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70
flaps

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SMALL WORLDS EARTH

Explore small habitats
in nature

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SMALL WORLDS

Have you ever lain down in long grass and watched bugs scuttling around? Or looked into the branches of a tree and wondered how many creatures live there?

Nature is full of small worlds. Every environment contains different plants and animals which work together in wonderful ways to survive. But lean in a little closer – turn over the leaves on a forest floor; venture into a cave; or peer into the crown of a Brazil nut tree – and you will find diverse and complex habitats which are, literally, crawling with life.

In this book you will find eight, very different, small worlds. You will look behind rocks and through meadow grass, you will see what is under the earth and you will peer into the hollow trunks of trees.

What will you discover?

Look out for:

Predators

These creatures prey on other animals for food.



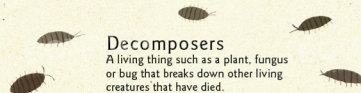
Herbivores

These are animals that only eat plants.



Decomposers

A living thing such as a plant, fungus or bug that breaks down other living creatures that have died.



Animal homes

Animals find many ways to shelter from predators and raise their babies.



Relationships

Sometimes different life forms behave in ways that help each other. These are called 'symbiotic relationships'.



LEAF LITTER

The leaf litter on a forest floor is a busy small world. In this North American forest, the many animals hide from predators and find food amongst fallen leaves.

Leaves collect under woodland trees – especially in autumn – and create a home for many bugs. What has this American robin found?

Little birds, like this chickadee, eat berries and bugs.

Leaf litter isn't just made up of dead leaves. It also contains soil, stones, tree roots and sticks. These hold plenty of air and water, making it a good home.

A grey squirrel is nibbling a pine cone to release the small seeds.

Fungi grow well in leaf litter, where there is plenty of water and rotting plants.

The foul-smelling skunk cabbage thrives in damp places. Some creatures think it smells good!

Toads and frogs keep their skin damp by lurking in decomposing leaves. Can you find one?

ALPINE MEADOW

The sun is shining on a high mountain meadow in the Swiss Alps in southern Europe. Even a small area of the meadow is full of life. Flowers and fungi grow, bees buzz and crickets sing.



Apollo butterflies have eyespots on their wings. They look like the eyes of a larger animal to scare predators away.

Most salamanders lay eggs, but the Alpine salamander gives birth to its babies.

The soil is thin, so few trees can grow here. Small plants suit this habitat.

It's easy to hear crickets singing loudly in the meadow, but it's hard to see them hiding under leaves! How many can you find?

Salamanders eat bugs, like this longhorn beetle.

Ants collect seeds from plants and bury them to eat later.

This hairy black caterpillar is eating the leaves of a yellow wood violet.

Ptarmigans build their nests on the ground. Their eggs are speckled, so they are hard to find.

Stoats have brown fur in the summer.

In spring and summer this meadow is carpeted with colourful flowers.

A dormouse has built its nest from meadow grass.

Marmots use grass to line their underground nests.

A bumblebee buzzes around collecting pollen and nectar from flowers.

MALAYSIAN RAINFOREST

As the sun sets over a rainforest on the island of Borneo in Southeast Asia, a colony of Malaysian giant ants gets busy. The ants' nest and environment make a fascinating small world. The forest is hot and lush with plants growing everywhere.

Ants live in groups called colonies, and they share the work of building the nest, finding food and caring for their young. This nest is mostly underground and has been built under the thick roots of a tall rainforest tree. It may contain up to 7,000 ants.

The Borneo bay cat comes out to hunt at night.

At night, when it is harder for predators to find them, the worker ants leave the nest in search of food.

An ant colony is a good source of food for hungry insects like this tricolored beetle.

Wax cicadas are insects that ooze a sugary liquid called honeydew. Ants collect it to feed to their larvae.

Ants also feast on bird droppings and other insects. How many ants can you find with food parcels?

These ants are from another colony of giant ants. They have come to fight their neighbours!

An alate (winged ant) is ready to leave the nest.

The damp leaf litter is the perfect place for seeds to start growing.

As leaves die and rot, the nutrients they contain pass into the soil below. This helps new plants to grow, which provide food for ants and other insects.

DESERT OASIS

The Sahara Desert is one of the hottest, driest places on Earth and few animals can live there. Many of them may be found near an oasis, a place in the desert where there is water.

The burning heat of the day makes life difficult and fierce winds can bring sandstorms. Only hardy plants like **date palms** can survive when temperatures soar to around 48° Celsius.

What is hiding behind this shrub?

Desert shrubs like this **saxaul** tree have small leaves.

Nile crocodiles lie still with just their eyes and nostrils poking above the water.

A **chukar partridge** has found a **white broom plant**. Eating plants is a good way to get water when there is none to drink.

