I can see a bee inside a flower with vibrant colours of yellow and orange.

In this picture there is a very big watermelon which most likely has been pollinated by bees. There is also a mix red, orange and yellow flowers. Also, there is vegetables surrounding the water melon

I see pink pretty flowers that have recently been pollinated because they are in the process of blooming. There is also tomatoes growing next to the flowers. I think that it is spring in the photo because both the flowers and tomatoes are in the middle of growing

coolaustralia.org
Learn for life

Student Worksheet

Name: _____ Class: _____

Love Food? Love Bees! – Bees, Pollination and Food – Year 5 & 6

Thought Starter: We once grew food without chemicals. We never grew food without bees.

1. Observe each of the pictures below. In the space next to each picture, describe what you see:

I see a bee that is pollinating a white flower it has chosen. It also shows the bee flying into a flower to pollinate which is the daily life of a bee.

This photo shows a be sucking out the nectar inside the flower while giving pollen making it grow for others to use.

ACT FOR BEES

Lesson developed in partnership with ACT for Bees.

I can see many different types of plants. There lots of yello red, orange, purple, blue and whit plants. I think this shows a lot of how much bees do to make our land and food pretty and healthy

This photo shows different types of fruit and vegetable These were all grown by pollinators like butterflies and bees

2. How do you think the pictures are linked? Write 2-3 paragraphs that explain your thoughts.

Hint: Think about bees, their (symbiotic) relationship with flowers, and how humans benefit from it.

You could use the list of words below to help you decide what to include in your paragraphs. Try to include as many as possible in your paragraphs.

- bees
- pollination
- food
- nectar
- pollen
- flowers
- fruit
- vegetables

The way all the pictures are linked is by the bee that pollinate all plants to help grow food and crops that are for animals and humans to eat. The bees pollinate plants everywhere and this process is done by the bees sucking the nectar out of a fruit, vegetable, crop or plant and puts pollen into plants.

Bees benefit humans because they basically do all the work of growing plants and make them healthy for us to eat. They can also benefit animal by making grass healthy for cows, sheep and other kinds of animals to eat.

LOVE FOOD? LOVE BEES!

The bees pollinate all the flowers, fruit and vegetables so the food we eat are purified and clean. Their pollination is very vital because without bees the fruit and vegetables will be contaminated. A show the effect of bees when they help food become edible.

They are crucial for food production, that is how some pictures link. Flowers are pollinated by bees and nectar is collected. There is also several flora and fauna in every picture. Fruit and vegetables are included in some of them.

Bees are responsible for a third of all of our mouthfuls, which means that bees are extremely indispensable and should not be harmed in any way or form. They must continue pollinating or we will lose a third of our food! WE SHALL PRESERVE BEES!!!

INVESTIGATE: bees

Research template

Name: Alice T, Jessica W, Jane G, Skye B, Natalie H, Erica W, Hailey K, Julie S

Date: 28.3.18

Species of bee: Carpenter Bee

Native or introduced? Do they occur in Australia? If yes, where do they live? They are a native species and can be found in parts of Queensland, New South Wales and South Australia.

Do they live in hives/colonies [social] or individually [solitary]? They are a solitary type of bee and prefer to live in wood nests, warm spaces and enclosed cavities.

Where do they prefer to live? A hole or depression away from the elements, in tropical and subtropical areas with warm, balmy climate.

Do they store honey? No, they don't. They feed on all the nectar and pollen that they collect.

Do they pollinate plants? Yes, they are one of the most efficient and productive pollinators, often considered the best.

Are they attracted to particular plants? No, they are generalists. This means that they are not picky and do not prefer particular plants.

INVESTIGATE:
bees

What do they prefer to nest in? They build their complex nests in wood, hence the name 'carpenter' bees.

Do they need water nearby? Yes, they need it nearby as they do not store water. They need it close to bring in to their nests and use regularly.

Tell us something unique about this species: The ability to carve their nests out of wood makes them very unique in the world of bees. But the wood they take away to make their nests is not devoured by them. Instead, they deposit it away.

Sources of information:

- www.orkim.com
- www.aussiebee.com.au
- wildlife.org.au
- www.chicagotribune.com

INVESTIGATE: bees

Research template

Name: _____

Date: _____

Species of bee: Honey Bee

Native or introduced? Do they occur in Australia? If yes, where do they live? The Honey Bee is introduced. It comes from Europe, and is the most common domesticated bee in the world. They live in tropical climates and areas with lots of trees.

Do they live in hives/colonies [social] or individually [solitary]? Honey bees live in hives. They are social and very good at adapting. As they live in groups, they defend eachother too.

Where do they prefer to live? Honey bees prefer to live in tropical temperatures and areas with lots of forests. They can live in any country, natural or unnatural.

Do they store honey? Yes, they store honey by sucking the juice called nectar out from a flower and store it in the honey stomach. They then bring the honey back to the hive.

Do they pollinate plants? Honey bees do pollinate many plants, such as cranberries and broccoli. They spread pollen from one plant to another and most plants rely on this bee to pollinate them.

