Teacher Notes

Themes

- Animal classification (taxonomy)
- Food webs
- Animal conservation

Key learning outcomes

- Wasps are a type of insect that come in a wide variety of shapes, sizes and colours
- Wasps play important roles in their ecosystem as predators, prey and pollinators
- By nurturing and protecting habitats wasps live in, we can help natural environments remain healthy

Key curriculum areas

- **Science:** Science Understanding (Biological sciences, Physical sciences)
- **English:** Language; Literacy
- **Cross-curriculum Priority:** Sustainability

Publication details

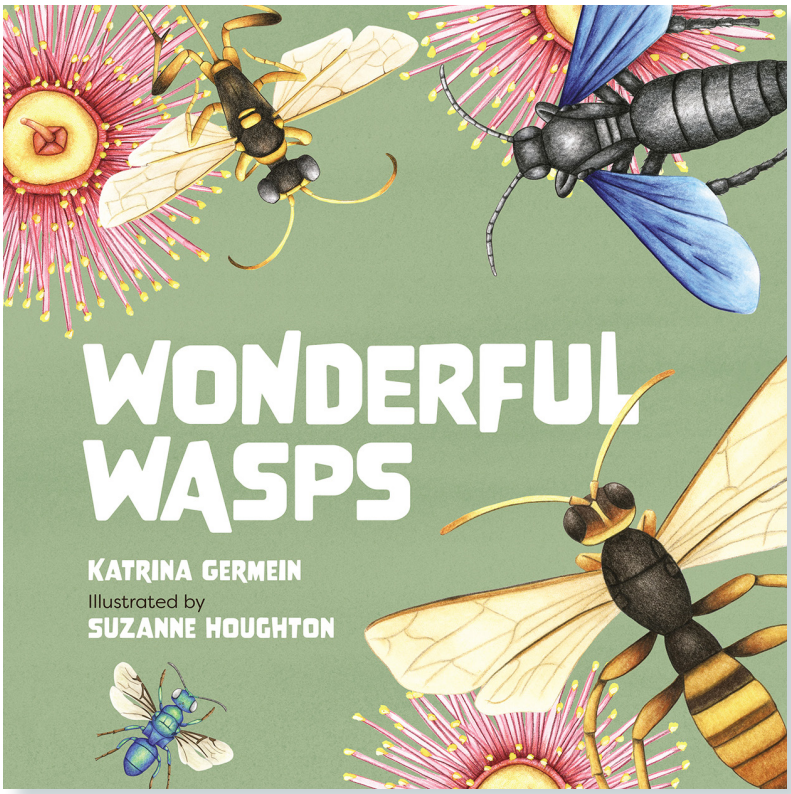
Wonderful Wasps

ISBN: 9781486315734

Teacher notes prepared by Mike McRae.

CSIRO Publishing
Private Bag 10
Clayton South, VIC 3169, Australia

Website: www.publish.csiro.au
Tel: 1300 788 000 (local call in Australia)
Email: publishing.sales@csiro.au



Wonderful Wasps

Katrina Germein and Suzanne Houghton

About the book

What do you know about wasps?

There are wasps that shimmer in shades of bright blue and green. There are some without wings – and some almost too tiny to see. Some capture spiders, while others nest in fruit or mud.

With over 12 000 species found in Australia, *Wonderful Wasps* brings the beauty and importance of native wasps to life, and reminds us every creature matters in its own wonderful way.

Recommended for

Readers aged 5 to 9 (Years 1 to 4)

CSIRO PUBLISHING

Teacher Notes

About the author and illustrator

Katrina Germein is a teacher and award-winning children's author. She writes picture books about family, fun and the natural environment.

Suzanne Houghton is an award-winning picture book author and illustrator. She works closely with local schools through workshops and presentations.

Pre-reading activities

Provide the class with art materials, including paper, and ask the students to draw a wasp. Ask them what the key characteristics are, prompting them on colours, number of wings, wing shape, legs and body shape. When they've completed their pictures, ask them to explain how a bee, ant or butterfly might look different.

Ask the class which of all of those insects they find most interesting. Which are they most cautious around?

In sharing the different wasp pictures, ask the class if they think there are different kinds of wasps. Invite them to make suggestions on things they might change in their wasp picture to make a new variety. Encourage the students to reinvent their wasp and describe where it lives, what food it might eat and what its predators might be.

