was a famous Australian...
  - a. Archaeologist
  - b. Physicist
  - c. Botanist
- 5. Complete this sentence. Ruby Payne-Scott played a really important role in the development of
- 6. What materials did she use to help develop radar equipment?
- 7. What challenges did Ruby Payne-Scott face?
- 8. What Australian scientist invented Wi-Fi?
- 9. Complete this sentence. Stephen Hawking's theory of evaporating \_\_\_\_\_\_ inspired him to invent Wi-Fi.
- 10. The invention of Wi-Fi earned what organisation around 1 billion dollars?

#### **Charles Darwin**

- 1. Briefly summarise the BTN Charles Darwin Day story.
- 2. What year did Charles Darwin join the crew of the HMS Beagle?
  - a. 1731
  - b. 1831
  - c. 1931
- 3. What type of bird did Charles Darwin study while travelling around the Galapagos and Cocos Islands?
- 4. Where are the Galapagos and Cocos Islands? Find using Google Maps.
- 5. What did Charles Darwin notice about their beaks?
- 6. What is the theory of natural selection? Explain using your own words.
- 7. What is the name of Charles Darwin's most famous book?
- 8. Why is Charles Darwin considered an important scientist?
- 9. What did you learn while watching the BTN story?
- 10. Illustrate an aspect of the story.

#### Einstein

- 1. Have you heard of Albert Einstein before? What do you know about him?
- 2. What did Einstein announce on the 25<sup>th</sup> November 1915?
- 3. Describe Albert Einstein's experience at school.
- 4. What did he study at university?
- 5. Where did he work after he graduated?
- 6. What is Einstein's famous formula?
- 7. His general theory of relativity helps us understand \_\_\_\_
- 8. What has his theory helped scientists explain?
- 9. What prize was Einstein awarded in 1921?
- 10. What did you learn watching the BtN Einstein story?





### Teacher Resource

# **Aussie Scientists**

### **Q** Focus Questions

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- 10. The invention of Wi-Fi earned what organisation around 1 billion dollars?

### **Activity**

#### **Class discussion**

After watching the BTN *Aussie Scientists* story, respond to the following questions:

- What did you SEE in this video?
- What do you THINK about what you saw in this video?
- What does this video make your WONDER?
- What did you LEARN from this story?
- How did this story make you FEEL?
- What was SURPRISING about this story?

## **Activity**

#### **Class discussion**

The school theme for National Science Week in 2018 is *Game Changers and Change Makers*. This could refer to individuals, teams, technologies or ideas – what does this theme suggest to you? Students will discuss in pairs and then share their responses with the class. As a class brainstorm a list of interesting scientific inventions or discoveries. Ask students to think how life would be different without scientific inventions and discoveries.

### C Key Learning

Students will investigate the achievements of Australian scientists. Students will investigate how scientific discoveries change our understanding of the world.

### Curriculum

#### Science – Year 5 and 6

Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions.

With guidance, pose clarifying questions and make predictions about scientific investigations.

#### Science – Year 7

Science knowledge can develop through collaboration across the disciplines of science and the contributions of people from a range of cultures.

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



## **Activity**

### Create a biography

Students will choose an Australian scientist that has made a significant contribution in the field of science and write a biography about them. Students can research one of the three scientists featured in the BTN story or choose another Australian scientist.

- **Howard Florev**
- Ruby Payne-Scott Listen to the ABC's • Fierce Girl podcast to learn more.
- John O'Sullivan
- **Graeme Clark** •
- Fred Hollows •
- **Douglas Mawson** •

Using the Biography template at the end of this activity, students will find and record information about the person they have chosen. Some possible areas of research include:

- What did they do or discover?
- When were they born?
- What scientific discoveries made them famous?
- What were their challenges? •
- How do we recognise their achievements?
- How did they change our understanding of . the world?
- How would our world be different if their • discovery had not been made?
- What do you admire about them?
- Imagine you could sit down and talk to them. What questions would you ask about their life and work as a scientist?