Are they attracted to particular plants? They are attracted to bright colours or black and white plants. The flower also has to be fresh and nice looking. Some flowers that they are attracted to include: crocus, hyacinth, borage, calendula, and wild lilac.

INVESTIGATE: bees

What do they prefer to nest in? Honey Bees prefer to nest in hives, trees, baskets, carrying devices, and agricultural voids. They also like to live in gardens.

Do they need water nearby? Honey Bees rarely drink water, but like all bees, they need water to survive. It is important to always give fresh water to bees.

Tell us something unique about this species: They are the most domesticated bees in the world. The male bees are called drones and the female bees are called worker bees. There is one queen in the hive and she has to find a drone to mate with. Once the queen has her baby, she stores it in a honeycomb cell until it is a certain age. They have a strong sense of smell and when they find a good place to get food, they perform a waggle dance to inform the other bees.

Sources of information: · Wikipedia · thehoneybeeconservancy.org/plant-a-bee-garden/ · www.beeculture.com > nest-habitats · growtherainbow.com/blogs/news/3570115-why-honey-bees-need-water · www.ontariohoney.ca/kids-zone/bee-fact ·

INVESTIGATE: bees

Research template

Name: Julie, Alice, Jane, Skye, Hailey, Erica, Jess, Natalie

Date: 28.3.18

Species of bee: Native Honey Bee (Tetragonla Carbonaria)

Native or introduced? Do they occur in Australia? If yes, where do they live? The Tetragonla Carbonaria is a native Australian bee species. They are endemic to the north-east coast of Australia. They are stingless and about 4mm long.

Do they live in hives/colonies [social] or individually [solitary]? They are a social bee species that live in tree hollows, wall cavaties or flower pots. Sometimes they live in warm, enclosed spaces like burrows.

Where do they prefer to live? The Tetragonla Carbonaria are comfortable living in climates from 18-40° degrees celcius. They like living in large, enclosed spaces that are already existent.

Do they store honey? Yes, they store honey in their nests/hives. They are actually known as the sugarbee because they produce approximately 500 grams of honey in each hive every year.

Do they pollinate plants? Yes they do pollinate? They pollinate crops and plants in the garden, especially flowers with bright colours.

Are they attracted to particular plants? They are attracted to bright, sweet-flavoured orchids.

INVESTIGATE: bees

What do they prefer to nest in? They do not favour building their own nests, so they find a previously inhabited hive or a man-made object big enough.

Do they need water nearby? No, they only need a bucket of water over their hives provided by beekeepers if they are overheated and need moisturising.

Tell us something unique about this species: They build their nests in an intriguing spiral formation, similar to the Milky Way. There is no proved reason, but they presumably find it easier. They also only produce less than 1kg of honey per year, so their honey is considered a rarity and is expensive and treasured.

Sources of information:

- Aussiebee.com.au
- gardenclinic.com.au
- milkwood.net

INVESTIGATE: bees

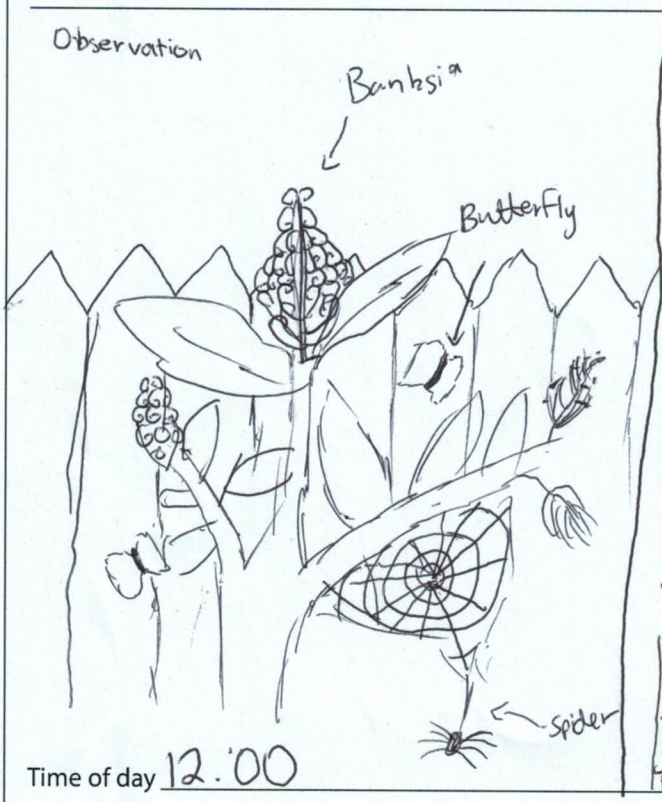
Observation template

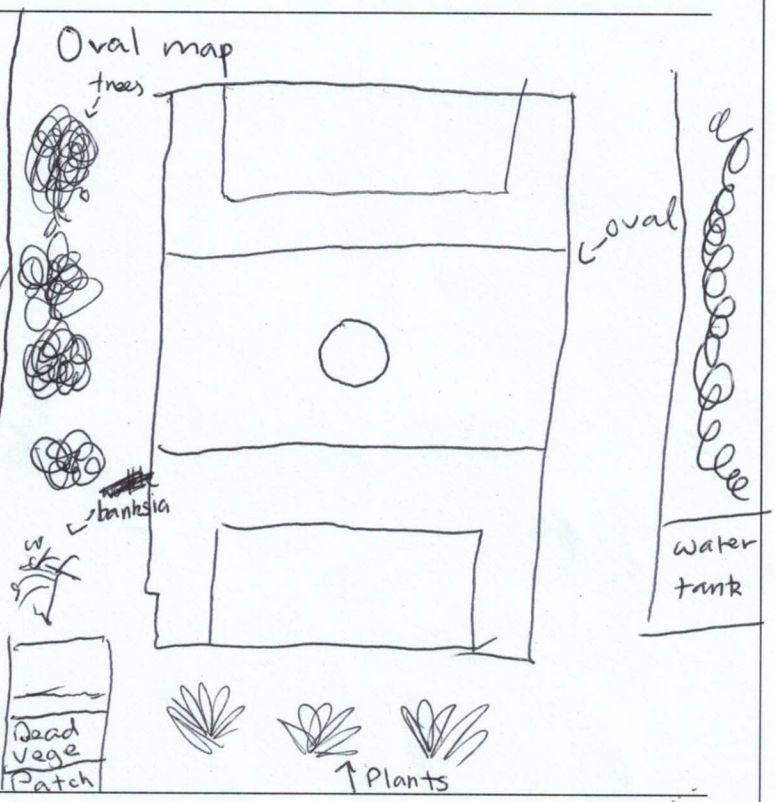
Name: Jess, Jane, Skye, Erica, Alice, Hailey, Julie, Natalie

Date: 3/5/18

Location name, features and description Ginkgo Playgroud, oval, plants on other side.

Describe the area (ie plants, buildings, water nearby, shelter or shade etc) or draw a map The playgroud has an artificial turf oval with dead vegetable patch and trees around the sides of oval.





Time of day 12.00

Weather Sunny and warm. No clouds

Type of insect	Number observed	What were they doing?
Butterflies	7	flying around sometimes landing on a banksia
Spider	1	
Wasps	10+	Flying in and out of nests
Ants	5	walking

