



Teacher Resource

Young Marine Scientist

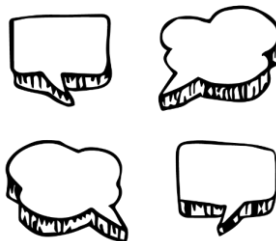
Focus Questions

Discuss the BTN story as a class and record the main points of the discussion. Students will then respond to the following:

1. What was the main point of the Young Marine Scientist story?
2. Rehan is one of the youngest people in Australia to become an author of a scientific paper. True or false?
3. What did Rehan observe when he was snorkelling?
4. Scientists use something called a scientific _____ to test their observations?
5. What question did Rehan investigate?
6. What does it mean to form a hypothesis?
7. How did Rehan test his hypothesis and gather evidence?
8. What conclusion did he come to?
9. What is the peer review process?
10. Where was Rehan's research published?

Activity: What do you see, think & wonder?

After watching the BTN Young Marine Scientist story hold a class discussion, using the following as discussion starters:



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

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. Use the internet to find answers to your class questions.

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KEY LEARNING

Students will use the scientific method to answer science related questions.

CURRICULUM

Science – Year 4

Living things depend on each other and the environment to survive.

Science knowledge helps people to understand the effect of their actions.

Science – Year 5

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

Science – Year 5 & 6

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

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.

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

Interactions between organisms, including the effects of human activities can be represented by food chains and food webs.

Activity: Glossary

Students will brainstorm a list of keywords that relate to the BTN Young Marine Scientist story. Here are some words to get them started. Students will create their own class glossary of keywords and terms. Students can use illustrations and diagrams to help explain each keyword.

CEPHALOPOD	BEHAVIOURAL ADAPTATIONS	HYPOTHESIS
INVERTEBRATE	SCIENTIFIC OBSERVATIONS	MARINE SCIENCE
SCIENTIFIC METHOD	NUCLEAR-FOLLOWER BEHAVIOUR	CONCLUSIONS

Activity: Inquiry based-learning

After watching and discussing the BTN Young Marine Scientist story, what questions do students have? The following KWLH organiser provides students with a framework to explore their knowledge on this topic and consider what they would like to know and learn.

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

Questions for inquiry

Students will develop their own question/s for inquiry. 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.

- What does an octopus' habitat look like? Study the habitat of one type of octopus species and create a diorama of its habitat.
- Research some specific adaptations that octopuses have made to survive in particular habitats, for example, body shape, colour. Give an oral presentation explaining the adaptations.
- Why are octopuses an important part of the marine ecosystem?
- What is the role of a marine biologist? What are the different parts to the job of a marine biologist and what skills do they need to have? Present your information in a creative way.
- Where are octopuses in the food chain? Draw a diagram showing what animal feeds on what. Use illustrations or photos to demonstrate this food chain.
- Why do octopuses have 8 legs, 3 hearts and 9 brains? Explore the physical adaptations that help octopuses survive.
- Why do people explore underwater? What are the benefits? Explore one area of underwater research (E.g., marine life, ecosystems, ocean health, biodiversity).

Activity: Scientific Method

What is a scientific method?

Before starting this activity, explain to students what the scientific method is and why we use it. As a class look at a diagram which illustrates the scientific method and explain the meaning of each step in the process. The method consists of a range of steps, however the order of the steps in the process can vary. The scientific method is a tool which helps us to solve problems and answer questions.



Framework

Provide students with the opportunity to think and behave like scientists. In pairs or small groups, students will conduct a scientific investigation using the scientific method to guide their investigation. Students will design and conduct their own scientific investigation in pairs or small groups. Students will use the framework below before, during and after their investigation.

Possible areas for investigation include [understanding climate change](#), [invasive species](#), [the role that bees play in the ecosystem](#), [plastic pollution](#), [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. Visit [BTN's Subjects page](#) to explore stories with a focus on science.

ASK A QUESTION

- Before you ask a question, plan a visit to a local nature reserve or your own school yard to explore and observe the world around you. Take notes about what you see, hear and touch and record what you are drawn to.
- Use speech bubbles to document your thoughts and graph paper to document what you see. Ask why or how something is happening.
- Brainstorm some ideas for your science investigation based on what you have observed.
- Identify a question that can be tested or researched. For example, "What happens when...?" or "What is the effect of...?"
- Describe what you are going to research using your own words.

