

Hello!

Let's do a technical check

How does your computer screen look? Can you see everything?

You can use "view option" if it needs adjusting

Is your camera on so we can all see you?

Can you mute yourself?

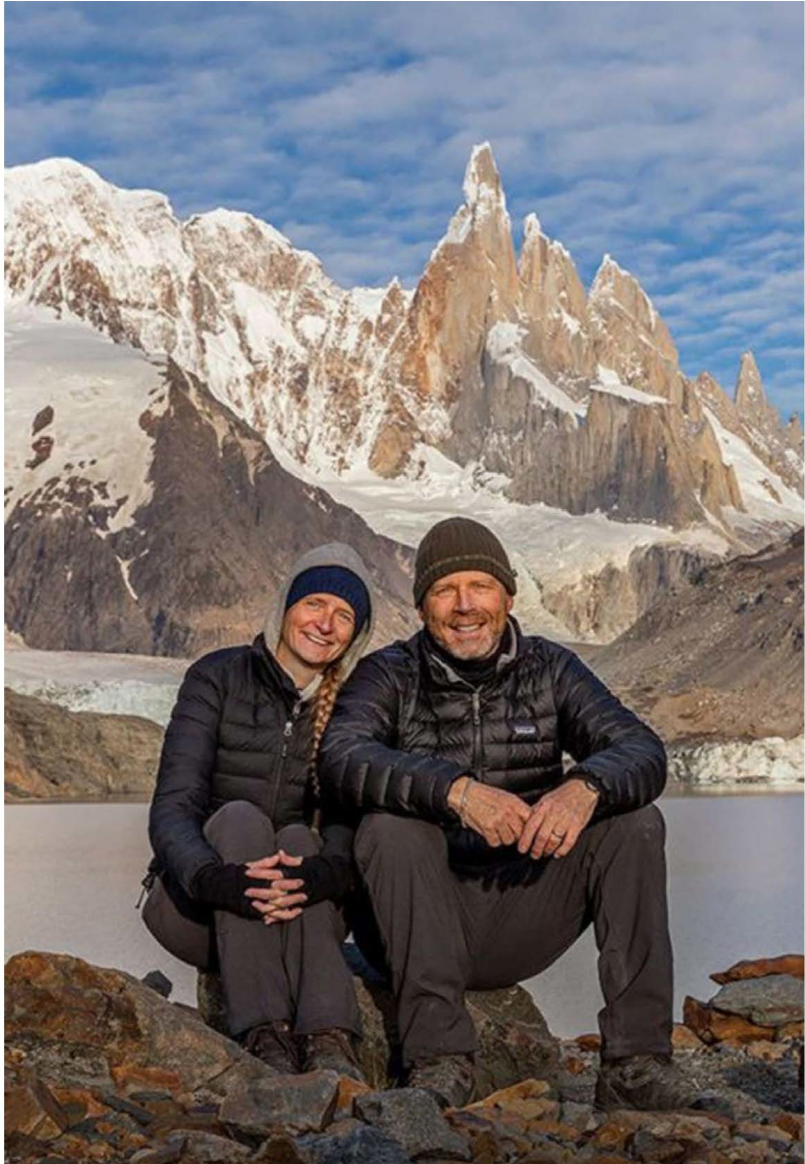
If you are not familiar with using **zoom**, no worries--we are all continuing to learn!

Does everyone know each other?

What happened this week that was special?

Ingo Arndt, Wildlife Photographer and his Wild Honeybee Project

Let's meet Ingo!



Silke and Ingo Arndt

Ingo was born in Germany. From childhood, he spent every single minute of his spare time outdoors in nature. Soon he realized he loved photography and he could use it as a tool to teach about the environment. He finished school and plunged into an adventurous life of a professional photographer. Since then, he has travelled around the globe as a wildlife photographer, taking pictures of animals and where they live. Ingo wants to show the ***magnificence*** of nature.² (Where do you think this photo was taken?)

Studying wild honeybees

- In the National Geographic article, Ingo talked about:
- How he decided he wanted to study a wild honeybee colony, but he is not an insect expert, so he partnered with a biologist, Jürgen Tautz, who specialized his studies in honeybees.
- He was the photographer working with scientists who were studying wild honeybees in a National Park in Germany. He was looking for photos to take of what was happening **inside** the natural nest, **which is impossible**.
- He knew that “the most exciting stuff is happening inside the tree,” but how could he see it when the honeybees wanted to sting? How could he unlock the secret of what was happening *inside* the nest?³

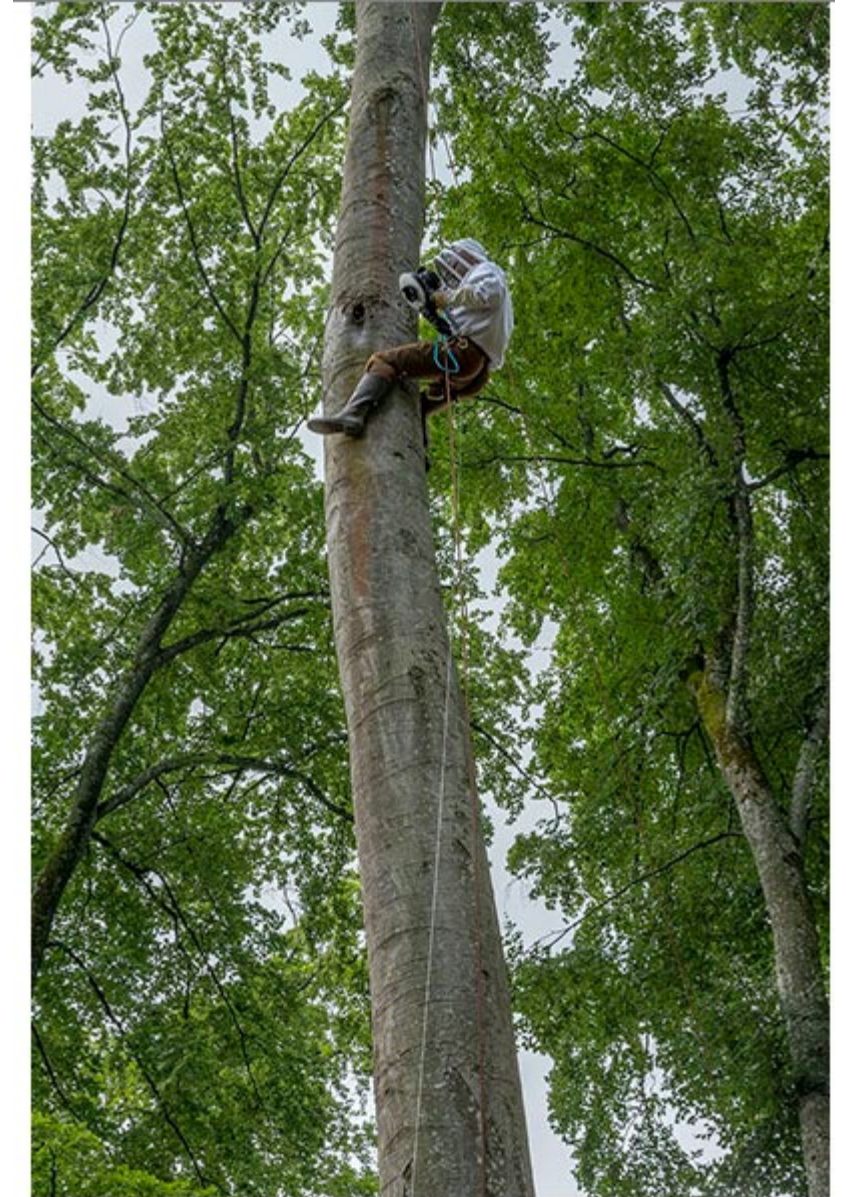
Ingo went to a local forest, searched for and found a tree that would make a home for wild honeybees. He found a fallen beech tree with an abandoned Black Woodpecker cavity in its trunk. This is a treasured home for honeybees.⁴



Wild honeybees like to be very high in trees!

Here's a photo of Ingo taking pictures of natural nesting Honey Bees (*Apis mellifera*), 20 meters high in beech tree, in Germany.

20 meters = about 65 feet



Ingo cut a piece of the log and took it home to his garden. He set to work building a four-walled, plywood photographer's "hide" or "blind up" against the section of tree he brought home. He built in some tiny windows, which allowed him to sneak his mini camera lens through the back of the cavity.⁷



When the cavity was ready, he found a queen bee from a nearby colony and placed her into the woodpecker cavity. Then he waited in the blind with his camera. The queen bee is mother of most, if not all, of the bees in the beehive.⁹



Honey Bee (*Apis mellifera*), queen, drone, and worker, Germany



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Within minutes, scout bees from the queen's original colony flew over and landed on the rim of the woodpecker cavity. More and more bees came until the log was humming with thousands of bees. The entire colony followed the queen to the new nest.

For six months, Ingo shot more than 60,000 pictures, taking photographs of wild honeybees unlike anything seen before. No one had ever studied bees in the wild before Ingo.¹³ (outside of tree)

"Honey Bees (*Apis mellifera*) at the beginning of the colonization a black woodpecker nest cavity. Nest entrance from the outside, Germany"



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“Honey Bees (*Apis mellifera*) colonizing a black woodpecker nest cavity, with the bees forming “chains” and a “ball” at the top of the cavity. Inside view of the cavity, Germany.”

Ingo spent hundreds of hours in the blind. He took pictures of the wild honeybees drinking water. They would suck up water with straw-like tongues and fly back to the nest. Inside, the honeybees passed the water to another group



of bees, known as the water spreaders, whose job is to **regurgitate** the water onto the honeycombs. The water evaporates and creates a cooling effect. Sometimes the bees would fan their wings to make a breeze to cool the honeycomb faster. It is like when you sweat and then sit in front of a fan.¹⁶

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“Honey Bees (*Apis mellifera*), drinking water on hot summer day, Germany.”



If they needed more heat in the nest because it was cold outside, the honeybees grabbed hold of each other's legs to form a living quilt along the surface of the combs. It was like a sleeping bag made out of bees!¹⁸

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Honey Bees (*Apis mellifera*) colonizing a black woodpecker nest cavity, with the bees forming "chains" and a "ball" at the top of the cavity. Inside view of the cavity, Germany."

