

JESS M^cGEACHIN



DEEP

TEACHERS NOTES

by Robyn Sheahan-Bright

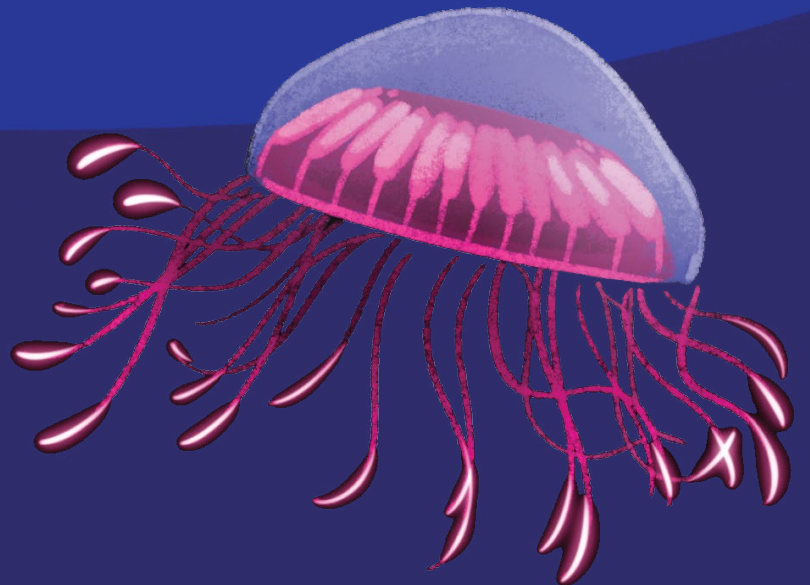


Table of Contents

p3 Introduction

p3 Author/Illustrator's Content Overview

p5 Themes & Curriculum Topics

Science

Humanities & Social Sciences (HASS)

English Language & Literacy

Visual Literacy

Creative Arts

Learning Technologies

Mathematics

p11 Worksheets

p14 Bibliography

p16 About the Author of the Notes

p9 Further Topics for Discussion and Research

p9 Conclusion

p10 About the Author / Illustrator



Introduction

Deep is an illustrated non-fiction book that explores the places hardest to reach, from the molten depths of our planet to the frigid depths of outer space. Linking seemingly diverse subject matter, it invites the reader to explore worlds hidden from view.

What hidden worlds lie beneath your feet? Or in the deepest parts of the ocean, where not even sunlight can reach? Come on a journey to meet glowing deep-sea creatures, zombie-making fungi and the trillions of tiny workers that live inside your own body. But be warned, things can get a little strange in the deep...

Author/Illustrator's Content Overview

Deep was written with the goal of linking seemingly diverse subject matter in a way that shows that all things on Earth are connected and what we do has an impact on them. The book aims to present beautifully illustrated worlds with simple, accessible text so the reader can dive in at any page or enjoy from start to finish.

As a series, the three books also have clear overarching themes *Deep* – Looking for connections, *High* – Finding new perspectives, *Lost* – Understanding consequences and inspiring action. There's lots of opportunities to connect it to the curriculum, and some chapter ideas are below.



Deep Ocean • Looking at the layers of the ocean • Looking at adaptation – how do you survive in the deep, dark ocean? • Bioluminescent and why some animals make their own light • What have humans left on the seafloor?

Deep Forest • Looking at the layers of the rainforest • Comparing nocturnal and diurnal animals • Colour warnings in nature (like poison dart frogs) • Hierarchy in animal colonies • What lives on the forest floor?

Deep Earth • Looking at the layers of the Earth • Looking at rocks and minerals and how they form • Looking at caves and thinking about the stories that have been left in them • Thinking about the underground worlds of animals and humans • Looking at what archaeologists have found and what it tells us about the past.

Deep Time • An introduction to geological time • Understanding what fossil evidence is and what it can tell us • Thinking about the things that humans leave behind • Thinking about generational equality.

Deep Space • Exploring our solar system • Looking at forces we can't see directly, like gravity and black holes • Looking at the ways we've travelled into space • What's next for space travel?

Deep Inside • Understanding the complex networks in our bodies and brains • Looking at the layers within our own bodies • Meeting microbes and cells – who's good and who's bad?

Deep Connections • What does it mean for somewhere to be 'Deep'? • What impacts have humans had on these places?

