

With
4 WIPE-CLEAN
SPOTTING
CARDS



MY FIRST BOOK of WEATHER

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UP IN THE AIR

Our planet is wrapped in a blanket of air called the atmosphere. This is where our weather is made. Weather is changing all the time, all over the world.

The atmosphere is made up of air. There are invisible gases in air, such as carbon dioxide, water vapour and oxygen.

The bottom layer of the atmosphere is called the troposphere. The air in this layer is always moving around. It swirls, whirls and flows through the sky, turning the weather warm, wet or windy.

Above the troposphere, the atmosphere slowly thins into space above.

Warm air inside a hot-air balloon lifts it up into the sky

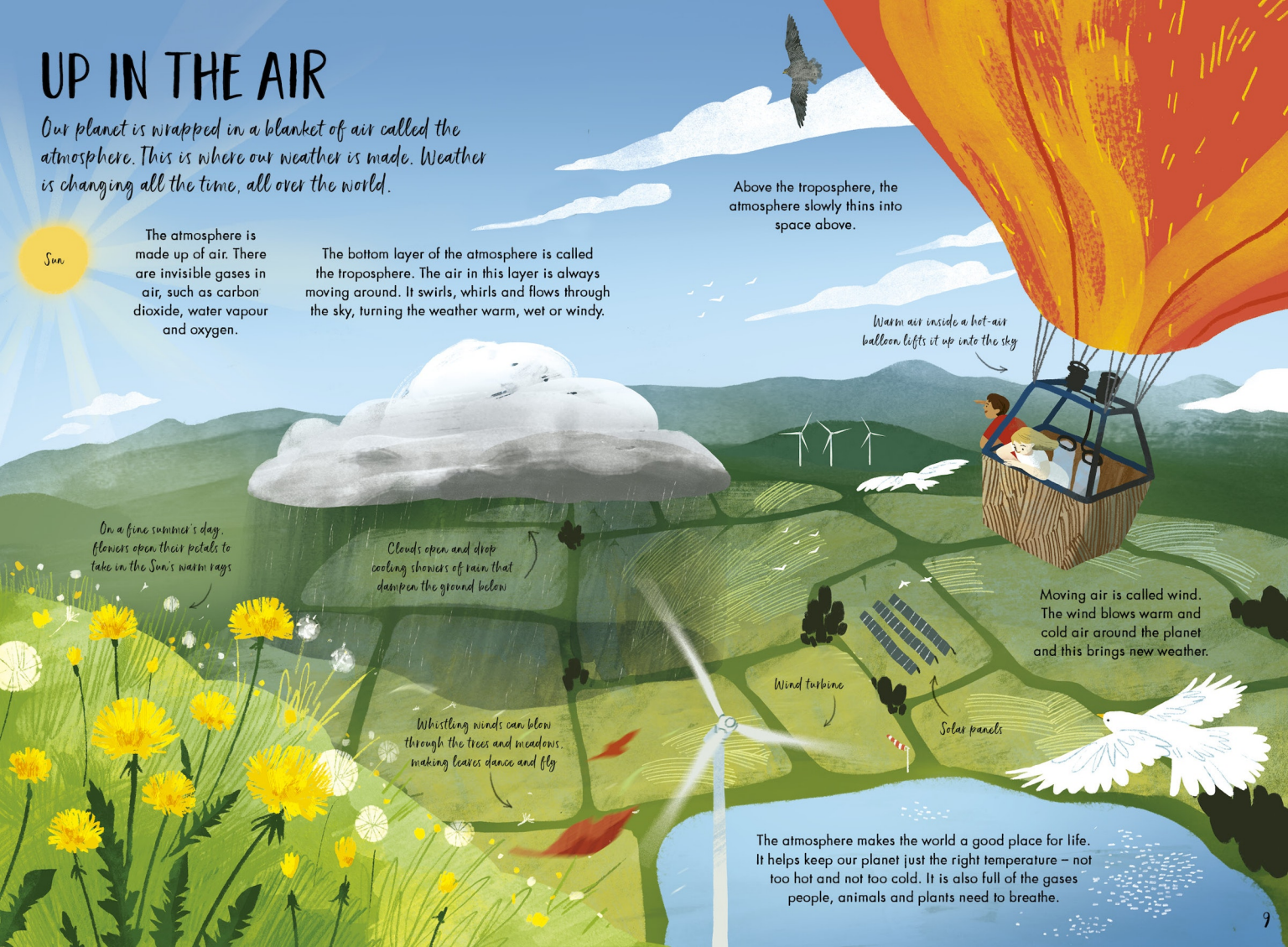
On a fine summer's day, flowers open their petals to take in the Sun's warm rays

Clouds open and drop cooling showers of rain that dampen the ground below

Whistling winds can blow through the trees and meadows, making leaves dance and fly

Moving air is called wind. The wind blows warm and cold air around the planet and this brings new weather.

The atmosphere makes the world a good place for life. It helps keep our planet just the right temperature – not too hot and not too cold. It is also full of the gases people, animals and plants need to breathe.



Sun

THE SUN

The world's weather starts with the Sun. Our sun is a star – a huge ball of glowing gas in space. It gives off energy that bathes our planet in heat and light.

The Sun is very big and very old!

If the Sun were the size of a front door, the Earth would be size of a coin. It is 4.5 billion years old. That number has eight zeroes and looks like this: 4,500,000,000.

