

Classe II M - Liceo Luigi Galvani - Anno Scolastico 2017/18

Dalla Ricerca alla Scuola e ... ritorno



meltin9Pro




ENEA

Metodo, linguaggio e
approccio scientifico per
una scuola di qualità.

MARINA MOWBRAY
VICTORIA MARRETTI

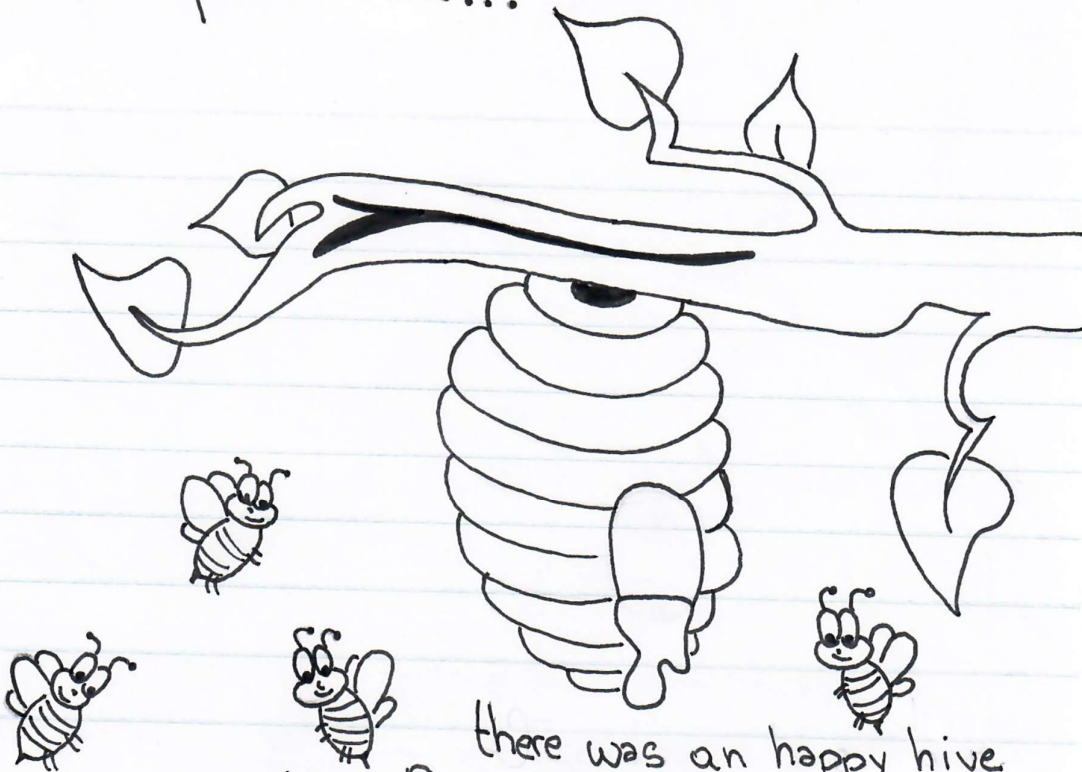


MISSION
HIVE
RESCUE

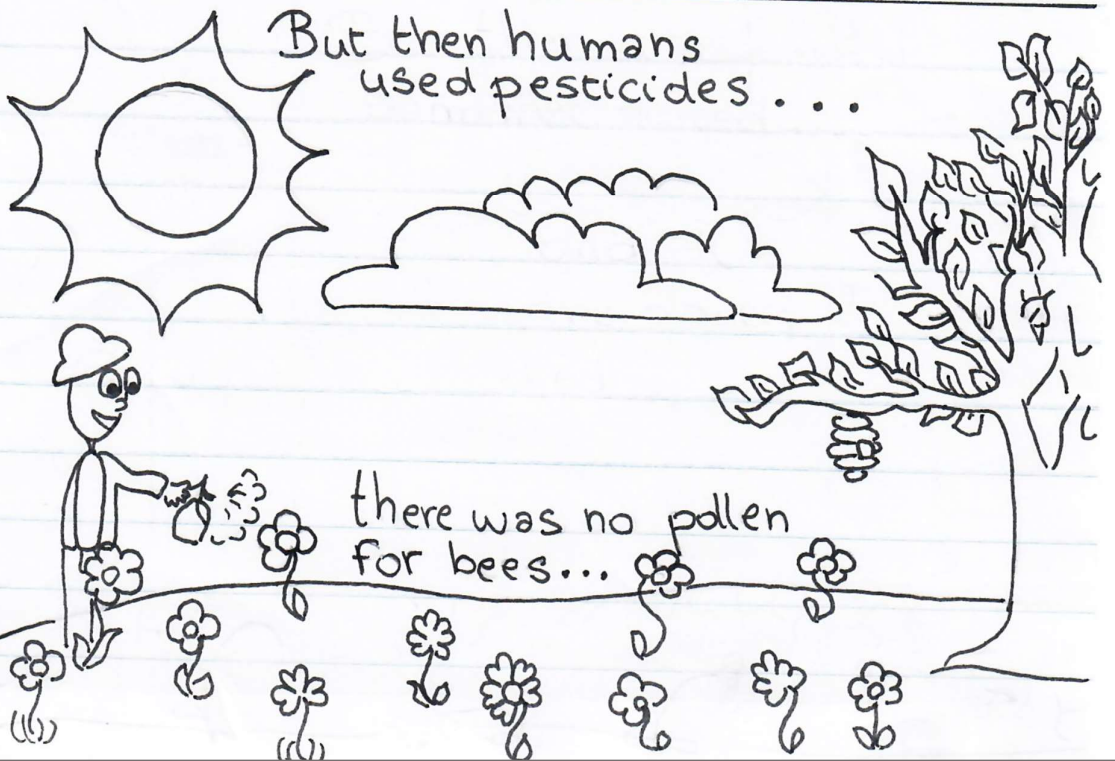


Once Upon a time...

1

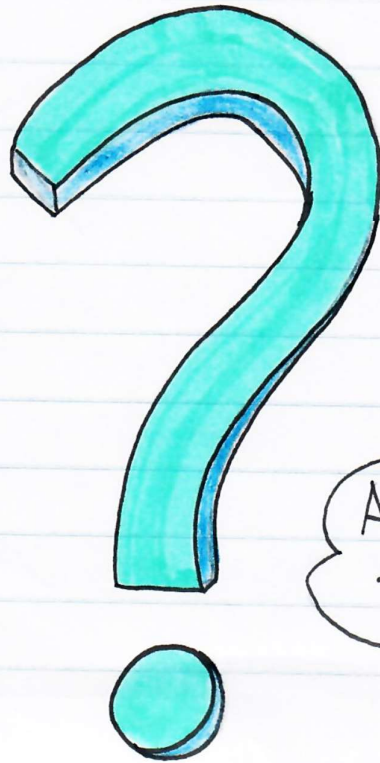
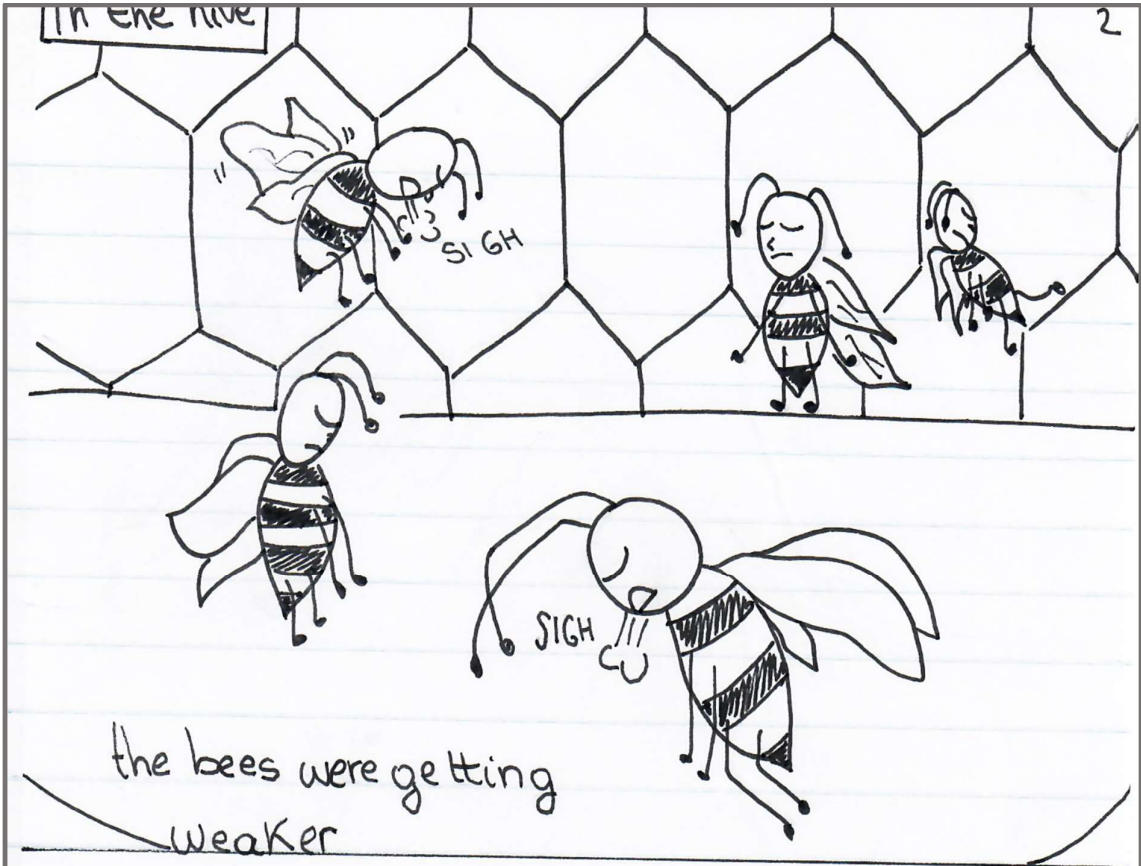


there was an happy hive
and it was Full of honey.



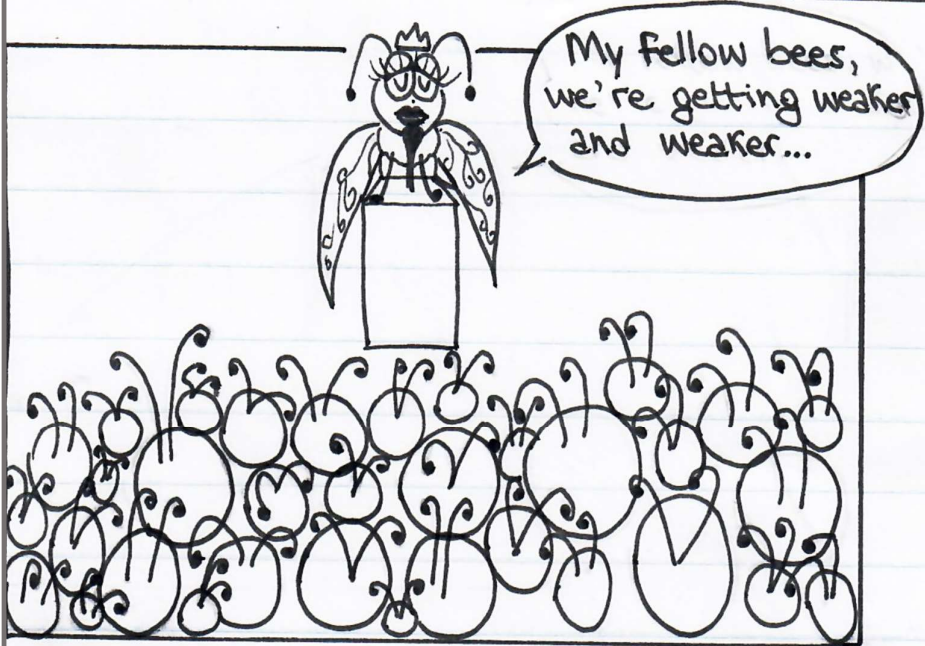
But then humans
used pesticides ...

there was no pollen
for bees...