Surviving the Deep • How have plants and animals adapted to survive in different environments? • What would you need to survive in these places? • What evidence do we have from the past? What does it tell us about the future?



Themes & Curriculum Topics

Several themes are covered in this book which might be related to the Australian Curriculum, including:

Science

'Australian Curriculum: Science' <<https://www.australiancurriculum.edu.au/f-10-curriculum/science/>>

Deep Ocean

Discussion Point: 'Deep-sea gigantism is a trait that means some animals grow to enormous sizes. It's thought to be a way of adapting to the cold temperatures and lack of food and oxygen. Some, like the giant squid, can grow up to 14 metres in length!' (p 10) Research this topic.

Discussion Point: 'Arthropods, such as the Japanese spider crab and the giant isopod, wear their skeleton on the outside. It's good protection from predators, but because it can't grow with them, the skeleton needs to be shed (or moulted) and replaced every so often. Have you noticed that many of these creatures share the same colour? Red is harder to see in the deep, so they'd actually appear as black — a clever fashion choice if you want to stay hidden.' (p 11) Research this topic.

Discussion Point: 'Deep-sea creatures have adapted to life in the dark, where their main goal is to eat or avoid being eaten.' (p 12) What forms of adaptation have they developed in order to avoid being seen?

Discussion Point: 'Sunlight can't reach the deepest parts of the ocean, so why not make your own? This process is called bioluminescence.' (p 12) Research this topic.

Discussion Point: Deep sea creatures are described as 'bottom feeders' or scavengers, and have adapted some peculiar habits in order to facilitate their feeding. (See: p 13) Research this topic.

Discussion Point: Shipwrecks, submersibles and rubbish exist even in the Mariana Trench! (See: pp 14–15) Research such debris. For example, the wreck of the *Titanic* which sank after striking an iceberg in 15 April 1912, still lies beneath the ocean floor.

Deep Forest

Discussion Point: The 'understory' exists under the forest 'canopy' and has distinctive features. (See: pp 16–17) Research this topic.

Discussion Point: 'The Amazon river twists through the heart of the rainforest. Along its banks live giant anacondas and black caiman, and in its fresh water swim piranhas and

even pink river dolphins.’ (p 17) Research the amazing wildlife (See: p 18) to be found on the Amazon.

Discussion Point: Study ants and ant colonies (See: pp 20–21) and discuss what you uncover.

Discussion Point: Fungi have a variety of very unusual features (See: p 22). Discover other fungi not mentioned on this page.

Discussion Point: There are a variety of insects which use camouflage to both protect themselves or to trick their prey (See: p 23). Discover other insects which employ camouflage.

Deep Earth

Activity: Make a model of the layers of the earth and label each one. (See: pp 23–24)

Discussion Point: What causes volcanoes to erupt?

Discussion Point: Encourage students to identify rocks and to classify them according to the information this book contains regarding igneous, sedimentary or metamorphic rocks. (See: pp 25–26)

Discussion Point: Caves are a unique underground feature, and they also sometimes contain cave drawings, stalactites and stalagmites (See: p 28). Research caves and these aspects of them.

Discussion Point: Underground homes known as burrows and setts are covered in this book (See: pp 30–31). Research to discover what other animals live underground.

Discussion Point: Cities sit upon a subterranean network of subways, pipes, vaults and bunkers. (See: pp 32–33). They also sit on sewers, catacombs and fatbergs. (See: pp 34–35). Choose any one of these topics and research further.

Discussion Point: Students may wish to explore the buried secrets archaeologists have discovered and the techniques they use. (See: pp 36–37) Make this relevant by discovering what archaeologists have discovered in their own cities, towns or regions? e.g. The dinosaur skeletons in Winton which led to the creation of the museum, *Australian Age of Dinosaurs*.

Deep Time

Discussion Point: Study the Timeline (See: pp 38–39) presented there and then discuss with your students.

Discussion Point: ‘Trilobites and ammonites are some of the oldest fossils we’ve found and they tell of ancient life beneath the waves.’ (p 41) Research this topic further.

Discussion Point: Human beings make waste including electronics and plastic which last an incredibly long time. (See: pp 42–43) Do some research into the life of certain products.

Discussion Point: ‘If we are going to leave a healthy planet for future generations, one thing’s for certain – we need to make deep changes. Some of the brightest minds are working on it right now, and you might even be one of them.’ (p 45) Discuss this quote.