### **&** Activity

#### **Questions and Answers**

Come up with some questions you think scientists ask and solve. Share your questions with the class and organise them into common themes.

Make a list of questions that you would like to ask a scientist. Use the internet to find answers to your questions. Compare your questions and answers with your classmates.

# **&** Activity

#### Curiosity, wonder and questioning

All scientific discovery starts with a question. Students will think of a science question which can be researched, make predictions based on what they already know and then design experiments to test those predictions. Students will use the following to guide their exploration.





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**Observe and explore** – You are an explorer and your mission is to document and observe the world around you (either in your classroom or in the school yard). Take notes about what you see and record what you are drawn to. Use speech bubbles to document your thoughts and graph paper to document what you see.

What do you wonder? – What do you wonder about what you see? For example, I wonder why the sky is blue. I wonder why plants are green. I wonder why I get a tiny spark when I've walked across a carpet and touched a door handle.

- Write one or more questions about things that you are curious about.
- Share your ideas as a class, writing each idea on a sticky note.
- Identify the questions that can be tested or researched.
- What will you investigate? Choose one of the science questions that you will explore through experiments and hands on investigations.

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#### **Predictions**

- What do you already know about this scientific topic?
- What do you predict to be true about the answer to your question?
- Form a hypothesis

**Experiment** – Design and conduct an experiment to test your predictions.

- Plan out a procedure to follow that will help you find answers.
- How you will test your question?
- List what materials you will need
- Plan how to record your data
- Perform your experiment, by repeating trials of tests, taking measurements, making observations and recording data.

#### Share

- Think of creative ways to explain/answer your science discovery (using multimedia, models, video or animation).
- Create your own mini science lesson about what you have learnt to teach to students in another class.



### **O Useful Websites**

National Science Week – Science Week 2018 https://www.scienceweek.net.au/

ABC News – Science Week http://www.abc.net.au/news/science/

National Science Week – Science Week 2018 https://www.scienceweek.net.au/

ABC News – Science Week http://www.abc.net.au/news/science/

BTN – Antibiotics http://www.abc.net.au/btn/story/s3714613.htm



CSIROpedia – Ruby Payne-Scott https://csiropedia.csiro.au/payne-scott-ruby/

ABC Fierce Girls – Ruby Payne-Scott: The girl who listened to the stars http://www.abc.net.au/radio/programs/fierce-girls/ruby-payne-scott-the-girl-who-listened-to-the-stars/9550284

CSIROpedia – John O'Sullivan https://csiropedia.csiro.au/osullivan-john/

BTN - Aussie Inventions http://www.abc.net.au/btn/story/s3603131.htm







# Teacher Resource Charles Darwin Day

## **Q** Focus Questions

- 1. Briefly summarise the BTN Charles Darwin Day story.
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- 3. What type of bird did Charles Darwin study while travelling around the Galapagos and Cocos Islands?
- 4. Where are the Galapagos and Cocos Islands? Find using Google Maps.
- 5. What did Charles Darwin notice about their beaks?
- 6. What is the theory of natural selection? Explain using your own words.
- 7. What is the name of Charles Darwin's most famous book?
- 8. Why is Charles Darwin considered an important scientist?
- 9. What did you learn while watching the BTN story?
- 10. Illustrate an aspect of the story.

## **Activity**

#### What do you see, think and wonder?

After watching the BTN *Charles Darwin Day* story, students will respond to the following questions:

- What did you SEE in this video?
- What do you THINK about what you saw in this video?
- What did you LEARN from this story?
- What was SURPRISING about this story?
- What QUESTIONS do you have about this story?

### **Class Discussion**

As a class discuss the BTN *Charles Darwin Day* story, using the following questions as a guide. Record the main points of the discussion.

- What do you know about Charles Darwin?
- What do you know about evolution?
- What has surprised you most about Charles Darwin?
- Why do you think his ideas are still relevant today?







Students will learn more about the life and work of Charles Darwin.

