

**For my queen bees,
Tanya, Becky and Louise**

— B. H.

For Zachariah

— N. C.



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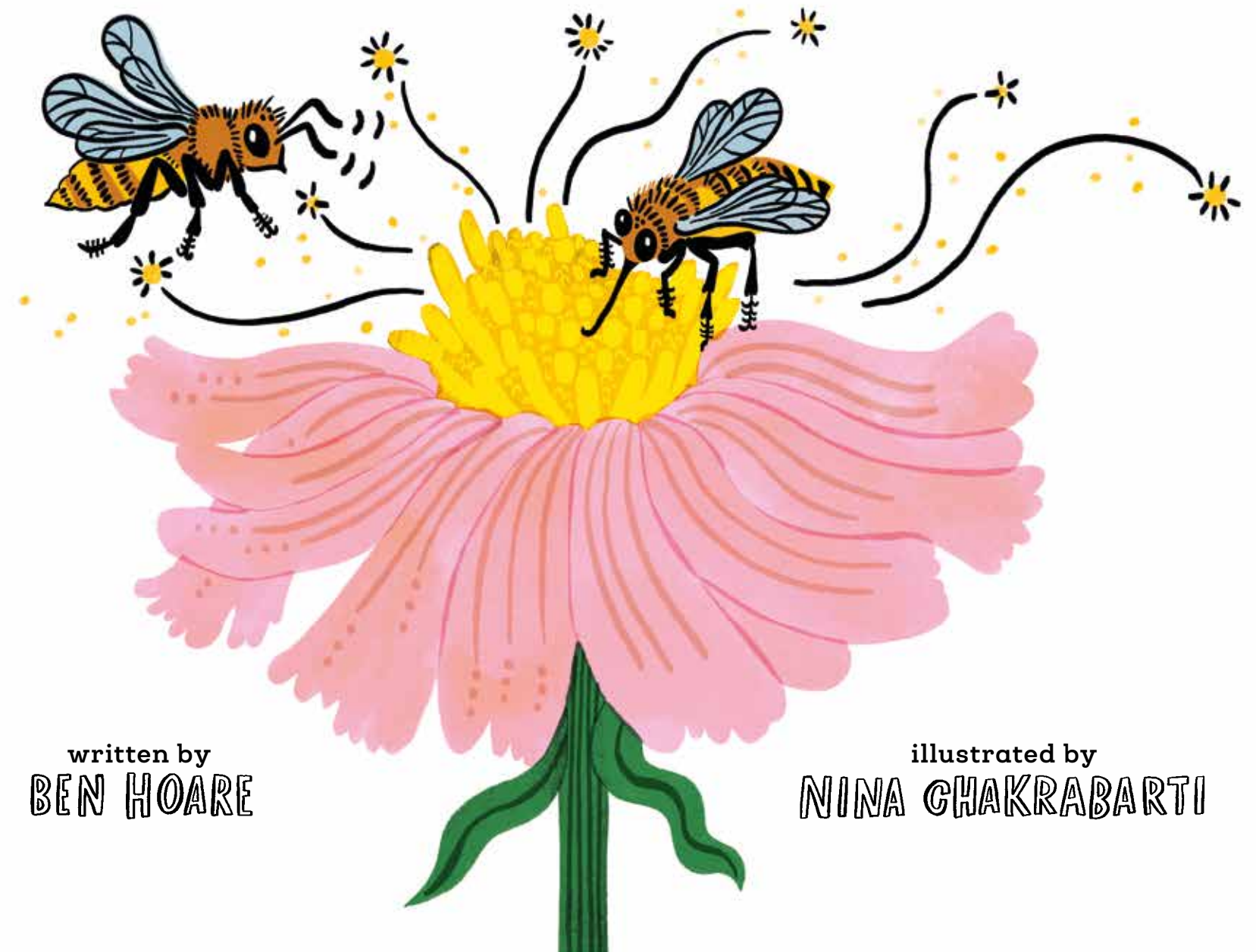
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SECRETS OF BEES



written by
BEN HOARE

illustrated by
NINA CHAKRABARTI



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Introduction

Whenever I notice a bee, I stop what I'm doing and watch. You see, I just love bees! They are such beautiful, nimble creatures. They have such intelligent little faces! Bees make yummy honey too. And, as you will discover in this book, by flying to and fro they also help to fill our planet with flowers. There's no doubt about it - bees are BRILLIANT!

Bees have always fascinated people. We have learned so much about their lives, including how they find food, build nests and 'talk' to each other. But bees still have many secrets. Perhaps in the future we will solve these mysteries too.