Deep Space

Discussion Point: What is the Kuiper Belt? (See: p 47) Discover more about this intriguing belt in the sky.

Discussion Point: Research what we can see on the sky: planets, galaxies, stars. (See: pp 48–49)

Discussion Point: Research what we can’t see in the sky: black holes, gravity, dark matter. (See: pp 50–51)

Discussion Point: Research the history and the discoveries made by space missions and space probes. (See: pp 52–53) Choose one to research deeply.

Deep Inside

Discussion Point: The brain has several parts, each of which has a different function. (See: pp 54–55) Research this topic as well.

Discussion Point: Did you know that the skin was an organ? (See: pp 56–57) Research its function and the parts of it such as nerves, glands and follicles.

Discussion Point: Choose another organ and research the function it plays.

Discussion Point: What do cells do? What do microbes do? (See: pp 58–59)

The book concludes with **Deep Connections (p 60)**, **Surviving the Deep (p 61)**, **Glossary (p 62)** and **Index (p 63)**. Make use of these sections when conducting your research.

Humanities & Social Sciences (HASS)

<https://www.australiancurriculum.edu.au/f-10-curriculum/humanities-and-social-sciences/hass/>

Environmental Waste & Degradation

Discussion Point: This book raises the question of waste in the oceans, a topic which students may wish to research further. ‘Space junk’ is another topic which might also be researched.

Discussion Point: Mining for minerals is deemed necessary for they are used in many products, but ‘the way we dig them up can cause huge damage to the environment. Mining and greed can unfairly impact local communities and the land on which they, and all of us, rely.’ (p 27) Research this topic further.

Climate Change

Activity: Research the impact of climate change on the earth and the oceans.

Discussion Point: Investigate the impact of deforestation in the Amazon.

Bodies and Health

Discussion Point: Our bodies are our 'engines' and they need looking after. Choose one area of health to research further, e.g. circulation system, immune system, blood system etc.

English Language & Literacy

<<https://www.australiancurriculum.edu.au/f-10-curriculum/english/>>

The text of this book might be studied in relation to the following aspects:



Activity: This is an expository text which outlines information. Study this form of writing and the style used by Jess McGeachin. After researching one of the topics suggested by this book, write your own short expository essay about that subject.

Activity: Test your students' **comprehension** by asking them questions about the written and visual text. [See also **Worksheet 2** below.]

Visual Literacy

<<https://www.australiancurriculum.edu.au/f-10-curriculum/the-arts/visual-arts/>>

The visual text of a book combines with the written text to tell the story using the various parts of the book's design and illustrations, as explored below:

Activity: The **cover** of a book is an important part of its message. What information does the cover of this book convey?

Activity: The bright, colourful illustrations were drawn digitally using an iPad. How do the illustrations help convey the information included in the text? Try drawing in a range of different styles and mediums.

Activity: Create an image of any creature you found particularly intriguing in this book. Create a classroom mural using all the images. [See also **Worksheet 1** below.]

Activity: Create a graphic novel/comic version of a scene in this book. [See **Bibliography.**] [See also **Worksheet 3** below.]

Creative Arts

There are many creative activities suggested by this text:

1. **Make a Shoebox Diorama** of any 'deep' environment depicted in this book.
2. **Create a model of one of the creatures depicted in this book** using materials such as fimo clay or papier mâché, depending on the project.
3. **Create a class 'installation' as a response to environmental waste** using actual waste products (such as plastic or styrofoam cups, plates, cutlery, wrapping and packaging) in a visual form.
4. **Create a poster** to advertise this book.
5. **Create a Book Trailer** to promote this book. [See **Bibliography**.]

Learning Technologies

Activity: Research the topics above online.

Mathematics

Activity: Many mathematical concepts are described in this book, for example, the years spanned in different periods of time, the life of waste products before they disintegrate and no longer pose a threat to our environment etc. Invite students to pursue a mathematical question posed by this text.



Further Topics for Discussion and Research

- Research the work of Jess McGeachin. Compare this to his other books.
- Students might research this book in comparison to reading other illustrated non-fiction books such as those listed in the **Bibliography**.

Conclusion

Deep is an entertaining work of non-fiction which poses many questions. Jess McGeachin has provided a plethora of facts about several deep environments in a very engaging way, and therefore encourages students to locate a wealth of further information.