With so few plants to eat, many of the animals that live here are predators such as the **Sahara frog**.

Adult dragonflies emerge from the earth after the rains.

Darkling beetles scuttle across the sand on tip-toe so they don't burn their feet. Lumps and bumps on their skin collect dew-water that the beetles can drink!

An oak tree's leaves are a popular food for many insects, including the caterpillars of the green oak tortrix moth.

It is summer now, but the oak tree changes with the seasons.

This jay is collecting acorns. It will bury them to eat in the winter. Can you find this bird's store?

Red squirrels scurry up and down the tree trunk with acorns. They store them in the ground below.

A pied flycatcher will eat almost any bug it finds in an oak woodland. What has the flycatcher spied?

Oak trees grow flowers and nuts, called acorns. A tree might be 50 years old before it produces its first acorns.

A great spotted woodpecker uses its strong beak to make a hole in the tree trunk.

The purple hairstreak butterfly lays its eggs on oak leaves.

OAK TREE

This ancient oak tree is a busy, buzzing, small world. The tree is both a home and food for many creatures, and hundreds of species of animals and plants rely on it to survive.

When this tree's leaves fall to the ground in autumn, they will add to a thick layer of leaf litter.

Jays catch wood ants and rub them over their feathers. This probably makes the ants release their nasty acid before the bird eats them, rather than once they are in its mouth!

DRY CAVE

Deep inside this cave in the Great Basin National Park, Nevada, USA, some animals spend their whole lives in the dark. Others visit the cave to rest, nest or to find safety. Caves are some of the world's most unusual habitats.

Hundreds of female bats and their young live in this cave. They cling to the rocky ceiling with their feet, hanging upside down.

Western screech owls normally nest in trees, but a cave can make a good home too!

pseudoscorpion

Animals like pseudoscorpions and springtails that spend their whole lives in dark caves are called trogllobites. Many trogllobites are pale and blind.

springtails

Deer mice can make a snug home in a cave.

Most pseudoscorpions have four eyes, but the ones that live in caves often have no eyes at all.

Pack rats make their nests in the dry, warm leaf litter on the cave floor.

Millipedes that live in caves are pale, long and slender.

Guano (bird and bat poo) can collect in deep piles on the floor of a cave. It is an important source of food for many small cave creatures and fungi.

Stalactites are rocks that hang in amazing shapes from the cave roof.

These caves are the only place in the world where the **moder cave harvestman** lives. It is a member of the spider family.

Canyon wrens have slender beaks that are perfect for picking up insects.

Water that drips onto the cave floor forms rocky spikes called stalagmites.

During windy weather, many leaves can blow into the cave.

A cliff chipmunk is carrying pine seeds and berries from the forest nearby in its cheeks. Where does it store its food?

BRAZIL NUT TREE

In the dappled shadows of the vast Amazon rainforest of South America, one tree stands taller than the rest. Brazil nut trees can grow 50 metres tall, stretching up above the forest so their leaves can reach the sunlight. The crown (leafy part) of a single tree can be busy and bustling with life – like a rainforest city.



This bromeliad grows on trees.

In January and February the Brazil nut tree's large, woody fruits ripen and fall to the ground with a heavy thud.

Only one animal – the agouti, which lives on the forest floor – can crack open the fruit.

This ancient tree's bark is coated in moss and lichen.

Praying mantises are camouflaged to suit their habitat.

In the rainforest, there are plenty of big leaves to hide under.

There are many colourful orchids.

This young strangler fig is growing from a sticky seed left behind by a bird or bat.

Most wildlife lives in the rainforest's canopy.

GRAND CANYON RIM

Steep cliffs line a deep river valley in the Grand Canyon in Arizona, USA. The high rims, or clifftops, of the canyon are where many creatures live. This environment can experience extreme heat and cold and sudden thunderstorms.

Mexican spotted owls nest on a ledge. They rest during the day.



This black tarantula spends most of its time in a burrow on a ledge.



The peregrine falcon is one of the fastest birds of prey.



Kestrels, eagles, hawks and falcons are birds of prey, and hunt other animals. They have superb eyesight, strong beaks and sharp claws called talons.

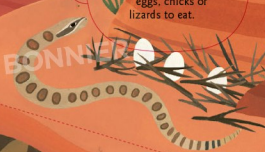
The largest bird in North America is the condor. Can you find its nest?



California condors soar high above the canyon looking for food below. They are scavengers and eat the remains of animals that have died.



Rattlesnakes are usually well-camouflaged against rocks. They search for eggs, chicks or lizards to eat.



Cliff swallows migrate from South America to the canyon to build mud nests where they lay their eggs.



The Utah agave plant survives dry summers by storing water in its plump leaves.



Fritillary butterflies seek out flowers growing on the cliffs and feed on the nectar. Birds such as cliff swallows hunt them.