Here is Ingo's book

Princeton Nature

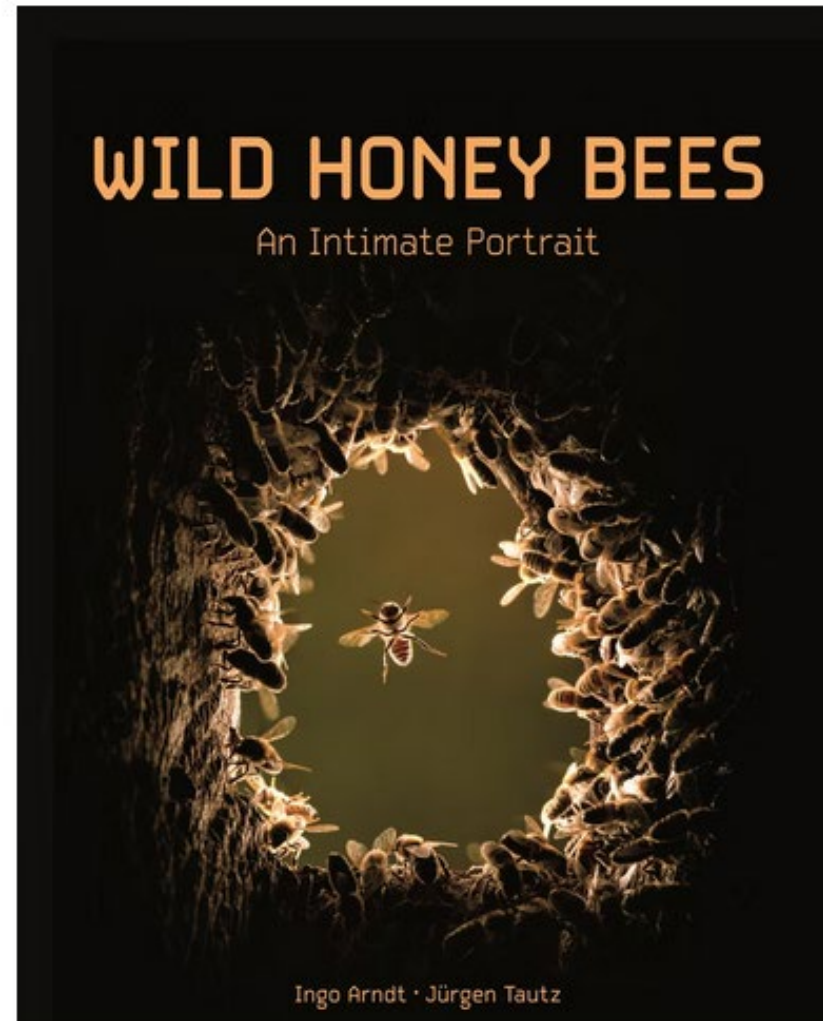
Wild Honey Bees: *An Intimate Portrait*

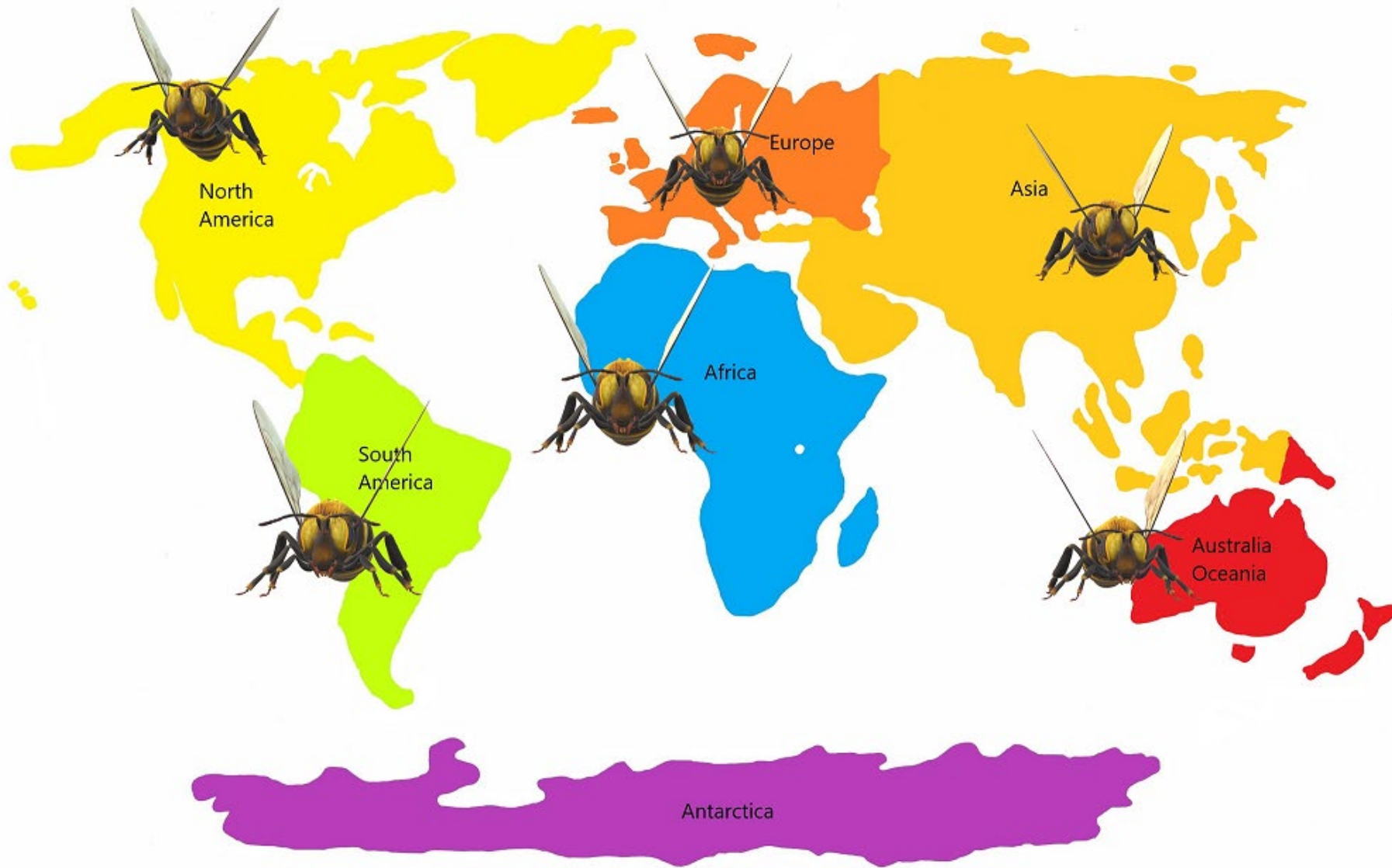
Ingo Arndt and Jürgen Tautz

Foreword by Thomas D. Seeley

A lavishly illustrated exploration of the mysterious, hidden world of forest-dwelling wild honey bees—with new insights that promise to revolutionize conservation and beekeeping