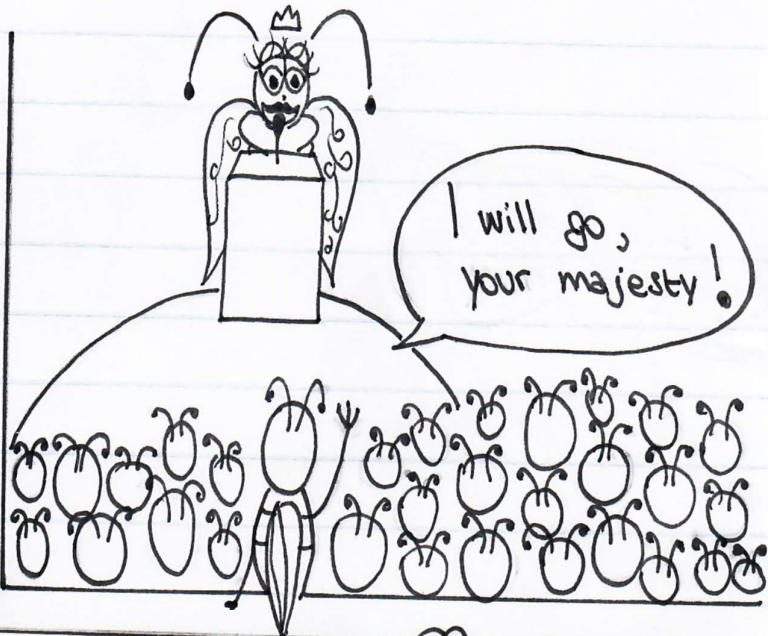


A solution needed to be found

The Queen Bee decided to hold a meeting to discuss the problem.

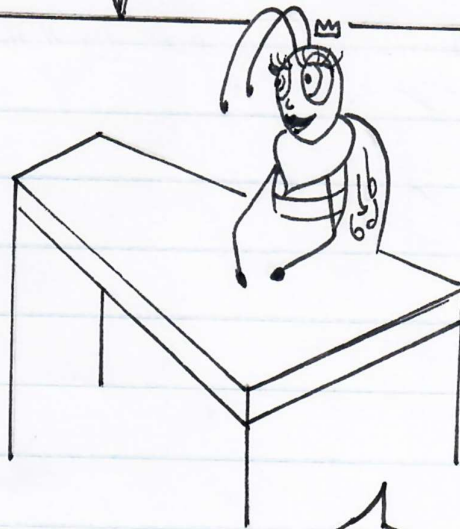


Anyone?



I will go,
your majesty!

Your majesty,
I know it will
be complicated,
but I can't
give up because
I want to help
the hive and
the sick bees



IN THE
QUEEN'S
OFFICE

Dear brave Buddy, I'm very proud
because you're so young and you
volunteered, but are you really sure
you want to go on this mission?

OK, I won't stop you, but I
won't let you go alone. In fact,
I've asked my brother Abe to be
your guide, you'll meet him tomorrow.

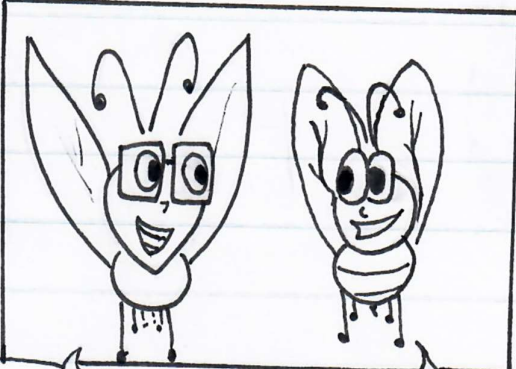
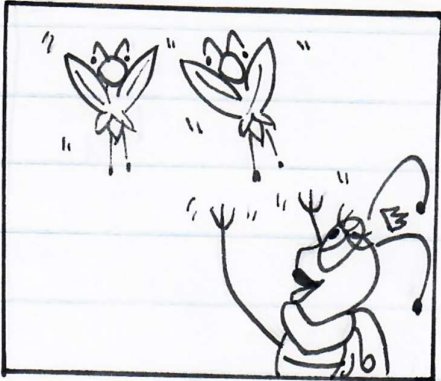
THE NEXT MORNING

Hi, yes I am. I'd like to chat but we don't have time. Are you ready to go?

Hi, I'm Buddy, you must be Abe

Yes! Let's go and save this hive!

Buddy, after greeting his family, goes to the hive exit where he meets Abe.

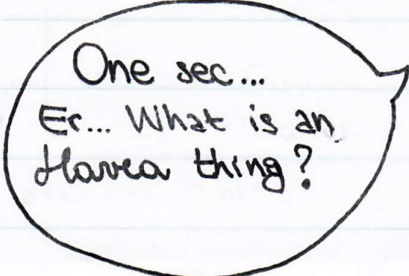
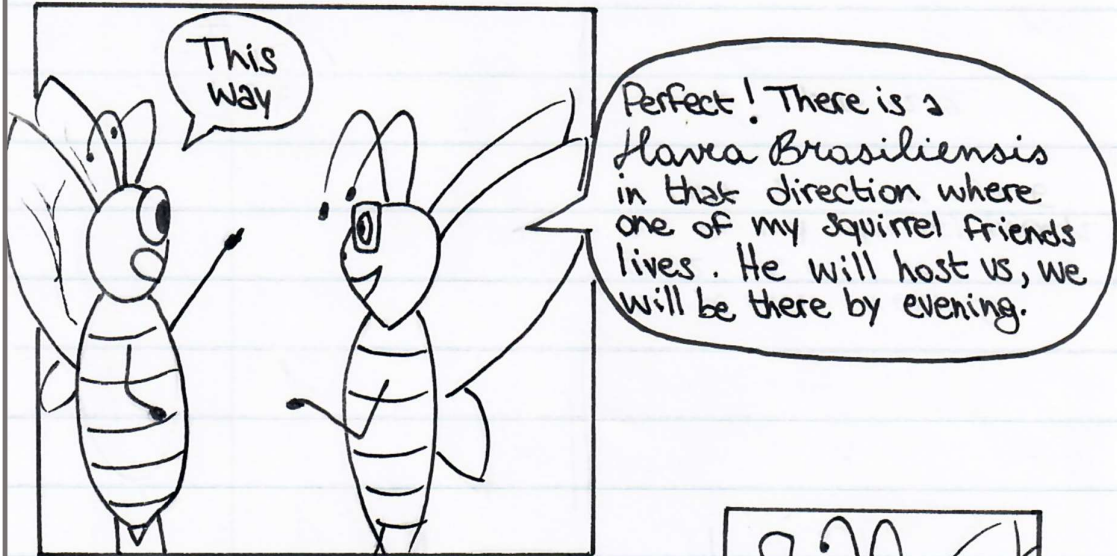
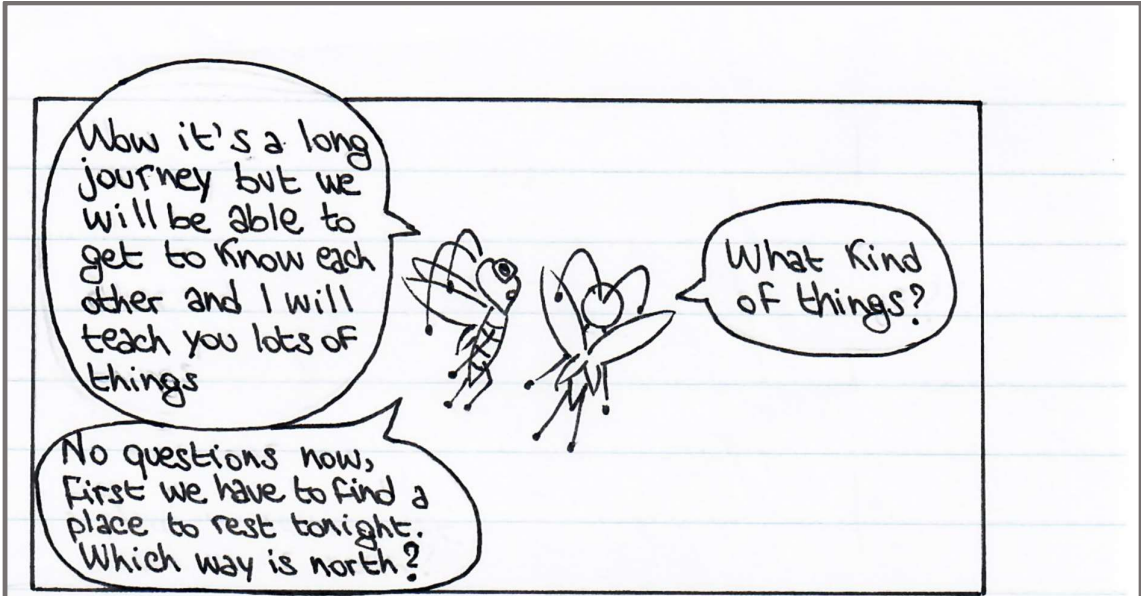


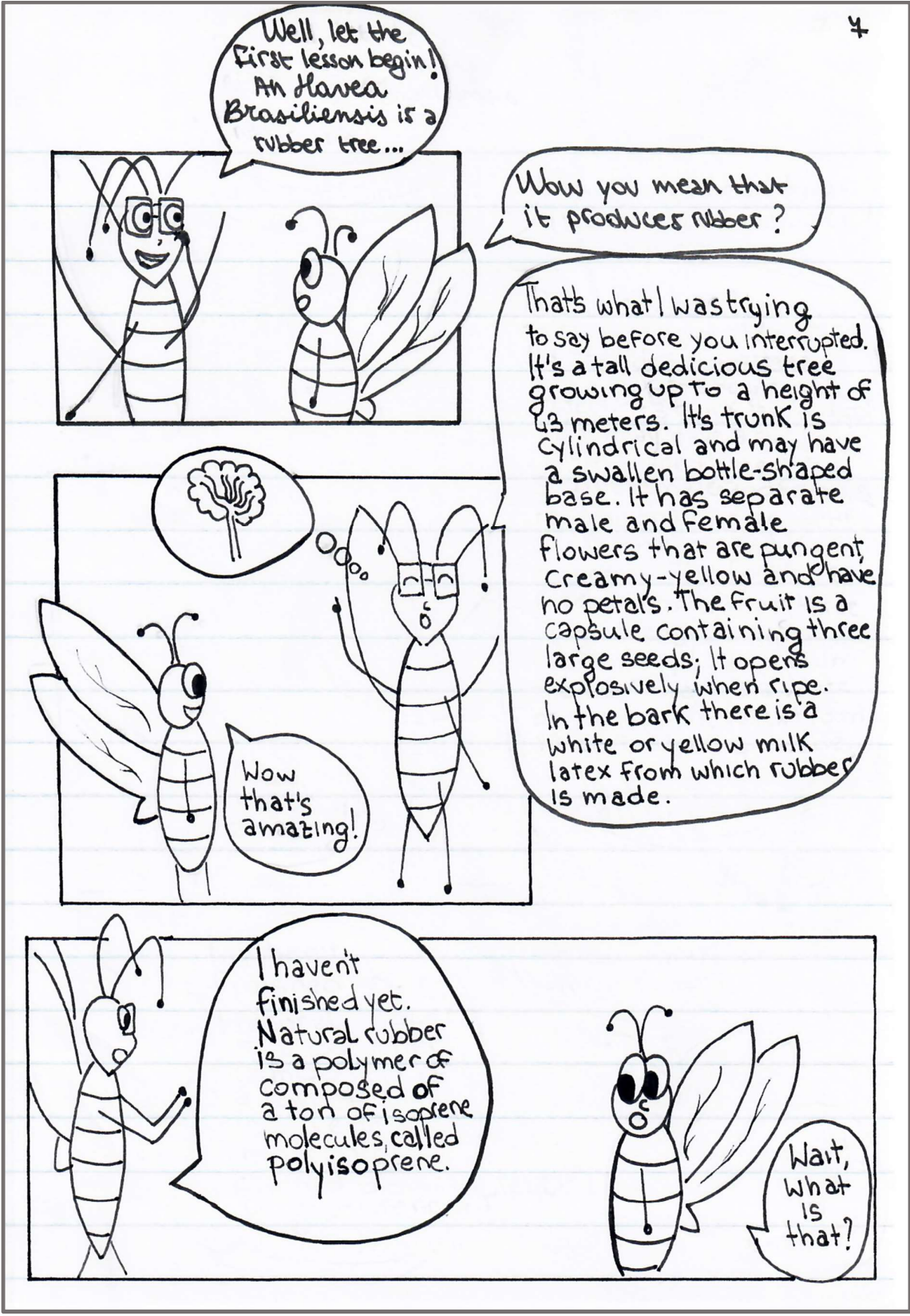
Perfect! How long does it take to get there?

