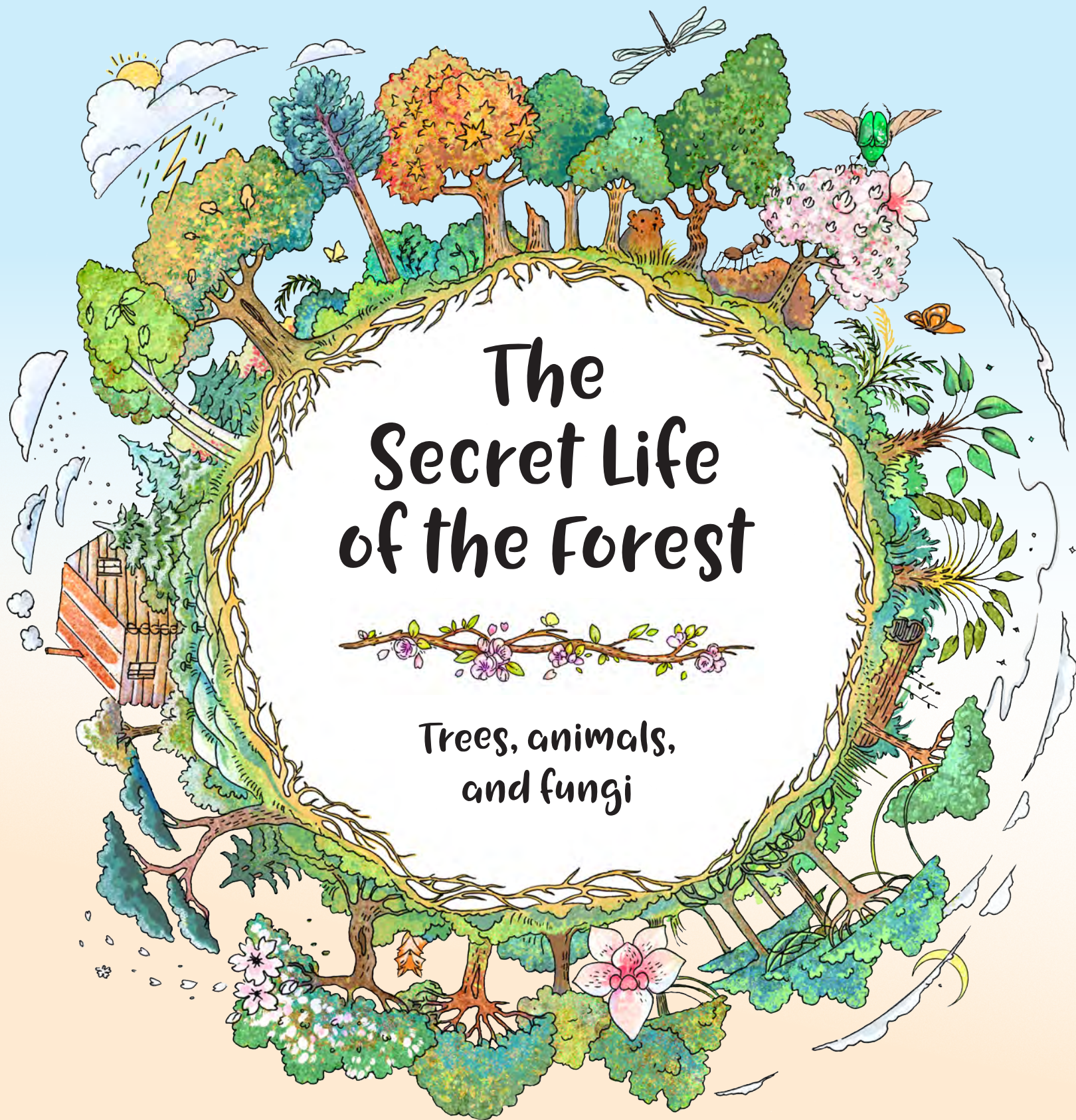


Written by Klára Holík, Ivi Niesner, and Jana Sedláčková

Illustrated by Katarina Kratochvílová