Observation record number 1 of 4

Next observation planned: /

INVESTIGATE: bees

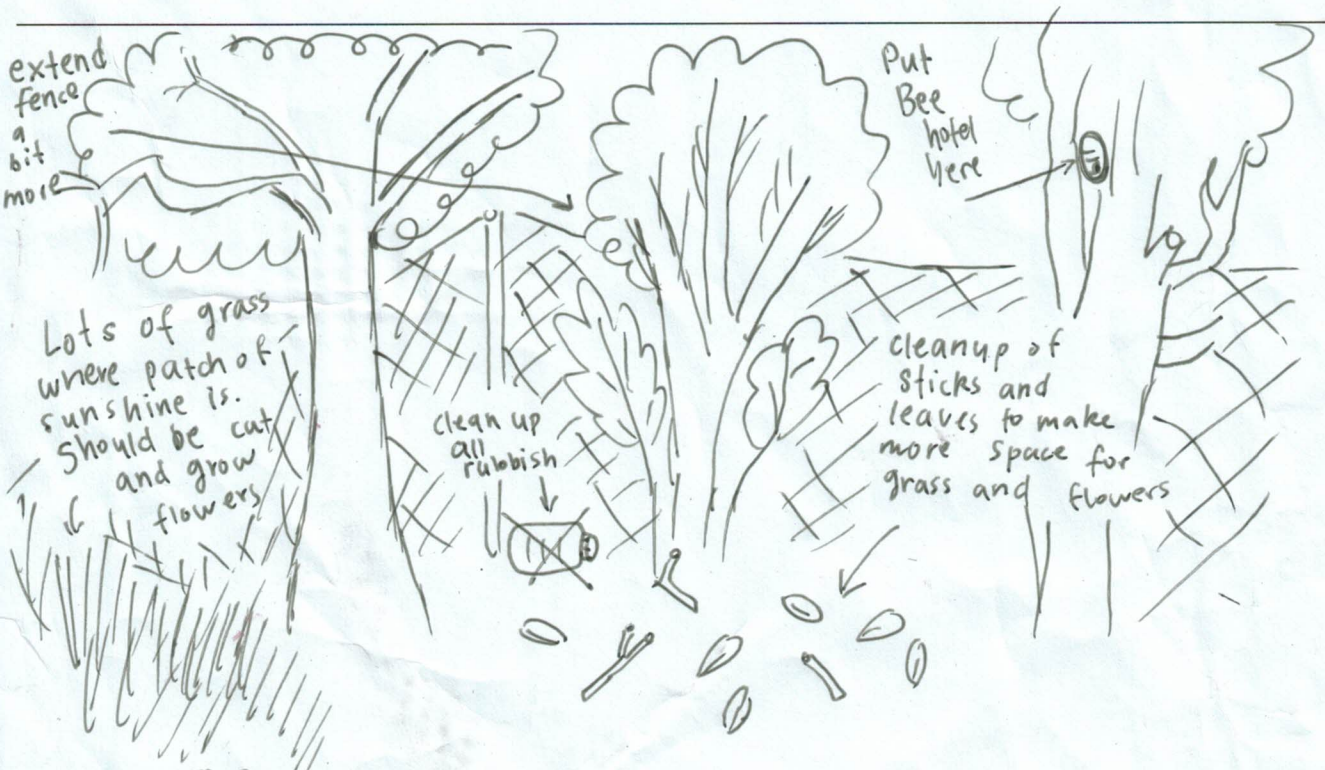
Observation template

Name: Lizzie and EmilyO, EmilyB, HayleyJ, Consuelas Olivia, Madi

Date: 9/5/2018

Location name, features and description Corner of palm with yellow box (thing)

Describe the area (ie plants, buildings, water nearby, shelter or shade etc) or draw a map Shelter and sunshine. Buildings and water source.



Time of day 10:36 am

Weather Sunny

Type of insect	Number observed	What were they doing?
No insects		

Observation record number 3 of 4

Next observation planned:

INVESTIGATE: bees

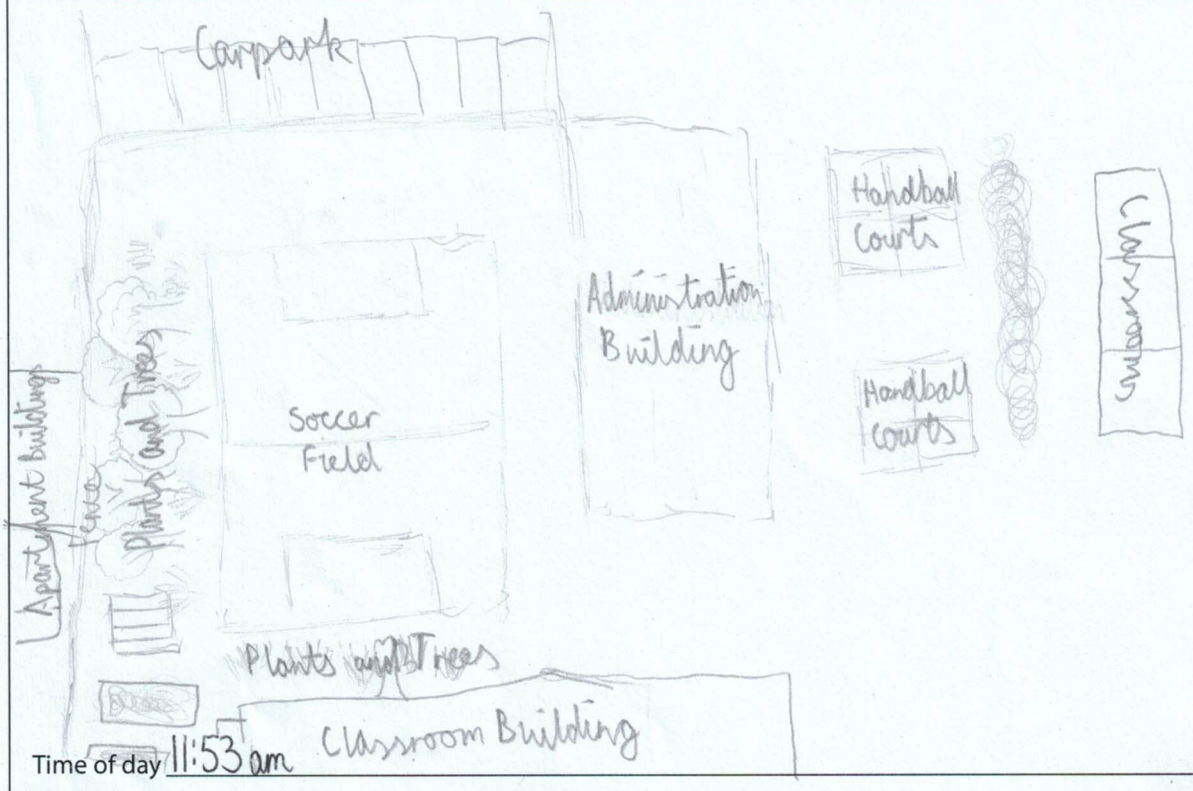
Observation template

Name: Erica W, Julie S, Natalie H, Jessica W, Alice T, Skye B, Hailey K, Jane C

Date: 3/5/18

Location name, features and description Ginkgo Playground

Describe the area (ie plants, buildings, water nearby, shelter or shade etc) or draw a map Swimming pool nearby, lots of surrounding bushes, trees, gardens and garden beds, brick administration building, large classroom building, classrooms, apartment buildings nearby, soccer field, carpark, insect hotel



Time of day 11:53 am

Weather Very sunny, warm temperature (23°C)

Type of insect	Number observed	What were they doing?
Ladybeetle	1	Crawling across a branch
White-grey moths	2	Flying around garden beds
Spider	1	Crawling along a branch
Ants	2	Crawling along a log
Brown moth	1	Flying around metal fence
Big, black butterfly	1	Flying towards apartment buildings
Cricket	1	On a bush

Observation record number 2 of 4

Next observation planned:

INVESTIGATE: bees

Reflection on the results of the surveillance program.

