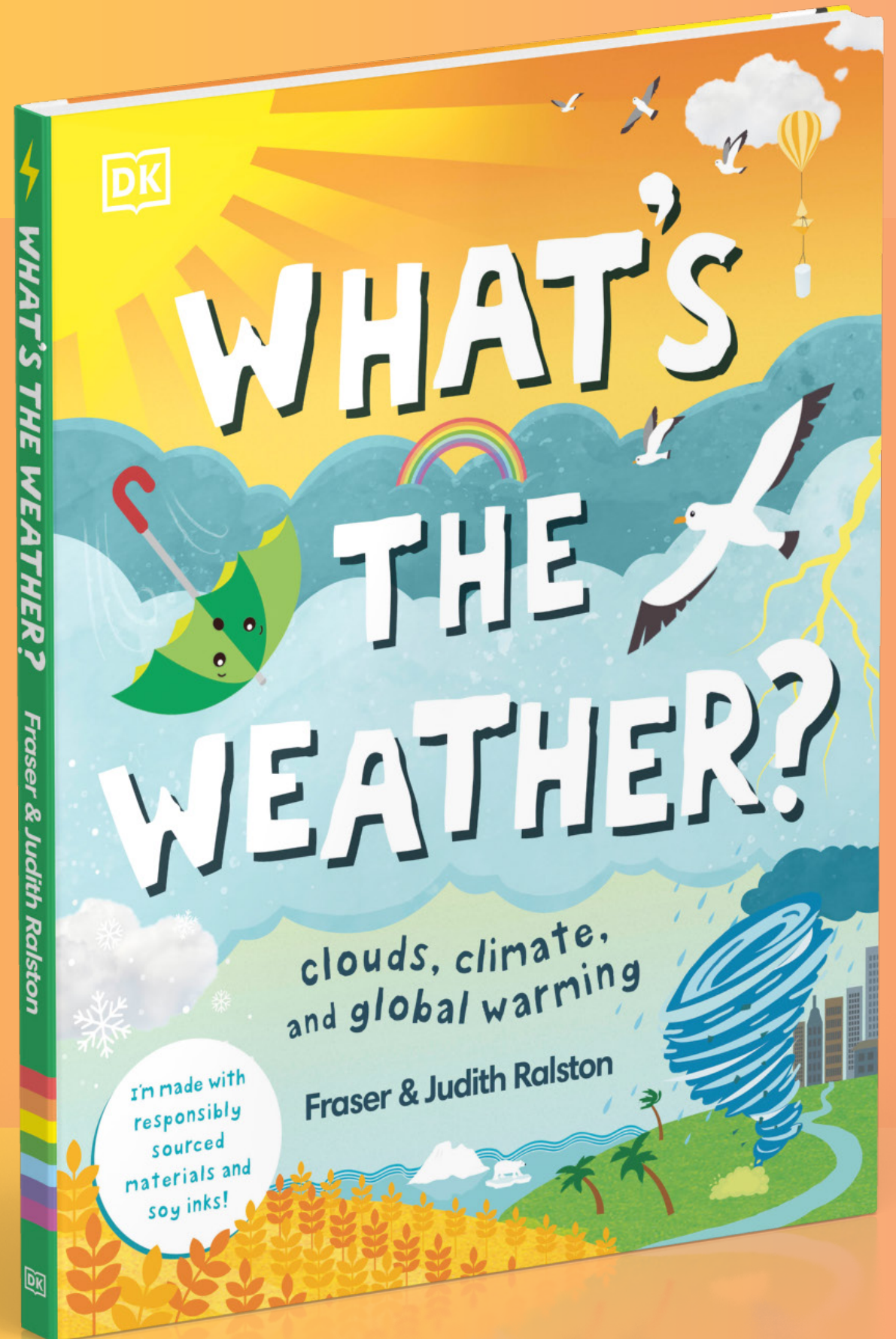


MINI METEOROLOGY PACK



For the curious

Hot or cold?

The relationship between the sun and the Earth is the main cause of hot or cold weather. However, currents of air in the atmosphere and of water in the ocean affect the temperature, too.

Atmosphere

The atmosphere is a thin layer of air surrounding the Earth. It acts like a protective skin by blocking out harmful particles from the sun. All our weather develops within the atmosphere.