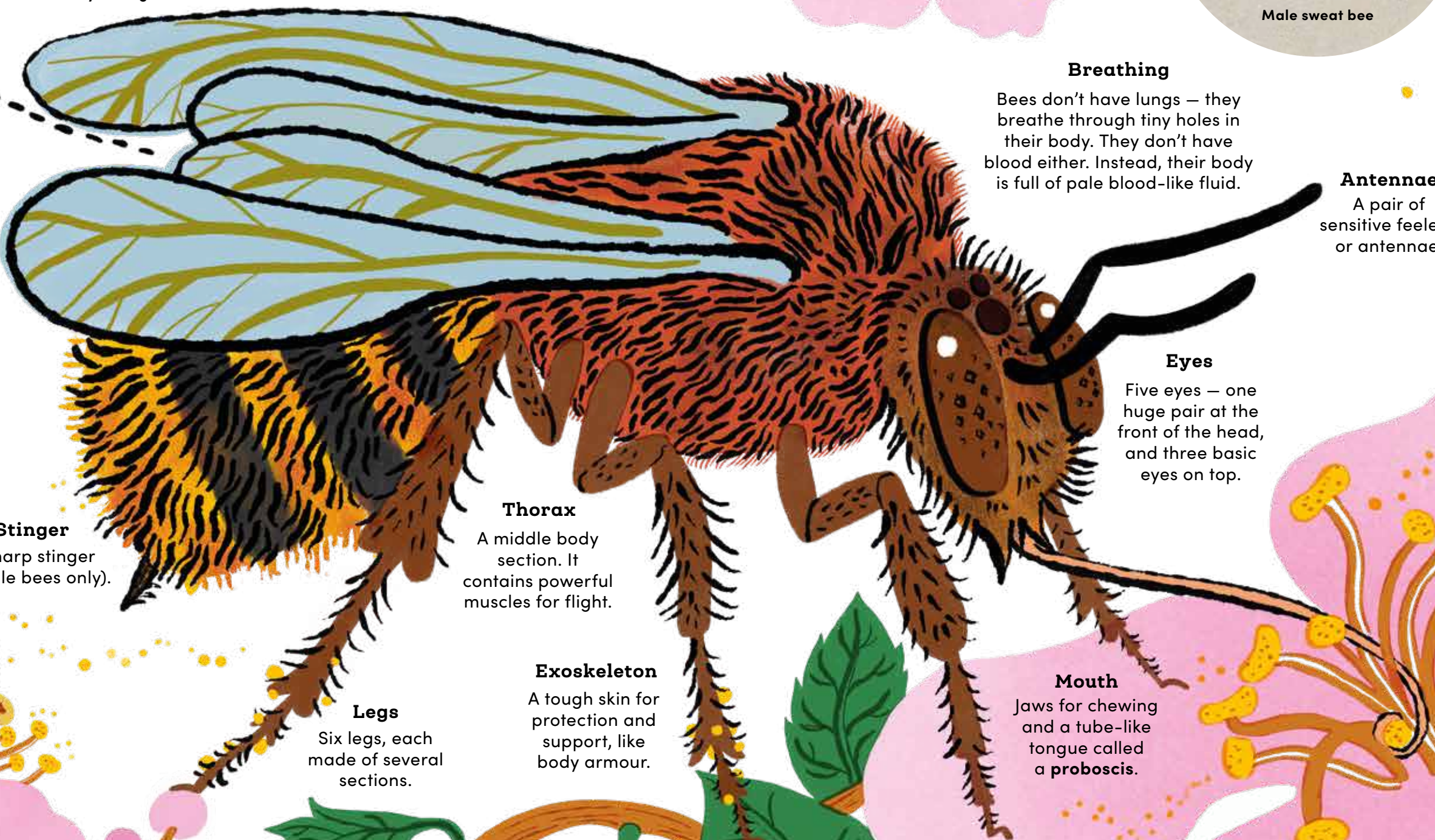
- BEN HOARE

What is a bee?

Bees are brilliant! These amazing creatures have superpowers that we can only dream of. But what actually are bees?

Bees are **invertebrates**, which means they don't have a bony skeleton like humans do. They belong to a large group of invertebrates called insects. All bees share these features:

Tawny mining bee



Wings

Four wings, which are light but strong. When a bee is flying, its wings hook together to make a single pair on each side of its body. Bees can beat their wings around 200 times a second!

Breathing

Bees don't have lungs – they breathe through tiny holes in their body. They don't have blood either. Instead, their body is full of pale blood-like fluid.

Antennae

A pair of sensitive feelers, or antennae.