So Buddy, have you got a plan?

Yes, I've heard there is a big hive a few miles from here that could help us.

I think about three days



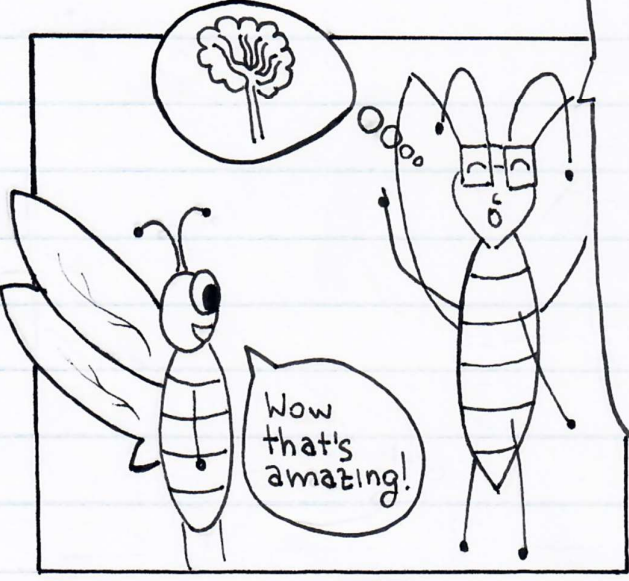


Well, let the first lesson begin!
An Havela Brasiliensis is a rubber tree...

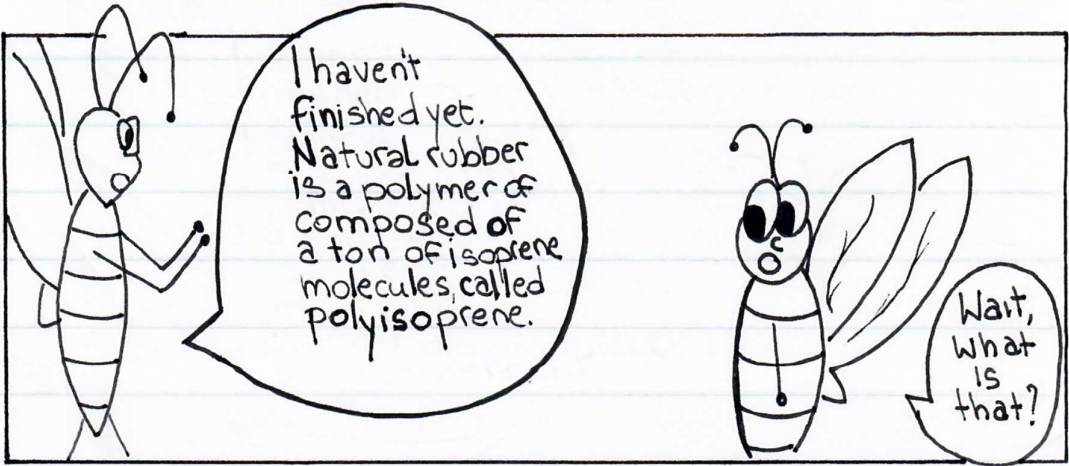


Wow you mean that it produces rubber?

That's what I was trying to say before you interrupted. It's a tall delicious tree growing up to a height of 43 meters. Its trunk is cylindrical and may have a swollen bottle-shaped base. It has separate male and female flowers that are pungent, creamy-yellow and have no petals. The fruit is a capsule containing three large seeds; it opens explosively when ripe. In the bark there is a white or yellow milk latex from which rubber is made.

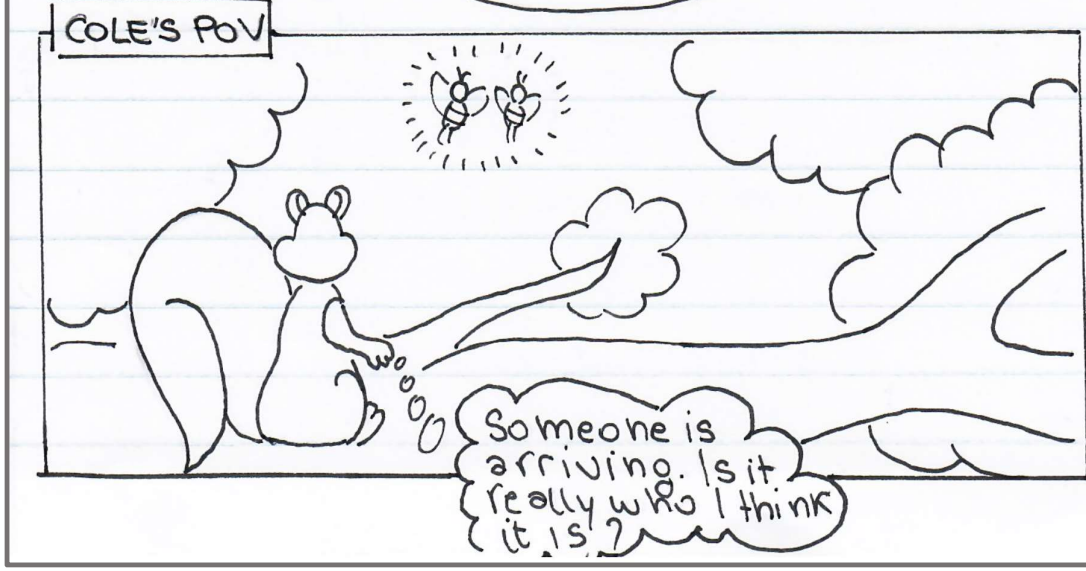
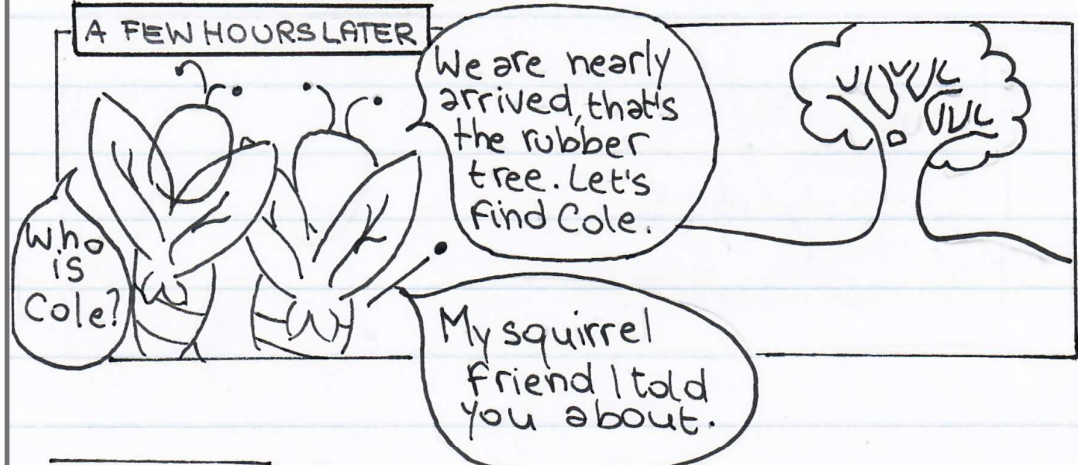
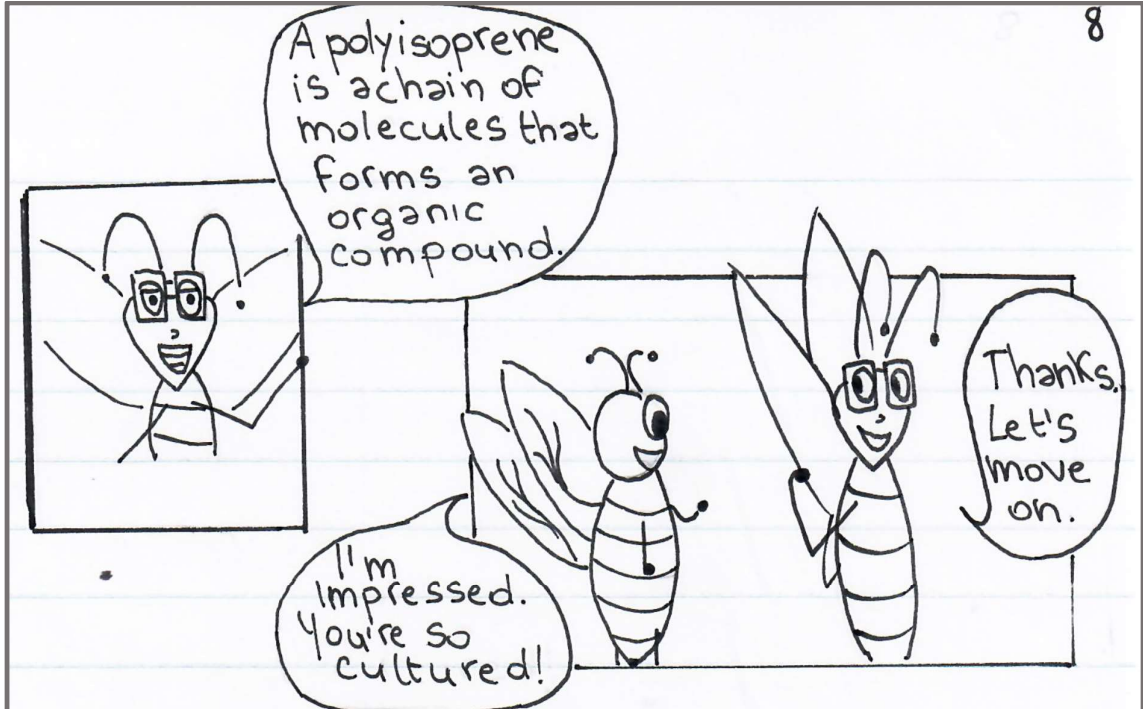


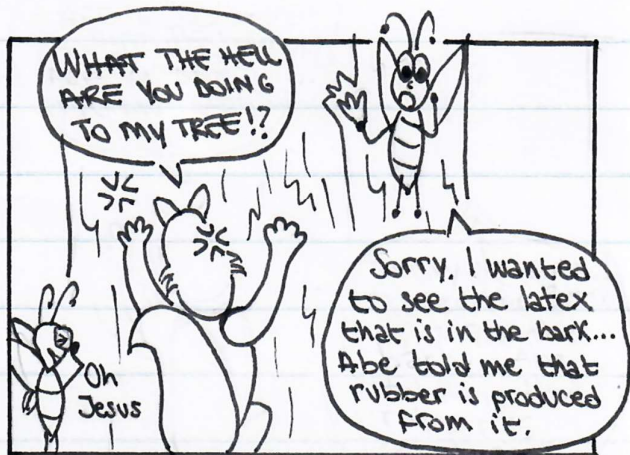
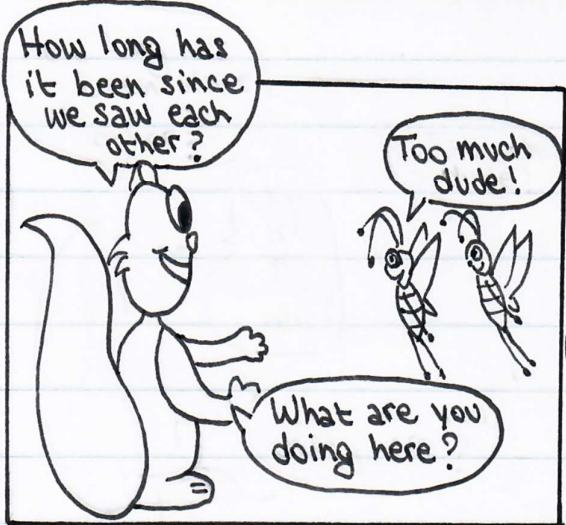
Wow that's amazing!