About the Author/ Illustrator

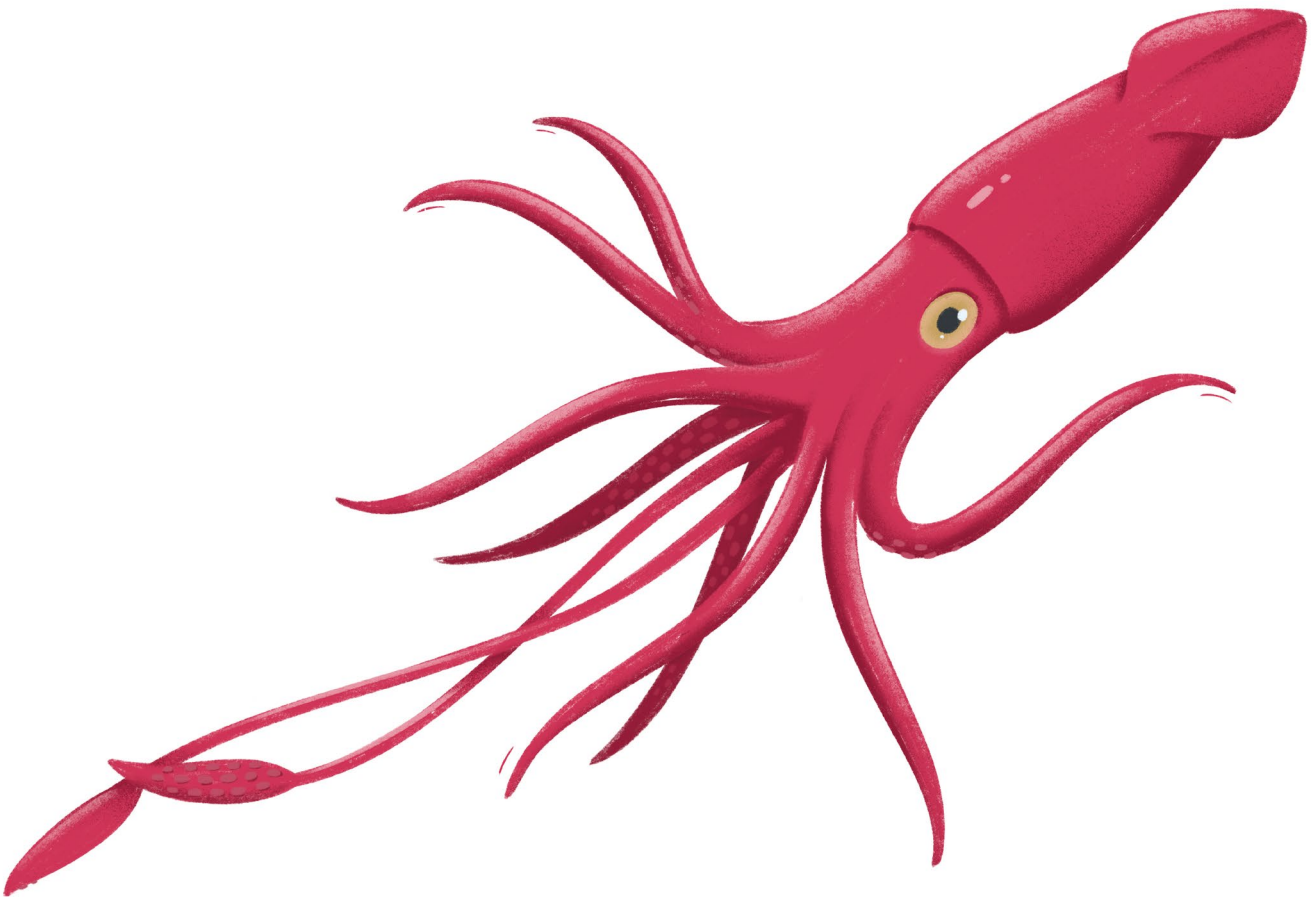
Jess McGeachin grew up in regional Victoria where he spent lots of time in the local library pouring over well-loved DK eyewitness books. He has fond memories of visiting the old Melbourne Museum where his mum worked as a scientific illustrator, meticulously drawing strange sea-creatures in glass jars. Jess studied Communication Design at RMIT and worked as a graphic designer before turning his hand to writing and illustrating picture books. He loves telling stories about hidden places, like the underground world beneath your feet or a secret library waiting to be found. Jess's first non-fiction title, *Deep*, won the Children's Book Council of Australia (CBCA) Eve Pownall award in 2023. Check out Jess's website: www.jessmcgeachin.com



WORKSHEETS

WORKSHEET 1.