Eyes

Five eyes – one huge pair at the front of the head, and three basic eyes on top.

Thorax

A middle body section. It contains powerful muscles for flight.

Mouth

Jaws for chewing and a tube-like tongue called a **proboscis**.

Exoskeleton

A tough skin for protection and support, like body armour.

Legs

Six legs, each made of several sections.

Stinger

A sharp stinger (female bees only).

Abdomen

A rear body section. Inside are the organs for digesting and breeding.

Often, you can tell male and female bees apart by their size and colour.



Male sweat bee



Female sweat bee

Ancient bees



Ancient bees have been found trapped in tree **resin**. They lived at least 120 million years ago when dinosaurs roamed the planet!

How many bees are there?

Earth is home to a mind-boggling variety of bees, which come in all sorts of shapes, sizes and colours.



Orchid bee



Long-legged oil bee



Blue carpenter bee

Did you know that there are even blue bees? One of the bluest is the blue carpenter bee.

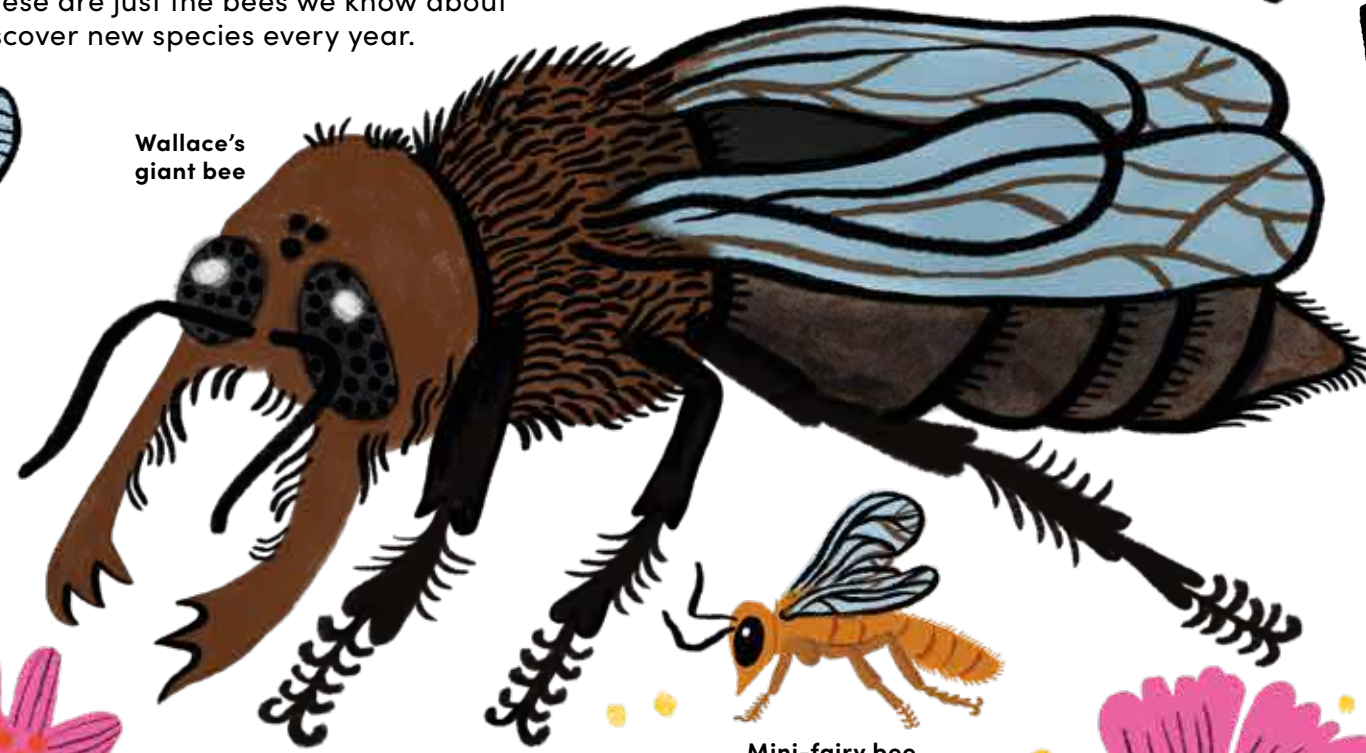


Orchid cuckoo bee

Honeybees have a stripy body and are probably the world's best-known bees. But they are just one kind, or **species**, of bee. In fact, there are more than 20,000 different species buzzing around this planet! And these are just the bees we know about so far. Scientists discover new species every year.



