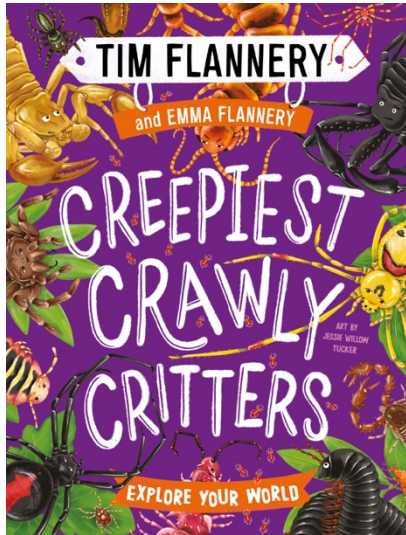


Teacher's Notes



Explore Your World: Creepiest Crawly Critters

Written by **Tim Flannery and Emma Flannery**

Illustrated by **Maude Guesne**

Teacher's Notes by **Bec Kavanagh**

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LEARNING OUTCOMES

RECOMMENDED FOR

6+ aged readers (grades 3-4)

KEY CURRICULUM AREAS

- Learning areas: Science
- General capabilities:
 - ACSHE050
 - ACSHE051
 - ACSSU075
 - ACSSU073

THEMES

- Creepy crawlies
- Understanding our local environment
- Conservation and caring for our world
- Evolution and survival
- Facing our fears
- Being curious about our backyards

SYNOPSIS

Tim and Emma Flannery follow up the first three books in their popular 'Explore Your World Series' with *Creepy Crawly Critters*, an exploration into the fascinating world of arachnids and other interesting arthropods. This book is an entertaining, informative (and occasionally gross) look into all the things that creep and crawl.

The book (and these notes) is divided into eight sections:

- Spiders
- Harvestmen
- Scorpions
- Pseudoscorpions
- Odd bunch
- Ticks
- Mites
- Centipedes & Millipedes

Within these sections, Flannery invites readers to confront their own preconceptions about creepy crawlies and understand their beauty and their place in our world.



ABOUT THE AUTHORS

Professor Tim Flannery is one of the world's leading scientists, explorers and conservationists. He has held positions in renowned institutions across Australia and internationally, including Director of the South Australian Museum, Visiting Chair in Australian Studies at Harvard University and Distinguished Research Fellow at the Australian Museum. He was named Australian of the Year in 2007. He has published more than thirty books, including the award-winning *Here on Earth* (2010), *The Weather Makers* (2005) and *Atmosphere of Hope* (2015). He is a frequent presenter on ABC Radio, NPR and the BBC, and has also written and presented several series on the Documentary Channel. This is his third book for children.

Emma Flannery is a scientist and writer whose curiosity for the natural world has seen her travel and work in some of its most wild and interesting places. She has explored caves, forests and oceans across most of the globe's continents in search of the elusive fossils, animals and plants that help us understand our planet and who we are in it. With postgraduate experience in geology, chemistry and palaeontology. Emma's research and writing has been published in scientific journals, children's books and a number of museum-based adult education tours. She has worked for and with universities, government agencies and museums. She is the co-founder of Museophilic, an independent curatorial service that has produced programs for the City of Sydney and the Australian Museum, aimed at bringing science to life for a range of audiences. Her passion for science has an infectious and playful enthusiasm that inspires curiosity in children and adults alike. She hopes to continue to produce fun and accessible science communication.

ABOUT THE ILLUSTRATOR

Maude Guesne grew up in a small town not far from Bretagne, in France. She studied graphic design and illustration at Brassart College of Art before embarking on her career in illustration in Paris. Maude has always been passionate about travelling, nature and seeing the world. On her adventures as a travelling illustrator, she has lived and worked in many different places, including Australia, Brazil, Canada, Indonesia, Thailand, Cambodia and Africa. Maude now lives in Groningen, in the Netherlands, where her studio is surrounded by nature, windmills and bikes. Maude is always exploring with a pen or camera and finds constant inspiration in the natural world around her. She loves to draw animals and whimsical characters, and is passionate about using textures and colours to tell stories with her art. Her illustrations are always imbued with a touch of humour and sparkle.

THEMES

This book is about the millions of creepy crawlies we share the planet (and even our own bodies) with. Creepy crawlies have a bit of a bad rap – think about how many people you know are afraid of spiders! But this book encourages us to face our fears and consider all the useful and interesting things creepy crawlies do. This book will encourage readers to:

- Understand warning signs
- Show an interest in the natural world
- Start to think about scientific naming conventions
- Consider our relationship with the environment and our impact on creepy crawlies



WRITING STYLE

Tim and Emma Flannery combine fascinating facts with anecdotes from their own life, bringing out some of the unique characteristics of creepy crawlies to encourage readers to view them in an entirely new way. The text is broken up into easy-to-read pieces, with puns and plenty of sub-headings to help guide reading.