<https://press.princeton.edu/books/hardcover/9780691235080/wild-honey-bees>





North
America

Europe

Asia

Africa

South
America

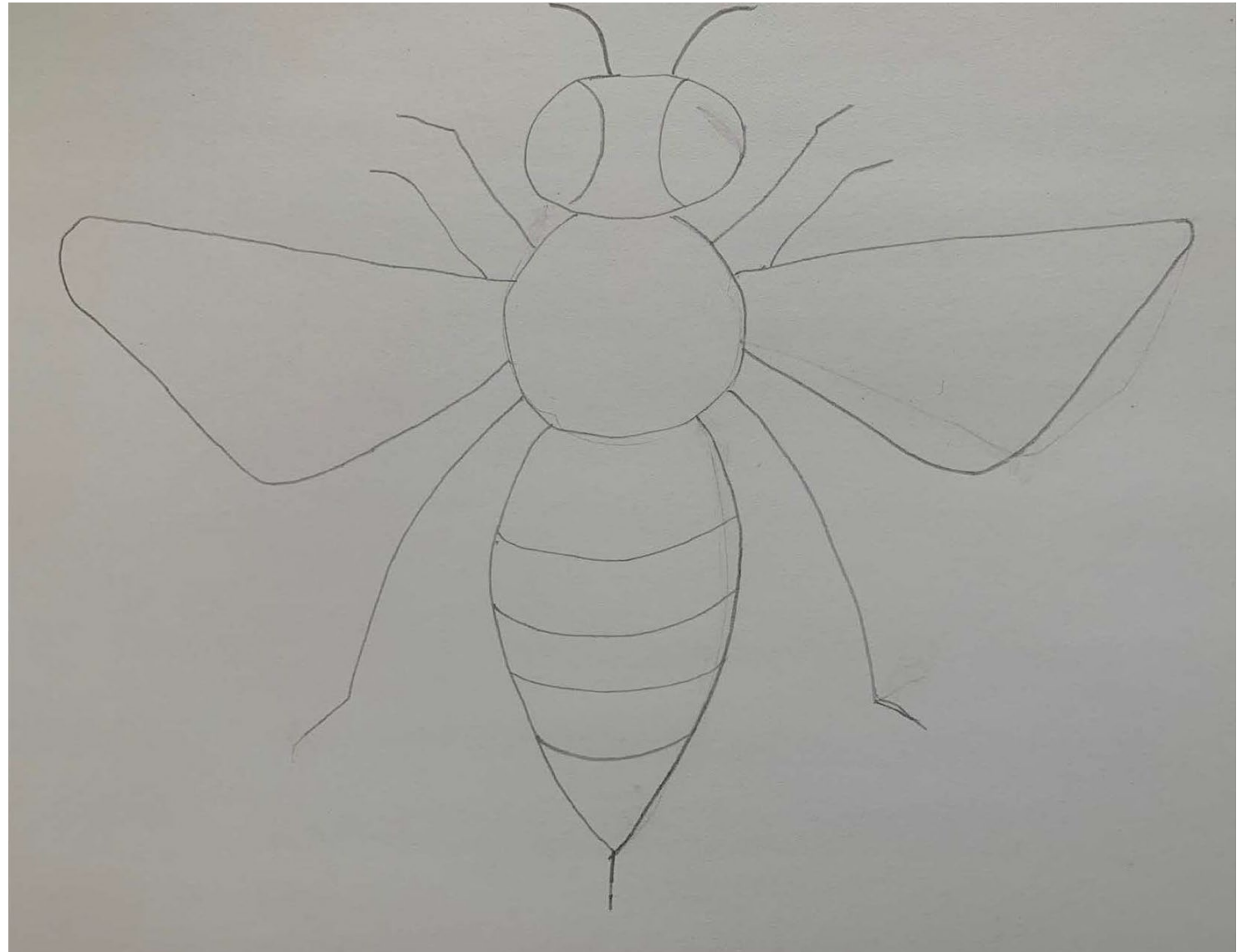
Australia
Oceania

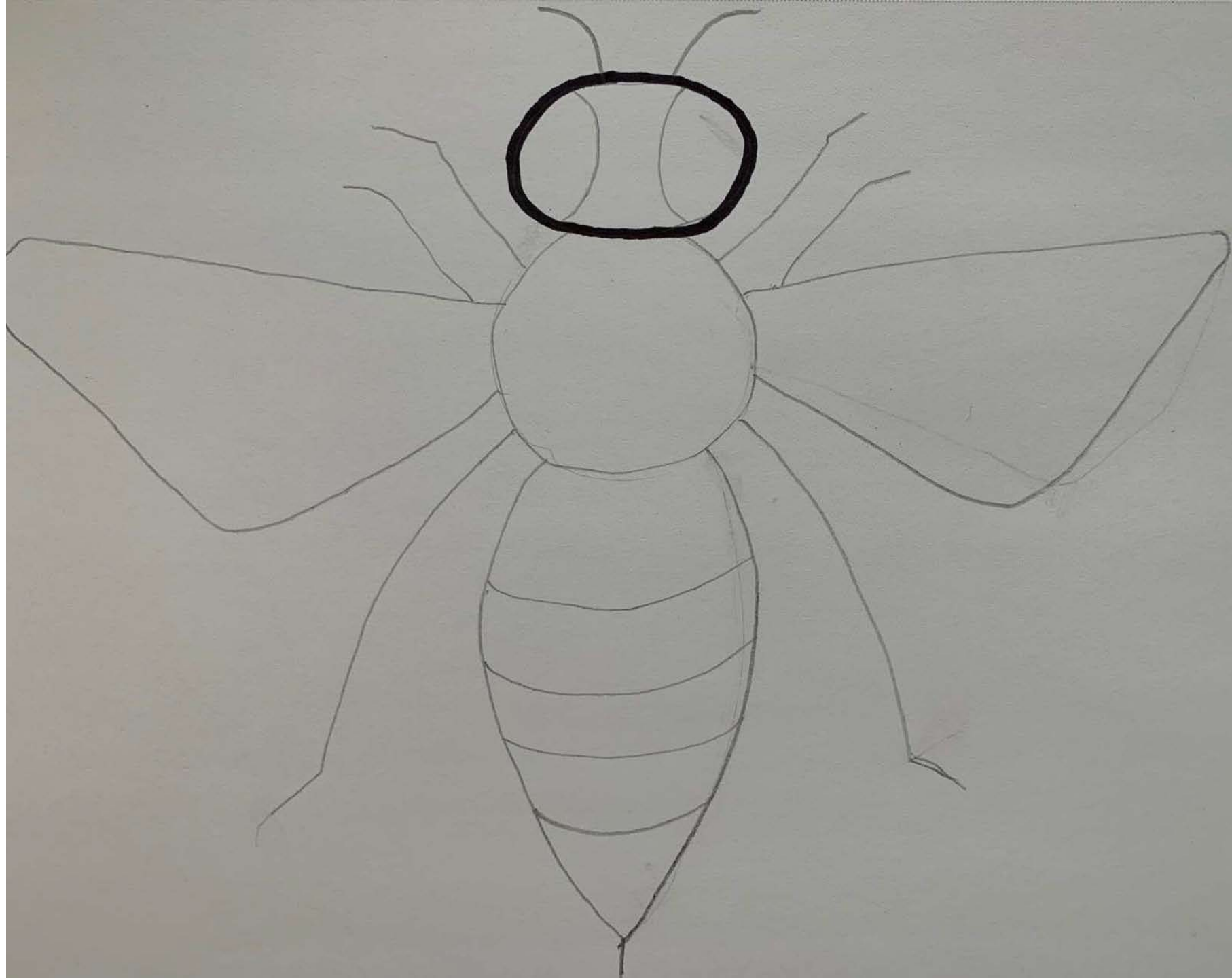
Antarctica

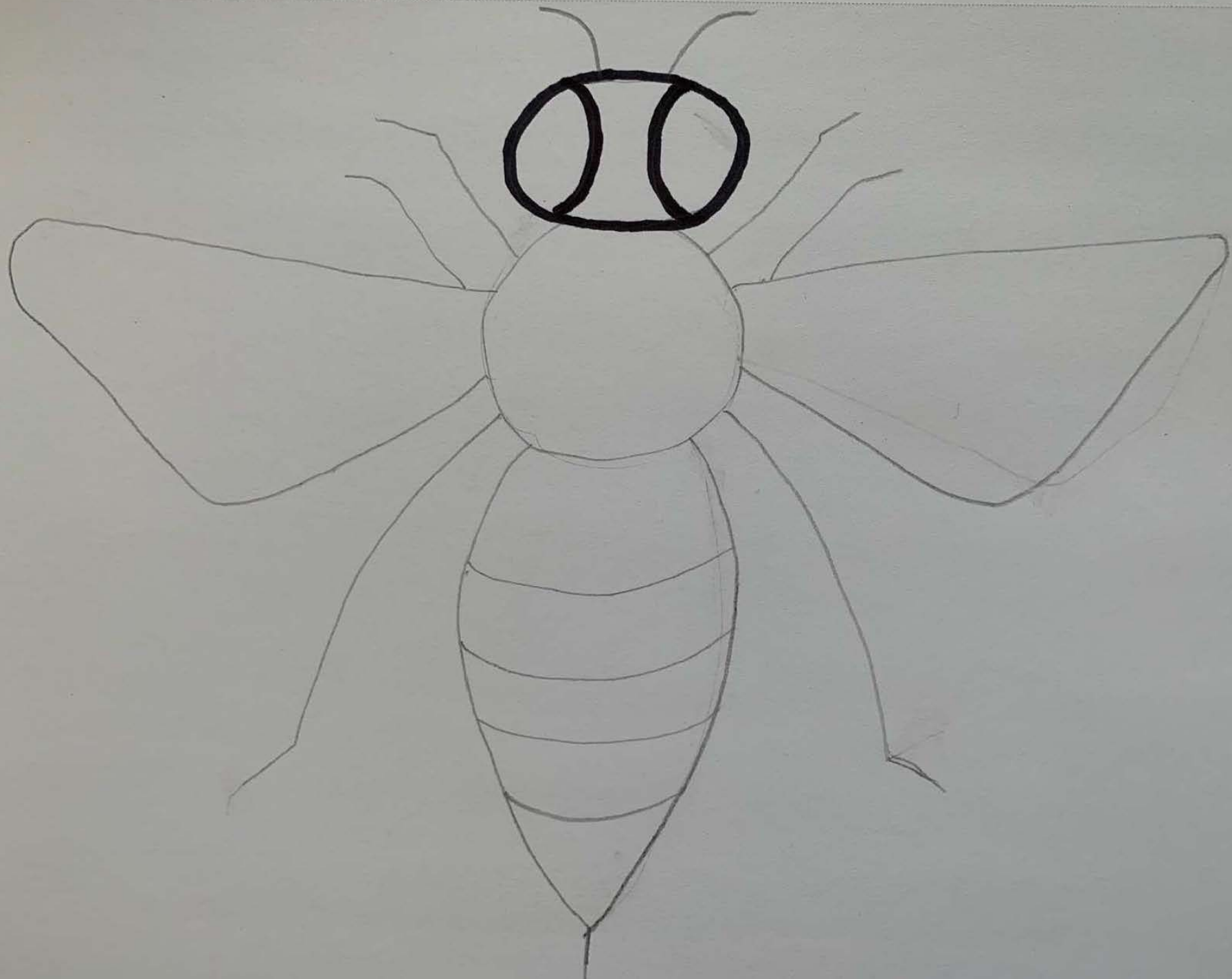
Where do bees
live?

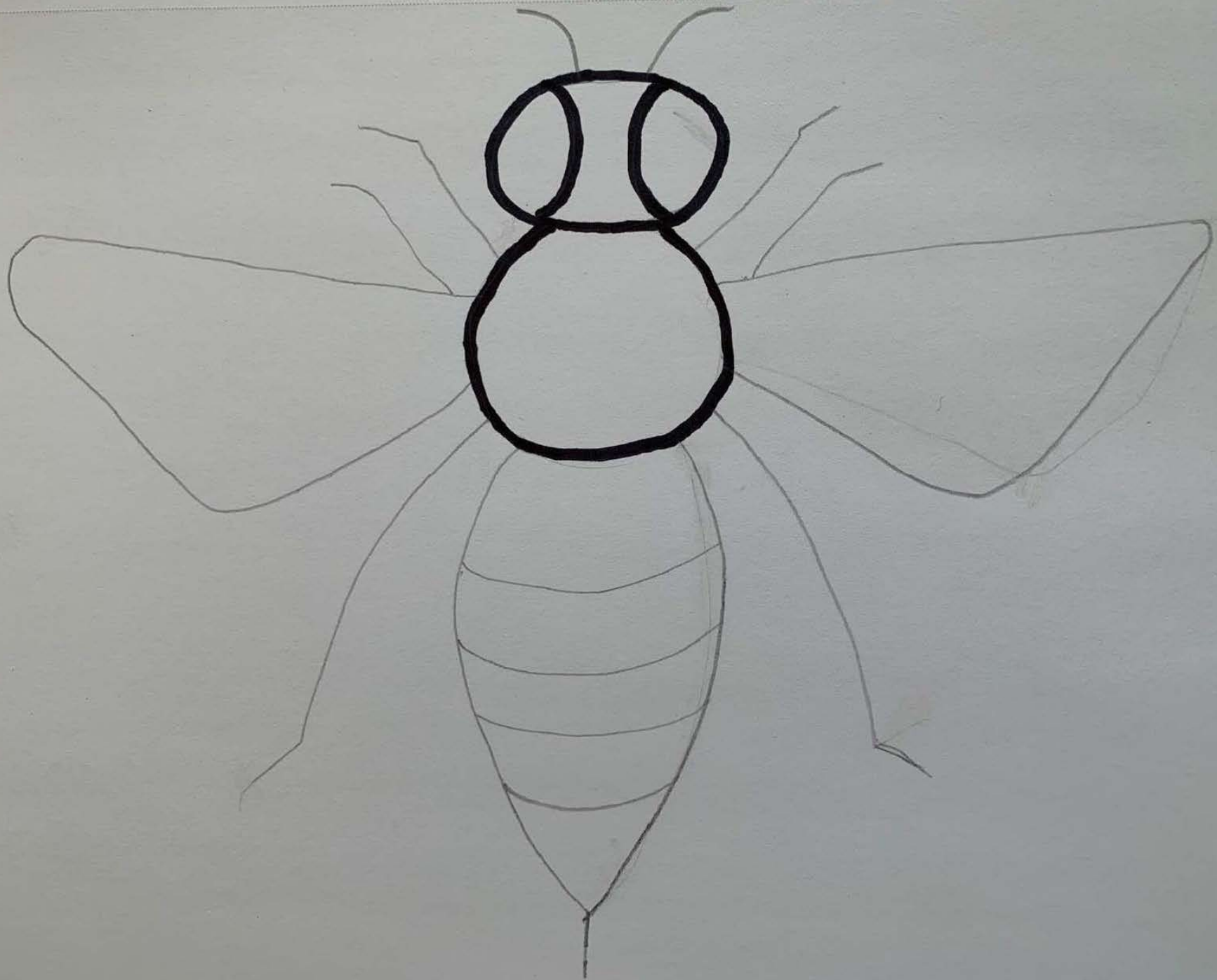
All continents except Antarctica.

