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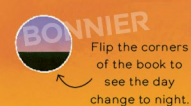
In 24 hours on Earth, discover the different worlds that wake up

DAY and NIGHT



With
**GLOW-IN-
THE-DARK**
pages





Flip the corners
of the book to
see the day
change to night.

For the human and non-human mammals in my family – LN.
For my niece and nephew, My and Huiy – XL.

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Wherever you see this icon,
recharge the page under a lamp while you read.
Then turn off the lights to see what glows!



Lela Nargi
Xuan Le

DAY and NIGHT



The velvety night feels like it will linger forever.

But all at once there's a shift.

You might think a mule deer's enormous ears would help it hear **PREDATORS**. But it's their amazing eyesight in low light and keen sense of smell that help them to sense a big cat **STALKING** nearby.

The deep dark pales, giving way to the day's first light.
Dozens flutter as birds call to one another.

Here in Western North America,
mule deer nibble at leaves while a mountain lion watches.

Mule deer are **HERBIVORES**. They eat plants, such as dandelion, clover and sagebrush.

Deer can see shades of blue best, which is ideal in the inky twilight.

Mountain lions are **CARNIVORES**. They eat meat.

So it happens that the world of shadows tiptoes towards day.

Often hidden in the dim light, mountain lions hunt bighorn sheep, porcupines, turkeys and even insects. One mule deer, though, can feed a mountain lion for a week.

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The sun rises like a hush. It reaches out its rays, brushing away the last patches of night, as it inches over the horizon.

In Western Australia, spiderwebs glitter with last night's dew.

Why does the sun look red at sunrise? When the sun is low in the sky, its light travels through a thicker layer of **ATMOSPHERE** to reach us. On this long journey, some of the light is scattered away but the reds and yellows make it to us.

But orb weaver spiders busily take them down. They must find a place to hide as hungry honey eaters dart from their nests.



The New Holland honey eater not only eats spiders, but also uses spider silk to hold its grass-and-leaf nests together.

Another of the honey eater's favourite foods is flower nectar, which it harvests in the early morning, before bees come out to forage for nectar, too.

After spinning webs in the evening to catch insect **PREY**, orb weaver spiders take them down in the morning by eating the silk.

Morning dew caught in the webs quenches the spiders' thirst.



*Little by little, the morning light deepens to gold
Here in the north of Mexico, more of the world awakens.*

*Mexican sunflowers aren't true sunflowers,
which can turn their heads to follow the sun.
But they, too, love the rays, which
warm their petals for visiting bees.
Their yellow colour is a bee favourite.*

*Mexican sunflowers bask in the sun.
They offer their pollen to hairy little bees
beginning their low-pitched buzz.*

*Many bees visit flowers
throughout the day.
But some **POLLINATORS**,
like sunflower bees, are
active in the early morning.*

*Sunflower bees are solitary. They live alone in
nests they make in the ground. Once the bees are
warm enough, they leave their nests for the day.*

*Hummingbirds zip up to tube-shaped
flowers for a long drink.*

*Like bees, hummingbirds
are pollinators. They carry
pollen from flower to flower,
which helps to make more plants.
When a hummingbird visits a flower,
it unfurls its long tongue, which it
keeps coiled inside its head.*



The brightening sun climbs in the sky.