Honeybee



Wallace's giant bee



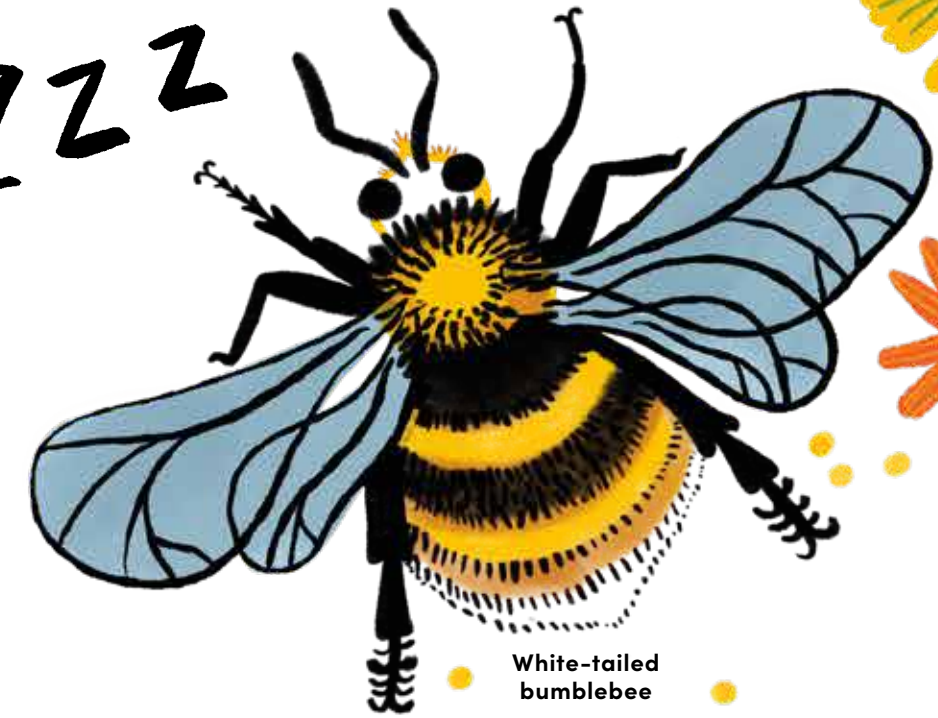
Mini-fairy bee

The biggest bee of all is **Wallace's giant bee**. This humongous bee has a body as long as an adult human's thumb. It lives in **rainforests** in Indonesia and is so rare that few people have ever seen one. The world's smallest bee is the **mini-fairy bee** of the USA, which is just two millimetres long – about the thickness of a grain of rice.

BZZZZZZZ

Bees live in most **habitats** on land. You can even find bees in deserts and in the middle of cities. The only places that *don't* have any bees are tiny islands far out at sea and the icy **continent** of Antarctica.

Many bees glitter like jewels. The shiny effect is not created by **pigment**, which is what gives paint its colour. Instead, these bees are covered in tiny bumps that bounce sunlight around, making their body sparkle.



White-tailed bumblebee



Cactus bee

Bumblebees are so big and furry, they look a little like flying teddy bears! But why are they so hairy? It's because long ago they used to live high in the Himalayas, at a time when the planet was much colder than it is now. The bumblebees developed fur to keep them warm. Today, you can meet bumblebees in many places, including parks and gardens.

What do bees eat?

Bees visit flowers every day to get their two main foods. One is a sweet liquid called nectar. The other is pollen, which looks like powder or dust. Most bees need both nectar and pollen to stay healthy.

Nectar is a mixture of sugar and water that gives bees masses of energy. They suck it out of flowers with their special tongue – a bit like drinking through a straw. Flowers come in many different shapes, and bees have short or long tongues, depending on which types of flowers they visit.

Pollen is packed with all the **protein**, **fats**, **vitamins** and **minerals** that bees need. Because pollen is gooey, when bees land on a flower, it sticks to the hairs on their legs and body. The bees fly off with it to eat later or feed to their young.



Orchid bee



A closer look



Pollen is made up of minuscule grains. If you look at them through a microscope, you'll see they often have lots of grooves or spikes.



Sweat bees sip the sweat off other animals – including humans! They probably do it because the sweat contains salt and other minerals.



Did you know that bees poo? You may see the droplets pop out of their bottom.



Vulture bees hunt for dead creatures, then feed on the rotting flesh. But they also feed on nectar, like other bees.



Bees LOVE dry, sunny weather. If it's raining, they stop looking for food to avoid getting wet. However, a few unusual bees fly at night and feed from flowers that open after dark!



Indian carpenter bee