### Curriculum

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 the physical conditions of their environment



## **Activity**

### Glossary

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

Evolution	Adaptation	Species	
Natural selection	Variation	Survival	

### **Activity**

### **Charles Darwin Research**

Students will be exploring the work of Charles Darwin in more detail. They can develop their own key questions to investigate or respond to one or more of the questions below. Students can complete the following KWLH organiser to explore their knowledge and consider what they would like to know and learn.

What do l <u>k</u> now?	What do l <u>w</u> ant to know?	What have I <u>l</u> earnt?	<u>H</u> ow will I find out?

Here are some possible questions for students to research:

- What did Charles Darwin see and do on his five-year journey on the HMS Beagle?
- What did Darwin discover about finches on the Galapagos Islands? How did it confirm his idea of natural selection?
- Charles Darwin visited Australia in 1836. Where in Australia did Darwin visit? Show the Beagle's Australian route on a map. What observations did he make?
- How did people react to Darwin's ideas, and how did they change the way people thought about the origins of the world?
- Why was Charles Darwin reluctant to publish his theory of evolution?
- What is Darwin's most important contribution to science? Give reasons for you answer.

## **Activity**

#### Who was Charles Darwin?

Before students begin to construct their biographies, hold a class discussion to find out what they already know about biographical writing. Below are some discussion starters:

- What does a biography tell us about a person?
- Where can you look to find information for your biographical writing? It could include the internet, newspaper articles, magazine articles and interviews, other biographies, historical books or television interviews. Why is it important to use more than one source of information?
- What makes a biography interesting? For example, key information





and facts, a timeline of events, photographs, illustrations and quotes.

Using the biography worksheet at the end of this activity, students will find and record information about Charles Darwin. This <u>Charles Darwin timeline</u> will help students with their research. Some possible areas to include are:

- Where was Charles Darwin from? Locate using Google Maps.
- When was he born? Describe his family life growing up.
- What were some of Charles Darwin's achievements? Choose one to explore in more detail.
- What were some challenges Darwin faced?
- How has Charles Darwin made an impact on people's lives?

Further investigation

• Imagine you could sit down and talk to Charles Darwin. What questions would you ask about his life and achievements?

## **Activity**

#### **Experiment - Does saltwater kill seeds?**

Before starting this activity, reading the following excerpt as a class.

I have begun making some few experiments on the effects of immersion in sea-water on the germinating powers of seeds, in the hope of being able to throw a very little light on the distribution of plants, more especially in regard to the same species being found in many cases in far outlying islands and on the mainland. Charles Darwin, Gardeners' Chronicle and Agricultural Gazette

To explore the question `How did plants become distributed over the Earth's surface?' Darwin tested how plant seeds would survive in seawater. Students will conduct a similar experiment as explained <u>here</u>. Before students conduct the experiment, ask them to make some predictions.

Students can then discuss the results of their experiment reflecting on:

- How many seeds germinated?
- Why did certain seeds germinate more than others?
- Why did Charles Darwin conduct this experiment?

### Activity

Watch the **<u>BTN Human Evolution</u>** story then answer the following questions:

- 1. What part of the human body is helping us learn about human evolution?
- 2. What is the scientific name for modern humans?
- 3. Approximately how far back in time do modern humans date?
- 4. Where did Homo sapiens originate?
- 5. What did our earliest ancestors look like? Describe.
- 6. How are Homo habilis different to Homo sapiens?
- 7. The most famous Australopithecus afarensis was discovered by scientists in which country?





## **O Useful Websites**

Human Evolution – BTN https://www.abc.net.au/btn/classroom/human-evolution/11481954

What is evolution? - BBC Bitesize https://www.bbc.co.uk/bitesize/topics/zvhhvcw/articles/z9qs4qt

Charles Darwin Timeline – The Darwin Project https://www.darwinproject.ac.uk/learning-resources/timeline#/







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## Teacher Resource Einstein

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### **Q** Focus Questions

- 1. Have you heard of Albert Einstein before? What do you know about him?
- 2. What did Einstein announce on the 25th November 1915?
- 3. Describe Albert Einstein's experience at school.
- 4. What did he study at university?
- 5. Where did he work after he graduated?
- 6. What is Einstein's famous formula?
- 7. His general theory of relativity helps us understand \_
- 8. What has his theory helped scientists explain?
- 9. What prize was Einstein awarded in 1921?
- 10. What did you learn watching the BTN *Einstein* story?