Some questions to consider:

- What did your survey reveal?
- Is your garden visited by a range of pollinating insects?
- What time of the day are they most active?
- Which parts of the school are they particularly active in?
- Could the area be improved?

☑ Yes: how? Is this possible?

☐ No: What are the features that already make your garden well suited to supporting bees and other pollinators? Or is it limitations on the site that mean it is as good as it can be?

We saw a wide range of insects including a few bees that pollinated on the flowers in the Palm playground. They would sit at one flower for a few seconds before they moved to another. They adored the sun and warm, vibrant colours. When we visited at twelve o'clock, there were a lot of insects buzzing in the sunlight.

The insects were attracted to Palm because there are gardens. We could plant flowers that bees are attracted to and make bee friendly garden signs to increase the number of bees around the school and the community. We can also make sure that no pesticides are used throughout the school so that the bees stay around the place they are welcome. This will make a huge difference to the community and will teach people about how bees are essential to humans.

INVESTIGATE: bees

Reflection on the results of the surveillance program.

Some questions to consider:

- What did your survey reveal?
- Is your garden visited by a range of pollinating insects?
- What time of the day are they most active?
- Which parts of the school are they particularly active in?
- Could the area be improved?

☑ Yes: how? Is this possible?

☐ No: What are the features that already make your garden well suited to supporting bees and other pollinators? Or is it limitations on the site that mean it is as good as it can be?

During the surveillance program, we found that there was a variety of pollinators around our school including bees. Looking at the pollinators, we found that they were particularly attracted to vibrant and bright flowers. They enjoyed pollinating at approximately twelve o'clock. When we were searching for potential pollinators, we realised that the bees and butterflies hovered in the air, landed and stayed on the flowers for a few seconds until they left for a new flower. In our school, pollinators stucked to two playgrounds. The first location was near our insect hotel as there were a lot of flowers. However, the second location was buzzing with life. Bees were pollinating the flowers. This area was called Palm. Palm tended to have a lot of bright flowers.

As for improvement, we could definitely make them both more bee-friendly. As our survey has shown, they liked to buzz around bright flowers so we could plant more. Also, in our insect hotel, we noticed that the bees didn't like to nest in man-made or artificial bottles so we could remove them and add more wood with holes in them. In Palm, usually, the sun is out and there's no water near the playground. We could add a bird bath and make sure that it is very shallow.

The surveillance program was successful and overall, we found a lot of flaws and learnt how to improve our bee-friendly playgrounds.

INVESTIGATE: bees

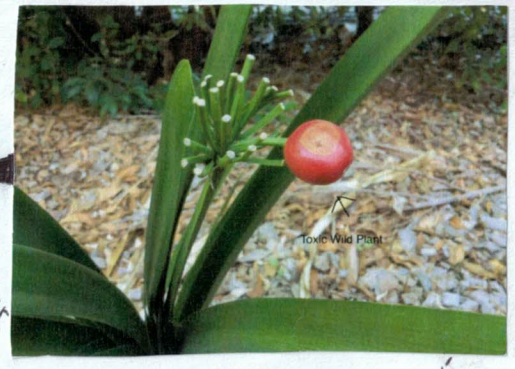
Plan for school grounds

Area of the school or garden?	What will you do? Or change?	Does it need to be discussed or approved?	Who will you approach?	When would you like this to be done by?
Eg empty garden bed at front gate	*plant flowers that flower at different times of the year*	*Yes*	*Principal and GA*	*End of term 1*
Teachers carpark at front of school (lower carpark)	add flowers, bushes and other things on the grass strip.	Yes	principal and Teacher	end of Year 6
Ginkgo entry near 7-11 and teachers carpark (upper carpark)	add flowers and vines on fence and on grass or mud.	Yes	principal and Teacher	end of term 2
insect hotel on ginkgo	add flowers, hanging pots and other plants and wildlife.	Yes	Teacher and Principal	end of term 3
grosvenor road entry near bus stop. (3/6 entry)	add flowers and a water source	Yes	princpal and Teacher	end of year 6
insect hotel	add water source	No	Teacher	end of term 2
ginkgo (under ginkgo) (near the new building, to the side of it NOT near walking hill)	add flowers, plants, mow lawn, add water source and add other things like bushes. ect.	Yes	principal and Teaher	end of 2019
near casuarina.	add flowers, water source and bushes	Yes	principal and Teaher	end of 2018
K/2 entry Teachers carpark (lower carpark)	add bright coloured flowers.	Yes	principal and Teaher	end of term 3
maple garden beds	add more flowers!	Yes	principal and Teacher	end of term 2
pool playground (hall)	add hanging pots on "verandah" of hall coming from roof	Yes	principal and Teacher	end of year 6
multipurpose	add vines and flowers in the gardens near	Yes	principal and Teacher	end of 2018