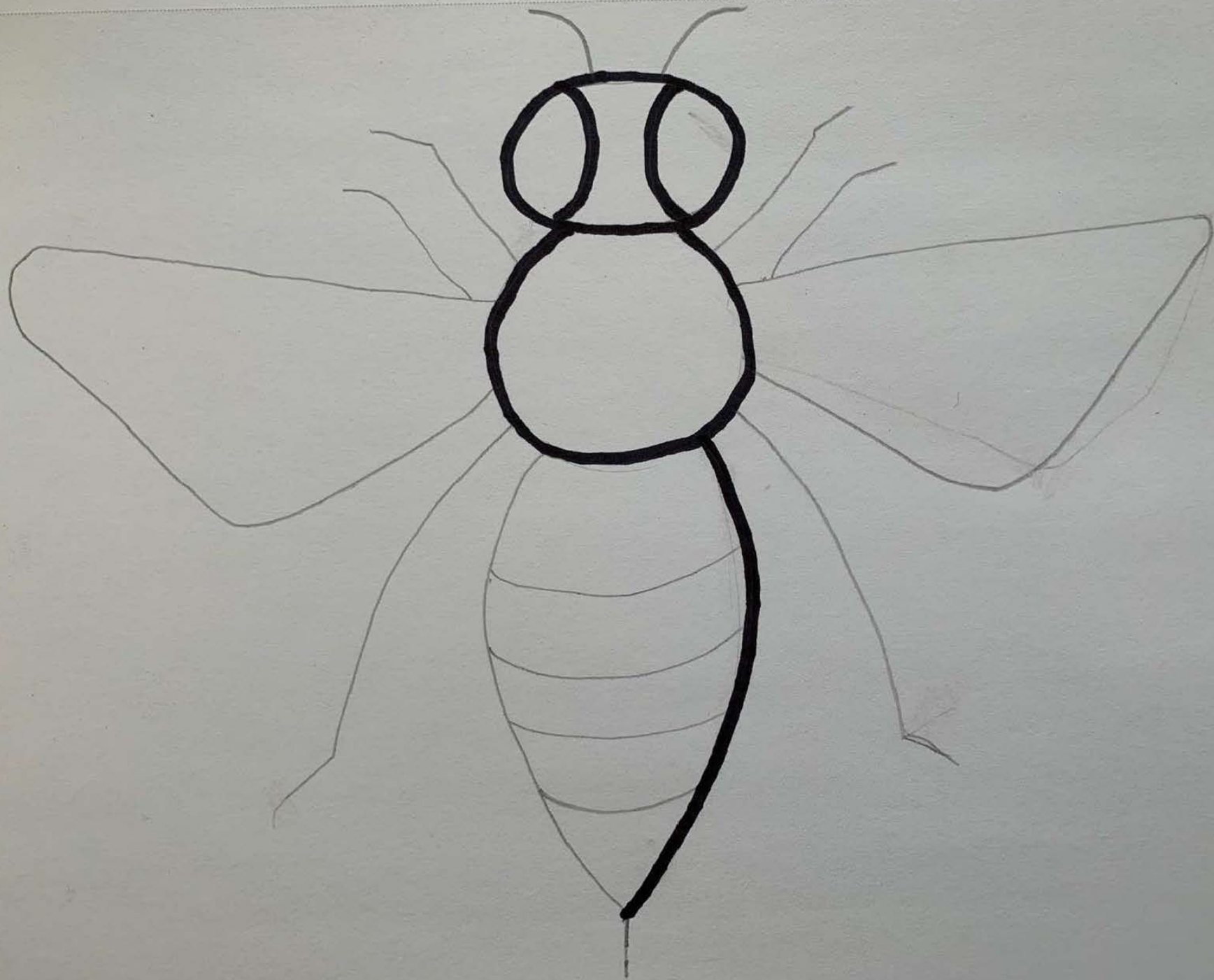
Let's draw a honeybee!