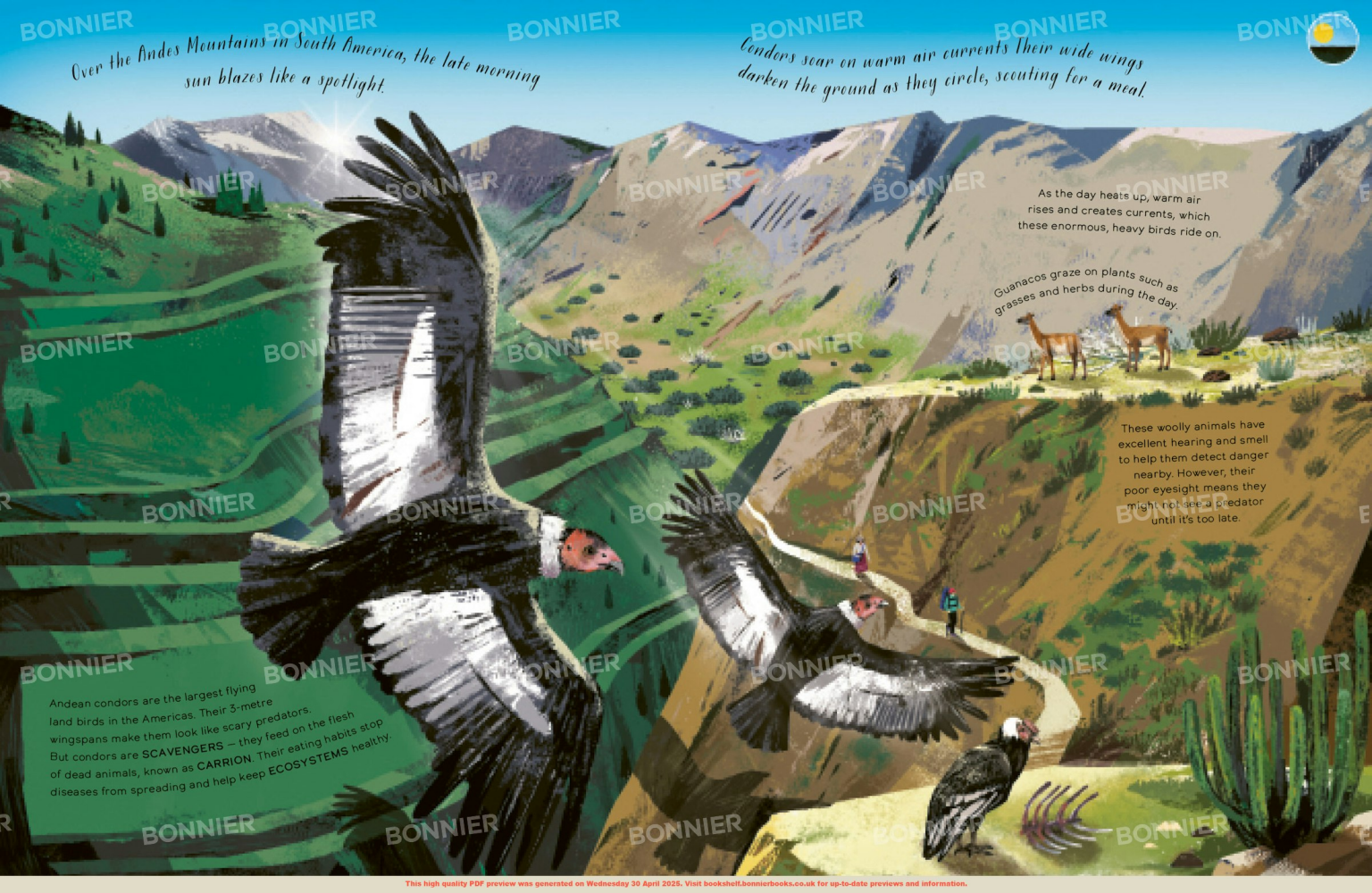
Pigeons strut and preen.
They nibble at fruit on trees.

Under its light, a pack of African wild dogs
rest and clean each other. Their bellies are full after a dawn hunt.

As a pet, a dog lives with its humans,
keeping them company in the day and sleeping
when they sleep at night. In the wild, African wild dogs
live in packs and hunt in the morning, before it gets
too hot to move, or at the end of the day.

The African green pigeon
eats mainly fruit, such as
figs. It might hang upside
down from a branch to
reach them. Although they
have sensitive eyesight,
pigeons see best and
clearest in daytime.

Pigeons live almost everywhere in
the world, including here in South
Africa. Though these smart birds
famously thrive in cities, around
300 pigeon species live in the true
wild, where there are no crumbs
left by humans for them to scavenge.



