



Bees and Forests

Teacher Overview

Students will learn about the importance of forests to honey bees and the production of honey, and how bees help plants to reproduce.

Learning Objectives

Students will:

1. Understand how honey is produced
2. Describe how bees pollinate flowers
3. Understand how different plants might be favoured for honey production, particularly Leatherwood trees

Background

Forests play an important role in the bee industry (apiculture). Honey producers rely on forests as they are an important food source for their bees. Many beekeepers move their beehives around different forests according to the flowering times of the trees in the forest. Besides producing honey, bees play a vital role in Australian agriculture because of the pollination services they provide.

The activities; there are 3 activities to use in this lesson. You may choose to undertake all of them, or alternatively, choose those relevant to the objective you wish to achieve.

Activity 1 – After the clip

<http://youtu.be/EDfeoA1HZ1s>

1. *Discuss the roles students think bees have in relation to plants and people.*
2. *Discuss how Australia's native forests and honey bees: might be connected.*
3. *Watch the video Going Bush 1 Bees and answer the related questions on Activity 1 Student Worksheet.*
4. *Students present and discuss their answers*

1. On which coast of Tasmania – north, east or west – does the annual Leatherwood flowering take place?
2. Julian Wolfhagen is the president of which association in Tasmania?
3. Apart from honey, name the three food products mentioned by Julian that come from Tasmania.

4. Julian Wolfhagen owns and runs over how many hives in Tasmania?
5. What does smoke do to the bees?
6. Which type of bee has been marked with yellow spot?
7. How are the newly hatched bees different from other bees?
8. Julian says he probably gets stung around how many times on a bad day?
9. Leatherwood honey is sometimes described as liquid what, starting with the letter G?
10. The narrator says it takes a bee how many kilometers of flight to make a small spoonful of honey?
11. In which century was Leatherwood honey first shipped overseas?

Activity 2 – More about bees

This activity explains the role bees play in pollination. It explains how pollination occurs and why it is important.

1. Read through the introductory paragraphs on the student worksheet together, then create a vocabulary list (for words highlighted in the text):
 - Nectar: a sugary-sweet liquid made by a flower
 - Pistil: the female part of a flower (including the stigma, style and ovary)
 - Pollen: a fine substance (which looks like powder or dust) produced by the anthers of a flowering plant
 - Stamen: the male part of a flower (including the anther and filament)
 - Pollination: the way pollen from the male part of a flower gets to the egg in the female part of a flower to form a seed.
2. Discuss. Watch the video https://www.youtube.com/watch?v=zy3r1zLC_IU. Students then create picture stories (with diagrams and dialogue captions) about Beetie the bee and pollination.
3. Students present and discuss their picture stories about Beetie the bee and pollination.

Did you know that bees are responsible for about a third of the food we eat? This is because bees are **pollinators**.

Pollinators help flowering plants make more plants. We need plants to survive.



Here's how it works

When a honey bee lands on a flower, it uses its long-tube shaped tongue like a straw to drink the sweet **nectar** contained inside the flower.



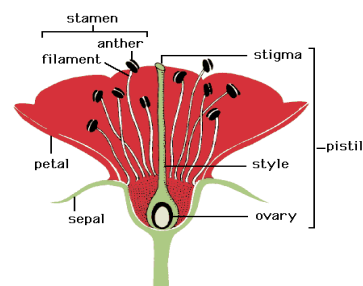
While the bee is busy drinking this nectar, tiny grains of **pollen** get stuck to the bee.



These grains of pollen come from the part of the flower, called the anther. The male parts of the flower are called the **stamen**.



When a bee flies to a different flower to get more nectar, some of the pollen grains fall off the bee and on to the new flower. When grains of pollen land on the **female part of the flower**, they move down through to the eggs, which are contained in the **ovary** at the base of the flower. The female part of the flower is called the **pistil**.



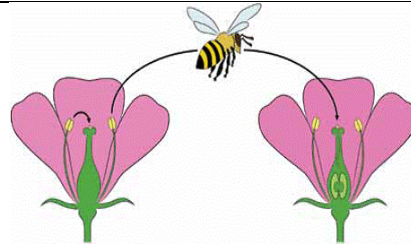
Once the pollen reaches the egg a **seed** is formed! Seeds usually form inside fruit and when the fruit is mature, it releases those seeds. The seeds land on the soil and create new plants.



https://www.reddit.com/r/pics/comments/4i9qxh/sprouting_strawberry_seeds/



So the flower is helping the bee, but the bee is also helping the flower. The plant provides nectar for the bees, help the flower to reproduce! And this is what we call **pollination**. Without pollination, these plants would not be able to produce fruit.



What happens inside a beehive?

This activity describes the structure of beehives and the process of making honey. Students are to retell the story of honey production in the hive in their own words.