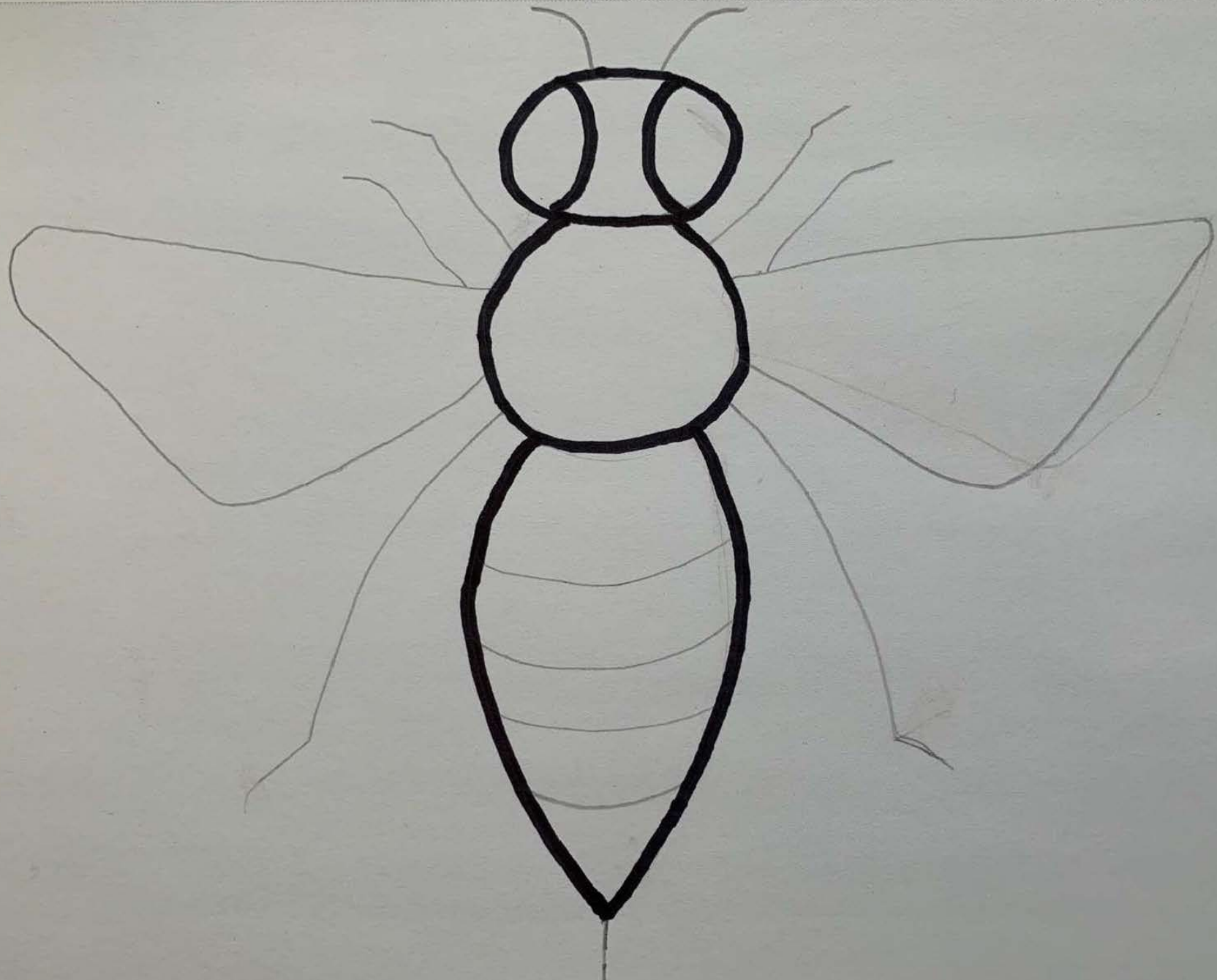




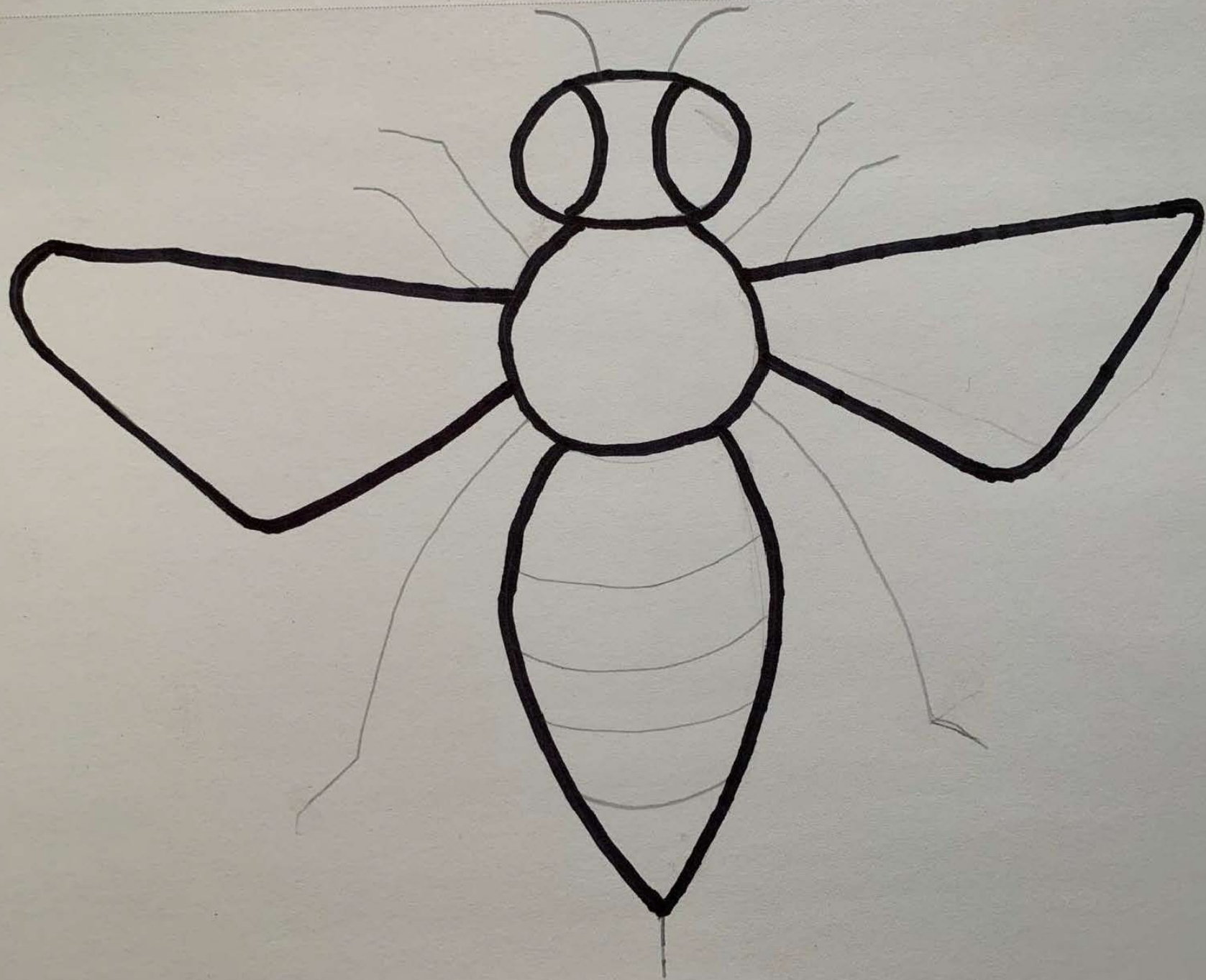


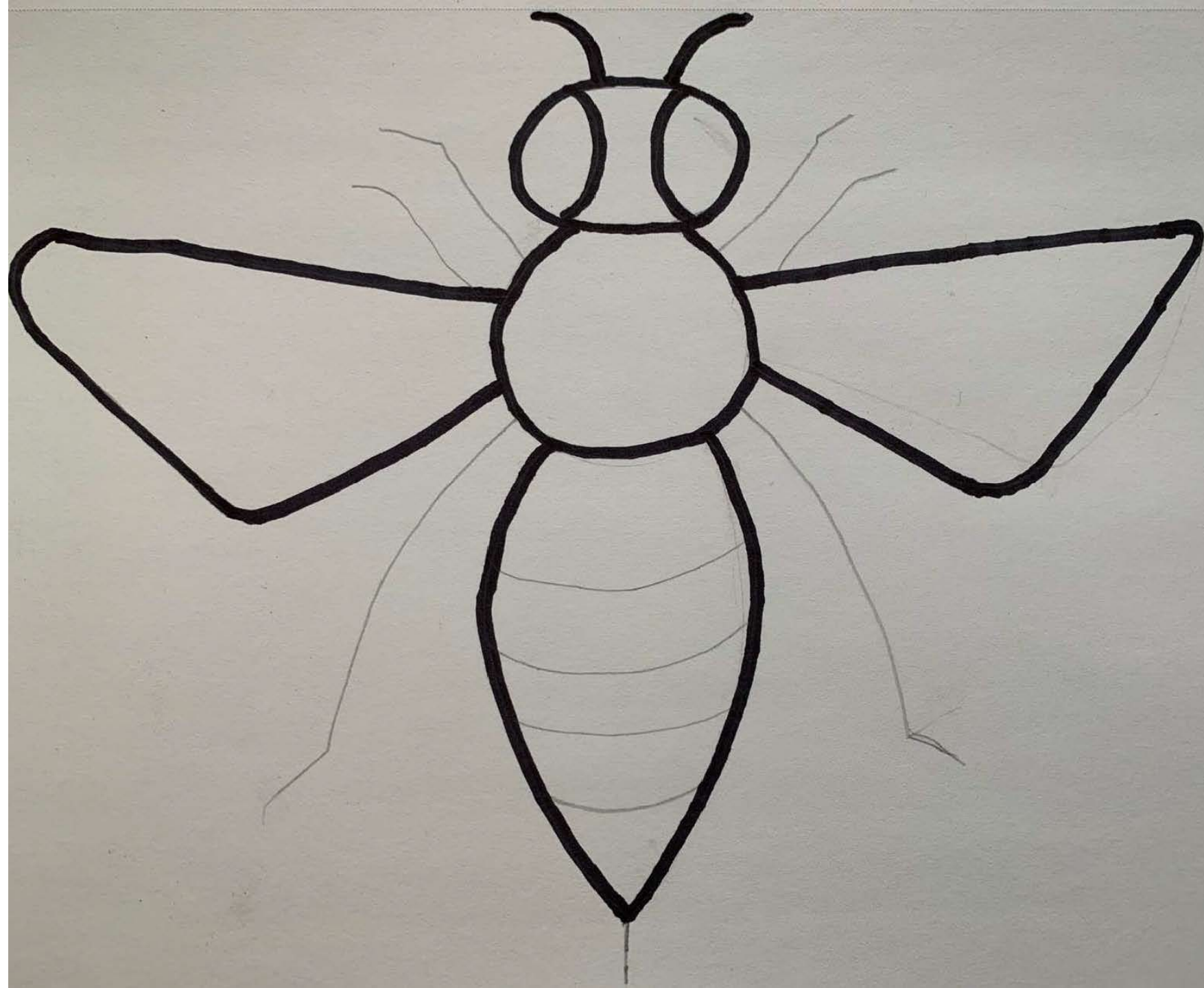


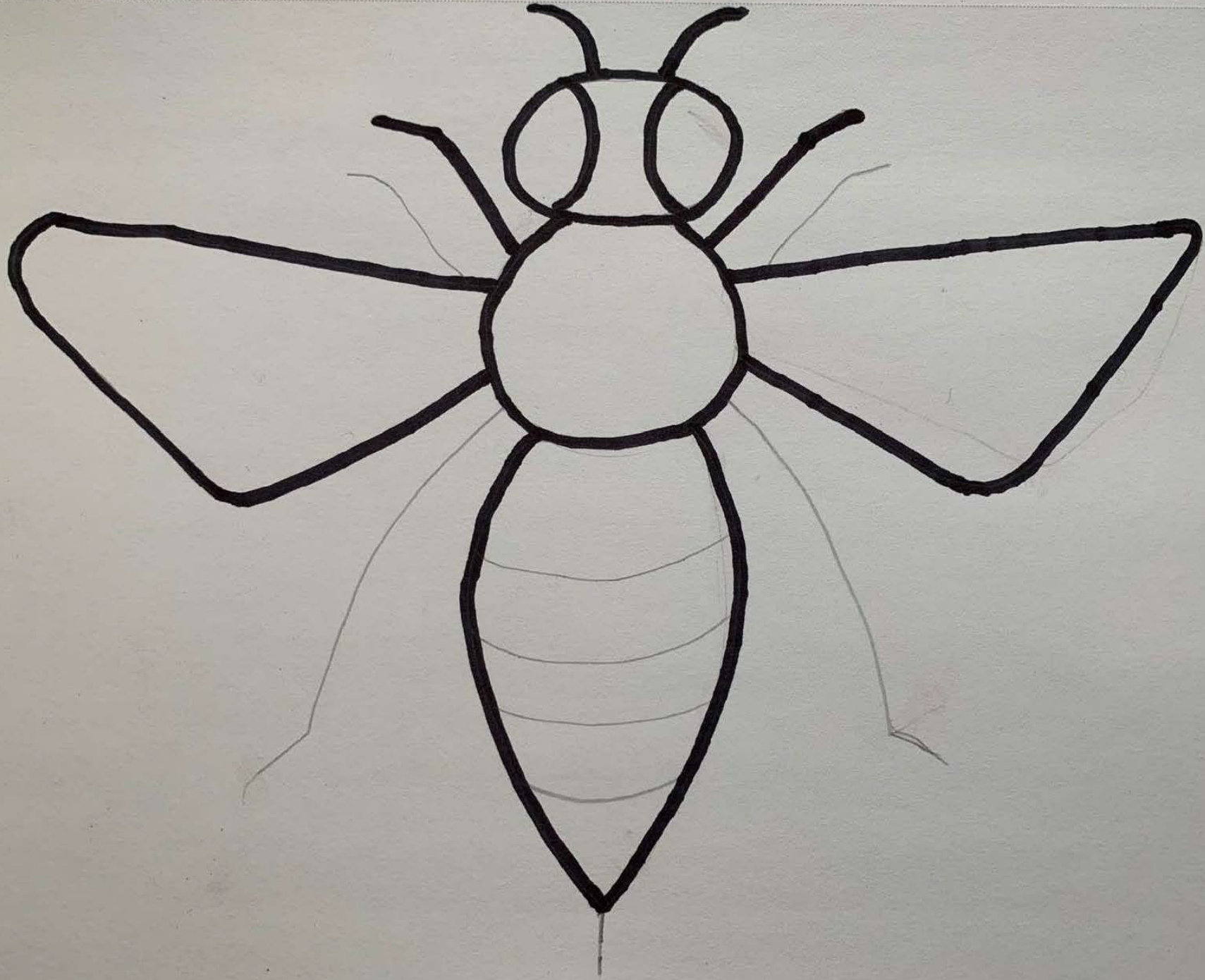