Do Tim or Emma sound afraid when they share some of their more alarming encounters with creepy crawlies? Would you feel differently about the creepy crawlies if they did? Think about how we can use tone in our writing to guide the emotions of our reader – what kind of language do the writers use to show that there's really nothing to be afraid of?

WRITING ACTIVITY

Flannery File: Throughout the book, Tim and Emma Flannery shares their own encounters with creepy crawlies in the 'Flannery Files'. Read one of the Flannery Files aloud in class and discuss how they tell the story in a way that is interesting to the reader. Why do you think these anecdotes are included in the book? What details do they include in each piece?

Write your own Flannery File, that details an encounter you've had with a creepy crawly.

COMPREHENSION QUESTIONS

- How did you feel about creepy crawlies before reading the book? Did your feelings change once you learnt more about them?
- What creepy crawlies have you encountered? (make a list and tick off the creepy crawlies you've seen against the ones described in the book)
- Why are creepy crawlies important? As you read the book, make a list of five ways that creepy crawlies help humans.
- Keep a vocab list as you read, writing down all of the words that are new to you and their meaning. Practice using some of these words in your everyday conversations with people.
- How have some of the creepy crawlies in nature inspired solution to human problems?

ILLUSTRATION STYLE

Maude Guesne's illustrations are bright, colourful, and mostly realistic. Guesne creates illustrations that are realistic, but also gives each of the creepy crawlies a personality. Some of the creepy crawlies are given cheeky expressions, or the illustrations are used to show-off their unique quirks. How do these personalities help you to see creepy crawlies differently? Draw a creepy crawly of your own showing off something interesting that you've discovered about it from the book.



CONCEPTS (AND INTRODUCTION)

SUMMARY

Do you know where to find all the creepy crawlies in your house and garden? Do you know how to understand the meaning of their scientific names, or what family they belong to? The introduction provides an overview of some of the terms and concepts that readers will need to be familiar with as they venture into the world of creepy crawlies. Tim and Emma Flannery share their own personal encounters with the crawly critters and drop some of their favourite facts about some of the interesting creepy crawlies that readers will discover in the book.

COMPREHENSION QUESTIONS

- Where do you find creepy crawlies?
- How long have some creepy crawlies been around for?
- What does Tim Flannery believe our relationship with creepy crawlies should be?
- What is a **phyla**? What phylum do creepy crawlies belong to? What do creatures belonging to this group have in common?
- Make a list of five creepy crawlies that are mentioned in the introduction that you'd like to learn more about.
- What is so special about the web of the golden orb weaver? What do you do when you come across spider webs at home?
- Why do we need creepy crawlies?
- What should you do if you encounter a creepy crawly?
- Why is the life of a creepy crawly 'ruthless' (p12)? What are some of the threats creepy crawlies face?
- What is the 'very special creepy crawly that isn't an arthropod' (p12)? How did you figure this out?
- What is the difference between a common name, and a scientific name? What do the parts of a scientific name reveal about the creature they describe?

ACTIVITY

Draw a map of your house and the creepy crawlies that live there. Where do they live? Are they dangerous? Draw a picture of the creepy crawlies who live with you and make a list of all the things you know about them.

SPIDERS

SUMMARY

The book's first (and longest) chapter is all about our favourite household creepers – spiders! Love them or hate them, spiders are fascinating creepy crawlies, who might seem frightening on first glance, but whose bodies and skills have inspired a lot of human inventions. Learning more about these fascinating arachnids will make you see spiders in a whole different light.

COMPREHENSION



- How many spiders could live on the size of one football field?
- What are three characteristics of a spider?
- Spider hairs are **hydrophobic** – what does this mean? How does this come in useful for spiders? What are some of the ways that hydrophobic materials could be useful for humans?
- What are the parts of a spider's body? Draw a picture and label each of these parts. What are some of the interesting things about spider bodies?
- What is antivenom? Where does it come from? What should you do if you get bitten by a spider?
- What's so special about spider silk? What are some of the clever ways that spiders use their silk? What do humans use silk for?
- What are some of the threats to spider habitats? What can we do to help?
- What letter does a golden orb weaver start with when spinning her web?
- What spiders are found in your local area?
- How do spiders live in or around water? What are the names of some of the spiders that live in this environment?
- What is the goliath birdeater's claim to fame?
- What are some of the defences that spiders have against predators?
- Which spider has the deadliest venom on earth?
- What are some of the ways that spiders interact with other animals (apart from eating them!)
- What are some famous spider (or spider-inspired) characters from film and fiction?
- Why do some spiders have colourful bodies? How do they use this colour?

