

Year 5 Teacher Guide: Government House, Darwin

A Buzz at Government House

Learning Area: Science **Stage of Schooling: Year 5**

Topic: Adaptations of bees

Knowledge and understanding

Students will investigate that living things have structural features and adaptations that help them to survive in their environment

Achievement Standard:

By the end of Year 5, students will analyse how the form of living things enables them to function in their environments. Students discuss how scientific developments have affected people's lives, help us solve problems and how science knowledge develops from many people's contributions.

Students follow instructions to pose questions for investigation and predict the effect of changing variables when planning an investigation. They use equipment in ways that are safe and improve the accuracy of their observations. Students construct tables and graphs to organise data and identify patterns in the data. They compare patterns in their data with predictions when suggesting explanations. They describe ways to improve the fairness of their investigations, and communicate their ideas and findings using multimodal texts.

Inquiry question:

Why do humans need bees and how do humans use the adaptations of bees for their own benefit?

Lesson: A Buzz at Government House

Lesson Inquiry:

Students will use their visit at Government house to find out about behavioural and structural adaptations of bees. They will observe the behaviour of bees at Government house and continue to learn about bees back at school.

Learning intention:

Students will investigate the adaptations of bees that allow them to survive and reproduce. They will gain an increased understanding of the types of adaptations shown by bees. They will explore how these adaptations have been used by humans and they will explore the relationship between bees and food production.

Success Criteria:

Students will be able to:

- list structural and behavioural adaptations of bees
- explain why bees are beneficial for humans
- explain the features of bees of which humans have taken advantage

Supporting Materials

Activity: Love Food? Love Bees! – Adaptations: Bee’s Knees and Flower Power – Year 5 & 6

<https://www.coolaustralia.org/activity/love-food-love-bees-adaptations-bees-knees-and-flower-power-year-5-6/>

Secret Bees Bees-iness <https://www.governor.nsw.gov.au/government-house/stories/secret-bees-bees-iness/>

Honey bees and beekeeping: <https://nt.gov.au/industry/agriculture/livestock/honey-bees-and-beekeeping/introduction>

Sugarbag bee honey a feast from nature, with stingless insects creating delicious outback bush tucker: <https://www.abc.net.au/news/2018-01-21/native-honeybees-provide-popular-bush-tucker/9333278>

Native bee hive honours Indigenous Dreaming story of Jabreen the warrior <https://www.abc.net.au/news/2019-02-21/aboriginal-dreaming-god-native-bee-hive/10793796>

Australian native been sightings: <http://www.bowerbird.org.au/projects/2/sightings>

Planting and creating habitats to attract bees: <http://mrccc.org.au/wp-content/uploads/2014/02/Attract-Bees.pdf>

Why do honeybees love hexagons?: <https://ed.ted.com/lessons/why-do-honeybees-love-hexagons-zack-patterson-and-andy-peterson#watch>

What is it about bees and hexagons?: <https://www.npr.org/sections/kruhwich/2013/05/13/183704091/what-is-it-about-bees-and-hexagons>

Asian Honey Bee poster: https://nt.gov.au/_data/assets/pdf_file/0011/268454/Asian-honey-bee-biosecurity-alert.pdf

Work Unit: The Geometry and Algebra of Honeycomb <https://calculate.org.au/2016/02/19/work-unit-the-geometry-and-algebra-of-honeycomb-2/>

Videos

[The first 21 days of a bee’s life | Anand Varma](#)

[Flow™ Hive Full Reveal \[Original crowdfunding video 2015\]](#)

[Pollinating Australia's Fresh Produce - Beechworth Honey](#)

[How bees help plants have sex - Fernanda S. Valdovinos](#)

Suggested Activities:

Excursion Activity 1. Observing the bees at Government House

School Activity 1. Questions about story: A Buzz at Government House

School Activity 2. Bee adaptations

School Activity 3. Roles and jobs of bees

School Activity 4. Bees and Indigenous Australians

School Activity 5. Hexagonal Maths

Suggested Sequence:

- Read text: A Buzz at Government House
- Complete school activities 1-5.

(School activity 2 and 3 are best completed sequentially)

- Complete excursion activity 1.

Excursion Activity 1. Observing the Bees at Government House

Name:

1. 'Bee' observant!

Since you're here at Government house, we'd like your help! We want to keep track of where our bees live and which flowers they are visiting. Choose a spot in the gardens. Sit quietly and record the following information.

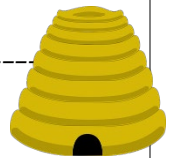
- a. **Predict:** before you start, predict how many bees you think you will see:

I predict that: _____

- b. **Count the number of bees you see and record in a tally**

Bee count (tally):