This giant squid has many neighbours. Draw and colour some of them in the water above and below the squid.



WORKSHEET 2. QUIZ

Deep Sea

1. What are The Trenches in the ocean known as?
2. Why are so many deep sea animals red?
3. What is Bioluminescence?

Deep Forest

4. What function does the white-lipped peccary, perform on the forest floor?
5. How many types of birds live in the Amazon Forests – 100, 500 OR 1,500 +?
6. What form of camouflage does the leaf-mimic katydid use?

Deep Earth

7. What is the outer layer of the earth called?
8. What word applies to a rock when heat and pressure change one rock into a new one?
9. What name is given to an animal that only lives in a cave?

Deep Time

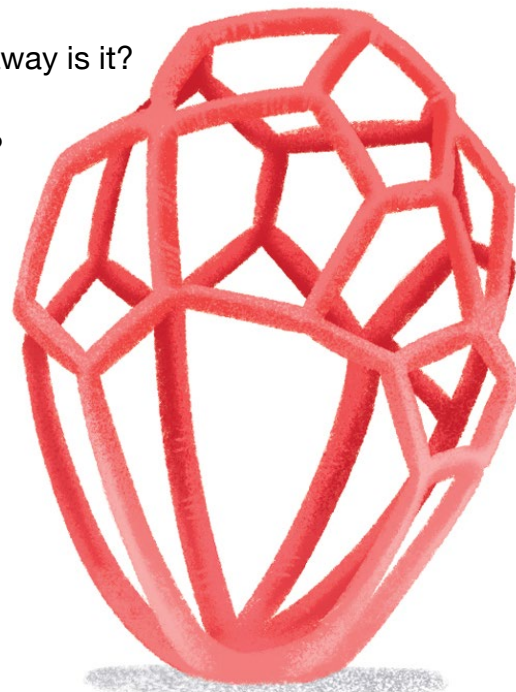
10. What was the first age called?
11. What is coprolite?
12. How long does a plastic toothbrush take to break down?

Deep Space

13. Andromeda is the nearest galaxy to our Milky Way. How far away is it?
14. What are galaxies made of?
15. What was the first spacecraft to successfully orbit the world?