Over the Andes Mountains in South America, the late morning sun blazes like a spotlight.


Condors soar on warm air currents their wide wings darken the ground as they circle, scouting for a meal.

As the day heats up, warm air rises and creates currents, which these enormous, heavy birds ride on.

Guanacos graze on plants such as grasses and herbs during the day.

These woolly animals have excellent hearing and smell to help them detect danger nearby. However, their poor eyesight means they might not see a predator until it's too late.

Andean condors are the largest flying land birds in the Americas. Their 3-metre wingspans make them look like scary predators. But condors are **SCAVENGERS** – they feed on the flesh of dead animals, known as **CARRION**. Their eating habits stop diseases from spreading and help keep **ECOSYSTEMS** healthy.



*The sun rises higher until it is straight overhead
and all shadows are swallowed up by the light.*

*In the tropical jungles of Malaysia
emperor cicadas rattle and hiss
from tree trunks.*

On very hot summer days in this
jungle, emperor cicadas chirrup loudly.
This sound comes from a muscle in their
abdomens called a TYMBAL. A cicada twitches
its tymbals to make its ribs SNAP apart –
up to around 400 times a second!

Cicada males make noise to attract females.
The hotter it is, the more friction
they can make in their bodies,
and the louder they become.

*Nearby, a chameleon forest dragon
stretches on a branch.*

Chameleon forest dragons are
not actually chameleons but they
can still change colours. This helps
them blend in with their daytime
surroundings and avoid predators.

These reptiles spend their days in trees,
hunting for cicadas and other insects.

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As the sun arcs towards the horizon on Africa's Serengeti,
its heat presses against the ground like a weight.

On the African SAVANNA, summertime is rainy season.
Days may start out sunny, but as hot, humid air rises
to meet cooler air, rain comes, and it may fall for hours.
African elephants can hear rain falling more than
200 kilometres away. They love to splash and play in it,
but sometimes they prefer to take shelter and stay dry!

The world pauses.
Even so, there is life breathing and blinking all around.
It is also digesting... And napping...

And taking shelter from an afternoon rain shower.

An African rock python can open its flexible jaws so wide it can swallow a warthog whole.

It will lie still for
weeks to DIGEST it.

Like most cats, the
caracal is usually active
at night. But it has also
adapted to hunting in the
daytime, when there is
more food on offer.
Its sand-coloured fur acts
as CAMOUFLAGE.

A caracal can leap 3 metres
into the air to snatch bird prey,
such as crested guinea fowl.



Some creatures have been on the move all day.

Swallows can fly up to 300 kilometres a day, on routes that may take them over the Sahara Desert.

Even now, as the sun begins to fall and the sky turns pink, swallows sweep tirelessly over a river in the north of Europe.

European swallows MIGRATE nearly 10,000 kilometres between Europe and Southern Africa twice a year.

Before they fly, swallows fuel up on big, juicy insects, such as horseflies. Then, when the afternoon is warm and the winds are calm, they start their long journey.

Tiny caddisflies are furry-winged, moth-like bugs. Females swarm to lay their eggs in rivers and streams by day and into the evening. Larvae hatch, then weave together pebbles, twigs and leaves. They PUPATE inside these clever homes, then emerge weeks later as adult caddisflies.

*The sun sinks and the sky flares red over Fiji as evening sighs in.
Daytime dwellers seek out resting spots for the night...*

During the day on the coral reef,
colourful plant-eating fish feed on
nutritious seagrass and seaweed.
These plants soak up vitamins
while the sun shines.

Corals begin to
wake up as the
light fades. They
feed at night.

As day turns to night
on the reef, daytime fish
tuck themselves into their
holes to sleep and nighttime
fish slowly begin to emerge.