The Secret Life of the Forest

Trees, animals,
and fungi

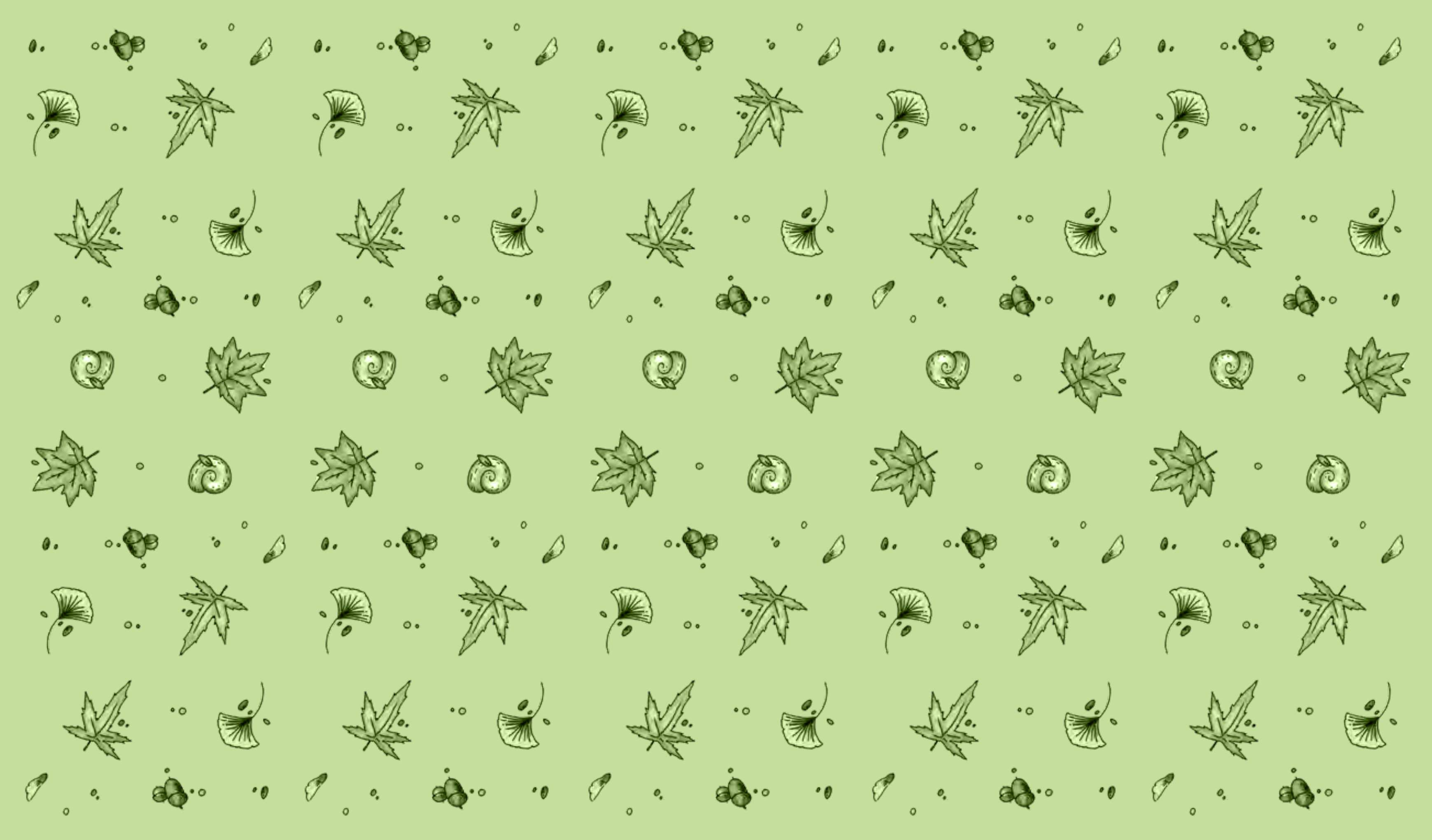
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Albatros