## **Activity**

#### **Class discussion**

After watching the BTN *Einstein* story, respond to the following questions:

- What did you SEE in this video?
- What do you THINK about what you saw in this video?
- What does this video make your WONDER?
- What did you LEARN from this story?
- How did this story make you FEEL?
- What was SURPRISING about this story?

#### **Questions and Answers**

Come up with some questions you think scientists ask and solve. Share your questions with the class and organise them into common themes.

Make a list of questions that you have. Discuss as a class where you could find the answers to the questions? Think about experts in the community that might help you answer the questions.



### C Key Learning

Students will learn about the scientific achievements of Albert Einstein. Students will investigate how scientific discoveries change our understanding of the world.

### Curriculum

Science – Years 5 & 6 Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions

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 knowledge can develop through collaboration across the disciplines of science and the contributions of people from a range of cultures

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

### **Activity**

#### Match the scientist

Can you match the following famous scientists with their discoveries or inventions? Cut out the words and pictures, match them and stick on an A4 piece of paper. Choose five scientists, find three surprising facts about each of them and share with the class.















**Charles Darwi** 

Gravity

Telephone

Relativity



Howard Florey



Alexander Graham Bell





DNA

Jupiter's major moons

**Evolution** 

Radioactivity

# Activity

### Class discussion: What is a biography?

Before students begin to construct their biographies, hold a class discussion to find out what they already know about biographical writing. Record your student's responses on the class whiteboard. Below are some discussion starters:



- What does a biography tell us about a person?
- Where can you look to find information for your biographical writing? It could include the internet, newspaper articles, magazine articles and interviews, other biographies, historical books or television interviews. Why is it important to use more than one source of information?
- What makes a biography interesting? For example, key information and facts, a timeline of events, photographs, illustrations and quotes.

### **Activity**

### **Biography – Who am I?**

Find out as much as you can about a famous scientist using a range of primary and secondary sources (internet, newspapers and books). Use the Biography Organiser Template at the end of this activity to structure your biographical information. Questions to research include:

- What did they do or discover?
- Where are they from? Locate using Google Maps
- When were they born?
- Explore the scientific discoveries that made them famous.
- What were their challenges?
- How do we recognise their achievements?
- How have they made an impact on people's lives?
- How did they change our understanding of the world?
- How would our world be different if their discovery had not been made?
- What do you admire about them?
- Imagine you could sit down and talk to them. What questions would you ask about their life and work as a scientist?

Present your findings in an interesting way.

- Give a presentation on their achievements
- Create a portrait
- Design a poster
- Make a "Did you know?" for other students
- Write a letter thanking them for their achievements and how it has changed the world
- Create a timeline highlighting significant events
- Design and create a 3D model (cube) to present the biographical information. Each side of the cube will include a different aspect of your research.

### **O Useful Websites**

ABC Catalyst – Australia's Top Scientific Contributions http://www.abc.net.au/catalyst/stories/2342479.htm

The Famous People – Famous Australian Scientists <a href="http://www.thefamouspeople.com/australian-scientists.php">http://www.thefamouspeople.com/australian-scientists.php</a>

Scientist Superstars – ABC Education <u>https://education.abc.net.au/home#!/media/103242/snapshots-of-top-australian-scientists</u>

Finding scientific solutions – ABC Education https://education.abc.net.au/home#!/media/38155/finding-scientific-solutions

Science Week - BTN http://www.abc.net.au/btn/story/s4291974.htm



### **BIOGRAPHY ORGANISER**

### Name:

an

Use different sources to find information about a famous scientist. Use this biography organiser to keep track of what you learn.