When will you review this plan? _____

Consuela 31.05.18

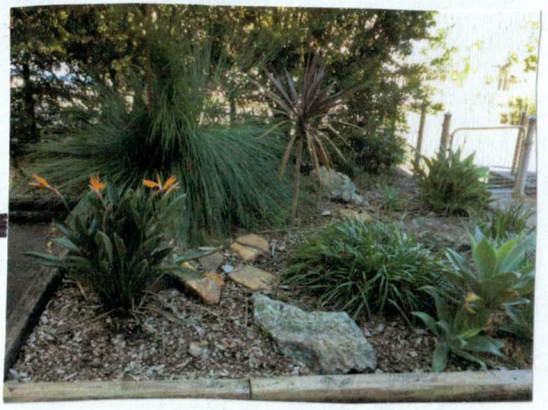
This is a wild toxic plant that we found in the garden and we are planning to remove it.



This is succulent in our garden bed and we are planning to use it as a water source.

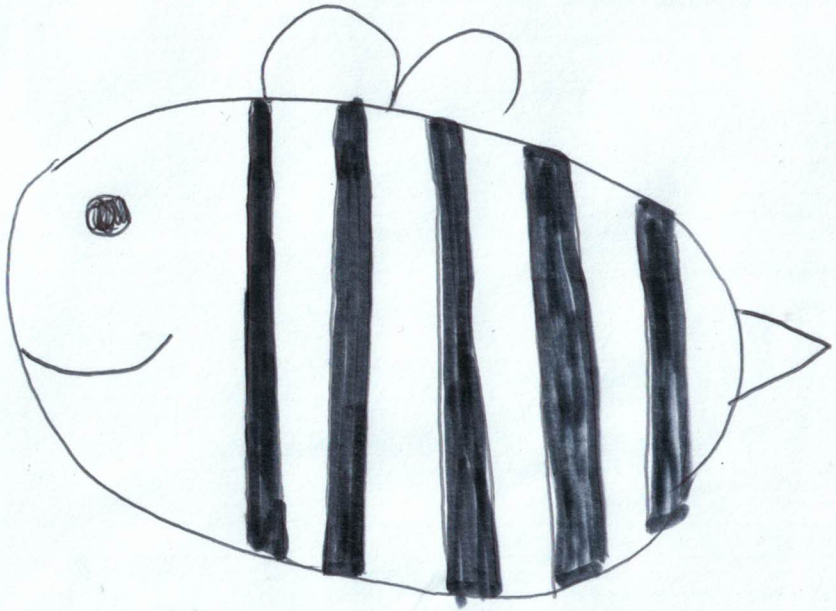
Pt.2

This is a view of most of the garden bed we are working on.

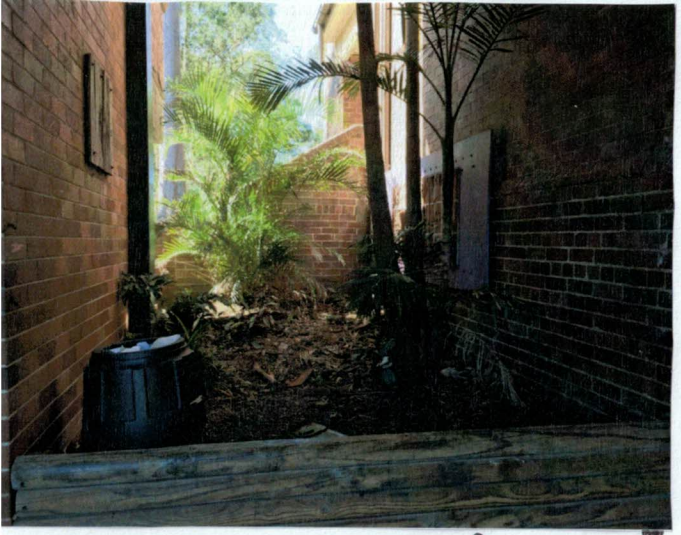


Today I was captivated the the amount of green in the garden bed. Many succulents bloomed in every direction and there was a few bright plants which we founed later were toxic. It was quite dry and some plants looked tired and dead. We needed to fix the garden, remove the toxic plants and make a water source!

We also need more light an to put more brigh flowers plus, some herbs. SO LET'S GET TO BEE ACTION!

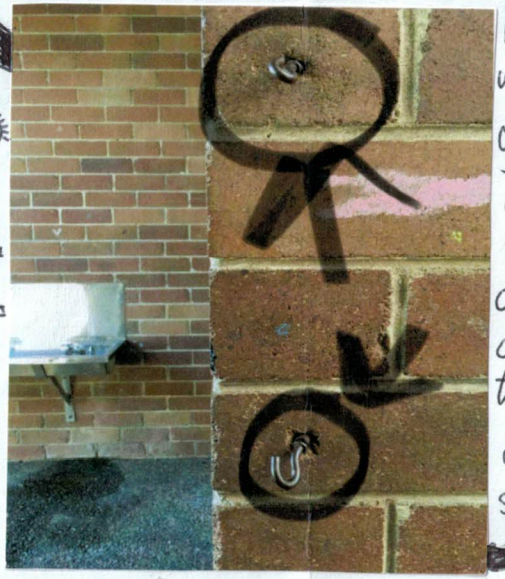


Pt. 1



This is a view of our garden. In this photo there is a little bit of sun on the far side of the area.