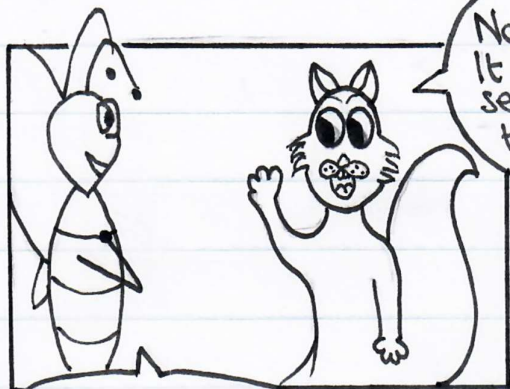
I haven't finished yet. Natural rubber is a polymer of composed of a ton of isoprene molecules, called polyisoprene.

Wait, what is that?



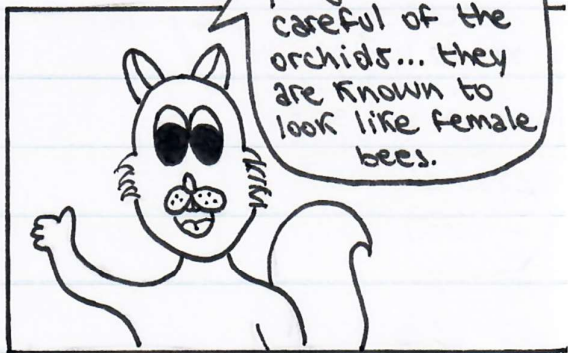


THE NIGHT PASSES



No problem mate!
It was a pleasure to
see you again and
to meet Buddy.

Thank you very
much for the
hospitality Cole



Anyway before
you go, be
careful of the
orchids... they
are known to
look like female
bees.

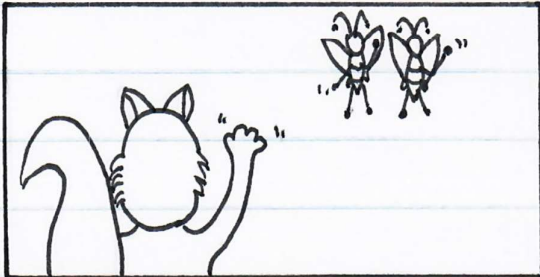


Why do they
do that?

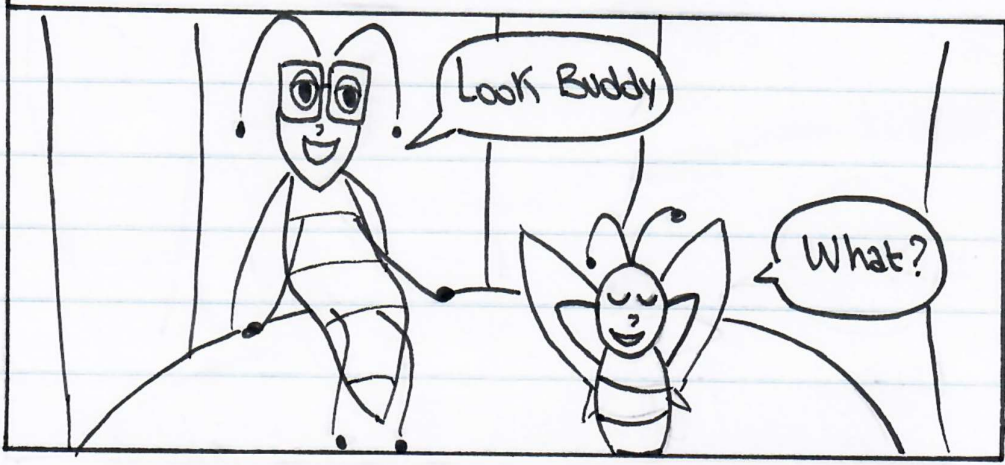
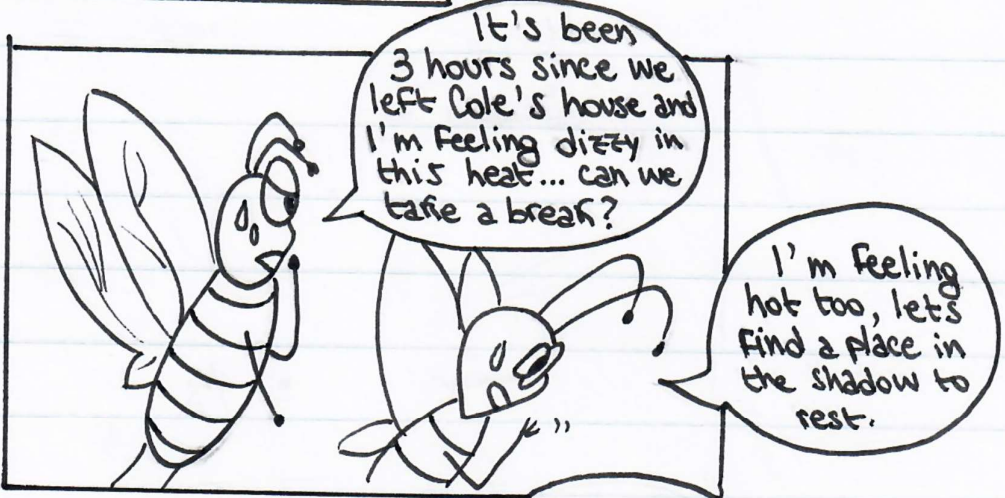
They want to attract
male bees so they
can be pollinated.



Thanks for the
advice Cole!
See you soon!

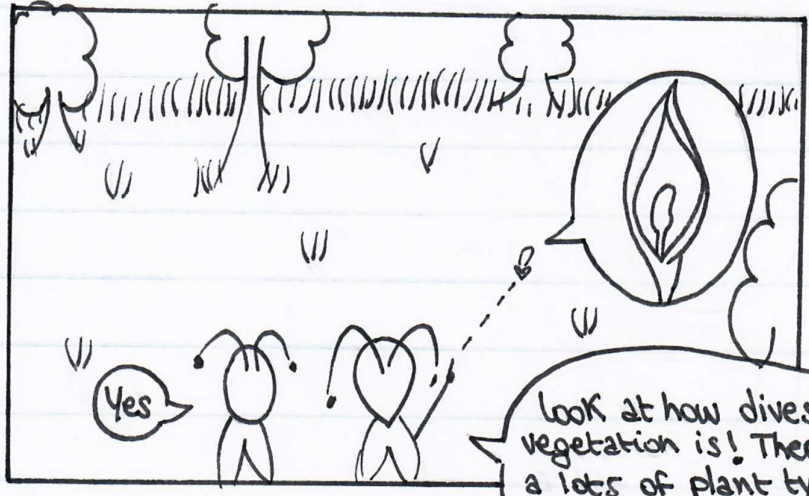


LATER THAT MORNING



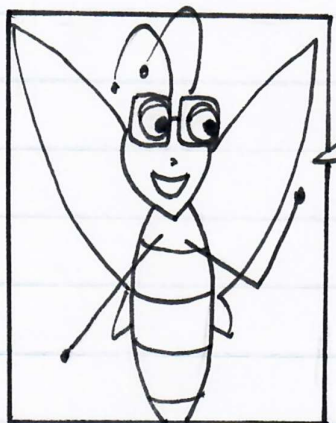
Don't you find nature amazing?

What do you find so incredible about it?



Yes

Look at how diversified vegetation is! There are a lots of plant types... For example: do you see that flower over there?

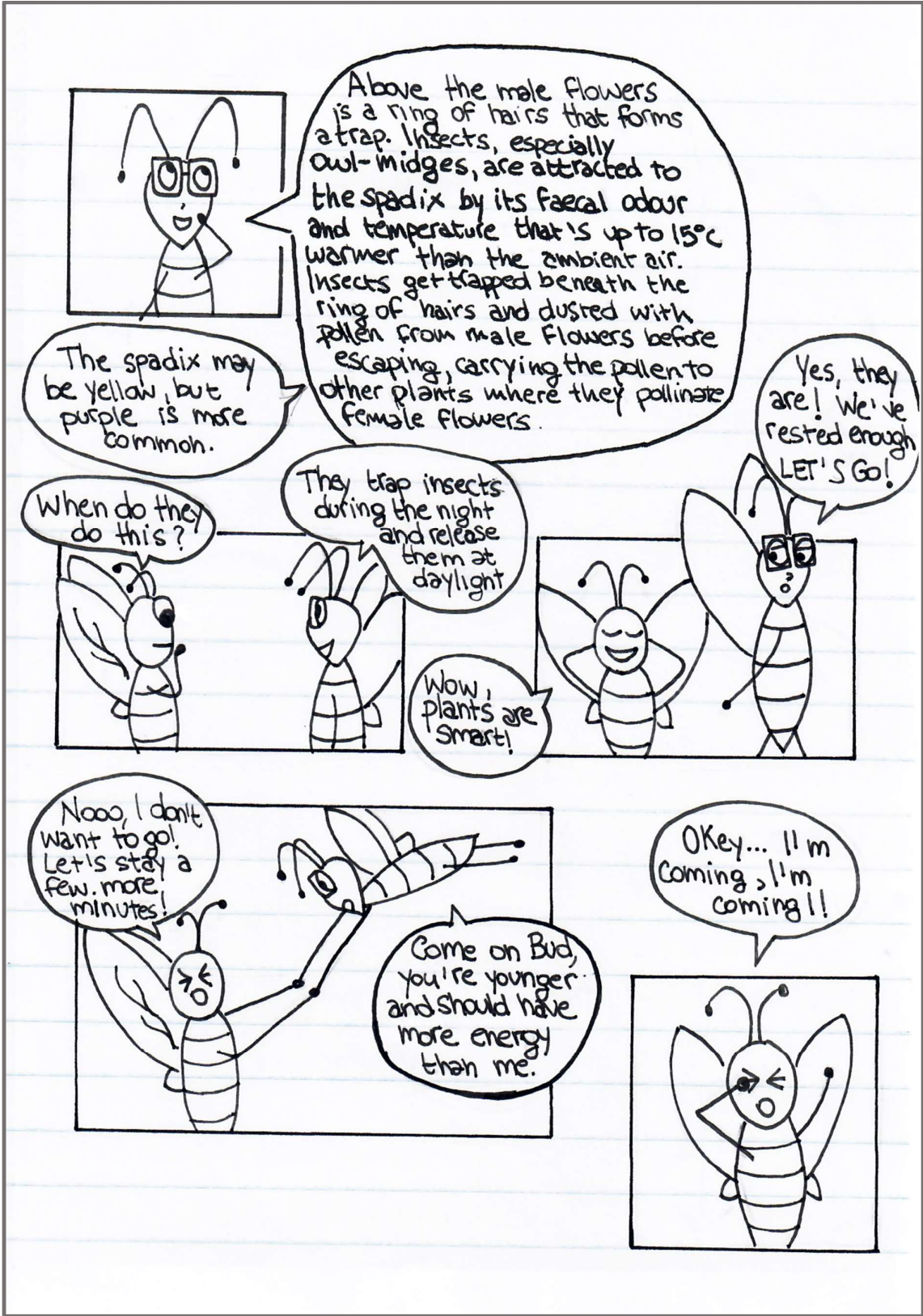


It's called *Arum maculatum*, a common woodland species of the Araceae family. It's not easy to find because it is hidden, clustered at the base of the spadix, with a ring of female flowers at the bottom and a ring of male flowers above them.