Discussion questions

Science

1. Show the class the image of the European wasp at the beginning of *Wonderful Wasps*. Ask them to point out parts of the wasp's body that they recognise. What might the wasp use each body part for? Ask them why it might be yellow and black, instead of other colours.
2. Explain to the class that European wasps were once only found in the Northern Hemisphere, in Europe, northern Africa and some parts of Asia. Today they're found all around the world, including Australia, where they are a serious pest. Discuss how they might have arrived here, and what we could do to help reduce the chance other invasive pests might become a problem.

3. Compare the bodies of the wasps in the book. What do these wasps have in common? What looks different about them? Ask the class why they would be called wasps and not moths, ants or bees.
4. Discuss the different kinds of homes wasps build. Invite the students to share their experiences of wasp homes around their own house and garden. Do they look the same as the ones featured in the book or do they look different?
5. Read 'More about Australian wasps' and point out how much wasps vary in size. We know of 12 000 native species – ask students whether it's likely entomologists will find more in the future. How might they go about finding a new wasp species?

English

1. Compare the different kinds of Australian wasps in the book, reading their names aloud. What might these names tell you about their behaviours?
2. Read 'Some of the wasps in this story' in the back of the book. Invite the students to try to pronounce the scientific names of the families, and the genus and species names. Make connections with their own family name, and ask the students why different group names like these might be useful.

Sustainability

1. Ask the students what jobs they think wasps might do in the wild before reading about their work pollinating flowers like bees. Discuss how pollination and providing food as prey might help numerous other species survive.
2. Read 'More about Australian wasps' and discuss the role spaces in our own yards have in giving native wasps a place to live. Ask students why they might want to encourage more native wasps into their yard.

Activities

Science

Healthy wasp, happy wasp

You will need:

- 20 × small squares of card (about the size of a playing card)
- Different coloured markers

What to do:

1. Write the common name of each of the wasps in the section 'Some of the wasps in this story' on a card. Use different coloured markers for the name of each wasp.
2. Discuss with students things wasps might need to survive, and write these on cards. Add water, air and warmth if they don't suggest them.
3. Ask students to reflect on the book and suggest things wasps might eat. Some of these might have already been suggested. Add native pollens, bugs, aphids, spiders, wasps and figs.
4. Write down things that could eat or harm a wasp. Include lizards, birds, cuckoo wasps and pest control.

How to play:

1. Sit the class in a circle around the cards.
2. Shuffle the wasp cards and place them in a pile face down. Do the same with the remaining cards (we'll call them environment cards).
3. Turn over the top wasp card and place it face up.
4. Ask a student to turn over the top environment card and place it face up next to the wasp card. Ask the class if the word on the card helps the wasp survive. If it does, leave it. If it doesn't, shuffle it back into the environment pile. If it is harmful, remove the wasp card, shuffle the environment cards back into the pile, and turn over the next wasp card.
5. Use the book and student opinions to make judgements on whether to keep or remove a card.

What's happening?

Wasps rely on a variety of living and non-living factors in the environment for survival. For native wasps, ensuring they have access to these things will help the ecosystem flourish. For invasive pests, finding ways to restrict their spread – such as by using pest control measures – is important for a healthy environment.

Cycle of life

You will need:

- Plasticine of different colours
- Cardboard
- Markers
- Internet access

What to do:

1. Read 'More about Australian wasps'. Discuss with the class what each word means in the wasp life cycle – egg, to larva (or grub), to pupa, to adult.
2. Use the internet to find images of each stage for one or more Australian wasp, asking the students to describe how they look. What makes them look similar? How are they different? Share images of the same stages in other insects from order Hymenoptera (ants and bees).
3. Allow the class to choose one or more colours of plasticine. Instruct them to use it to create each stage of the wasp's life cycle. They can use the cardboard as a platform for their sculptures, using markers to depict arrows connecting each stage.

What's happening?
Wasps, like other related insects, go through stages of life where they look very different. Some students might already understand butterflies undergo changes from egg to caterpillar. Each stage might rely on different foods and environmental conditions to survive.

Buzz off
Safety: This activity requires use of scissors. Teachers are encouraged to do the cutting for younger students.

Sustainability: Share the limited materials you have, even if it means doing this activity as a single class demonstration or reusing materials in multiple classes for different activities. Please dispose of the waste responsibly, recycling or reusing what you can.