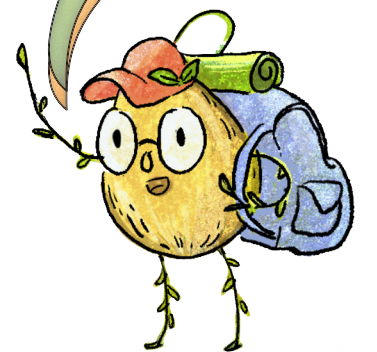
The Secret Life of the Forest



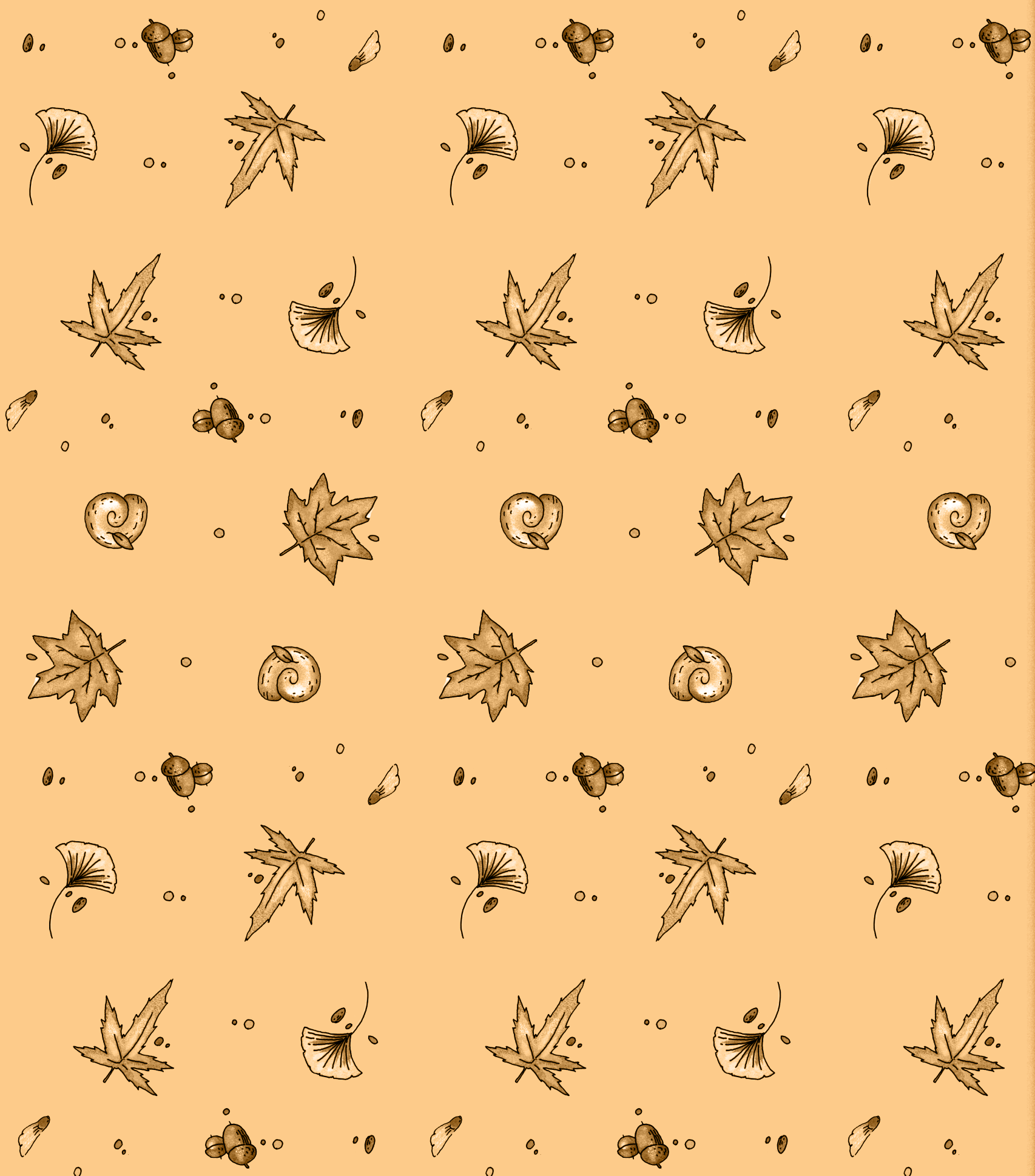
Explore the connections between trees, animals, and fungi

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Hi there! I'm a little linden seed. I'm going to guide you on your way through the forest realm!



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1. Honeybee: We bees keep ourselves quite busy! In a single flight we can visit around a hundred flowers. Each of us makes several flights a day, so by the time the sun sets we might have pollinated a thousand flowers.

