

# Teacher Resource

## Science Lessons

Episode 22  
13<sup>th</sup> August 2019

### Focus Questions

1. Discuss the *BTN Science Lessons* story with another student.
2. What year did the first human step foot on the Moon?
3. When was the first exoplanet discovered?
4. How many planets are in our Solar System?
5. What is Pluto?
  - a. An exoplanet
  - b. A star
  - c. A dwarf planet
6. Complete the following sentence. Scientists have found fossils showing many dinosaurs were covered in \_\_\_\_\_.
7. What animal do scientists say that some dinosaur species have evolved into?
8. What have scientists discovered about our DNA?
9. Describe what computers looked like when they were first invented.
10. Illustrate an aspect of the *BTN* story.

### Activity

#### Class Discussion

After watching the *BTN Science Lessons* story, students will respond to the following questions:

- What did you SEE in this video?
- What does this video make your WONDER?
- What did you LEARN from this story?

Create a class mind map about science and the topics explored in the *BTN* story asking students to record what they know. Use the following questions to guide discussion:

- Make a list of scientific inventions or discoveries.
- How would life be different without scientific inventions and discoveries?
- What is a scientist? List some areas of science that scientists might explore.

#### Questions and Answers

All scientific discovery starts 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. Use the internet to find answers to your class questions.

### Key Learning

Students will choose a science investigation to explore in more detail. Students will investigate how scientific discoveries change our understanding of the world.

### AC Curriculum

#### Science – Year 4

Suggest ways to plan and conduct investigations to find answers to questions.

#### Science – Years 5 & 6

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

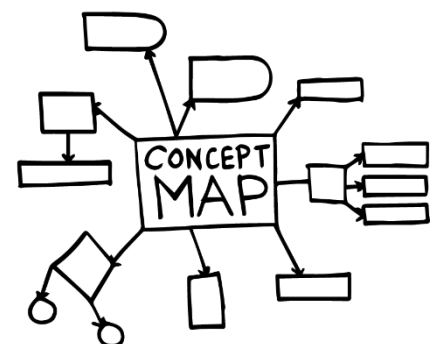
Scientific knowledge is used to solve problems and inform personal and community decisions.

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

#### 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.



## Activity

### What is a science investigation?

Before starting this activity, explain to students what a science investigation is and why we do them. Think of words that relate to “science investigation” and then find and explain their meanings. Here are some concepts to get you started: observation, hypothesis, diagram, data, prediction, conclusion.

### Framework

Provide students with the opportunity to think and behave like scientists. In pairs or small groups, students will conduct a scientific investigation. Students will design and conduct their own scientific investigation in pairs or small groups. Students will use the investigation framework below before, during and after their investigation. Possible areas for investigation include space junk, ocean rubbish, the impact of technology on health or if you are already focusing on a science topic in class use this as a basis for your investigation.

<b>Brainstorm</b>	<ul style="list-style-type: none"><li>• Brainstorm some ideas for your science investigation.</li><li>• Describe what you are going to research using your own words.</li></ul>
<b>Observations</b>	<ul style="list-style-type: none"><li>• You are an explorer and your mission is to document and observe the world around you. Take notes about what you see and record what you are drawn to.</li><li>• Use speech bubbles to document your thoughts and graph paper to document what you see.</li></ul>
<b>Research Question</b>	<ul style="list-style-type: none"><li>• Identify a question that can be tested or researched.</li></ul>
<b>Write a hypothesis</b>	<ul style="list-style-type: none"><li>• What do you already know about this scientific topic?</li><li>• What do you predict to be true about the answer to your question?</li><li>• Formulate your hypothesis.</li></ul>
<b>Design and perform investigation</b>	<ul style="list-style-type: none"><li>• Design and conduct an experiment to test your predictions.</li><li>• How you will test your question?</li><li>• What steps do you need to follow to investigate your prediction?</li><li>• Plan how to record your data.</li><li>• Perform your experiment, by repeating trials of tests, taking measurements, making observations and recording data.</li></ul>
<b>Analyse your data</b>	<ul style="list-style-type: none"><li>• What does the data mean? Write a paragraph that summarises what happened.</li><li>• Draw a labelled diagram of your results to show what happened.</li></ul>
<b>Communicate your results</b>	<ul style="list-style-type: none"><li>• Think of creative ways to explain/answer your science discovery (using multimedia, models, video or animation).</li><li>• Create your own mini science lesson about what you have learnt and teach students in another class.</li></ul>
<b>Reflection</b>	<ul style="list-style-type: none"><li>• Was this what I expected? Explain.</li><li>• What problems did I experience when I was doing the investigation? How could I fix these problems?</li></ul>