You will need:

- Plastic drinking straws
- Scissors

What to do:

1. Cut each drinking straw in half.
2. Trim two sides of one end of each straw to form the straw into a point. Make the angle relatively steep (making a very pointy arrow).
3. Give one half straw to each student. Instruct them to place the blunt end of the straw into their mouth and to blow softly until the end buzzes with sound.
4. Trim some of the straws slightly shorter. Ask students if they hear a difference in the buzzing tone.

What's happening?
As air blows past the thin points of the straw, the air pressure at the tip decreases, causing the points to bend in and then bounce out. This rapid wobble sends vibrations through the air which we hear as buzzing.

Shorter straws will allow air to move quicker, causing the ends to wobble faster and have a higher pitched buzz.

Wasps buzz because their wings vibrate at a particular speed. This sound is useful for the wasp, as it warns potential predators it's not an insect to be trifled with. Bite, and be stung! This saves the wasp from being accidentally chomped on.

English

Picture is a thousand words
Invite a student to find a page in the book they like.

Instruct them to write a short paragraph describing the image on the page. However, they cannot use any noun directly describing an object in the picture. For example, if it is a wasp on a flower, they cannot say 'wasp' or 'flower', but they could use less direct words, such as 'insect' or 'plant'.

Encourage them to use adjectives and verbs that help give a sense of the imagery.

Hand the book to another student, or a group. As the first student reads their description, the second student or group must identify their picture.

Sustainability

Native gardening
Take a tour of the school grounds, noting or photographing significant trees, shrubs and grasses the students notice.

Back in the classroom, ask the students if they could tell the difference between any native plants – those which have grown locally without a human planting them – and introduced species. A few students might have some knowledge of plants that could be used in the conversation.

Invite a local gardening group, nursery owner or even community Elder in to share facts and ideas about native plant species that flower and might invite wasps.

Work with the students to design a native garden near the classroom. Encourage students to consider places for wasps, spiders and other insects to hide.

Australian curriculum links (Version 8.4)

Year level	Learning area: Science	Other learning areas
Year 1	**Science Understanding: Biological sciences** • Living things have basic needs, including food and water (ACSSU002) **Science Understanding: Physical sciences** • Light and sound are produced by a range of sources and can be sensed (ACSSU020)	**English: Language** • Explore differences in words that represent people, places and things (nouns, including pronouns), happenings and states (verbs), qualities (adjectives) and details such as when, where and how (adverbs) (ACELA1452)
Year 2	**Science Understanding: Biological sciences** • Living things grow, change and have offspring similar to themselves (ACSSU030)	**English: Language** • Understand the use of vocabulary about familiar and new topics and experiment with and begin to make conscious choices of vocabulary to suit audience and purpose (ACELA1470) • Identify visual representations of characters' actions, reactions, speech and thought processes in narratives, and consider how these images add to or contradict or multiply the meaning of accompanying words (ACELA1469)
Year 3	**Science Understanding: Biological sciences** • Living things can be grouped on the basis of observable features and can be distinguished from non-living things (ACSSU044)	**English: Literacy** • Use comprehension strategies to build literal and inferred meaning and begin to evaluate texts by drawing on a growing knowledge of context, text structures and language features (ACELY1680)
Year 4	**Science Understanding: Biological sciences** • Living things depend on each other and the environment to survive (ACSSU073)	**English: Language** • Explore the effect of choices when framing an image, placement of elements in the image, and salience on composition of still and moving images in a range of types of texts (ACELA1496)
All	**Cross-curriculum Priority: Sustainability** • OI.2: All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.	

Related books from CSIRO Publishing

For younger readers:

- *AmAZed! CSIRO's A to Z of Biodiversity* (https://www.publish.csiro.au/book/7984)
- *Bee Detectives* (https://www.publish.csiro.au/book/7962)
- *Poo, Spew and Other Gross Things Animals Do!* (https://www.publish.csiro.au/book/8021)
- *The Butterfly and the Ants* (https://www.publish.csiro.au/book/7965)

For adults:

- *A Guide to Native Bees of Australia* (https://www.publish.csiro.au/book/7388)
- *Bees of Australia: A Photographic Exploration* (https://www.publish.csiro.au/book/7786)

Other CSIRO resources

CSIRO has developed and delivered a broad range of high-quality STEM education programs and initiatives for nearly 40 years. Our programs aim to inspire the pursuit of further STEM education among students and the community, to equip the emerging workforce with tomorrow's skill sets, and to strengthen collaboration between industry and classrooms across Australia. For more information visit: https://www.csiro.au/en/Education