ACTIVITIES

A spiders-eye view

It's almost impossible to walk around our house or backyard without encountering a spider. What kind of spiders live at your house? Do they live inside or outside? Are you scared of them?

Try to imagine yourself into the spider's shoes (web?) for a moment and write a day in the life from the spiders perspective. How would they describe encounters with humans? What else do they do or see while you're at school all day?

Spiders in hiding

Flannery describes some pretty amazing ways that spiders disguise themselves to hide from their prey. If you were a spider, how would you disguise yourself? Draw a picture of your spider in disguise, waiting to catch its prey.

Spider poetry

An acrostic poem is when the first letters from each line of poetry can be read vertically to spell a word. For example:

Hiding in the kitchen
Eager for flies
Lies the spider
Patiently waiting for dinner

Using the letters in 'spider', can you write an acrostic poem about spiders? You might choose to use facts from the chapter as inspiration for some of your lines.



Dinner's Ready!

On page 24-25, Tim Flannery describes the way that spiders catch and eat their prey. Using the information on these pages, draw a picture, comic or a flow chart to show how a spider catches and eats its food.

Wonderful webs

Read about the ways that all the different spiders build their webs – how do each of the unique shapes and designs work to keep the spider safe, and provide them with food? Using materials that you can find around your house, make a 3D model of one of the webs in the book, and explain to your classmates how it works.

HARVESTMEN

SUMMARY

Harvestmen might look like spiders, but in fact they're more closely related to mites! This chapter will help you to distinguish between your huntsmen and your harvestmen like a pro. Did you hear about the harvestman who was discovered during the filming of a documentary?

COMPREHENSION

- How is a harvestman different to a spider?
- How do we know that harvestmen have been around for more than 400-million years? How long is that compared to human civilisation?
- What beneficial role do harvestmen play in the garden?
- What do harvestmen eat?
- What kind of scientists classify animals and plants?

ACTIVITY

What is so unique about the Bunny Harvestman? Design an experiment that you could do to discover why it has such a funny-looking body – think about all of the things you've discovered about creepy crawlies so far to come up with a list of possible reasons and think of ways that you could test to see if any of these are correct.

SCORPIONS

SUMMARY

Scorpions are the survivors of the creepy crawly world, with a tough exo-skeleton and a curved tail ending in a venomous stinger. Scorpions can survive being frozen, and even a nuclear explosion! Would you go up against one?



COMPREHENSION

- What are some of the characteristics of a scorpion?
- What do scorpions use their pincers for?
- What is nightmarish about a scorpion's mouth?
- What are some of the similarities between spiders and scorpions?
- Why is life without a tail particularly bad for a scorpion?
- Which scorpions should humans be afraid of?
- Why do scientists think that scorpions glow under UV light?
- What kind of scary scorpion might have you encountered during prehistoric times?
- What superstar scorpion is usually used in movies? Why?
- Where are you most likely to find a scorpion?

ACTIVITY

Scorpions are pretty tough, but are they the toughest creepy crawly? Imagine a battle between a scorpion and one of the other creepy crawlies in the book. What are their strengths and weaknesses? Describe how a battle between these two creepy crawlies might play out. Who do you think will emerge victorious?

Make a deck of creepy crawly cards, giving each creepy crawly in the book attack points and damage points based on their strengths and weaknesses. Use them to defeat other creepy crawlies from your classmates' decks.

PSEUDOSCORPIONS

SUMMARY

What has miniature claws and looks like a scorpion but is NOT a scorpion? A pseudoscorpion! These little creatures, like scorpions and spiders, are arachnids and there are over 3,000 types to be found over the world. The most ancient pseudoscorpion lived over 380 million years ago! That's a long time. How did we discover this little guy? Read on to find out...

COMPREHENSION

- What is the closest relative of a pseudoscorpion?
- List three characteristics of a pseudoscorpion.
- What is it called when a female animal can reproduce without a male?
- How do pseudoscorpions travel?
- How are pseudoscorpion mothers different to scorpion mothers when it comes to sharing the food?

ACTIVITIES

Pseudoscorpions can travel by 'phoresy', which is when a creature hitches a ride on the body of another creature. Write (or draw) a short story that imagines an adventure that a pseudoscorpion might take when travelling the beetle express.