Warm and rainy

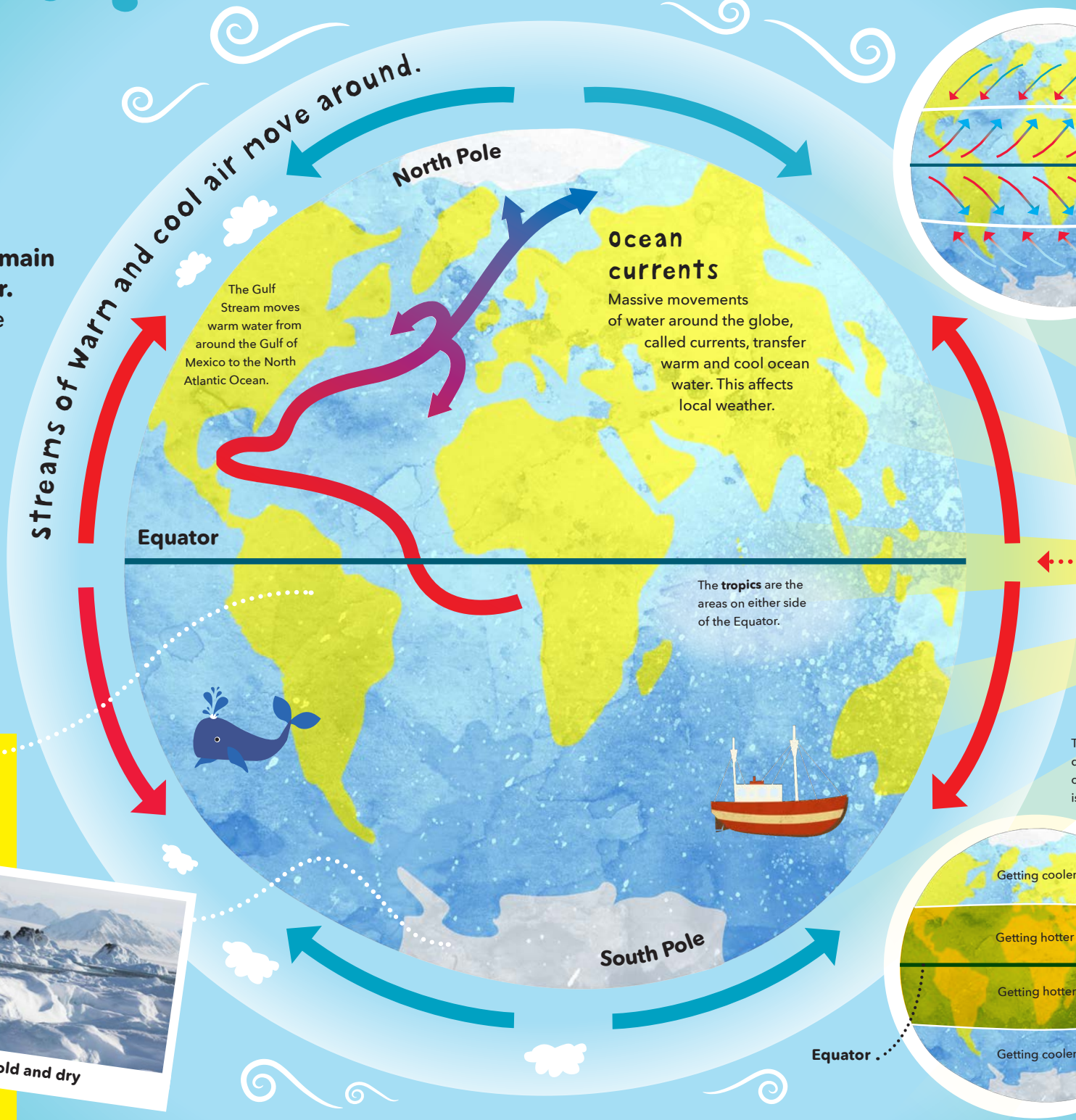
Climate

Weather conditions over a long period of time form a climate. There are different climates around the world.



Cold and dry

streams of warm and cool air move around.



Ocean currents

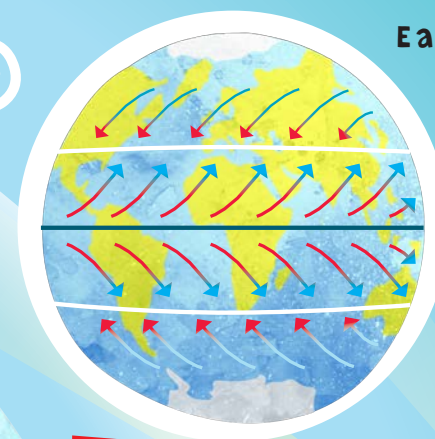
Massive movements of water around the globe, called currents, transfer warm and cool ocean water. This affects local weather.

The Gulf Stream moves warm water from around the Gulf of Mexico to the North Atlantic Ocean.

The tropics are the areas on either side of the Equator.

Earth air conditioning

Air currents swirl around in the atmosphere. These act like an enormous temperature engine. They transport warm air away from the tropics and cold air away from polar regions. This effect is called general circulation.



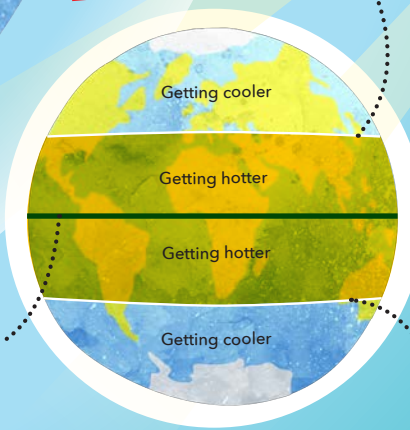
The sun

The sun's rays hit the Equator directly, making it hot. Other parts of the Earth are hit at an angle, so the heat is spread out across a greater area. This makes them less warm.