*And new faces peek out
from their sleeping holes,
ready for 'breakfast'!*

Did you know that coral
is alive? A reef is made of
colonies of tiny creatures
that are related to jellyfish
and sea anemones. They are
called coral POLYPS. They
open at night to feed on
the tiny animals and plants
known as PLANKTON.



As the fading sun drops behind the horizon,
bats call to each other in the low light.

Then a flash.
Then a hundred more.
Fireflies pulse green
among the leaves.

Bats are not
on fireflies.
That's because
they taste terrible!

Here in North America,
little brown bats stream from their roosts in the cliffs.
They circle in the air, gobbling insects as they go.

One little brown bat can eat 1,000 mosquitoes,
beetles and moths in an hour. The bats make
sounds that bounce off the flying insects.
This is called ECHOLLOCATION and it
helps the bats find the insects in the
dark. They hunt at night to
avoid competing with other
insect-eaters, like birds.

A firefly's glow warns
predators not to eat it.
It also signals to potential mates to say,
"Here I am!" Nighttime is the best time
to see those flickering messages.



Darkness creeps in until all memory of day is erased.

*In South Asia, snow-white moonflowers open wide.
Moths flicker through the cool air,
lured by the sweet smell of nectar and the glow of petals.*

Moonflowers, also called evening glories, open as soon as night falls. They release a smell that attracts night POLLINATORS, such as moths. The white petals of the moonflower glow in moonlight to give these insects extra help in finding them.

The hawk moth has a long, tube-like tongue, called a **PROBOSCIS**. It is long enough to reach the nectar deep inside a moonflower. A hawk moth can hover in the air while it feeds. Some moths come out in the day or the evening. But nocturnal moths have evolved to navigate using the moon and stars.



*Shhh! In this Canadian forest
the trees are sleeping! They slowly let
their branches droop in the darkness.*

Trees really do 'sleep' at night. As the sun goes down, they slowly, slowly relax their branches. Scientists have recorded trees drooping by as much as 10 centimetres. Their branches begin to rise again at dawn as the trees wake up.

*Mushrooms glow on dead tree
trunks and in the dirt between
live tree roots. Ants and beetles
come to nibble them.*

A mushroom is a fungus's above-ground part, which may pop up overnight when the air is cool and damp. It contains **SPORES**. A fungus's underground part is made up of root-like **MYCELIUM**.

Mushrooms are not plants, which all belong to the plant **KINGDOM**. They belong to their own group of organisms - the fungus kingdom.

Some fungi are **BIOLUMINESCENT**. That means they can make their own light. This attracts insects, such as ants. Ants eat the spores, then poop them out as they scuttle through the forest. This makes more fungi.



*A nighttime breeze pushes through
the trees by an English river.
It tickles awake an otter
napping on the bank.*

*It has been dreaming of dinner,
of the tasty eels sneaking along the muddy riverbed.*

Otters have excellent eyesight, which helps them spot prey. They also have sensitive whiskers, which let them sense eels and other fish moving nearby.

Eels are very shy and secretive animals. Freshwater eels spend their days buried in mud on riverbeds. At night they feed on other fish and molluscs, such as snails.

In the evening and at night, otters dive into the water – as deep as 18 metres – to capture prey. They can close their ears and noses so water can't get in.

European eels are born in seagrass forests in the Sargasso Sea near Bermuda. They drift as eggs on an epic journey across the ocean for up to 10,000 kilometres, growing and changing over several years. Eventually they find their way up rivers.

When they are 20 or more years old, they return to the Sargasso Sea to breed. Then they die.



At the north and south of the planet, colourful lights steal the sky from the stars.

In the Northern Hemisphere, these lights are called the Northern Lights or the Aurora borealis.

This phenomenon, called aurora, is caused by solar storms.

Solar storms on the surface of the sun shoot out charged particles. When they reach our **ATMOSPHERE**, some get trapped in Earth's magnetic field and travel to the poles. There the particles mix with oxygen and nitrogen to give us colourful light shows.

Dovekies are Arctic birds that spend their lives on and around the ice. They feed both day and night, diving 30 metres into the water to catch crustaceans and other food.