ODD BUNCH

SUMMARY

What's in a name? The odd bunch offers an introduction to some of the stranger creepy crawlies you might come across. These creepy crawlies might share a name, or features, with other insects, but belong to their own groups entirely, making them deserving of their own section in the book.

COMPREHENSION

- How many kinds of tailless whip scorpions are there?
- Where do you find a tailless whip scorpion?
- Should you be afraid of them?
- How does the tailless whip scorpion hunt for food?
- Where did Tim Flannery encounter a tailless whip scorpion?
- Why do you want to hold on tight if you're a baby tailless whip scorpion?
- What is the 'cool nickname' of a camel spider?
- What noise do camel spiders make to warn predators to stay away?
- Where do you find camel spiders?
- Do sea spiders swim in the sea?
- How many kinds of sea spiders can you find? What are some of their distinctive characteristics?
- What would you find inside a sea spiders' leg?
- What does a tardigrade look like? How big are they?
- What would happen if a tardigrade dried out?
- What do tardigrades eat?
- What kind of extreme environments can the tardigrades survive?

ACTIVITY

A tailless whip scorpion looks as though it's made up of the parts of several other creepy crawlies. What are they? Design your own creepy-crawly mash up. Take your favourite parts of some of the other creatures described in the book and put them together to make a new creepy crawly. Draw a picture of it in its natural habitat.

Give your new creepy crawly a scientific and a common name. What does it eat? Where might you find it? Is it dangerous? Compare your new creepy crawlies to your classmates.

ACTIVITY

Following the instructions in the book (p169) try to catch your own tardigrade. Even if you don't find one, write about the experience. How could you increase your chances next time?

TICKS

SUMMARY

Ticks are like the vampires of the creepy crawly world, able to drink so much blood that they can be 100 times heavier after a meal! Ticks are sneaky little bloodsuckers, hiding carefully on their hosts to ensure



they have time to drink a full meal. Keep an eye out for these parasites though, a tick's spit can contain some nasty germs!

COMPREHENSION

- How do ticks move from one place to the next?
- Who is Otzi? How did he die?
- What is co-extinction? Why are certain ticks in danger of this?
- What are some of the useful things scientists might be able to learn from tick venom?
- Where do ticks like to hide in humans?

ACTIVITY

Make a poster that highlights some of the dangers of getting bitten by a tick. How will you illustrate your poster? Who is the information for? What can people do to avoid a tick bite?

MITES

SUMMARY

Welcome to the age of the mammal! After the freezing cold that followed the Mesozoic period, the conditions on Earth changed to allow new life to take over. But while these ancient primates might be familiar, they're still pretty different from the animals we know and love! The early years of the Cenozoic saw the emergence of creatures like the woolly mammoth who could survive the extreme cold. But the really exciting thing about the Cenozoic age is that we're in it right now!

COMPREHENSION

- What is distinctive about the bodies of mites? How many eyes do they have?
- What are some of the useful things that mites do around our homes?
- What is the name of the mightiest mite?
- Why should we be careful with biological control agents?
- How big are the mites that live on our faces?
- What do mites eat?

ACTIVITY

Farmers might order snout mites on the internet to control outbreaks of spider mites. Write an advert for snout mites – what would you say to sell them to eager farmers?

CENTIPEDES & MILLIPEDES

SUMMARY

Centipedes and millipedes, with their abundance of legs, are perhaps the crawlies of all the creepy crawlies in the book. Despite the painful and sometimes deadly bites of some centipedes to the stinky sprays of millipedes, these creepy crawlies have many valuable functions to play in the environment.



COMPREHENSION

- What group do centipedes and millipedes belong to?
- How does a centipede's body differ to a millipede's?
- What important function do millipedes play in nature?
- What is it called when a creature uses colour to show that it's dangerous to eat?
- When does a creature become a pest? What kinds of millipedes are pests in Australia?
- What is the fastest centipede on earth?
- What are some of the ways millipedes protect themselves against predators?

ACTIVITY

Become a citizen scientist. Use this website (<https://citizenscience.org.au/ala-project-finder/>) to discover some of the citizen science projects going on around Australia. Either individually or in small groups, choose a project to participate in using some of the creepy crawlies from your local area as data.

RELATED READING

'Explore Your World: Weird, Wild, Amazing!' by Tim Flannery

'Explore Your World: Deep Dive Into Deep Sea' by Tim Flannery

'Explore Your World: The Weirdest Creatures in Time' by Tim Flannery