2. Bumblebee: I don't mind low temperatures, so I can start pollinating early in the spring. Mmm, this crab apple tree, for example, smells just divine!

3. Fruit fly: Can you smell that too? Something is fermenting here ... I definitely don't want to miss out on that! I love the scent of rotting fruit, especially figs, apples, and pineapples.

4. Chafer beetle: We bugs like big open flowers with lots of pollen, like this magnolia. We help to transfer its pollen and as a reward we get to stuff ourselves!

5. Ruffed lemur: As a primate that is the world's largest pollinator, I may seem slightly out of place among all these tiny little fellas, but believe it or not, I can pollinate every bit as well as them. After all, my whole life revolves around transferring pollen from the traveler's tree and drinking its nectar ...

6. Banana bat: I specialize in banana trees and cactuses. Each spring I lick the sweet nectar out of their long

flowers, transferring pollen in the process. Then in the summer I have a regular banana feast!

7. Honey possum: I have a long snout and a very long tongue and I like collecting the nectar from the flowers of the Australian banksia plant. The pollen that sticks to my fur is then easily transferred from the stamens to the pistil.

8. Blue-tailed day gecko: Lots of beautiful and very rare shrubs grow on the island of Mauritius. And I have

the honor and responsibility of being their one and only pollinator!

9. Monarch butterfly: With my long proboscis I pollinate the occasional orchid too. But shhhh!, not a word to my nocturnal relatives the hawkmoths, who come out for nectar when the sun goes down ...

10. Hummingbird: I flap my tiny wings so quickly I can hover in one place. Naturally, that's the perfect opportunity to grab a quick snack. My beak is as well equipped for pollinating orchids as a butterfly's proboscis. It's just a question of who gets to the flower first!

11. Blowfly: I'm a bit of a carnivore ... What I like best is the deep-red rafflesia flowers with the delightful stench of rotting meat.

Birch tree, leave it to me!

Mmm, rotten figs, yummy!

Yep, without me there'd be no bananas or mangoes ...

Hey, that's my orchid!



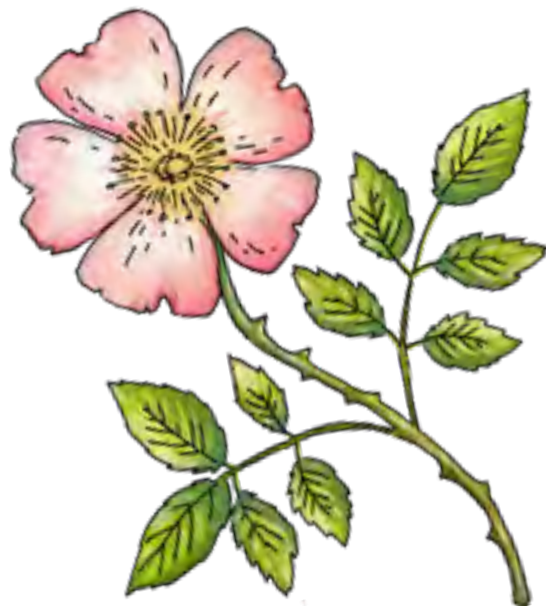
Protection against the wind

The wind is useful, as it can carry small seeds hundreds of miles across the country. Sometimes, though, it goes crazy and blows up a storm. Then everything in its path goes flying. But can slender forest trees hold their ground? And how do they do it?



Can trees stop the wind?

Fortunately, all trees have **branches** that can withstand the wind (coniferous trees in particular are excellent at protecting the forest from the wind all year round). And when tall trees and low shrubs join forces, they stand a much better chance against the wind. **Shrubs** (such as rose, euonymus, blackberry, privet, and elderberry bushes) are excellent at protecting the forest against ground-level winds.



When a strong wind blows ...

When the wind really picks up, it doesn't seem like a very good idea to linger around in the forest, right? You're much better off avoiding the falling trees and branches. But the truth is that a forest, which is made up of different kinds of trees, is the best landscape for withstanding strong gusts of wind. It's usually only the old and very dry trees that succumb to a gale ...



The layers of the forest



In addition to trees and shrubs, the forest has a few other layers that provide a cosy retreat for large animals as well as small insects.