1. Read through the introductory paragraphs together. Discuss. Create a vocabulary list (for words highlighted in introductory text):
 - *Beehive: a nest for bees*
 - *Honeycomb: a structure containing rows of wax cells (which are shaped like hexagons), made by bees in their hive to store honey, pollen, and their eggs*
2. Watch the video <https://www.youtube.com/watch?v=-LDa30-pUU>.
3. Extension Exercise: Students to present and discuss their picture stories about the bee and how they make honey.
4. Students feedback 3 things that they learnt from the clip on how bees make honey and what happens inside a hive.

Watch this clip in pairs to find out what happens in a hive:

<https://www.youtube.com/watch?v=-LDa30-pUU>

A beehive is an interesting and very busy place because each bee has a special job to do and each bee does it very well. Once the bee arrives at the hive with the nectar, it delivers it to one of the indoor bees. The nectar is passed mouth-to-mouth from bee to bee until the moisture in the nectar is reduced. This changes the nectar into honey.

But sometimes when the bee arrives back at the hive it drops the nectar straight into **cells** in the **honeycomb**, without passing it mouth-to-mouth to another bee.



The bees fan their wings to evaporate and thicken the honey. When this is done, the bees cap the honeycomb with wax and move on to the next empty honeycomb, to start their work all over again.

Write 3 things that you learnt:

- 1.
- 2.

3.

Activity 3 – About Tasmania's Leatherwood honey

This activity provides for further inquiry into the production of Leatherwood honey. It is best done in conjunction with Activity 1.

1. Read through the introductory paragraphs for question 1 together.
2. Working in pairs, students search the internet for the distribution of Tasmania's Leatherwood forests and plot their distribution on the map.
3. Students to continue working in pairs to answer questions 3 and 4.
4. In pairs, students to present and discuss their answers.

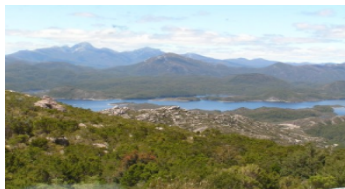


Leatherwood honey is the honey that bees make from the nectar of the Leatherwood trees' flower.



Leatherwood is the single most important nectar plant in Tasmania and is the source for about two thirds of all the honey produced in the state.

The Leatherwood plant is native to Tasmania and is found in the wetter forest regions throughout the Western part of the state. A large part of this area has been **World Heritage** listed because it is rich in **flora** and **fauna**.





Working in pairs, search the Internet to find out where the Leatherwood forests are found in Tasmania and draw where on the map below:



About the bees that make Leatherwood honey:

Honey bees are not native to Australia. They were first brought here in the early 1820's about the convict ship Isabella. Those first honey bees adapted so successfully that other types of honey bees were later introduced from Italy, Yugoslavia and North America.

1. What country did the honey bee that makes Leatherwood honey originally come from?
2. What do bee keepers do every year in Tasmania for the annual Leatherwood flowering?
3. What months of the year does the Leatherwood flowering take place?



Your Thoughts!

This activity can be used as a student self-evaluation. It will encourage students to think about how our minds can be changed by what we learn.

- Get the students to answer the questions on the activity work sheet.
 - Discuss their answers: Had the students thought about the importance of bees before? How might this lesson have changed their opinion about bees?
1. Have you ever been stung by a bee?
 2. What did it feel like? What did it do to your skin?
 3. Did you know how important bees were for you and the environment?
 4. How has this lesson changed your mind about bees?



Sources:

Leatherwood honey facts:

<http://fennerschool-associated.anu.edu.au/fpt/nwfp/leatherwood/lw2.html>

<http://www.tasmanianbeekeepers.org.au/beekeeping-in-tasmania/>

<http://www.smh.com.au/national/a-billion-bees-on-the-move-in-tasmania-20120105-1pn3d.html>

<http://www.tasmanianbeekeepers.org.au/new-page-3/>

<http://www.beebeauty.com/leatherwood-story/>

<http://www.smh.com.au/national/a-billion-bees-on-the-move-in-tasmania-20120105-1pn3d.html>

<http://www.geocities.ws/southernbranch/beekeepersad.pdf>

[Bees first introduced to Australia](#)

<http://honeybee.org.au/education/wonderful-world-of-honey/>

Bees as pollinators

<http://nativeplants.msu.edu/about/pollination>

<http://www.abc.net.au/catalyst/stories/4094061.htm>

Bee mask for students to cut out:

<http://kidsgrowingstrong.org/sites/default/files/downloads/beemask.pdf>

How bees make honey:

<http://animals.howstuffworks.com/insects/question300.htm>

<https://www.youtube.com/watch?v=GHRsYtWM4jI>

<http://honeybee.org.au/education/wonderful-world-of-honey/how-bees-make-honey/>

<http://miniymmers.com/how-do-bees-make-honey-for-kids/>



<http://www.benefits-of-honey.com/how-do-bees-make-honey.html>

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