Deep Inside

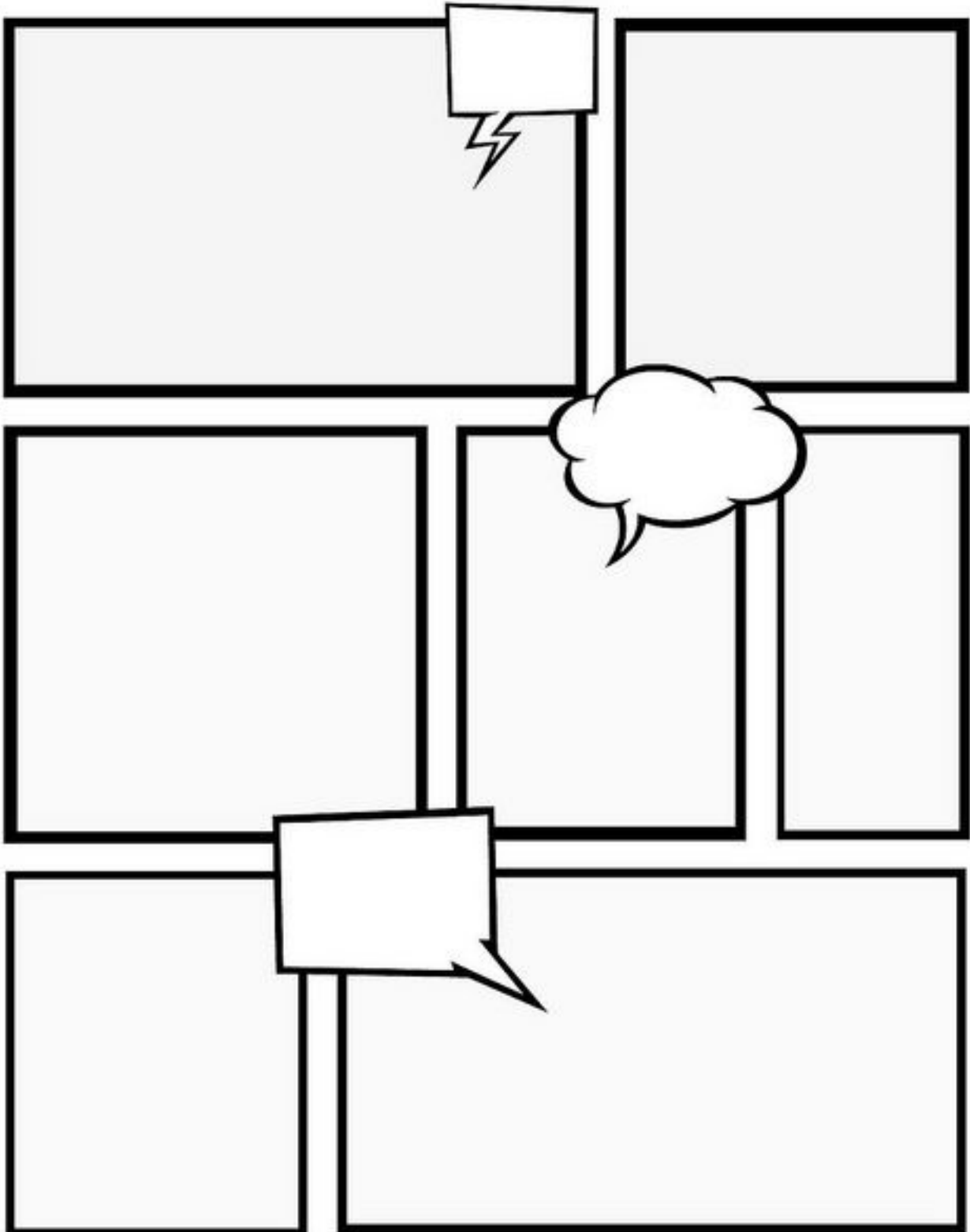
16. What is the cerebellum or the 'little brain' responsible for?
17. What is the largest organ in the body?
18. What are microbes?



Answers: 1. The Hadal Zone which is below 6,000 metres. (p 9) 2. Red is harder to see in the deep, so they'd actually appear as black. (p 11) 3. Bioluminescence is a process by which deep sea creatures make their own light. (p 12) 4. A squadron of them 'can break up the soil and help new plants to grow.' (p 16) 5. 'There are more than 1,500 different types of birds in the Amazon.' (p 18) 6. The 'leaf-mimic katydid is so dedicated to its disguise that it's even got see-through 'holes' on its wings – just like a rotting leaf.' (p 23) 7. The crust. (p 25) 8. Metamorphic (p 26). 9. 'An animal that only lives in a cave is called a troglobite.' (p 29) 10. Precambrian (4.6 billion years ago). (p 38) 11. 'Fossilised poo is called coprolite.' (p 40) 12. It takes 500+ years to break down. (p 43) 13. 'Andromeda is just 2.5 million light-years away.' (p 47) 14. 'Galaxies are made up of dust, gas and billions of stars all held together by gravity and dark matter.' (p 49) 15. Russian Sputnik 1 (p 52). 16. 'It's responsible for movement, balance and motor learning.' (p 54) 17. The skin. (p 56) 18. 'Microbes are the tiny guys living on your skin, around your mouth and especially in your gut. The most common are bacteria, but there's also archaea, fungi and viruses. Together they make up your microbiome.' (p 59)

WORKSHEET 3. GRAPHIC STORYTELLING

Create a graphic novel/comic interpretation of one of the creatures depicted in this book. Use the layout below as the storyboard for your comic. Enlarge on a photocopier to give you more space.



Picture Books

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- Bunting, Philip *Give me some Space!* Omnibus Books, 2020.
- Greenwood, Mark *Moonwalkers*. Ill. by Terry Denton. Penguin Books Australia, 2019.
- Jackson Hill, Diane *Saving Seal: the Plastic Predicament*. Ill. by Craig Smith. Museums Victoria Publishing, 2021.
- Jeffers, Oliver *Meanwhile Back on Earth...* HarperCollins GB, 2022.
- Lord, Michelle *The Mess That We Made* Ill. by Julia Blattman. Flashlight Press, 2020.
- Motum, Markus *Ducks Overboard! A True Story of Plastic in Our Oceans* Walker Books, 2021.
- Tonkin, Rachel *Leaf Litter* Angus & Robertson, 2006.
- Winton, Tim *The Deep* Ill. by Karen Louise. Fremantle Press, 1999.