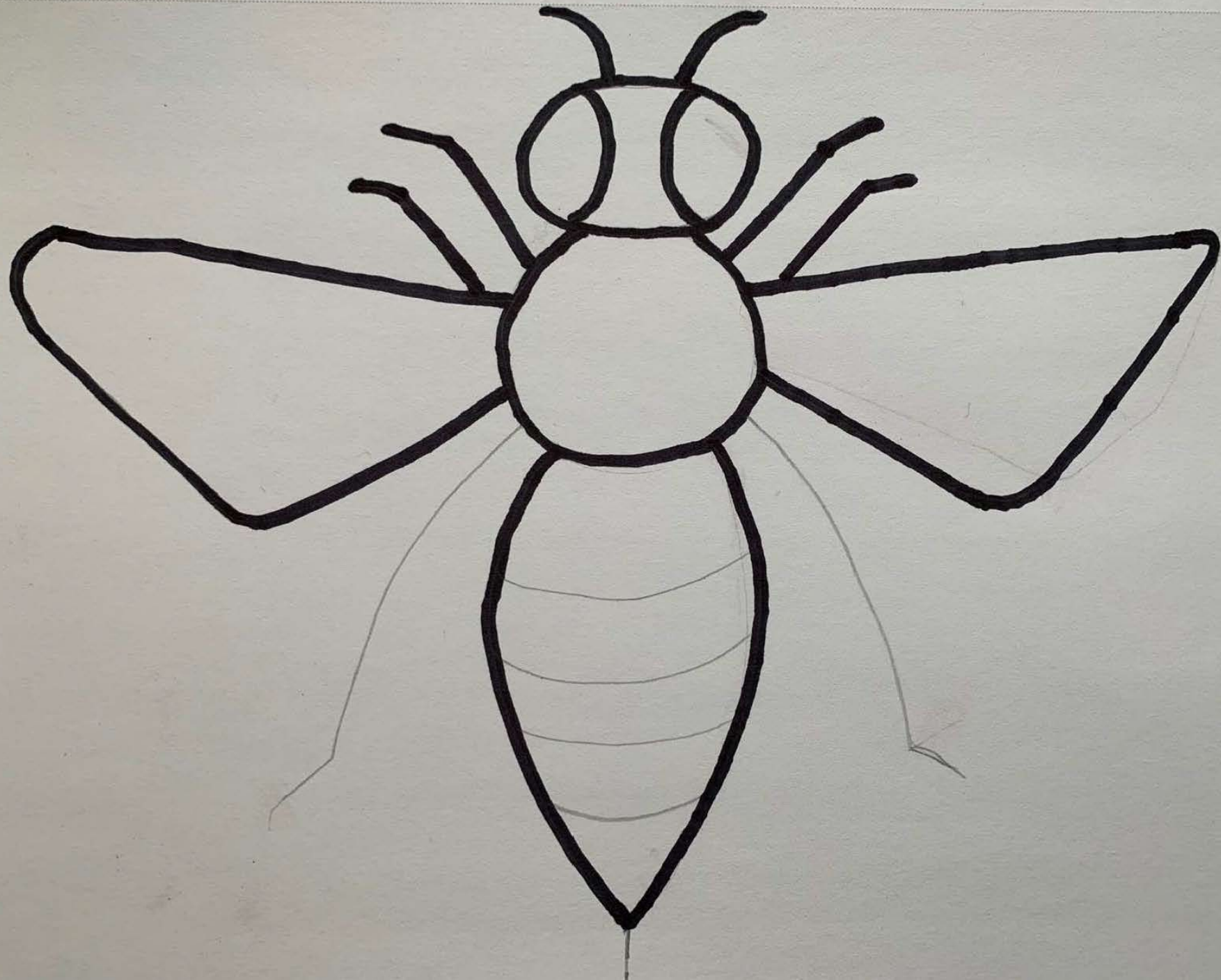


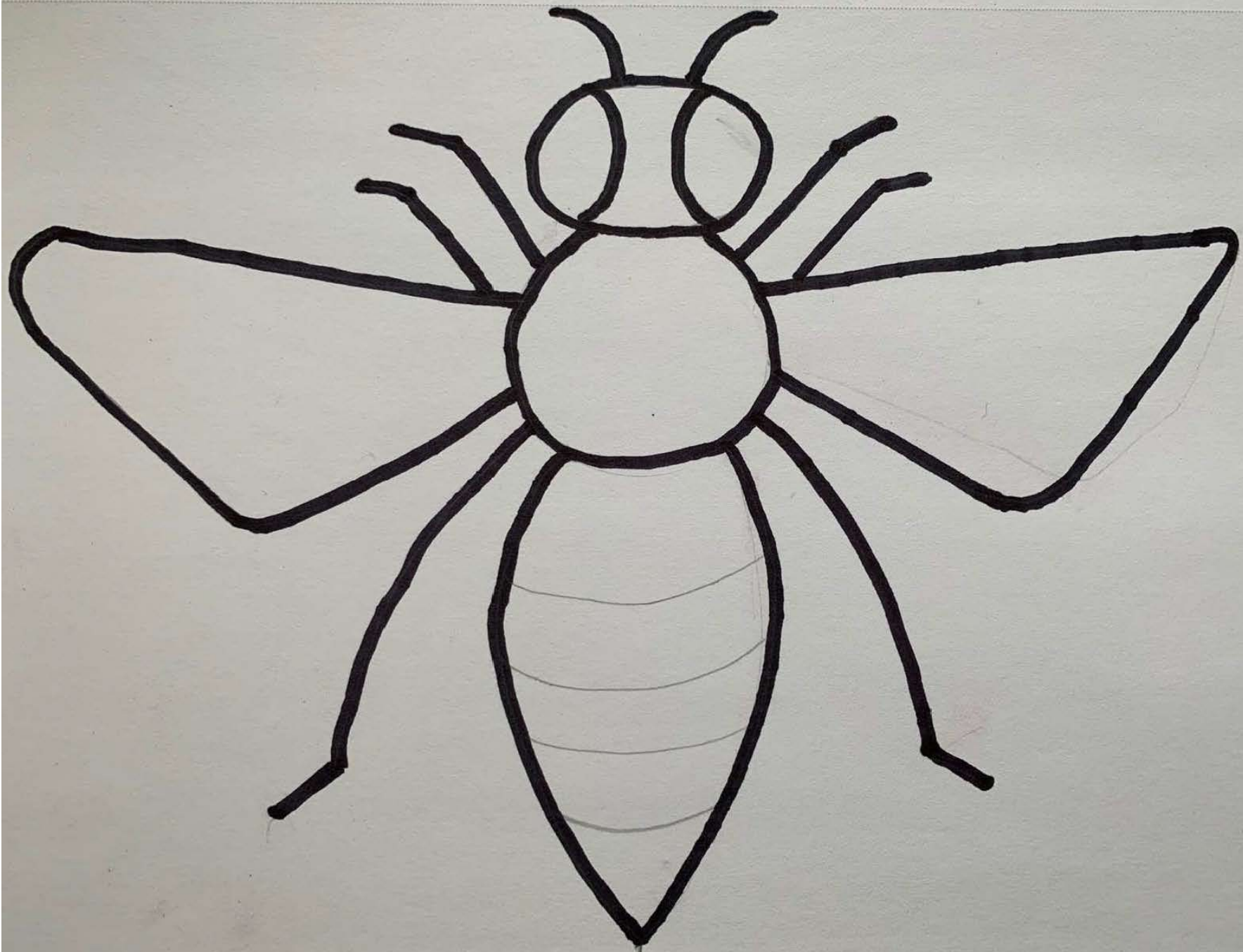


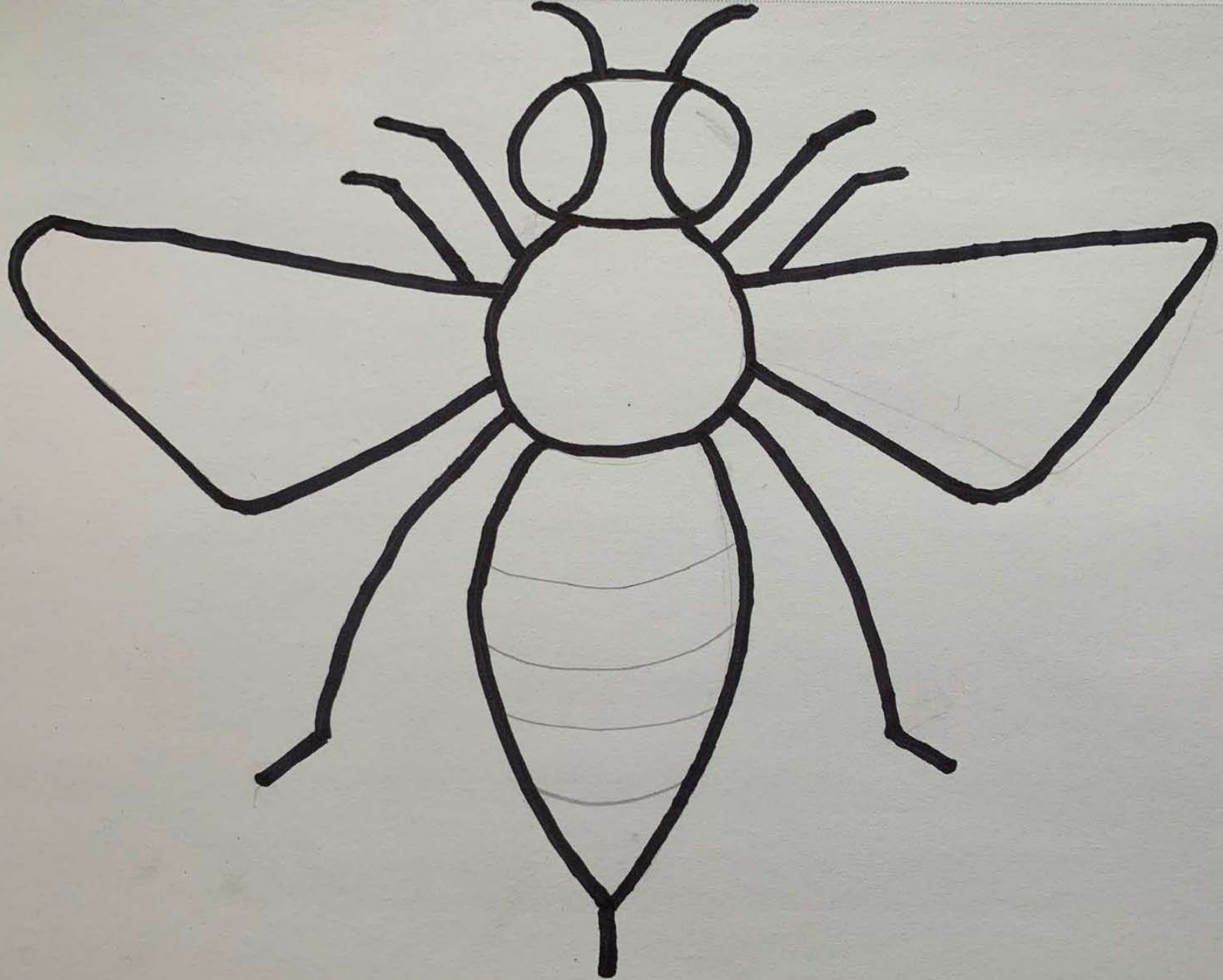