Do you know what they do to get pollinated?



What?



Above the male flowers is a ring of hairs that forms a trap. Insects, especially owl-midges, are attracted to the spadix by its faecal odour and temperature that's up to 15°C warmer than the ambient air. Insects get trapped beneath the ring of hairs and dusted with pollen from male flowers before escaping, carrying the pollen to other plants where they pollinate female flowers.

The spadix may be yellow, but purple is more common.

When do they do this?

They trap insects during the night and release them at daylight

Wow, plants are smart!

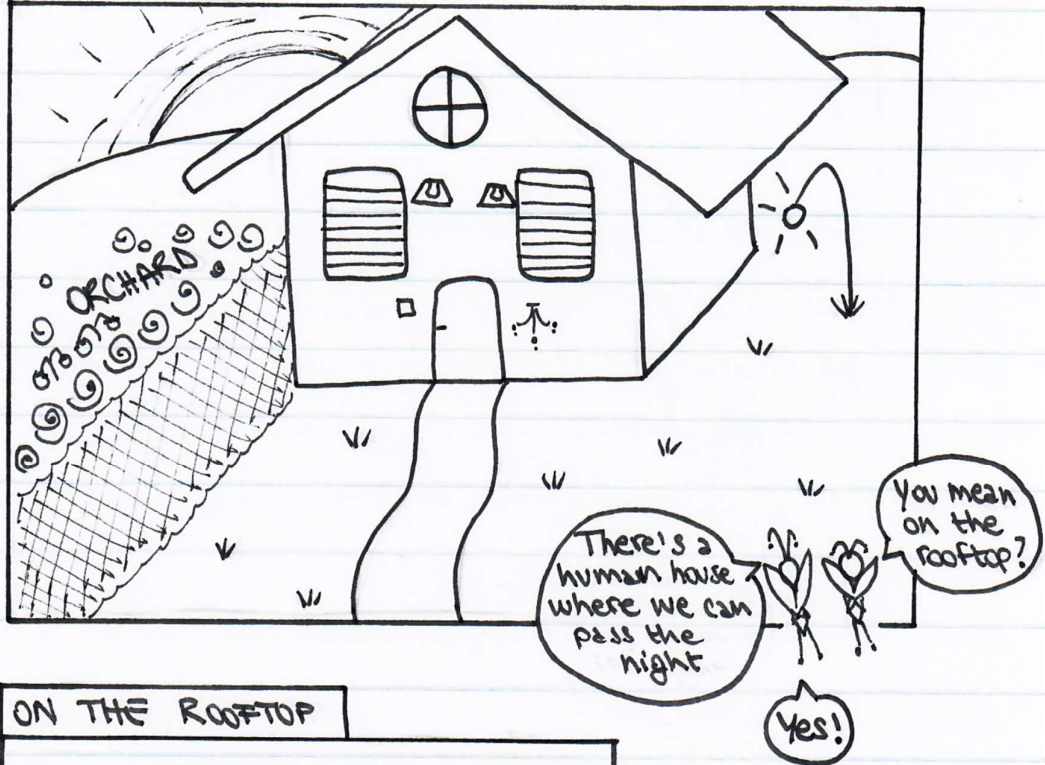
Yes, they are! We've rested enough LET'S GO!

Nooo, I don't want to go! Let's stay a few more minutes!

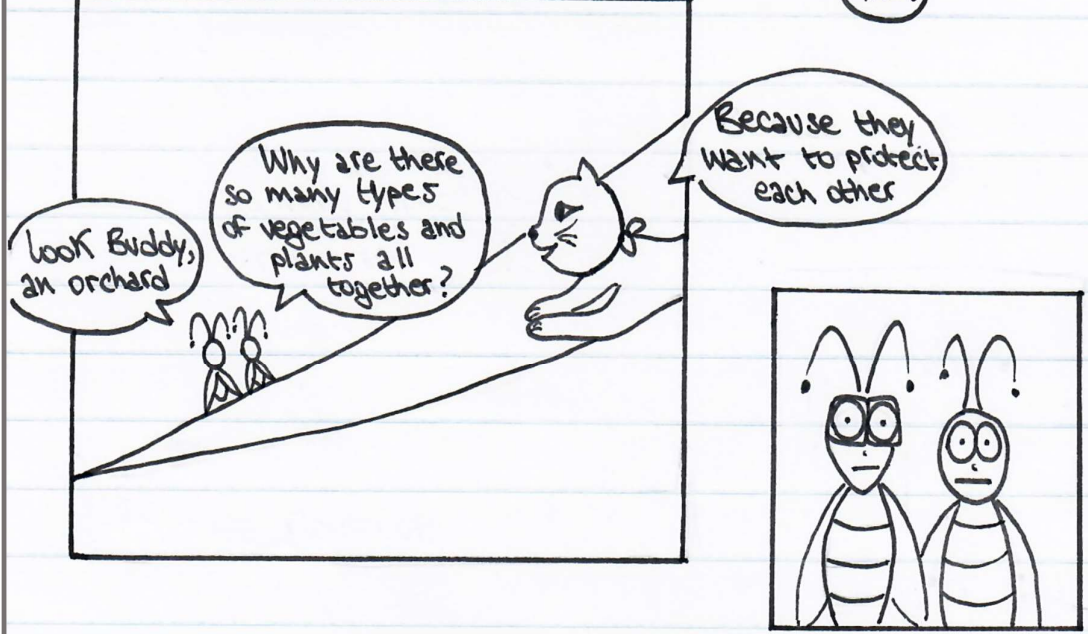
Come on Bud, you're younger and should have more energy than me.

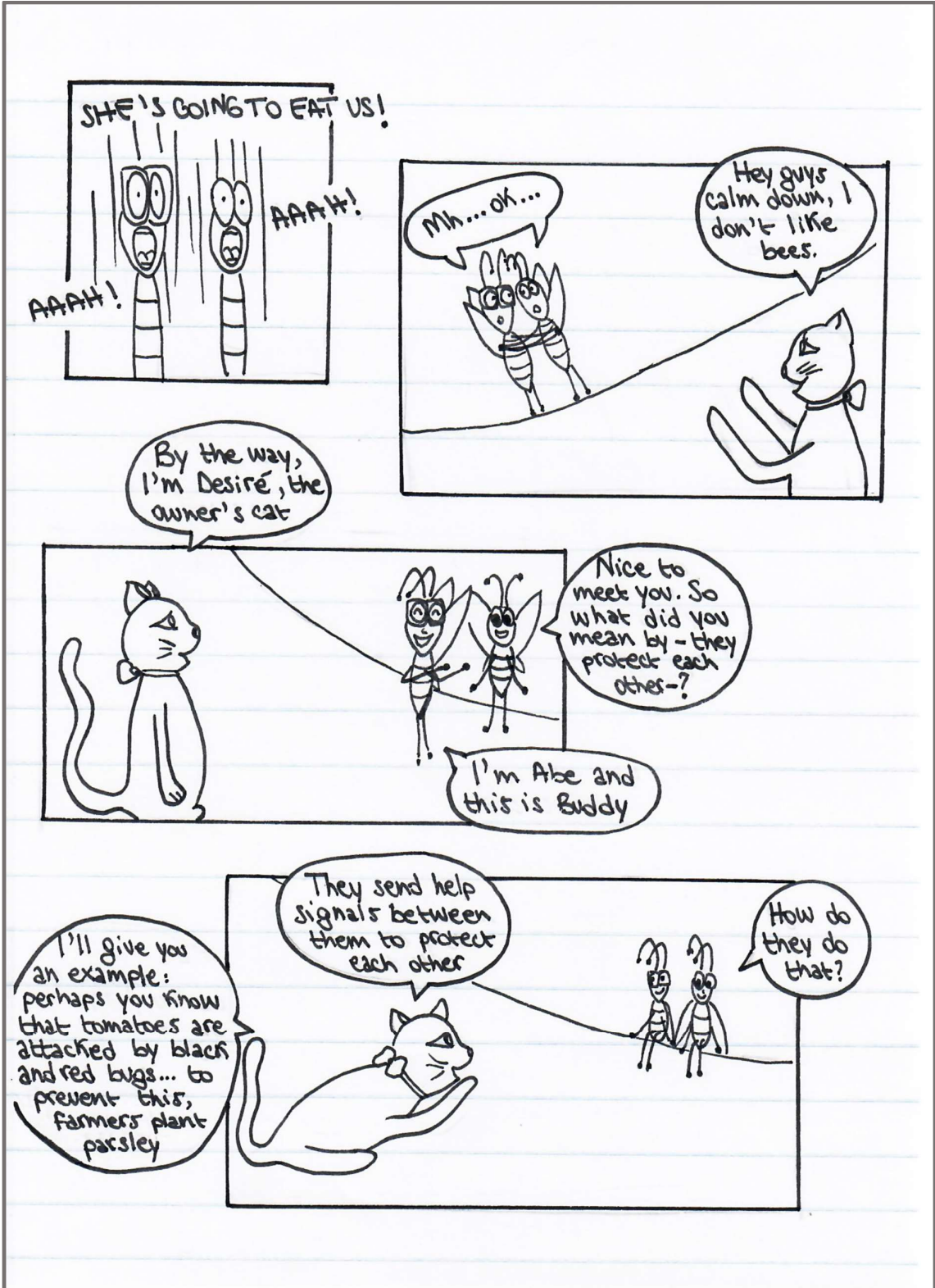
Okey... I'm coming, I'm coming!!

DURING THE TRIP IN THE EVENING

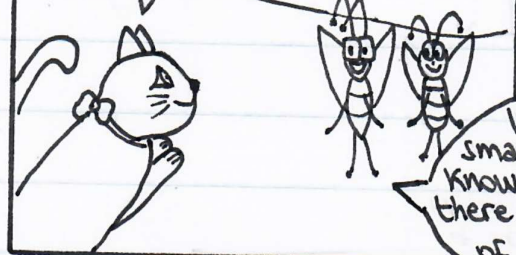


ON THE ROOFTOP





Then, parsley emits a smell that bugs don't like and it makes them go away. Result: the tomato plant is safe.



Wow, I'm smart but I didn't know that! Are there other ways of protection?

And then?

Yes, another example is the tobacco plant. It is threatened by *Manduca sexta*, also known as tobacco hornworm, but it's a moth. Their larvae are distinguished by lateral markings; they have 4 white diagonal lines with a black border and also have red horns. These caterpillars attack tobacco plants.