1. **Tree layer** – plants over 16 feet high
2. **Shrub layer** – plants reaching heights of between 3 and 16 feet
3. **Herb layer** – all woody and herbaceous plants under 3 feet
4. **Moss layer** – moss and lichen
5. **Root layer** – plant roots and fungi mycelium (a hidden network that helps bring life to the soil)

Whoaaaa, everyone take cooover!





Woodpeckers

It's not just bark beetles that are happy to take advantage of what trees (willingly or not) provide them with – woodpeckers bore holes into trees so they can feast on ... you've guessed it: bark beetles! However, trees are not exactly thrilled about these building projects – to them, each hole the woodpecker drills is an open wound that increases the risk of rotting ... And as soon as the meal is over, the lovable woodpecker moves on to its banquet elsewhere.



EAGLE OWL



Hollow trees

Trees are **home to many other animals**: owls, bats, martens, squirrels, nuthatches, and titmice. An old tree can almost look like a big hotel, where you can meet various neighbors passing through all its corridors. The squirrels, for example, are very talented builders. They can make cozy nests and warm them, even when it's extremely cold outside, up to a constant, pleasant temperature of 70 degrees Fahrenheit – which, by the way, is probably the same temperature you have in your room!



Tree dwellers

- | | |
|--------------------|------------------------------|
| 1. wood nuthatch | 9. honeybee |
| 2. great tit | 10. great spotted woodpecker |
| 3. stag beetle | 11. hoof fungus |
| 4. fire salamander | 12. red wood ant |
| 5. pine marten | 13. European hedgehog |
| 6. tawny owl | 14. edible dormouse |
| 7. cross spider | 15. common mole |
| 8. red squirrel | |



Let's experiment in the forest!

Nowadays, especially near cities, it's difficult for birds to find a fully grown, preferably hollow tree to set up shop in. If you want to help them, you can build a home for them! It isn't hard to do. If you have a garden, the

birds will reward you by gobbling up worms and slugs – a great tit, for example, can save up to 90% of a crop from them. Or you can just enjoy the singing of the birds and their playful flitting around outside your window.

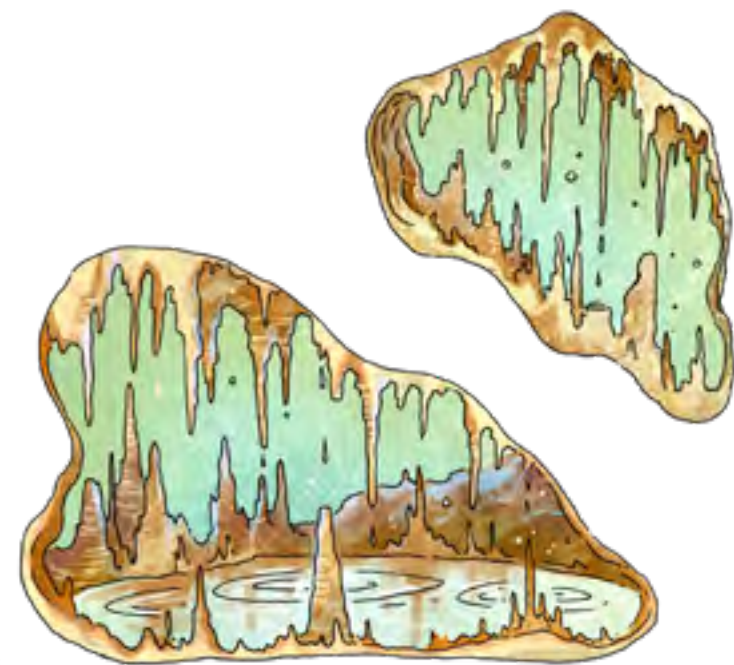


The forest water cycle

Has it ever occurred to you that the forest is full of water? No doubt you'll immediately picture springs, babbling brooks, and fast-flowing torrents ... But there's water in other parts of the forest too – you just might not notice it at first glance ...

It soaks up water and holds onto it

Freshwater around the world is getting scarcer ... If things continue like this, many lakes and watercourses will dry up soon. Moss can hold a lot of water, and in heavy rain it can increase its size up to ten times! And if there is only light rain, trees can absorb a third of the rainwater. But what if not a single drop falls ... ? Or, on the contrary, what if a huge amount falls in a short time? Then it's only the roots that can help, as they can slow the rate at which rivers flow or dry up for a time.