We can put hanging flowers on these hooks.

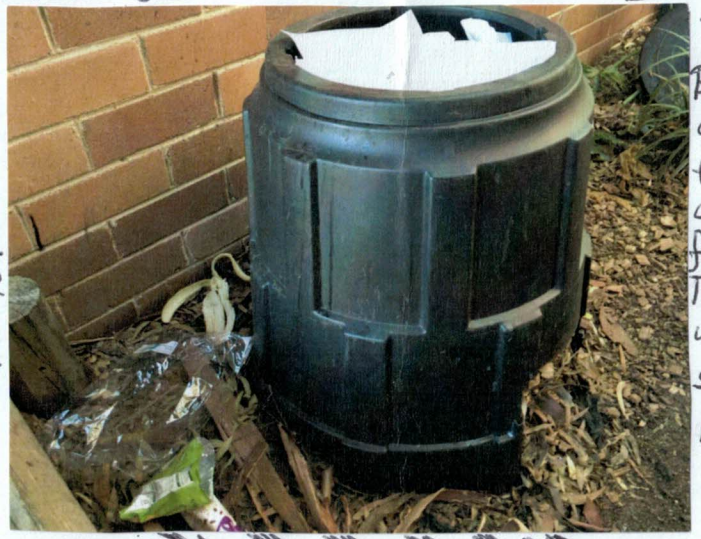


It would work best if they were brightly coloured or if they had a strong smell.

It was not sunny on this day the area became quite dark.

B Bee Friendly

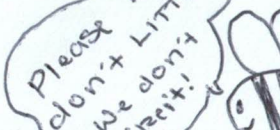
Something seems to be eating the plants.



Don't litter! It's Bee Not-Friendly

People are using the compost bin for rubbish. That is why we should remove it.

People keep littering in the garden.



Bee Not Friendly

INVESTIGATE: bees

Encourage community support

How can we encourage others in the community to support bees? By creating attractive bee-friendly brochures detailing the beneficial qualities of bees, risks to their population and methods to help them. The brochures must be informative, engaging and would have to banish the fear of bees stinging and waging harm upon the environment. Instead of portraying bees and their relation to honey, these brochures must emphasise on the more impactful pollination aid and stress the importance and our dependability upon them. Then we can hand out these brochures on the playground to all students and increase awareness. We can open a donation centre where 100% funds go to a bee charity. After being informed by the brochures, people may come and donate. Next to the donation centre stall there might be a store selling bee souveniers and playthings and forwarding profits to the same charity. It will resemble a bee-mini-fete.

How will we know if it worked? Many people are not aware of the dangers faced by bees. By providing brochures, they might decide to attend our bee-fete and buy goods or donate. We will know that our community support works if most people receiving the information brochures express interest or actively partcipate in preserving the bee population via our stalls. We will begin on Stage 3, then if it works, on Yrs 3-6 and eventually, if there is success, the whole school. If such mass support works, we can encourage parents and carers to abnegate some gold coins. When we have more than expected money, (if that is the case), we can also contribute some for improving our insect hotel and other areas around the school, as well as donating to environmental charities.

INVESTIGATE: bees

Encourage community support

How can we encourage others in the community to support bees? A way to encourage others to support bees would be to create a sale to 'Adopt a Bee'. You would take home a box with information on saving bees and the role of bees. As well as the information pamphlets, you would receive a mini sculpture of the bee you adopted. Your sculpture would have a name and would have some string attatched to it, so you can hang it around your neck saying "I adopted a bee!"

Another way to support bees is to create a 'Bee Movie'. Anybody who is interested in watching it could buy a ticket to watch the movie. That money would go to supporting bees.

'Bee Hotels'! We would be supporting bees if every park in the local neighbourhood had a Bee Hotel. It's a small sculpture (usually in the shape of a house) filled with hollowed-out wood for bees to live in.

How will we know if it worked? We would know if our ideas worked because soon after Adopting a Bee finishes and the Bee Movie ends, people would use the information that they found out.

While walking along around the neighbourhood, you would see Bee Hotels and blossoming flowers in yards and parks if the ideas worked. There would be lots of water sources for bees such as shallow bird baths with stones for bees to land on, and there would be the Adopt a Bee sculptures hanging of the door knobs of front doors.

Bright signs on garden gates and public parks would reads 'THIS IS A BEE FRIENDLY GARDEN!'. Small garden beds would be scattered around the community. If the Bee Movie was popular, then maybe once every semester we could replay it, earning more money to support... BEES!!!