RESEARCH

- Research the topic to learn as much as you can.
- Research using secondary sources of information to help you understand the observations you have made.

HYPOTHESIS	<ul style="list-style-type: none"> • What do you already know about this scientific topic? • Formulate your hypothesis. • What do you predict to be true about the answer to your question?
EXPERIMENT	<ul style="list-style-type: none"> • Design and conduct an experiment to test your predictions. • How will you test your hypothesis? • What steps do you need to follow to investigate your prediction? • What equipment and materials will you need to conduct your investigation? • How will you gather evidence? • Plan how you will record and organise your data. • Perform your experiment, by repeating trials of tests, taking measurements, making observations, and recording data.
ANALYSE DATA	<ul style="list-style-type: none"> • What does the data mean? Write a paragraph that summarises what happened. • Make calculations using the data you have collected. • Can you see any patterns in the data you have collected? • Draw a labelled diagram of your results to show what happened.
CONCLUSION	<ul style="list-style-type: none"> • Review your findings in relation to your hypothesis. • How effective was your investigation in testing your hypothesis? • Think of a creative way to explain/answer your science discovery (using multimedia, models, video, or animation). • Create your own mini science lesson about what you have learnt and teach students in another class.
REFLECTION	<ul style="list-style-type: none"> • Was this what I expected? Explain. • What problems did I experience when I was doing the investigation? How could I fix these problems?

Activity: Species profile

Students will imagine they are marine biologists and study one species from the cephalopod family.

Students will create a profile about the species, see below for some examples:

- Blue-lined Octopus
- Striped pyjama squid
- Mourning Cuttlefish
- Common Sydney Octopus
- Nautilus
- Cone shell

Students will research the following and then share their research findings with the class or create a display in the classroom.

- Name (common and scientific name)
- Biological illustration or photo
- Classification (class, family, genus)
- Description (size, colour, physical features)
- Habitat
- Diet
- Behaviours
- Adaptations
- Conservation status
- Threats

Students will then choose one of the following activities to complete:

- **Model** – Create a 3D model of an octopus or another type of cephalopod using recycled materials. Display your model in the classroom.
- **Haiku** – Write a haiku poem about octopuses or another type of cephalopod.
- **Children’s book or comic** – Write and illustrate either a children’s book or comic which tells the story of an octopus.
- **True or false?** – Find out as much as you can about octopuses. Create a true or false quiz and test your classmates. Alternatively, create a word find or crossword about octopuses.
- **Celebrate** – On October 8th, World Octopus Day celebrates one of the oldest animals on earth. Think of a creative way to celebrate the day in your class.



Activity: New species

Create a new species of cephalopod

Students will imagine they are biologists and create a new species of cephalopod! Students will draw the animal and classify it according to the principles of classification.

- Name the species
- Draw what it looks like (you may want to draw a scientific illustration or draw the animal in its natural habitat). Label important features.
- List the animal’s classification
- What are its characteristics?
- What adaptations help the animal to survive?

Activity: Quiz

1. How many brains does an octopus have?

A. 3 brains

B. 8 brains

C. 9 brains

2. What colour is an octopus' blood?

A. Red

B. Blue

C. Purple

3. What class is the octopus from?

A. Mammalia

B. Chondrichthyes

C. Cephalopoda

4. Octopuses have beaks.

A. True

B. False

5. How many hearts does an octopus have?

A. 1 heart

B. 3 hearts

C. 8 hearts

6. Octopuses are invertebrates.

A. True

B. False

7. What adaptation does an octopus have to escape predators?

A. Camouflaging themselves

B. Expelling ink

C. Squeezing into tiny spaces

D. All of the above

8. Octopuses are herbivores.

A. True

B. False

9. How many species of octopus are there?

A. 100

B. 200

C. 300

10. Octopuses have excellent eyesight.

A. True

B. False

Quiz Answers: 1C, 2B, 3C, 4A, 5B, 6A, 7D, 8B, 9C, 10A.

Useful Websites

- [Perth boy Rehan Somaweera has become one of Australia's youngest authors of a scientific paper](#) – ABC News
- [Science Lessons](#) – BTN
- [Science Week 2021](#) – BTN
- [Molluscs](#) – Australian Museum
- [Did you know that octopuses dream?](#) – Newsround
- [Octopus](#) – BBC Earth