A ray of sunlight takes about 8 minutes and 20 seconds to reach the Earth

The Sun is a long way away. The distance to the Sun is around 400 times the distance to the Moon. Yet we can feel the energy from the Sun as heat and we can see it as sunlight.

The Sun helps our bodies to make vitamin D, which keeps us healthy

At midday the Sun is high in the sky, right above us, and its rays of energy are at their strongest.

The Sun warms the Earth and the atmosphere traps the Earth's heat close to it. This keeps our planet warm. The warmed air in the atmosphere has energy and that makes it move around, helping to create weather.

The Sun's energy can burn us, so it's a good idea to protect your skin by covering up or using sun lotion.

Plants need sunlight to grow. They use the Sun's energy to make food from water and air. Many animals eat plants, and so the Sun's energy is passed on to other living things on Earth.

Sunlight is made up of different colours of light. As sunlight passes through the air, the blue light is scattered more than the other colours. That's why we see the sky as blue.

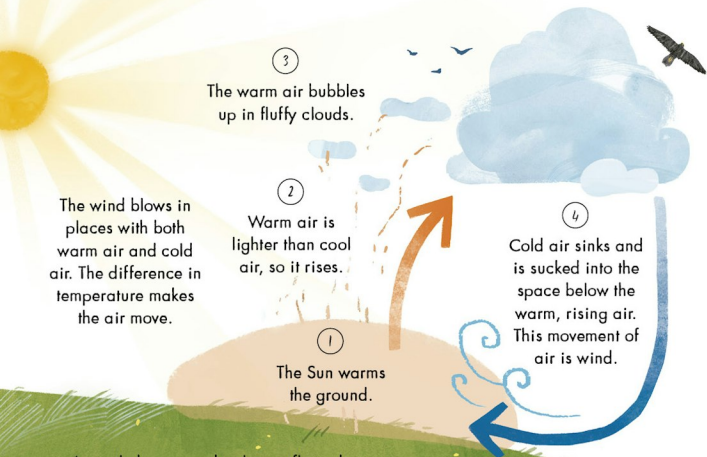
Blue light

1 The Sun rises in the east, marking the start of a new day.

3 In the evening, the Sun sinks below the horizon in the west.

THE WIND

Wind is air that is moving from one place to another. Powerful winds blow all over the world. Even though we cannot see the wind, we can see how it moves things and we can feel it on our skin.



The wind blows in places with both warm air and cold air. The difference in temperature makes the air move.

A gentle breeze makes leaves flutter but when strong winds blow, trees can fall over. The speed of the wind can be measured on a scale from 0 (no wind) to 12 (hurricane). It's called the Beaufort Scale. Here are some of the levels:

1 LIGHT BREEZE

Grasses and flowers on long stems sway a little in the wind. Leaves rustle.

2 GENTLE BREEZE

Leaves and small twigs on trees are moving constantly.

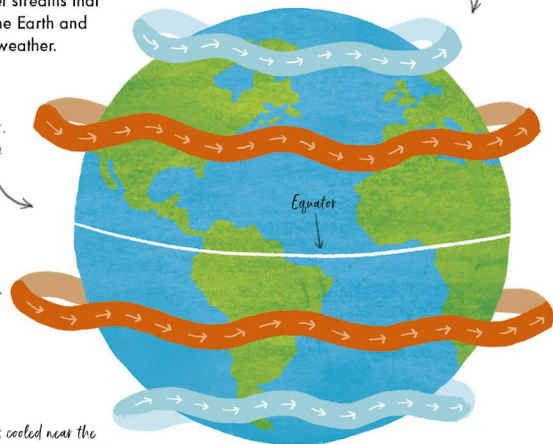
Some winds blow right around the world. Jet streams are strong winds that flow high up in the atmosphere, from west to east. There are four jet streams that blow around the Earth and affect the weather.

Polar jet streams flow in the northern hemisphere and the southern hemisphere

The Sun is strong around the equator, so the air is warm

Subtropical jet streams flow above and below the equator

The air is cooled near the north and south poles



4 MODERATE BREEZE

Clothes on a washing line flap in the breeze.

5 FRESH BREEZE

Colourful kites dart and dive. The moving air makes them dance in the sky.

6 STRONG BREEZE

It is difficult to hold an umbrella when strong breezes blow. Even large branches in the trees sway!

As the wind whips across the top of the ocean, it makes waves. When the frothy tops of the waves tumble, they are said to look like white horses galloping.

WATER

We can't always see it, but water is all around us. Water is always on the move between the air, the land and the sea. The way that water moves around the planet is called the water cycle.

①

When the Sun heats water, it turns into water vapour (an invisible gas). Plants make water vapour, too. They soak up water from the ground and water vapour escapes from their leaves into the atmosphere.

Water vapour from the ocean rises in the air

Water vapour from plants rises in the air

②

High up, water vapour cools to form tiny water droplets. This is called condensation. These droplets gather together to form clouds.

③

Clouds grow bigger as more and more water vapour condenses into tiny droplets. Moving air high up in the sky blow clouds to different places.

④

When the water droplets are too heavy, they fall from the sky as rain. If the air is very cold, the clouds are made of ice crystals instead of water droplets. Ice crystals can fall as snow.

⑤

Rain pours down on the land and begins to flow in rivers and streams back towards the ocean. Snow settles on the ground, or it melts and turns back into liquid water.

⑥

Some of the rainwater stays in lakes. Water also soaks into the ground and the rocks. It is called groundwater.