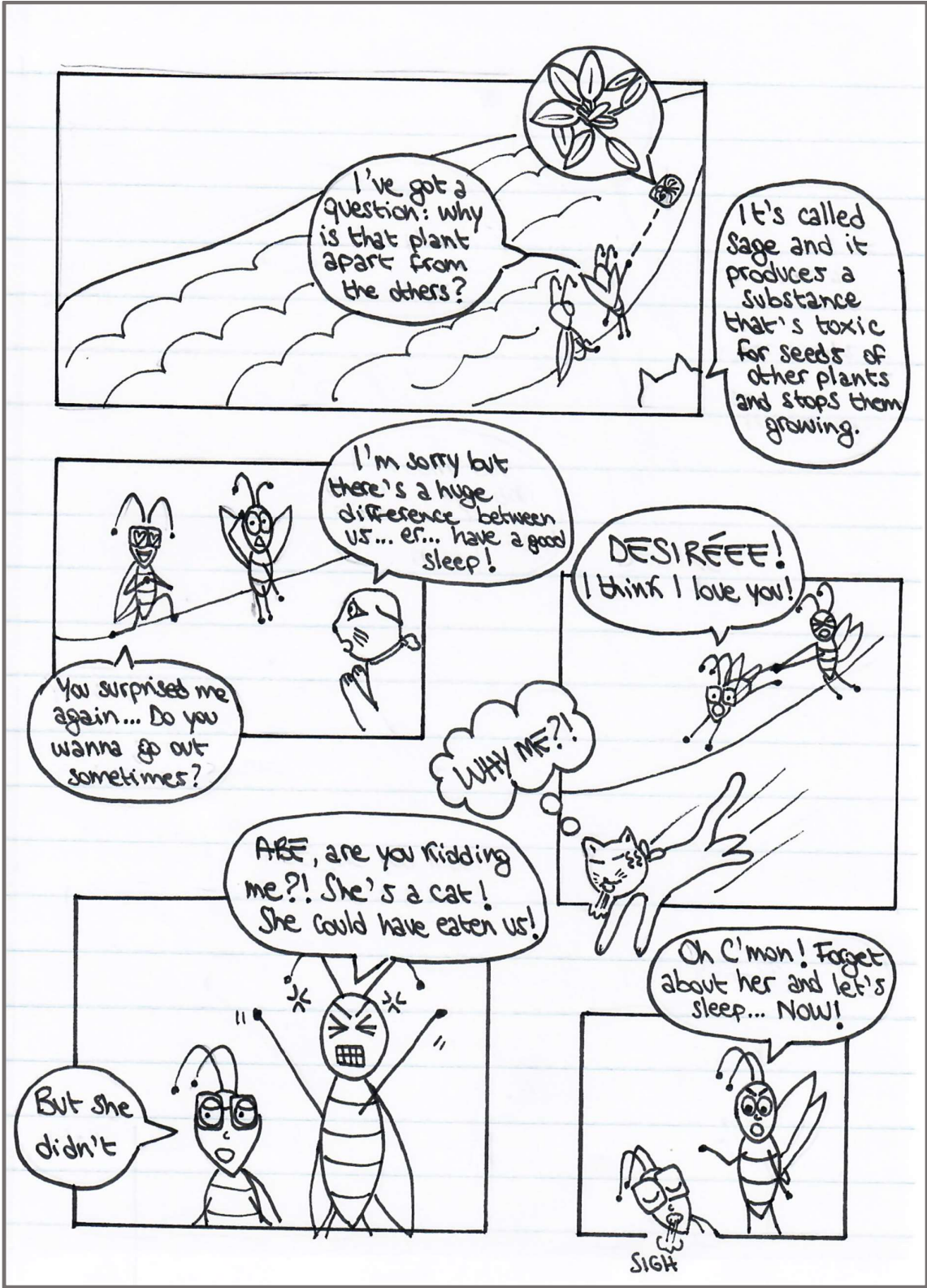


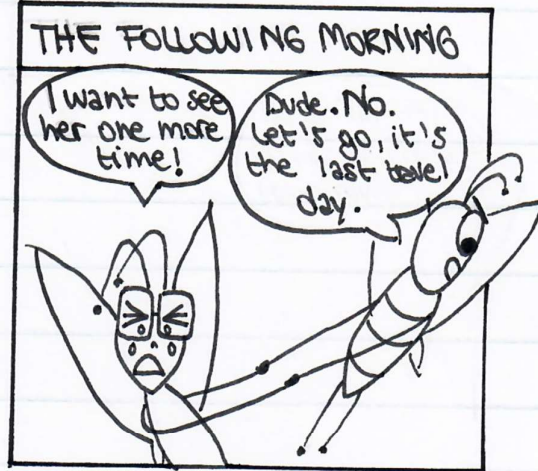
Let me guess... Result: tobacco plant is safe.



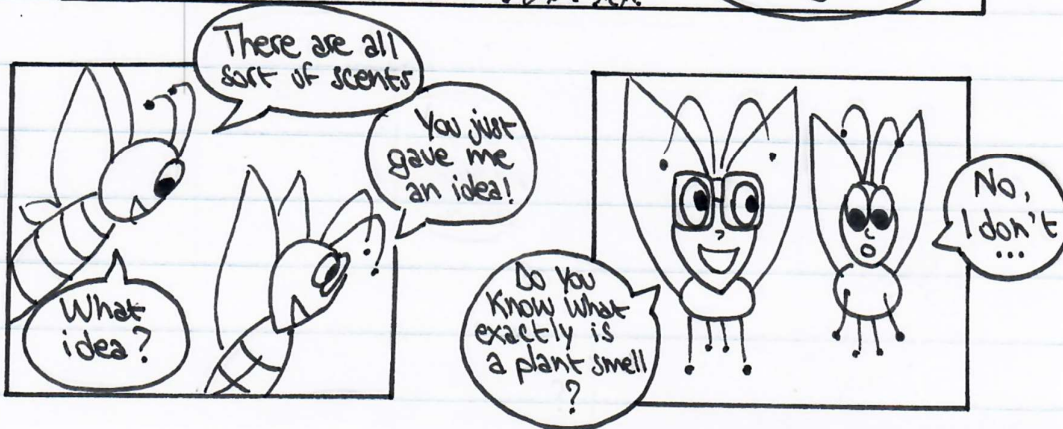
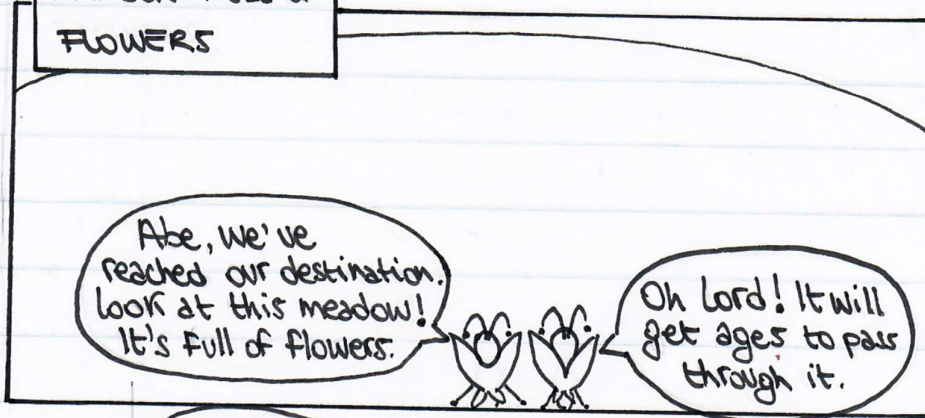
Tobacco plants emits a smell called Linalol that attracts the *Geocoris* insects, a beneficial predator which eats the caterpillar.

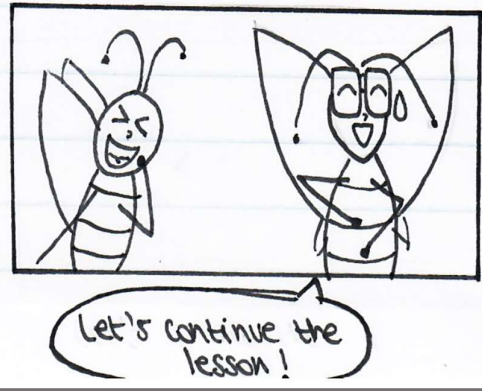
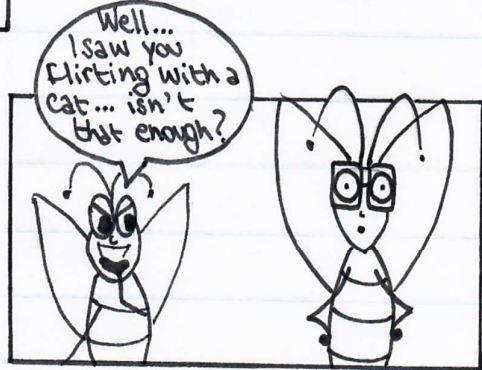
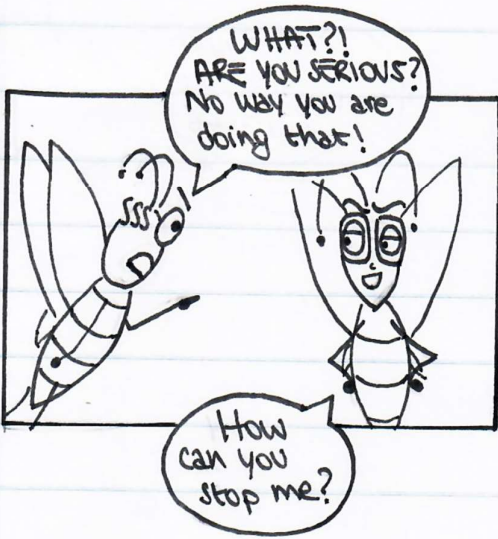
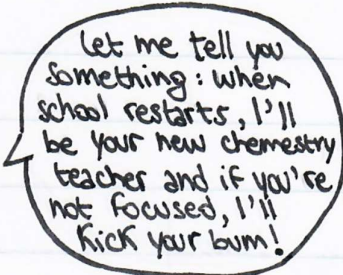
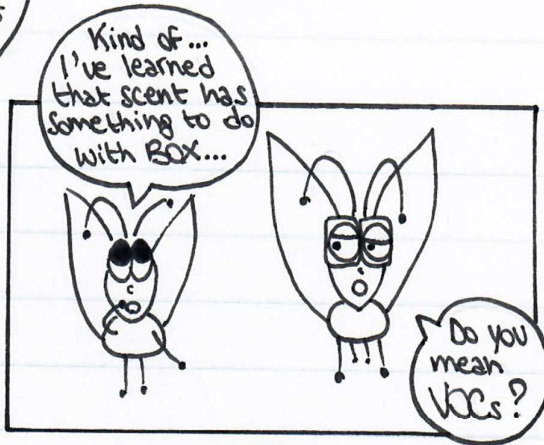
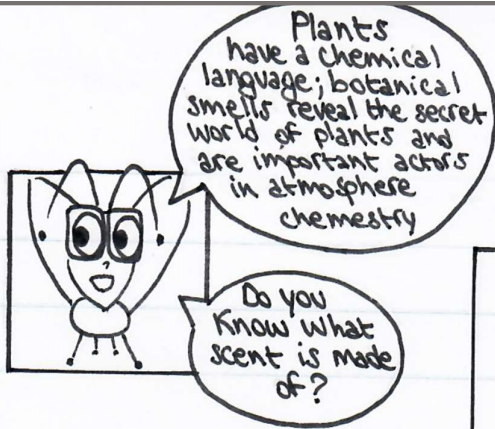
Right! A fun fact is that you find *Artemisia* plants near tobacco because, when attacked by the caterpillar, it emits 2 toxins that make the bug go away. The smell is also sensed by the tobacco and so it grows close to it.