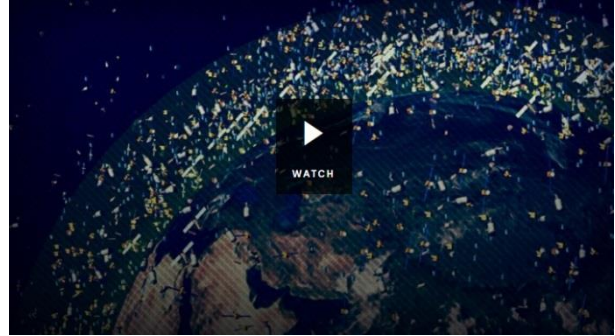
## Activity

### Investigation #1 – Solving the problem of space junk

In this activity students will design an object that can clean up space junk from the Earth's orbit. The BTN [Space Junk Clean-up](#) story explained how a spacecraft successfully fired a harpoon into space junk that was orbiting Earth. Students can watch the videos below to get more ideas about ways to solve the problem of space junk. Ask students to create a labelled diagram of their design and an explanation of how the object cleans up space junk.



[How to solve the problem of space junk](#)



[BTN Space Junk](#)

## Activity

### Investigation #2 – Solving the problem of ocean rubbish

In the BTN [Ocean Rubbish Clean-up](#) story we learn about a project that is helping clean up the Pacific Ocean. A giant tube has been towed out to a giant patch of garbage where around 1.8 trillion pieces of plastic have gathered together. Students can learn more about the project by watching the story and then responding to the following questions:

1. Complete this sentence. The rubbish found in the Pacific Ocean is also known as the Great \_\_\_\_\_ Patch.
2. Who is Boyan Slat?
3. When did Boyan start thinking of ways to help reduce ocean rubbish?
4. How many pieces of plastic do Aussies throw away each year?
5. How is ocean rubbish impacting on marine life?
6. Describe how Boyan's invention works.
7. What powers the giant snake-like invention?
8. How many 'giant snakes' will they use to collect rubbish in the Pacific Ocean by 2020?



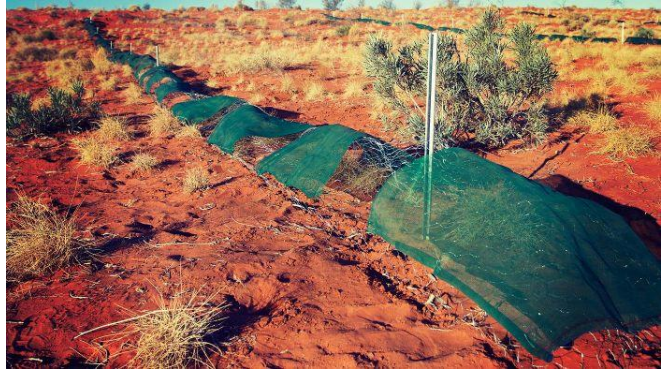
In small groups, students will brainstorm innovative ways to clean up the rubbish found in our oceans. Encourage creativity during this activity and give students the time to explore their thinking and illustrate their ideas. Students will then share their ideas with the class, taking it in turns explaining how their creations will help reduce the amount of rubbish in our oceans. Encourage the class to ask questions about the other groups' creations and then reflect on their own learning by responding to the following questions.

- What was challenging about this activity?
- What did you enjoy about this activity?

## Activity

### Investigation #3 – Protecting desert animals

In the BTN [Protecting Desert Animals](#) story, we learn that scientists are designing predator-proof homes for the desert's smaller creatures to hide in. The chicken wire tunnels are 50 metres long and allow small animals to run in and out as they please. The tunnels protect native desert animals who are under stress from feral animals. Students will watch the story and then respond to the following questions:



- What surprised you about the design?
- Can you improve on the design? If so, what improvements would you make?
- What alternative techniques can you think of? Design your own shelter to help native desert animals hide from predators. Share your design with the class. Describe the materials used to make it, its features and how it will help protect native species.

## Useful Websites

Moon Landing – BTN

<https://www.abc.net.au/btn/classroom/moon-landing/10538584>

Planet Nine – BTN

<https://www.abc.net.au/btn/classroom/planet-nine/10523444>

Exoplanets – BTN

<https://www.abc.net.au/btn/classroom/exoplanets/10948804>

National Science Week

<https://www.scienceweek.net.au/>

Dinosaur Tracks – BTN

<https://www.abc.net.au/btn/classroom/dinosaur-tracks/10531678>

Robot Jobs – BTN

<https://www.abc.net.au/btn/classroom/robot-jobs/10522582>

Science Week 2015 – BTN

<https://www.abc.net.au/btn/classroom/science-week/10526004>

Science Class – BTN

<https://www.abc.net.au/btn/classroom/science-class/10524250>

Aussie Scientists – BTN

<https://www.abc.net.au/btn/classroom/aussie-scientists/10488692>