Underground water

The forest soil itself holds some water, but only if it has a deep and dense enough network of roots and it is regularly loosened by earthworms. In that case, there's less danger of **erosion** – i.e., of the soil being washed away by the rain. This is every forest's nightmare ... The water, which is filtered down through the roots, down to where the soil gives way to rock, can carve out tunnels or **cave systems** in even the hardest stone. These then become **reservoirs of clean underground water**, which sometimes returns to the surface in the form of gurgling streams or gushing springs.



The forest cleans water

The forest acts as a giant filter which gradually cleans water. First of all, **raindrops** pass through the leaves and branches of trees, then through bushes, herbs and moss, and finally they seep through the soil – there, thanks to the roots, the dirty rainwater is transformed into **pure water**.



Steam rises through the forest

It feels pleasant in a forest even when it is swelteringly hot and muggy all around. That's because on hot days the water from the entire forest evaporates, cooling the air inside it. We can often see **water vapour** rising upwards in the form of tiny droplets, which then turn into clouds and finally into rain.



Let's experiment in the forest!

You can find a large number of springs in the forest. However, before you drink from them, look for an information panel, which will tell you if the water is drinkable. In the springtime, you can help these springs by removing fallen leaves and other debris from them. Then the water will be lovely and clear!

Does fire belong in the forest?

If you were to say the words “forest fire,” everyone would immediately get ready to run. Because fire doesn’t belong in a forest ... Or does it? Some trees wouldn’t grow at all without fire. So, what is the truth about forest fires?

For example, in Australia, fires are relatively frequent. They can be caused by lightning or volcanoes, or sometimes the trees catch fire even by themselves in the heat ...



Fire-loving trees

However, this is good news for the **eucalyptus** and the **Australian banksia**. Their seeds are enclosed within tight capsules and will only come out in extreme heat – for example, during a fire. Then the capsules open up and the seeds have a chance to grow in the fertile ash-rich soil. These two strange species of tree then **rise like a phoenix from the ashes!** For trees that aren’t used to fire, however, a forest fire can spell disaster. All you need is one badly put-out campfire or a piece of glass that acts like a magnifying glass and all hell can break loose. Deciduous trees can resist fire a little longer, but for dry spruce trees all it takes is one little spark and because of their resin they go up like match-

es. The resulting fire can spread through a forest at speeds of up to 100 miles per hour – which is why we should only make fires in designated areas and always extinguish them properly.



Save yourselves!

Fire is also dangerous for animals. In Australian forests, the unfortunate fleeing animals can be saved by **wombat burrows**. Wombats are marsupials that look a bit like hairy pigs. They like to dig vast networks of underground burrows, where other animals – such as insects, reptiles, and birds, as well as koalas, echidnas (egg-laying mammals also called spiny anteaters), and even kangaroos – can take shelter.