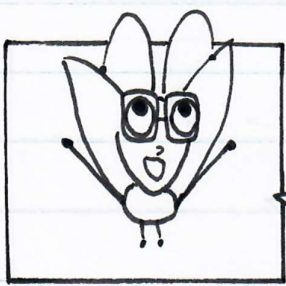
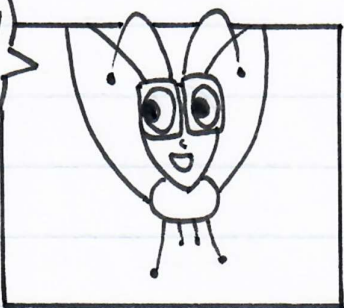


THEY'RE FLYING AND ARRIVE IN A MEADOW FULL OF FLOWERS



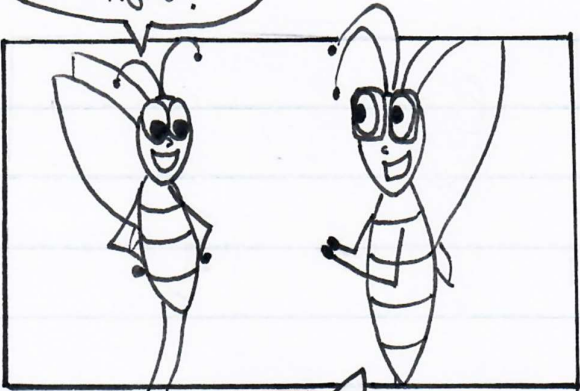


I was saying:
VOCs means Volatile
Organic Compounds; these have
a high vapour pressure due to their
low boiling point. Molecules quickly
evaporate or sublime from the
liquid or solid forms of the
compound. This is known
as volatility



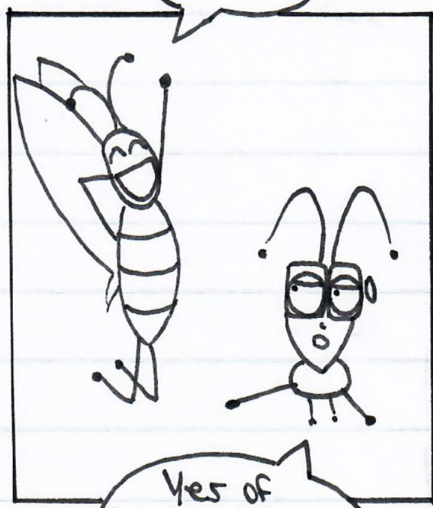
VOCs are numerous and
varied. They include human-made
and naturally occurring chemical
compounds. Most scents are VOCs.
They play an important role in
plant communication, and between
plants and animals. Some are
dangerous to humans or cause
harm to the environment

I remember
some of them, like:
terpenes, limonene,
linalool and
alpha-pinene
right?

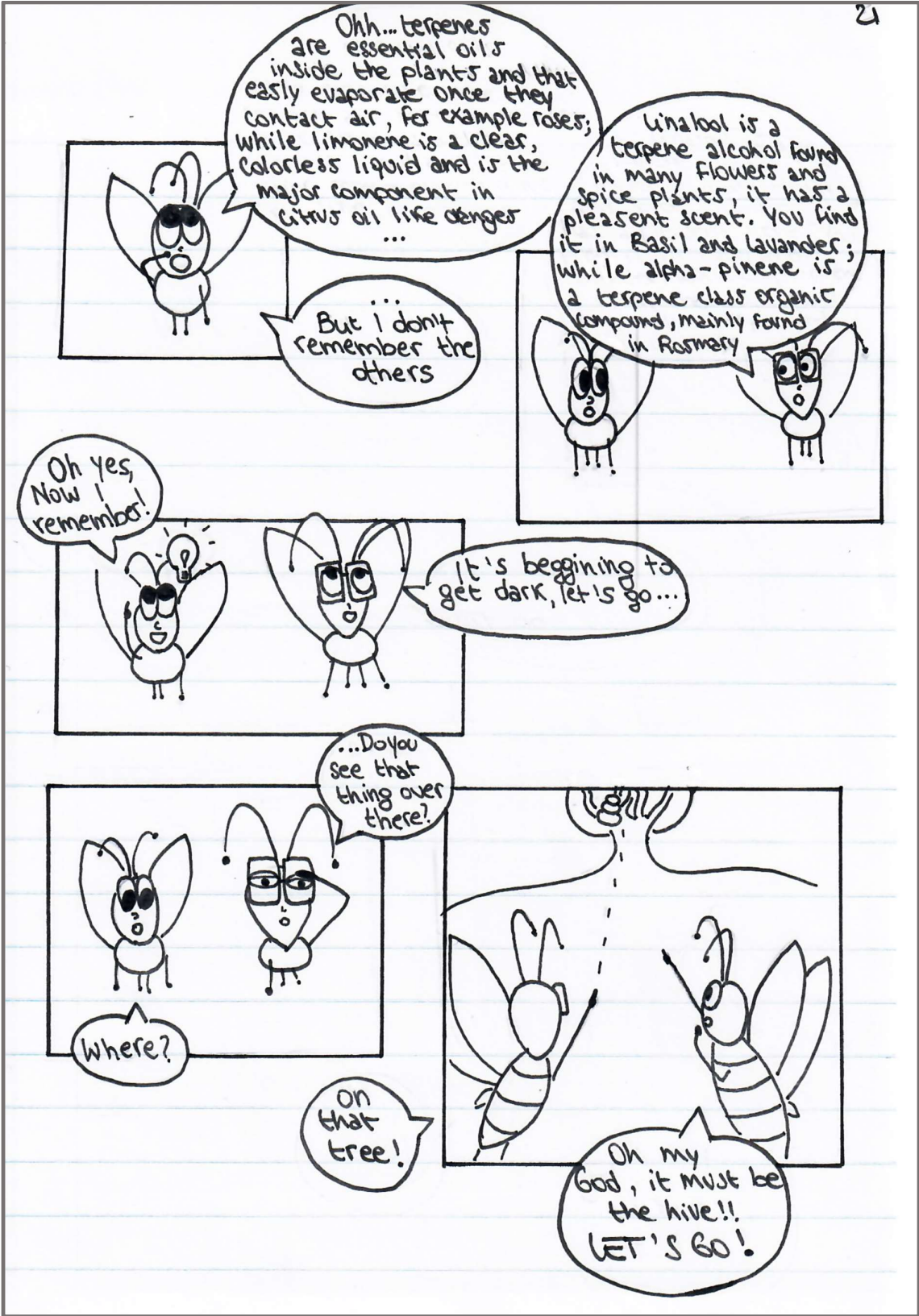


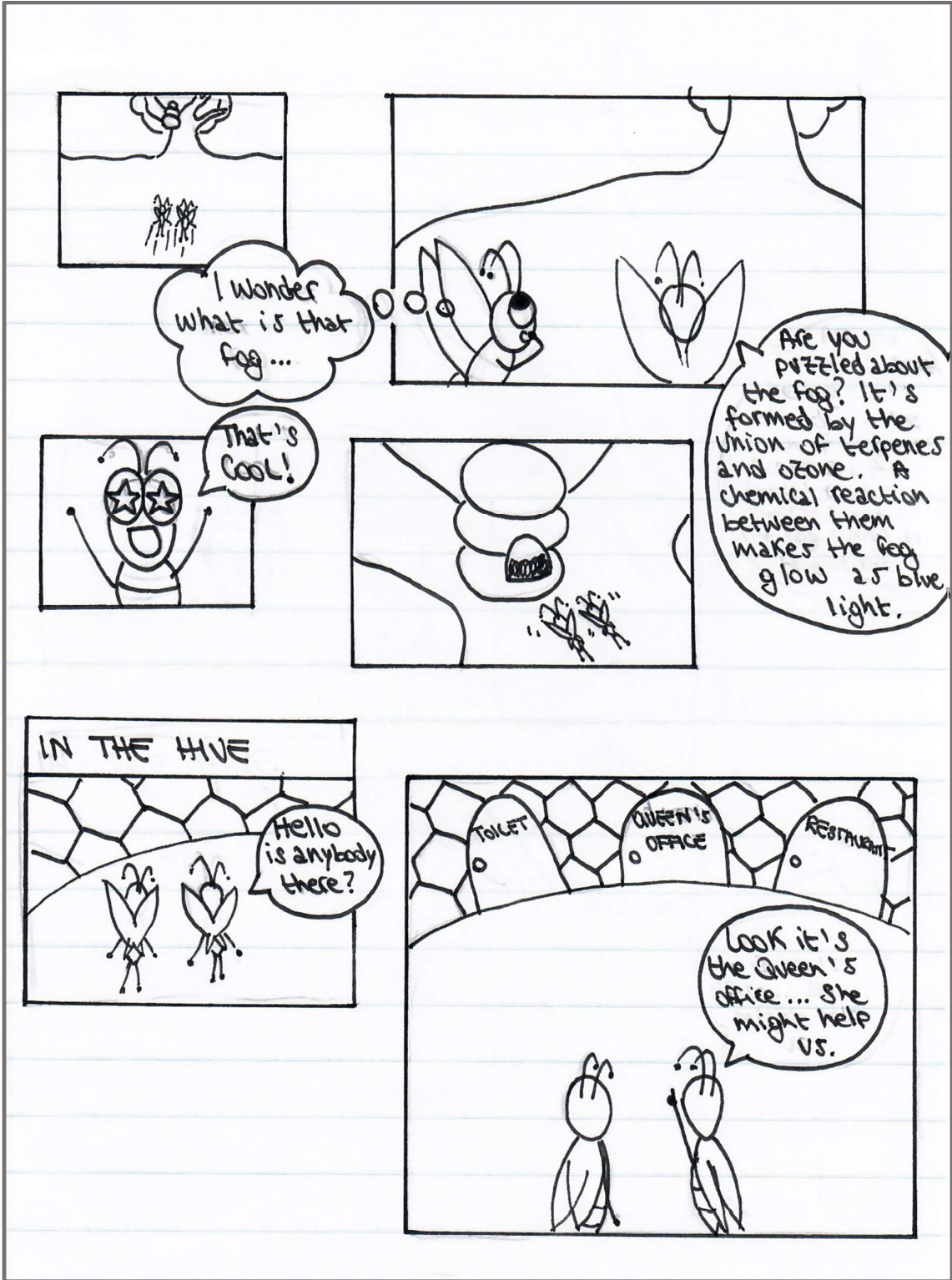
Well done Bud.
At least you remember
the most important
ones. Do you know what
they are?

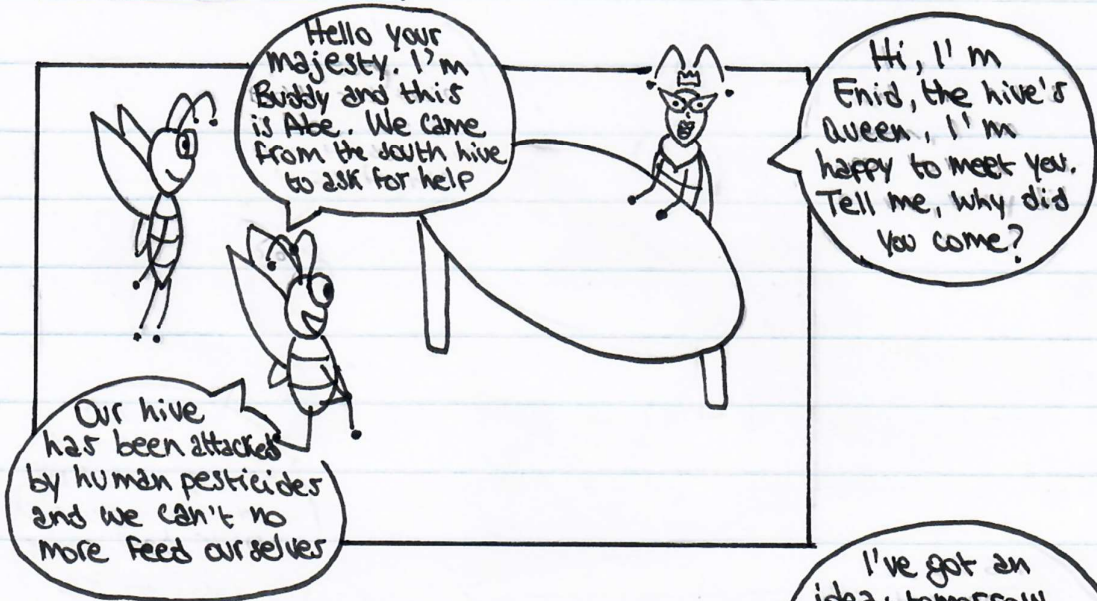
VOCs!