- c. **Where did you see the bees?**



2. Visit the bee hives

- d. **Draw what the bee hives looked like:**

- e. **Describe some features of the bee hives**

School Activity 1. Questions about Story: A Buzz at Government House

1. How do you think European honeybees (*Apis mellifera*) got to Australia? (page 3)
2. How many sides does a hexagon have? What is the difference between a hexagonal prism and a hexagonal pyramid (page 4)
3. Can you think of any other insect or animal that makes geometric patterns? (page 4)
4. What does the word fertile mean? (page 5)
5. Why do you think bees communicate using chemicals or movement? (page 6)
6. Do you know of any other insects that have a proboscis? (page 7)
7. Can you list sources of protein and carbohydrates in your diet? (page 7)
8. Is nectar or pollen turned into honey? (page 8)
9. What does the word **regurgitate** mean? (page 8)
10. What are the two reasons that a bee may use a **waggle dance**? (page 9)
11. How do you think we know that the Ancient Egyptians kept bees? (page 10)
12. What does the word **domesticated** mean? (page 10)
13. Which other insects and animals are important pollinators? (page 11)
14. Look at the picture of the hive. How do the bees get into the hive? (page 12)
15. What do you think biosecurity refers to? (page 13)
16. Why does the Asian honeybee have a negative impact on the European honeybee? (page 13)

School Activity 2. Bee Adaptations

Question 1:

For the following adaptations, decide whether they are behavioural or structural by placing a tick in the correct column. The first two are done for you

Adaptation	Behavioural <i>(how the bee acts)</i>	Structural <i>(how it's body is made)</i>
Having wings to fly		✓
Flying	✓	
Collecting and storing honey		
Having a proboscis to suck and lick nectar		
Making pheromones to communicate		
Living in large social groups		
Having corbiculae on their legs to collect pollen		

Question 2:

Choose one of the adaptations in the table and describe how it is beneficial for a bee.

The adaptation I chose is: _____

The reason it is beneficial is: _____

Question 3:

List three other adaptations that a bee has.

1) _____

2) _____

3) _____

School Activity 3. Roles and Jobs of Bees

One adaptation that Honeybees have is that bees of different genders have different roles. Each of the different types of bee has different adaptations.

Complete the following table using the information provided in 'A Buzz at Government house' and other sources.

Type of Bee	Gender	What role does it play for the hive?	How is it adapted to do its job?	Type of adaptation: structural / behavioural?
Queen Bee	Female		- The queen bee is fertile and lays many eggs.	- Structural & Behavioural
Worker Bee				
Drone			- Drones stay in the hive.	- Behavioural
Scout Bee				

School Activity 4. Bees and Indigenous Australians

Use the following resources to conduct further research about Native Bees and Indigenous Australians. Record your findings below.

1. Sugarbag bee honey a feast from nature, with stingless insects creating delicious outback bush tucker:

<https://www.abc.net.au/news/2018-01-21/native-honeybees-provide-popular-bush-tucker/9333278>

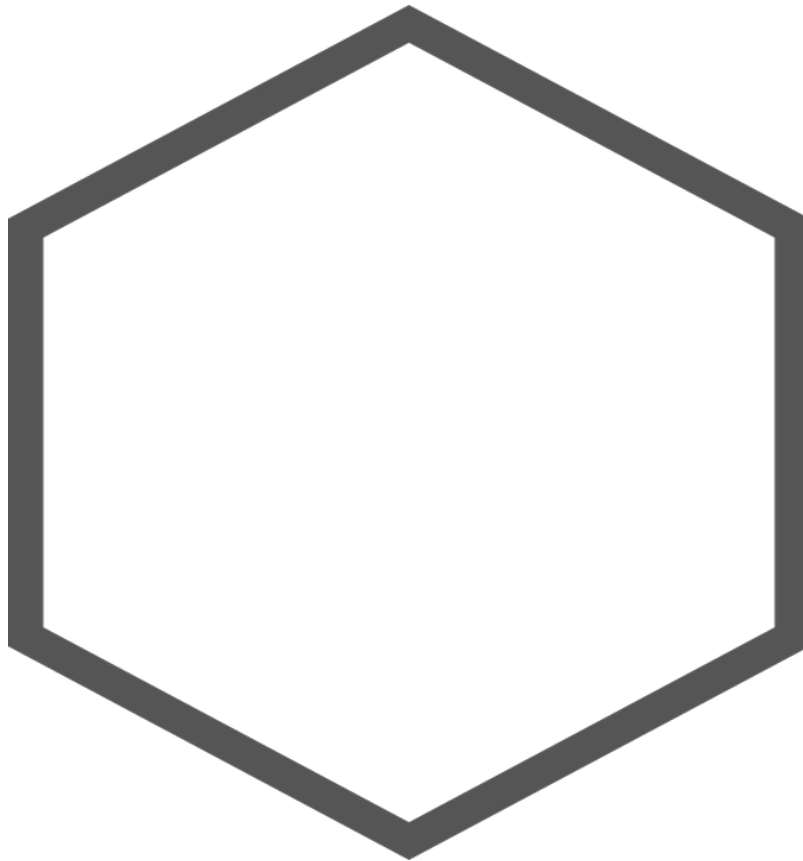
2. Native bee hive honours Indigenous Dreaming story of Jabreen the warrior:

<https://www.abc.net.au/news/2019-02-21/aboriginal-dreaming-god-native-bee-hive/10793796>

School Activity 5. Hexagonal Maths

Complete these facts:

1. A hexagon has _____ sides.
2. Each angle inside a hexagon is _____ degrees.
3. The perimeter of the hexagon below is _____ cm.



Challenge: Can you calculate the area of the hexagon? _____

Extension maths for year 5/6 students:

<https://calculate.org.au/2016/02/19/work-unit-the-geometry-and-algebra-of-honeycomb-2/>