The area 40 degrees north of the Equator is called 40N.

Up and down

North of 40N and south of 40S, the Earth loses heat. South of 40N and north of 40S, the Earth gains heat. The general circulation then acts like a global air conditioner by cooling some areas and heating others.



The area 40 degrees south of the Equator is called 40S.



For the curious

Content taken from *What's the Weather*



Through the year

In most parts of the world, the weather changes throughout the year. The temperature rises in some months and falls in others, and there is a variety of weather. These periods of different weather are called **seasons**.

It is spring in areas that start to tilt toward the sun...

Spring

During spring, days get longer and nights get shorter. Temperatures steadily rise. The warmer weather means that some flowers start to grow and many trees begin to grow leaves.

...summer in areas that tilt toward the sun...

Summer

This is the warmest time of year, with long hours of daylight. It happens from June to August in the northern hemisphere (above the Equator), and December to February in the southern hemisphere (below the Equator).

Many areas have less cloud during the summer months.

...fall in areas that start to tilt away from the sun...

Fall

The days get shorter and the weather starts to turn cooler in fall. It can become very wet and windy. However, some mornings glitter with frost.

The leaves of deciduous trees turn golden colors and begin to fall.

...and winter in areas that tilt away from the sun.

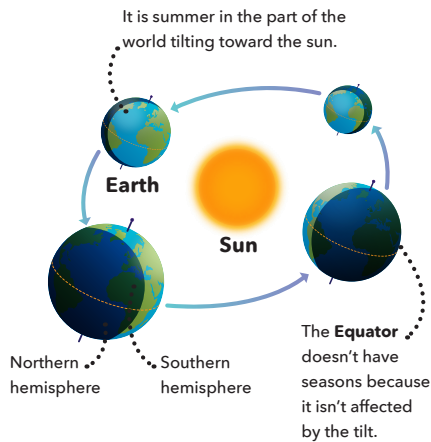
Winter

The days become very short in winter. The weather turns colder. There is more rain, with snow and freezing fog in some places. Some animals go into a sleeplike state, called hibernation.

The sun is low in the sky and not much of its heat reaches the ground.

Seasons

The Earth is tilted. As it circles the sun, different parts lean toward or away from it. This means they get more or less heat, causing seasons.



Deciduous trees that were bare in winter start to grow leaves and blossom again.

Lots of flowers grow in the warm summer weather, and plenty of butterflies can be seen.

Some animals, such as hedgehogs in Europe, emerge from hibernation, which is like a deep sleep.



Deer mate in fall, so that babies are born when it's warm again in spring.

Some animals, such as the snowshoe hare in the US, have white coats to blend in with snow.

Light nights

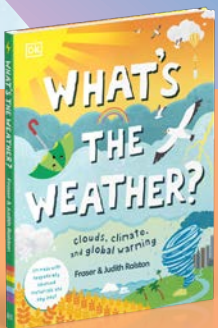
The North and South Poles are tilted in such a way that they get constant sunlight at one point of the year, and no sunlight at all at another.



A "midnight sun" shines all day and night during midsummer.



During midwinter, the sun never rises!



Thunderstorms

A single cumulonimbus cloud can develop into the intense weather wonder of a thunderstorm. This can happen almost anywhere in world, if the right conditions are present. A thunderstorm can include lots of different weather, from heavy rain to snow.

A storm brewing

In order to grow, storms need a combination of warmer air near the Earth's surface and much colder air higher up. They also need a lot of humidity. Thunderstorms mostly happen in warm weather, but they can develop in winter, when cold air moves over warmer oceans.

Strong wind

Warm air currents move upward to build the thundercloud. Cold air sweeps down to give gusty winds.

Lightning can heat air to **50,000°F (30,000°C)!**

Lightning strike

Some lightning travels all the way down to the ground from the cloud. It often hits high objects such as trees and flagpoles—but it can strike anywhere.

Lightning

Particles inside a cloud can become electrically charged. When different parts of a cloud have opposite charges—negative and positive—an electrical current is created between the two. This is lightning!

Center of positive charge

+

+

+

+

-

-

-

-

Center of negative charge

Thunder is heard after a lightning strike because light travels much faster than sound.

Thunder

Lightning heats up the air around it, causing it to expand. This makes a very loud rumbling noise—thunder.

Forked lightning

This is created when lightning travels from the cloud to the ground, and returns back up into the cloud.

Heavy rain

Thunderclouds are formed from a huge amount of water droplets, which can join together to form torrential downpours.

Hail

If rain is carried upward by wind inside a thundercloud, it can freeze to form hail.

Snow

In winter, thunderstorms can give very heavy snow showers, sometimes called "thundersnow."

All the water droplets in a cumulonimbus cloud can

weigh more than **1,000,000 lbs (450,000 kg)**.



For the curious



Content taken from *What's the Weather*