Walruses can sleep anywhere! Scientists have discovered that they can snooze as they float on top of the water, lying at the bottom of it, or standing and leaning against an object (or friend!) on land.

Antarctic fur seals feed at night. Their favourite prey are lanternfish and squid.

Penguins never take a deep slumber, preferring to nap instead. This keeps them alert to the seals that want to eat them.



On the East Coast of the United States,
late night bustles with songbirds following stars across the black sky.
They soar high over forests, and far out over the ocean.

They see the moon as if's swallowed by clouds.
They see tiny spots glittering on wave tops.

Some songbirds
migrate thousands of
kilometres in spring and
autumn, to and from the places
they were born. They travel by night,
when there are fewer predators awake
for them to worry about. Earth's magnetic
pull helps guide the birds. They also use the
stars to find their way. Scientists believe
baby birds in their nests learn to read
CONSTELLATIONS as if they were maps.

Bioluminescence not only lights up fireflies and mushrooms, it makes the sea sparkle too.
Tiny organisms light up in the water when waves wash over them.



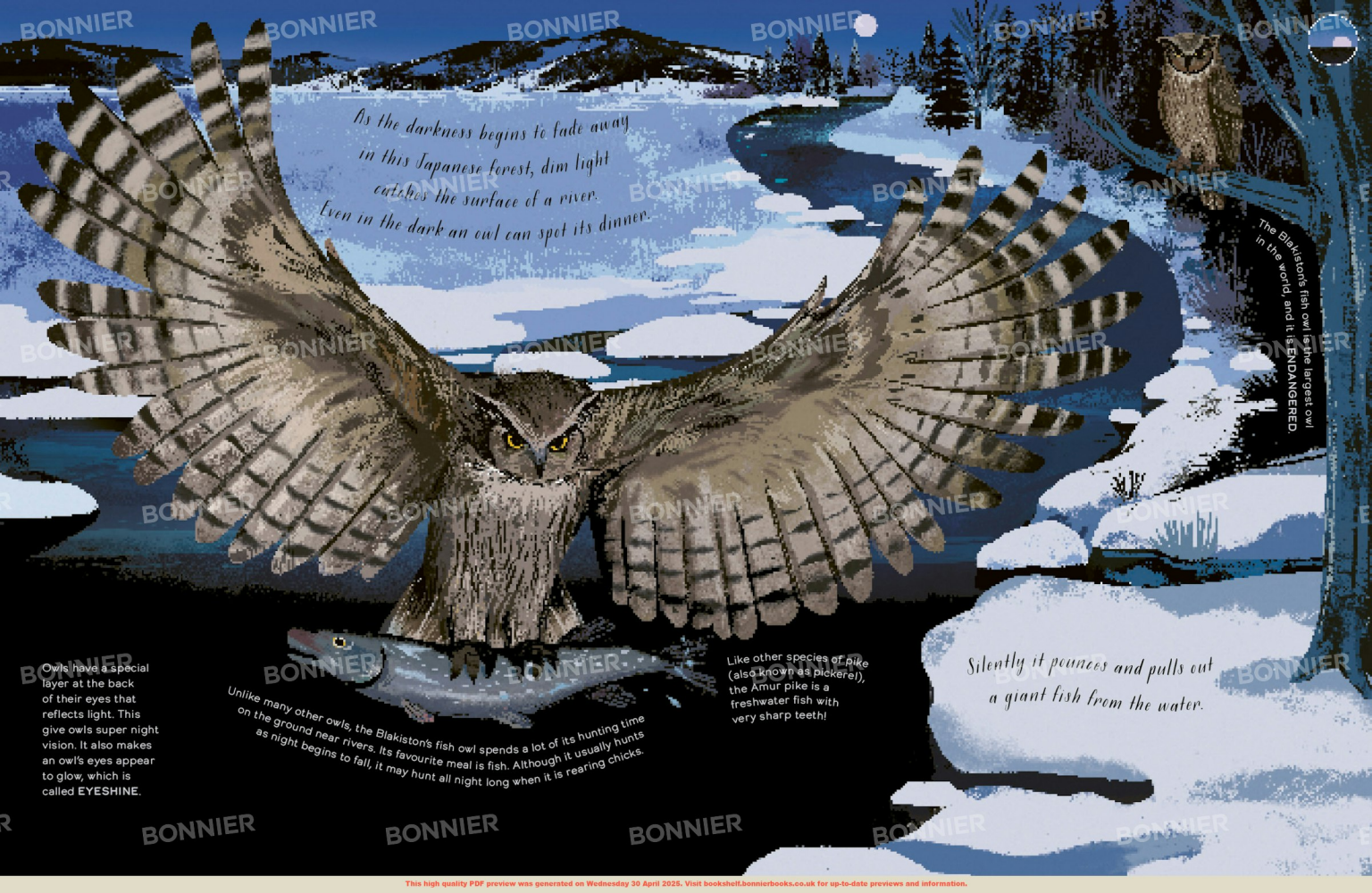
*The bright light of the moon catches
rippling waves off an island
in the Indian Ocean.*