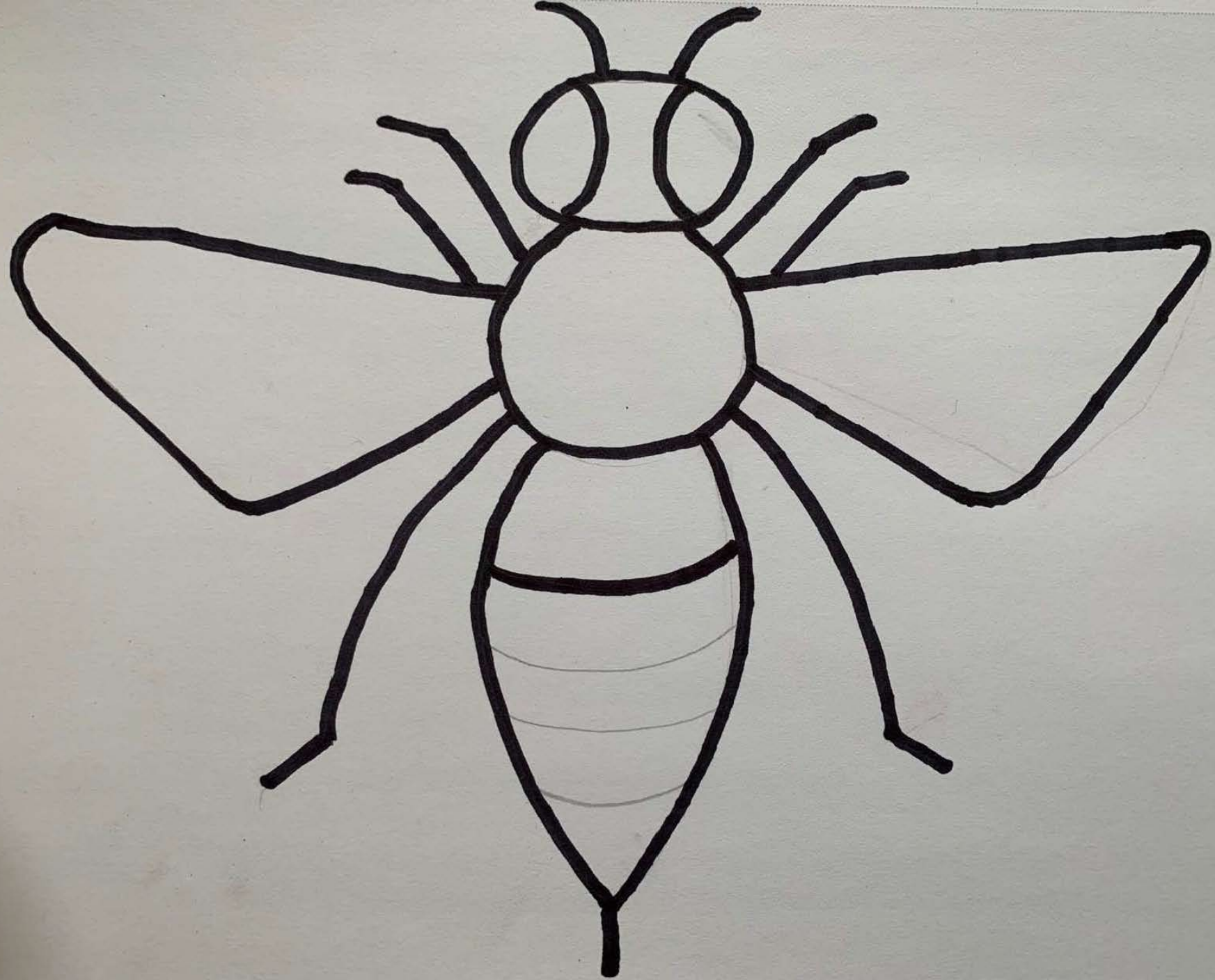


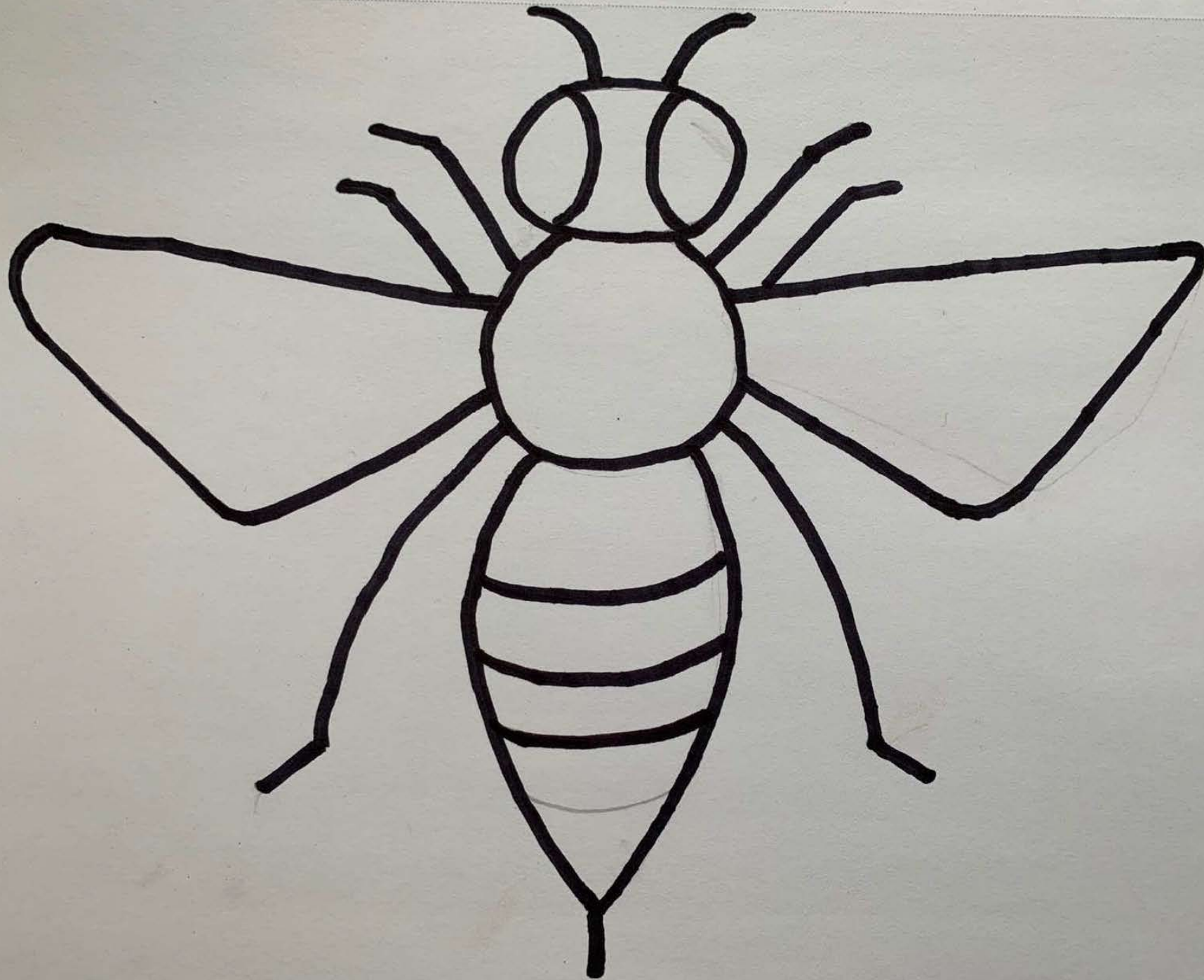


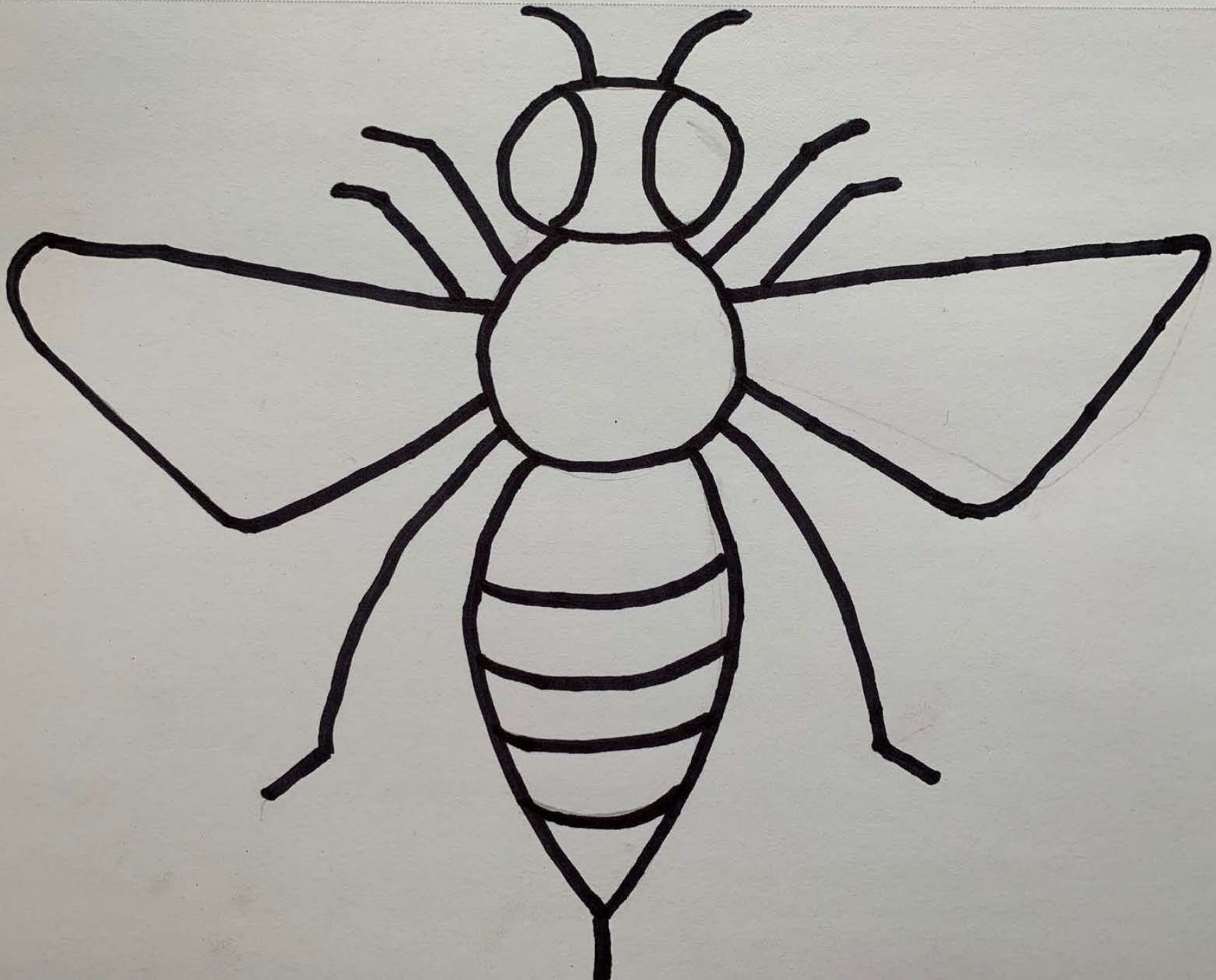












Let's see your work!