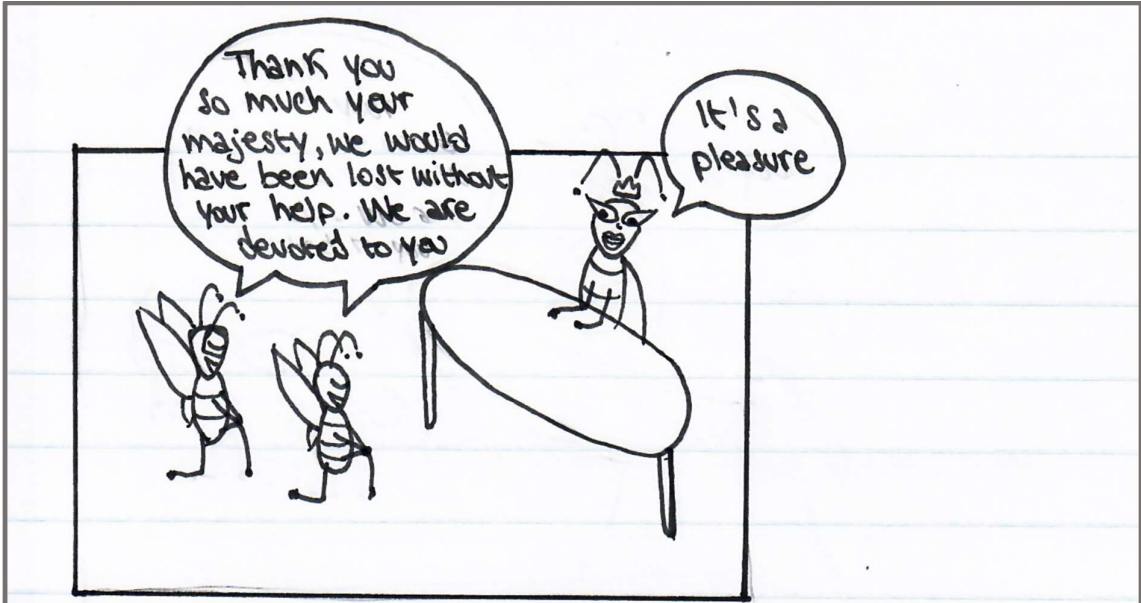


Yes of
course! But what
else?

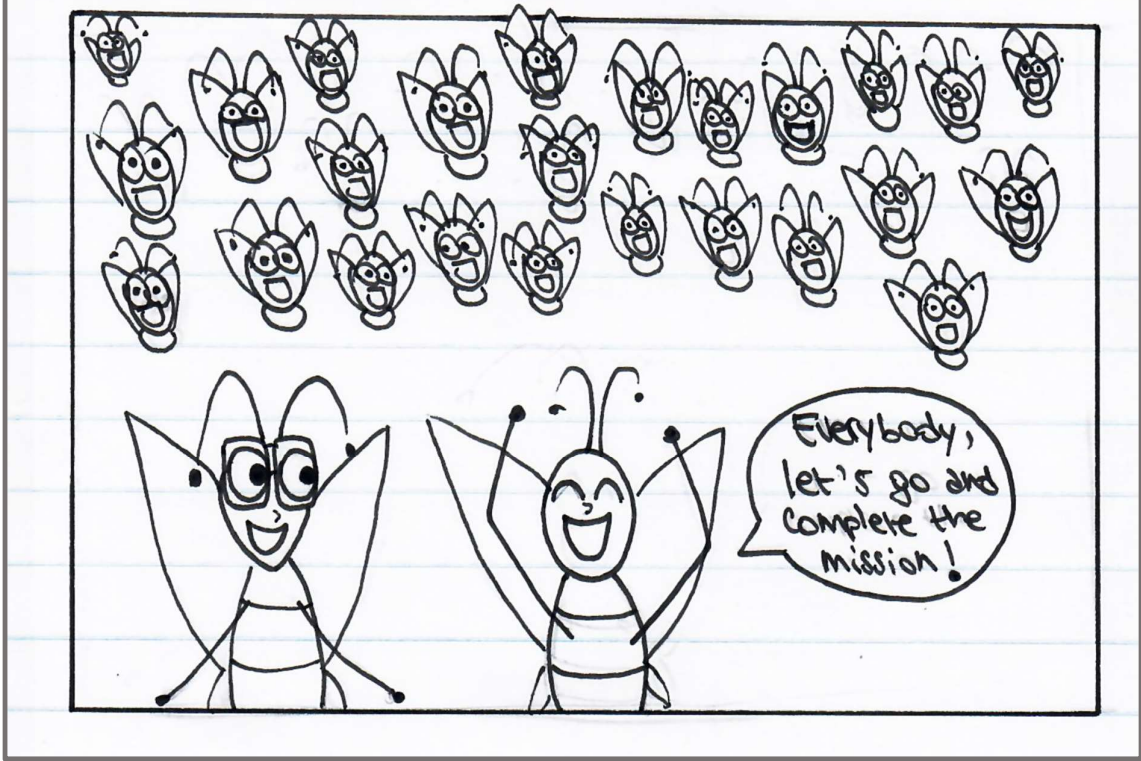




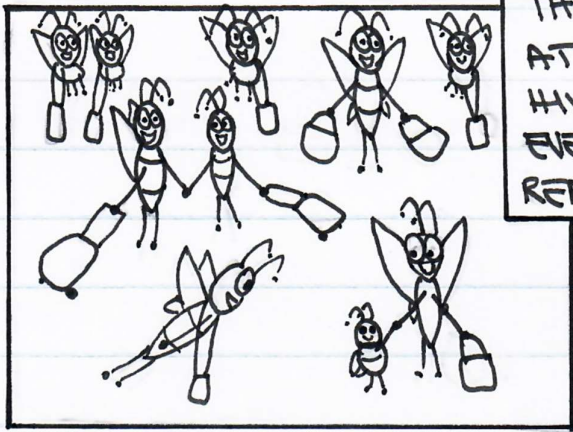




THE NEXT DAY

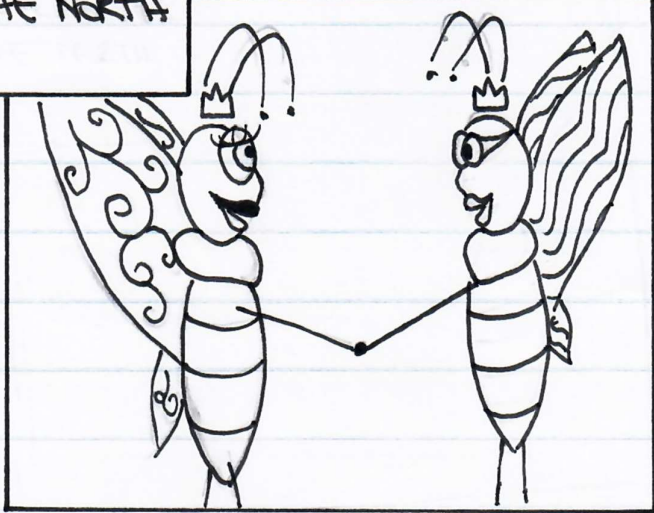


THE FOLLOWING DAYS

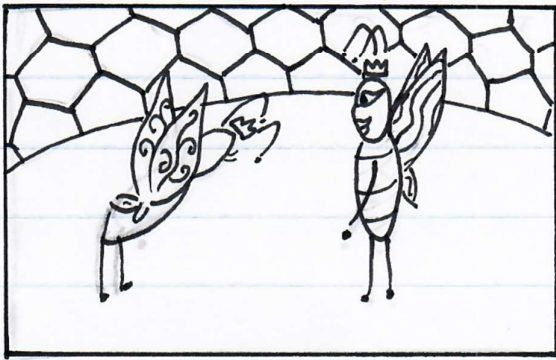


THEY ARRIVE AT THE SOUTH HIVE AND EVERYONE IS READY TO MOVE

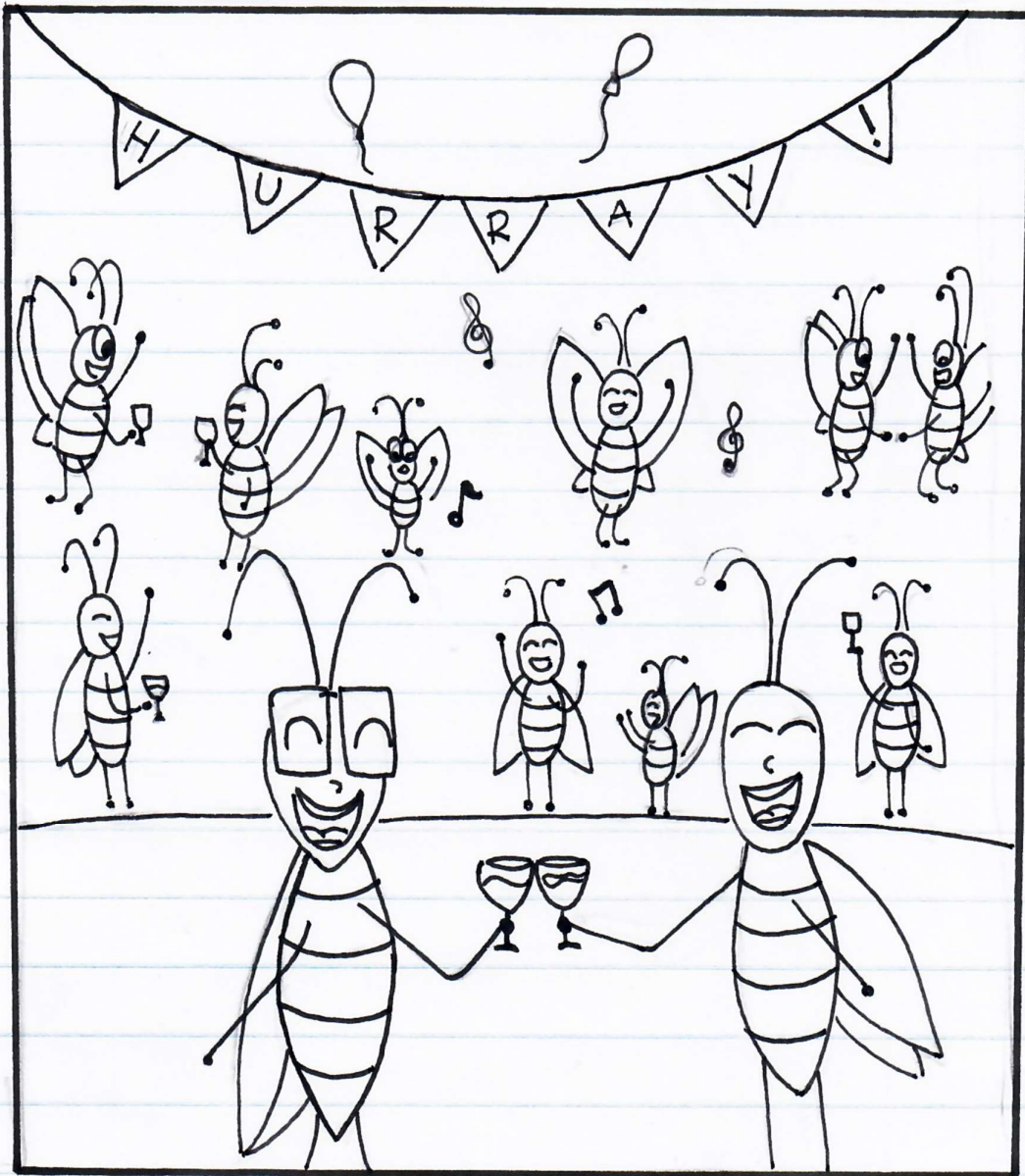
AT THE NORTH HIVE



THE TWO QUEENS UNITE THEIR KINGDOMS



THE END



And they lived happily ever after