Giant coconut crabs come out of their
BURROWS in the dark, when the air is cool
and there is less danger of them drying out.
These 2-kilogram crabs are **CANNIBALS**.
That means they eat their own kind. They
also eat fallen coconuts, which they crack open
with their powerful pincers. They can even climb
trees to hunt birds, such as the red-footed booby.

*It glistens off the shiny shells
of crabs on the shore.
It shimmers across sating feathers.*

Unlike songbirds, many
seabirds migrate during the
day. The red-footed booby,
though, stays put all year
long. It does travel – but only
out to sea to hunt for fish.

At night red-footed boobies
ROOST in trees off the ground.
They tuck their heads under
their back feathers
to keep warm.



*As the darkness begins to fade away
in this Japanese forest, dim light
catches the surface of a river.
Even in the dark an owl can spot its dinner.*

The Blakiston's fish owl is the largest owl
in the world, and it is ENDANGERED

Owls have a special
layer at the back of
their eyes that
reflects light. This
gives owls super night
vision. It also makes
an owl's eyes appear
to glow, which is
called EYESHINE.

Unlike many other owls, the Blakiston's fish owl spends a lot of its hunting time
on the ground near rivers. Its favourite meal is fish. Although it usually hunts
as night begins to fall, it may hunt all night long when it is rearing chicks.

Like other species of pike
(also known as pickerel),
the Amur pike is a
freshwater fish with
very sharp teeth!

*Silently it pounces and pulls out
a giant fish from the water.*



*Night is drawing to a close,
but in the city you sleep on and on.*

*The sky begins to brighten once more
as the chirp and chatter of
a new day begins.*

*Beside you, a fearless feline friend
watches a new dawn sneak over the horizon.*

Humans are **DIURNAL**. That means we spend most of our time
awake in the day and asleep at night, but we are highly adaptable.

Some people work
through the night and
sleep during the day.
However, this goes
against our body's
built-in rhythm and
many people go back
to sleeping at night
when they are able to.

Housecats are adaptable, too. They are nocturnal, hunting at night and
sleeping during the day. However, when they live with people, they often adjust
to our schedules, staying awake for parts of the day to get strokes and treats.

A Guide to Day and Night

Polar night and midnight sun

At the very north and south of Earth, days work differently. For six months of the year the sun never rises above the horizon. This is called the **POLAR NIGHT**, and it is dark all the time. For the other six months of the year, the sun never falls below the horizon. This is called the **MIDNIGHT SUN**, and it is light all the time.

This phenomenon happens because Earth is tilted. When one pole is tilted towards the sun, the other pole is tilted away. This makes daytime or nighttime last more than 24 hours in these places.



Dawn

Before the sun has risen above the horizon, the sky lightens. This time of day is also known as twilight.