Let's take turns holding up our drawings so we can all see!

Hold it up to the camera.

An email reply from Ingo!

April 2020

From: Ingo Arndt
Sent: Tuesday, April 14, 2020 5:35 AM
To: Spencer, Roberta L <rspencer@albany.edu>
Cc: Silke Arndt <silke@ingoarndt.com>
Subject: Re: Home school project - National Geographic article on wild honeybees

Dear Roberta,

many thanks for your email. I'm glad to hear you use the bee article for home schooling/Grandparents Academy. This sounds like a very good project. You find my postal address in the email signature below. It would be great to receive something from the kids :-)

Stay well and heathy in this difficult times!

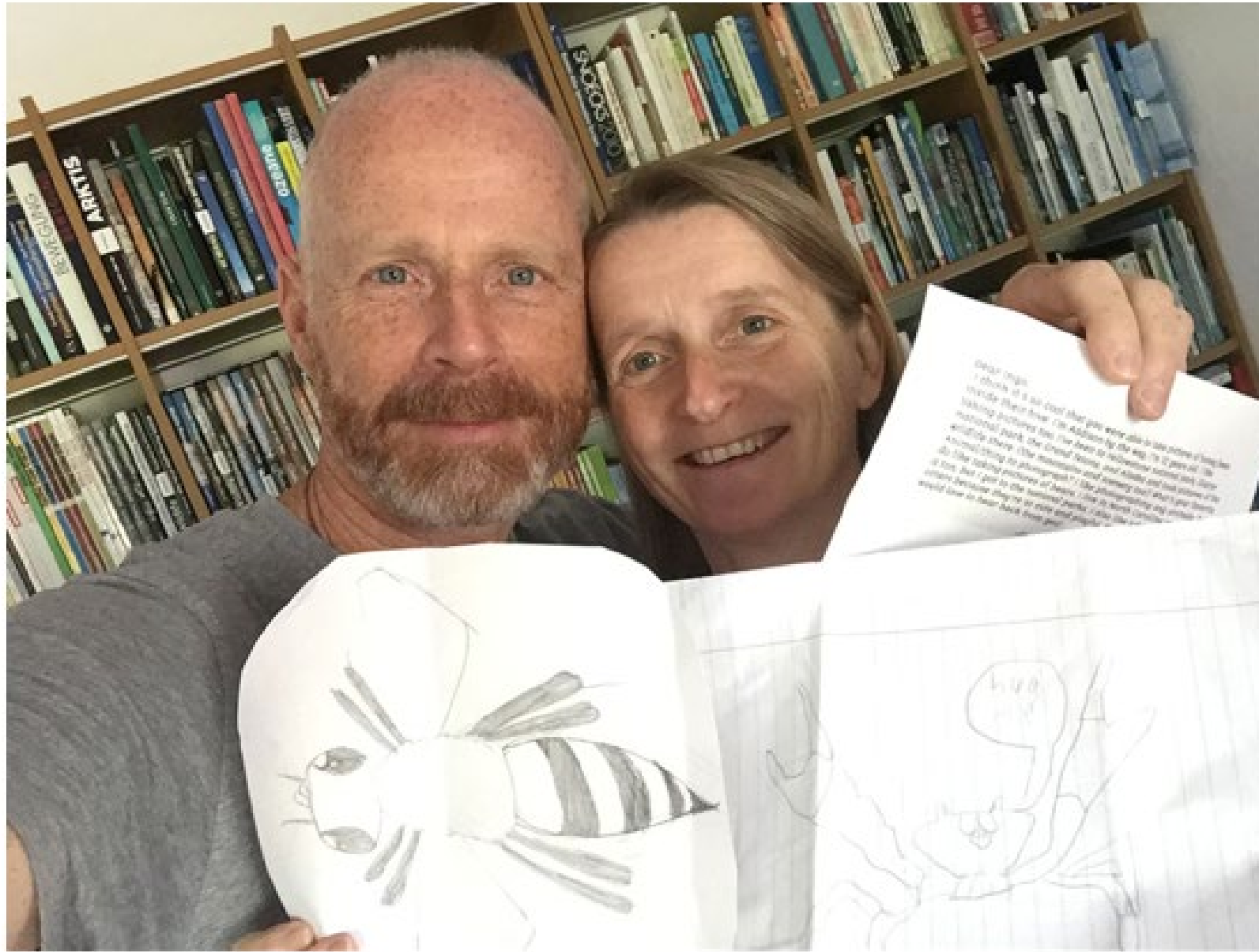
All the best from Germany,

Ingo

INGO ARNDT PHOTOGRAPHY

www.ingoarndt.com
thepotosociety.org/member/ingo-arndt

Silke and Ingo replying to a letter they received with drawings done during this lesson.



Just for Fun! Music inspired by bees

Music Made with Bees <https://www.youtube.com/watch?v=LRragvvrZcg>

t0nehammer YouTube Channel. (2010, October 8). *Music Made with Bees* [Video]. YouTube, <https://www.youtube.com/watch?v=LRragvvrZcg>

The musician wrote: “I wanted to see how far I could take the recordings of bees into the realm of music. The bee produces about 200-230 wing flaps pr. second, which is enough to generate a nice, rich sounding buzz. I recorded a bunch of bee sounds and manipulated them through a variety of tools (including timefreezers, delays, filters, glitch modules etc.). ...Hope you enjoy it. Einstein once predicted that the human race would survive no more than 4 years after the extinction of bees due to their keystone role in the entire ecosystem.”

Opera: Flight of the Bumblebee: Written by Nikolai Rimsky-Korsakov for an opera, composed in 1899–1900. Its composition is intended to musically evoke the seemingly chaotic and rapidly changing **flying** pattern of a **bumblebee**.

Rousseau YouTube Channel. (2018, July 2). *Flight of the Bumblebee - Rimsky-Korsakov (arr. Rachmaninoff* [Video]. YouTube, <https://www.youtube.com/watch?v=M93qXQWaBdE>



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1. Arndt, Ingo. "Silke and Ingo Arndt." *Ingo Arndt Wildlife Photography, About Us*, (n.d.), <https://www.ingoarndt.com/about-us/>.
2. Arndt, Ingo. "About Us." *About Us | Ingo Arndt*, <https://www.ingoarndt.com/about-us/>.
- 3, 4. Arndt, Ingo and Jürgen Tautz. "The Secret of Bees." *National Geographic*, Mar. 2020. pp 72-83.
5. Hirsch, Stefan. "Black Woodpecker Macaulay Library ML364863721." *Black Woodpecker Macaulay Library*, 23 Apr. 2019, https://macaulaylibrary.org/asset/364863721?_gl=1%2Ah7trb2%2A_ga%2ANTUyOTU3MTUuMTY0NDI2ODA5OQ..%2A_ga_QR4NVXZ8BM%2AMTY0NDI2ODA5OS4xLjEuMTY0NDI2ODE2My41Nw..
6. Arndt, Ingo. "Wildlife Photographer Ingo Arndt taking pictures of natural nesting Honey Bees (*Apis mellifera*), 20 meters high in beech tree, for his photo project on honey bees, Germany." By Ingo Arndt, Sept 2019. *Ingo Arndt Wildlife Photography, Project Honeybees*, <https://www.ingoarndt.com/projects/honeybees/>
7. Arndt, Ingo and Jürgen Tautz. "The Secret of Bees." *National Geographic*, Mar. 2020. pp 72-83.
8. Arndt, Ingo. "Wildlife Photographer Ingo Arndt in his hideout taking pictures of the inside of a black woodpecker nest cavity colonized by Honey Bees (*Apis mellifera*), Germany." By Ingo Arndt, Sept 2019. *Ingo Arndt Wildlife Photography, Project Honeybees*, <https://www.ingoarndt.com/projects/honeybees/>
9. Arndt, Ingo and Jürgen Tautz. "The Secret of Bees." *National Geographic*, Mar. 2020. pp 72-83.
10. Arndt, Ingo. "Honey Bee (*Apis mellifera*), queen, drone, and worker, Germany." By Ingo Arndt, Sept 2019. *Ingo Arndt Wildlife Photography, Project Honeybees*, <https://www.ingoarndt.com/projects/honeybees/>
- 11, 12. Arndt, Ingo. "Honey Bees (*Apis mellifera*) at the beginning of the colonization a black woodpecker nest cavity. Nest entrance from the outside, Germany." By Ingo Arndt, Sept 2019. *Ingo Arndt Wildlife Photography, Project Honeybees*, <https://www.ingoarndt.com/projects/honeybees/>

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13. Arndt, Ingo and Jürgen Tautz. "The Secret of Bees." *National Geographic*, Mar. 2020. pp 72-83.
14. Arndt, Ingo. "Honey Bees (*Apis mellifera*) colonizing a black woodpecker nest cavity, with the bees forming "chains" and a "ball" at the top of the cavity. Inside view of the cavity, Germany." By Ingo Arndt, Sept 2019. *Ingo Arndt Wildlife Photography, Project Honeybees*, <https://www.ingoarndt.com/projects/honeybees/>
15. Arndt, Ingo. "Honey Bees (*Apis mellifera*), drinking water on hot summer day, Germany." By Ingo Arndt, Sept 2019. *Ingo Arndt Wildlife Photography, Project Honeybees*, <https://www.ingoarndt.com/projects/honeybees/>
16. Arndt, Ingo and Jürgen Tautz. "The Secret of Bees." *National Geographic*, Mar. 2020. pp 72-83.
17. Arndt, Ingo. "Honey Bees (*Apis mellifera*) colonizing a black woodpecker nest cavity, with the bees forming "chains" and a "ball" at the top of the cavity. Inside view of the cavity, Germany." By Ingo Arndt, Sept 2019. *Ingo Arndt Wildlife Photography, Project Honeybees*, <https://www.ingoarndt.com/projects/honeybees/>
18. Arndt, Ingo and Jürgen Tautz. "The Secret of Bees." *National Geographic*, Mar. 2020. pp 72-83.

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Helpful Resources:

<https://press.princeton.edu/books/hardcover/9780691235080/wild-honey-bees>

Drawing instructions modeled after: Draw Easy YouTube Channel. (2018, February 22). *How to Draw Honey Bee Step by Step Learn Drawing Honey Bee Very Easy For Kids* [Video]. YouTube, https://www.youtube.com/watch?v=_vspUWmQfkM.

This presentation was inspired by trying to talk about a hardcopy article together with one of my grandchildren, chatting and showing the photos over Zoom. It was difficult. To make it easier and more interactive, this file was created. The article was:

Arndt, Ingo and Jürgen Tautz. "The Secret of Bees." *National Geographic*, Mar. 2020. pp 72-83.