4



9

1

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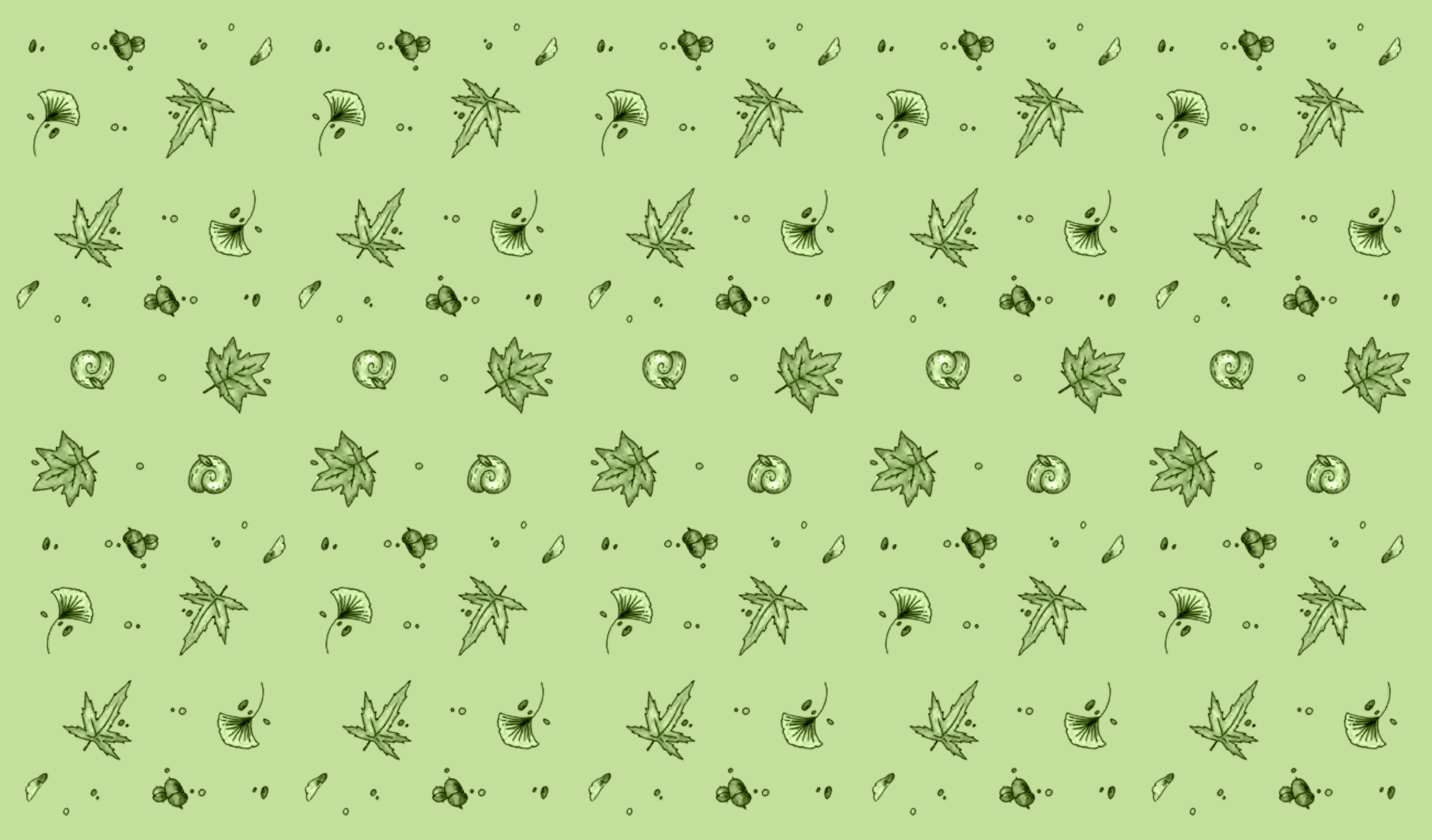
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- 1. Kangaroo family:** I think we have a chance of escaping! We can jump distances over 30 feet!
- 2. Koala:** Wombat, can I come into your burrow, please? I’m your closest living relative ...
- 3. Possum:** H-e-e-l-p, fire! We have to move to another forest!
- 4. Cockatoo:** Crrraa! Oh no, my tree hollow!
- 5. Termite:** Fire? Oh no, and I’m photophobic – I’m sensitive to light! I’m afraid that my nest of dung and dirt has burned to the ground ...
- 6. Australian emperor moth:** Is it just me or can my antennae detect smoke ...?

- 7. Stick insect:** Now is probably not the time to disguise myself as a twig ...
- 8. Wombat:** Everyone, quick, take shelter in the wombat burrows!
- 9. Eucalyptus:** Where’s everyone running off to? It’s quite pleasant here ... I don’t mind a little fire, and my seeds really like it. Straight away they’ll have fertile soil to sprout in!
- 10. Banksia:** Another hour at 280 degrees Fahrenheit and my seeds will pop out.
- 11. Banksia seed:** Ahh, at last! The capsule has opened and I can jump out!






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Trees, animals, and fungi

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What exactly is a forest? Is it just a group of trees? Or is something greater hidden among all those mysterious roots and branches? The lives of trees are truly remarkable ... Just like we humans, trees can breathe. They can even get hungry or thirsty. They have families that protect their little seedlings, as well as friends who give each other help whenever it's needed. At first sight, it might seem like the relationships between the inhabitants of the forest (trees, ants, birds, fungi, and others) are all tangled up, but when we take a closer look, we can see that they live together in an invisible harmony. How is that possible, though? Join our guide - the intrepid, curious Little Seed - as we climb into the branches and peer under the roots to learn the mysterious language of the forest.



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