Junior Non-Fiction

- Bayly, Sami *The Illustrated Encyclopedia of Peculiar Pairs in Nature* Lothian, Hachette, 2021.
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- Bayly, Sami *The Illustrated Encyclopedia of Ugly Animals* Hachette, 2019.
- Bayly, Sami *Surprising Sea Creatures (How We Came To Be)* Hachette, 2022.
- Bayly, Sami *Creatures of Camouflage and Mimicry (How We Came to Be)* Hachette, 2023.
- Bestard, Aina *How Our Solar System Began: The Planets, Their Moons and Beyond* Thames & Hudson, 2023.
- Betts, Bruce *Space Exploration for Kids: A Junior Scientist's Guide to Astronauts, Rockets, and Life in Zero Gravity* Rockridge Press, 2020.
- Burleigh, Robert *Solving the Puzzle Under the Sea: Marie Tharp Maps the Ocean Floor* Ill. by Raúl Colón. Simon & Schuster, 2020.
- Chakrabarti, Nina *Hello Fungi: A Little Guide to Nature* Laurence King Publishing, 2023.
- DeCristofano, Carolyn *National Geographic Ultimate Space Atlas* National Geographic, 2017.
- Factopia – Planet Earth* Lonely Planet Global, 2022.
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- Hume, Sam *An Anthology of Aquatic Life* Dorling Kindersley, 2022.
- Jenkins, Steve *Down, Down, Down: A Journey to the Bottom of the Sea* Houghton Mifflin Children, 2016.
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- Knowledge Encyclopedia Ocean!: Our Watery World As You've Never Seen It Before* Dorling Kindersley, 2020.
- Knowledge Encyclopedia History!: The Past as You've Never Seen It Before* Dorling Kindersley, 2019.
- Knowledge Encyclopedia Space!: The Universe as You've Never Seen it Before* Dorling Kindersley, 2021.
- Lukidis, Lydia *Deep, Deep Down: The Secret Underwater Poetry of the Mariana Trench* Ill. by Juan

Calle. Capstone, 2022.

Maggi, Nicole *Lonely Planet Kids Hidden Wonders* Lonely Planet, 2019.

Ocean Animal Atlas Lonely Planet Kids, 2022.

Miles, Lisa *The Usborne Book of Astronomy and Space* Usborne, 2016.

Polyquin, Rachel *The Museum of Useless Body Parts: A Tour of Your Body's Leftovers, Flaws and Other Weird Bits* Ill. by Clayton Hanmer. Affirm Press, 2023.

Reynolds, Eddie *Climate Changes for Beginners* Ill. by El Primo Ramon. Usborne GB, 2021.

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Vestal, Meghan *Geology for Kids: A Junior Scientist's Guide* Rockridge Press, 2020.

Wagner, Kristie *Human Anatomy for Kids: A Junior Scientist's Guide to How We Move, Breathe, and Grow* Rockridge Press, 2021.

Zommer, Yuval *The Big Book of the Blue* Thames & Hudson, 2018.

Website Teaching Resources

'All About the Ocean' *National Geographic*

<<https://education.nationalgeographic.org/resource/all-about-the-ocean/>>

'Archaeological Sites in Australia' *Wikipedia*

<https://en.wikipedia.org/wiki/Category:Archaeological_sites_in_Australia>

Australian Age of Dinosaurs

<<https://www.australianageofdinosaurs.com/>>

'Australian Archaeology' *Australian Museum*

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Australian Earth Science Education

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'War on Waste' *ABC Iview*

<<https://iview.abc.net.au/show/war-on-waste>>

'Wreck of the Titanic' *Wikipedia*

<https://en.wikipedia.org/wiki/Wreck_of_the_Titanic>



About the Author of the Notes

Dr Robyn Sheahan-Bright AM operates justified text writing and publishing consultancy services, and is widely published on children's literature, publishing history and Australian fiction. In 2011 she was the recipient of the CBCA (Qld Branch) Dame Annabelle Rankin Award for Distinguished Services to Children's Literature in Queensland, in 2012 the CBCA Nan Chauncy Award for Distinguished Services to Children's Literature in Australia, and in 2014, the QWC's Johnno Award. In 2021 she was appointed a member of the Order of Australia.