Sunrise

The sun rises higher, eventually coming up over the horizon line, warming the air.



Daytime

The period between sunrise and sunset, when the sun peeks up over the horizon line then travels in an arc across the sky. It is warmer than it is at night and there is more food around, but animals are more easily spotted by predators in the light.



Animals and plants that are active in daytime are called **DIURNAL**.



Sunset

The sun sinks below the horizon line, causing light and warmth to fade.



DIURNAL animals and plants prepare to rest for the night.



Dusk

The sun lowers even more, even though we can't see it now. The sky grows darker but there is still a faint glow of light. This time of day is also known as twilight.



CREPUSCULAR animals and plants are active again.



Night

The period between dusk and dawn, when it is dark. The air is cool and more humid. There is less food around at night but under the cover of darkness animals can avoid getting caught by predators.



Animals that are active at night are called **NOCTURNAL**.

GLOSSARY

Words shown in **CAPITAL LETTERS** in the book are explained here.

ATMOSPHERE: The layer of gases that surrounds Earth.

BIOLUMINESCENT: Animals or other organisms that can make their own light are bioluminescent.

BURROW: A shelter dug in the ground by an animal.

CAMOUFLAGAGE: Colour, shape or pattern that makes an animal hard to see in its surroundings.

CANNIBAL: An animal that eats its own kind.

CARNIVORE: An animal that eats other animals.

CARRION: The flesh of a dead animal. Scavengers such as condors eat carrion.

CONSTELLATION: A group of stars in the sky that humans may see as forming the shape of an animal, such as a swan, or an object, such as a plough.

DIGEST: The process by which our bodies break down food so that we can use it for energy.

ECHOLLOCATION: The way animals, such as bats, find objects in the dark using sound.

ECOSYSTEM: The plants, animals and other organisms that live in an environment and interact with each other to survive.

ENDANGERED: At risk of dying out.

EYESHINE: Light reflected in an animal's eye at night, which lets it see extremely well in the dark.

HERBIVORE: An animal that eats only plants.

HORIZON: The place where Earth meets sky.

KINGDOM: All living things are organised into groups that help us identify them. The biggest of these groups are called kingdoms and there are five of them: Animal, Plant, Fungi, Protist and Monera.

MIGRATION: The movement of animals with the seasons, to find enough food to eat and to stay warm or cool.

MYCELIUM: The biggest part of a fungus, which is made up of a network of tiny threads called hyphae. The mycelium usually lives underground, but also in places such as decaying tree trunks.

PLANKTON: Tiny plants, animals and other marine organisms. Plankton is the main source of food for many ocean creatures.

POLLINATOR: An animal that helps plants reproduce by moving pollen from one flower to another.

POLYP: A tiny sea creature. Colonies of polyps make up the living part of coral.

PREDATOR: An animal that hunts and eats other animals as its prey (see below).

PREY: An animal that is hunted by other animals, known as predators (see above).

PROBOSCIS: A long tube-like mouthpart. Hummingbirds and butterflies use theirs to drink nectar from flowers. An elephant's trunk is also called a proboscis and is used for many activities, including drinking and spouting water.

PUPATE: The stage when an insect larva, such as a butterfly caterpillar, turns into a form called a pupa. This happens inside a protective case and the insect is inactive during this time. A butterfly's pupa case is called a chrysalis. Inside the chrysalis, the pupa turns into a new butterfly and then emerges.

ROOST: To settle down to sleep. Many birds roost at night.

SAVANNA: A habitat, also known as tropical grassland, that can be found in the regions just above and below the equator. It is covered with many types of grasses and a scattering of trees and shrubs.

SCAVENGER: An animal that eats animals that are already dead.

SPORE: The tiny, seed-like part of a fungus.

STALK: To hunt stealthily, like a predatory cat hunting bird prey.

TYMBAL: A cicada has a hard shell covering the outside of its body, called an exoskeleton. The tymbal is the part of the exoskeleton it vibrates to make sound.