Dear Ms Lockery,

5/6A are working on a bee project and we have chosen two areas of the school that we can make more bee friendly. However, we do not have any means of making money to work on these parts of school. We plan to run a bee movie in the hall to make some money for this project. The entry prices are as follows; $1 per person over the age of 12, and 50c per person under the age of 12. It would go for about an hour and 30 minutes. If you give us permission to do this, we will be getting money to fund the bees and hopefully save them.

Any money that we make or is donated to us will go to the 5/6A bee organisation and will be put towards buying new plants, flowers and any other necessary materials. Bees are important for the following reasons; they pollinate plants and flowers, and are responsible for a third of the food that we eat. Without bees, everyone would have a lot less food, all the plants would die, and the world would be a lot less colourful.

Bees are dying more and more every day. At the moment, about 1000 bees die everyday in each colony! This is because humans are becoming more careless with the environment every second by building on land that was home to important animals for the ecosystem, such as bees.

So if you agree with us and believe that bees are important, we hope that you will allow us to run a bee movie and help to raise money to save the bees.

From,
The 5/6A Bee Organisation

Written by Olivia Noga-Piekarska and Jessica Woods

Information for Newsletter Week 4 Term 2 2018

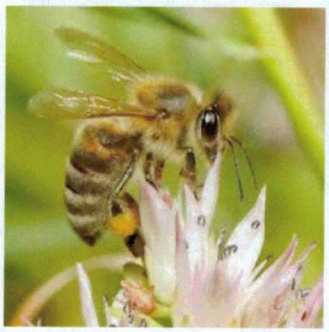
Dear Mrs Cornell,
Could you please include this information in our school newsletter week 4 edition. 5/6A have been researching all about bees and the important role they play in the ecosystem. We would love to inform our local community about how to make their garden bee friendly. We hope you could consider this important message for the newsletter.
Kind Regards,
Emily

Why Are Bees Important?

Bees are important to our community because they pollinate one third of the food that we eat. Pollination is not just important for the food that we eat directly, it's vital for foraging crops. They even need to pollinate grass so the cows that eat it can put on weight.

How Can We Make A Bee Friendly Garden?

- Many plants have been bred to have lots of petals but it makes it harder to access the pollen for the bees. Bees prefer plants with 'open petals'.
- Avoid using pesticides since they can harm bees. To keep away pests, try planting plants in a certain combination.
- Bees need water so you need a water source, such as a bird bath. Add stones in the water to prevent bees drowning.
- Finally, you could make a bee hotel. A simple one could be tying a bunch of hollow bamboo, tie it together and hang it from a tree.



World Bee Day

World Bee day is on 20th May.

"Ending hunger is everyone's responsibility" - Ban Ki Moon

It was voted to be in May to celebrate the birth of the beekeeper Anton Janša

DID YOU KNOW?
A honeybee can flap its wings 230 times a second.

Facts about Honey Bees

- A queen bee can live to about 5 years.
- The average worker bee can only live for 5 to 6 weeks.
- The only purpose of a drone (male bee) is to mate with the queen. After mating it dies.
- A queen bee can lay up to 2,500 eggs a da
- To share information about food sources, bees perform a special 'boogie dance'.
- Each bee has 170 odorant receptors, which means they have an excellent sense of smell.

Why are Bees going Extinct?

Since 2006, the population of bees have declined considerably. Pesticides, disease, parasites, and poor weather due to global warming have done a major role in this decline.

How to make a Bee Friendly Garden tips

- add a sheltered, shady corner.
- bees like plants with 'open petals' so is easier to get the pollen.
- a simple birdbath is a good water source. Add pebbles in the water to stop bees drowning.
- stop using pesticides for they can harm bees.
- you can make a simple bee hotel by getting hollow bamboo, tying it together and hanging by a tree.

Be Bee Friendly!

INVESTIGATE: bees

Honey game reflection

Which event had the greatest impact on your honey production? When the trees blossommed or when the hives were checked for that disease. One contributed alot to us (as many of our hives were near the trees) and one deducted alot from us, (as it deducted from all hives) One improved it by 100% and the other deducted by 100%. These were both extremely large things.

What would you do differently to minimise or maximise that impact if you played the game again? I'm not sure if I would do much different if going again. Our hives were in quiet convinient places and weren't affected by many of the diseases or deductions said. We were also near everything you had to do. I think we placed the hives very well.

Identify one of the events that beekeepers cannot influence The pesticide spray on the water supply. The boxes and how they settled in a place so near to all these towns, diseases and suspicious items such as boxes.

How can they manage the impacts of that event on their bees and honey production? Not settle near all of these dangerous and/or suspicious things. If I were a beekeeper I would try stay away from all the villages and main roads as that's were the pesticides are probably going to be. They should be more intelligent with their location

What did you learn about the role of beekeepers from playing the Honey Game? That it is very hard to find a place where there isn't anything that can't impact the bees. Also that there are alot of risks and good things that can happen. Bees are harder than they look and being a beekeeper can be a very hard job. Bees are complicated and important animals. It is very important to find them a safe place to live and protect them from things.