SPECTACULAR STARS

There are billions of stars in the universe, including the one that lights our sky in the daytime — the sun! Did you know that stars are born, grow and die? Here's how...

Stars are formed in large clouds of dust and gas, called stellar nebulae. The hydrogen gas in the nebula is pulled together by gravity and it begins to spin. As the gas spins faster, it heats up. When it reaches 15 million °C, nuclear fusion starts in the condensed core. Nuclear fusion is when two lighter atoms are forced together to create a larger one, releasing a lot of energy.

Smaller stars like our sun are stable and burn their hydrogen into helium slowly, taking millions and millions of years.

When the hydrogen in the core is used up, the core becomes unstable and contracts, and starts fusing helium into carbon. The outer shell expands, cools and glows red, turning the star into a red giant.

When the core has converted to carbon, it collapses and clouds of hot plasma are sent into space. This is a planetary nebula.

A star's life starts here!

The collapsed core remains as a white dwarf, which is very dense and about the size of the earth. Eventually it cools and dies as a black dwarf.

MASSIVE STARS BURN THEIR HYDROGEN FUEL QUICKLY

When a massive star becomes a red giant, gravity keeps pulling the carbon atoms together. Fusion creates oxygen, then neon, silicon, sulphur and finally iron.

When the core is just made of iron, fusion ceases but gravitational collapse continues. The core reaches over 100,000,000,000 °C as the iron atoms are crushed together. The star explodes, creating a supernova.

What remains after a supernova is a neutron star – a super-dense, tiny ball of neutrons.

The largest stars become black holes. The remaining core of the star is so dense that nothing can escape its gravity. Not even light!

What makes you go wow? Big things like stars? Or little things in your life? Both can be amazing!

The Bible tells us:

"God decided how many stars there would be in the sky and gave each one a name. Our Lord is great and powerful! He understands everything."
Psalm 147:4,5

When you discover such amazing, huge things like stars, what goes through your head?

WICKED WEATHER

Ever got caught in a rain storm and wondered how it happened?

PRECIPITATION

Tiny water droplets form clouds. They join together to make larger rain droplets and fall to the earth again.

SNOW OR HAIL?

If droplets reach the top of clouds, they freeze. They continue to get coated with ice until they're so heavy they fall as hailstones.

Snow forms when water vapour turns to ice without going through the liquid stage. These ice crystals combine and fall to earth.

There are three main types of clouds (but lots of variations). They are:

CUMULUS

These are big, fluffy clouds, piled high in the sky

CIRRUS

These are wispy clouds

STRATUS

These are sheets of cloud, just like a grey, cloudy day

"Consider carefully the many wonders of God. Can you explain why lightning flashes at the orders of God who knows all things? Or how he hangs the clouds in empty space?" Job 37:14-16

Humans have been curious about the natural world for as long as we can remember... Science helps us to learn more about God's world.

CONDENSATION

When the water vapour gets high enough, it cools down and turns back into water - very small droplets.

EVAPORATION

The sun heats the earth. Water (in the sea or on land) is turned into vapour and rises into the sky.

Lightning is formed when different sized ice crystals collide in large cumulonimbus clouds (huge, complex towers of cloud). Some electrical charge rubs off the larger crystals onto the smaller ones. Eventually, enough charge is built up to result in lightning. The speed and heat of the lightning makes the air around the flash heat up and expand very rapidly, causing the sound of thunder.

WHAT CAUSES WIND?

The sun heats the earth. As warm air rises, colder air rushes in underneath to replace it. This is what we call wind.

You've seen how powerful the weather can be, but what if there was a person who could control the weather? The Bible tells us about a time when Jesus did just that - it's in Luke 8:22-25.

One day, Jesus and his disciples got into a boat, and he said, "Let's cross the lake." They started out, and while they were sailing across, he went to sleep.

Suddenly a windstorm struck the lake, and the boat started sinking. They were in danger. So they went to Jesus and woke him up, "Master, Master! We are about to drown!"

Jesus got up and ordered the wind and waves to stop. They obeyed, and everything was calm. Then Jesus asked the disciples, "Don't you have any faith?"

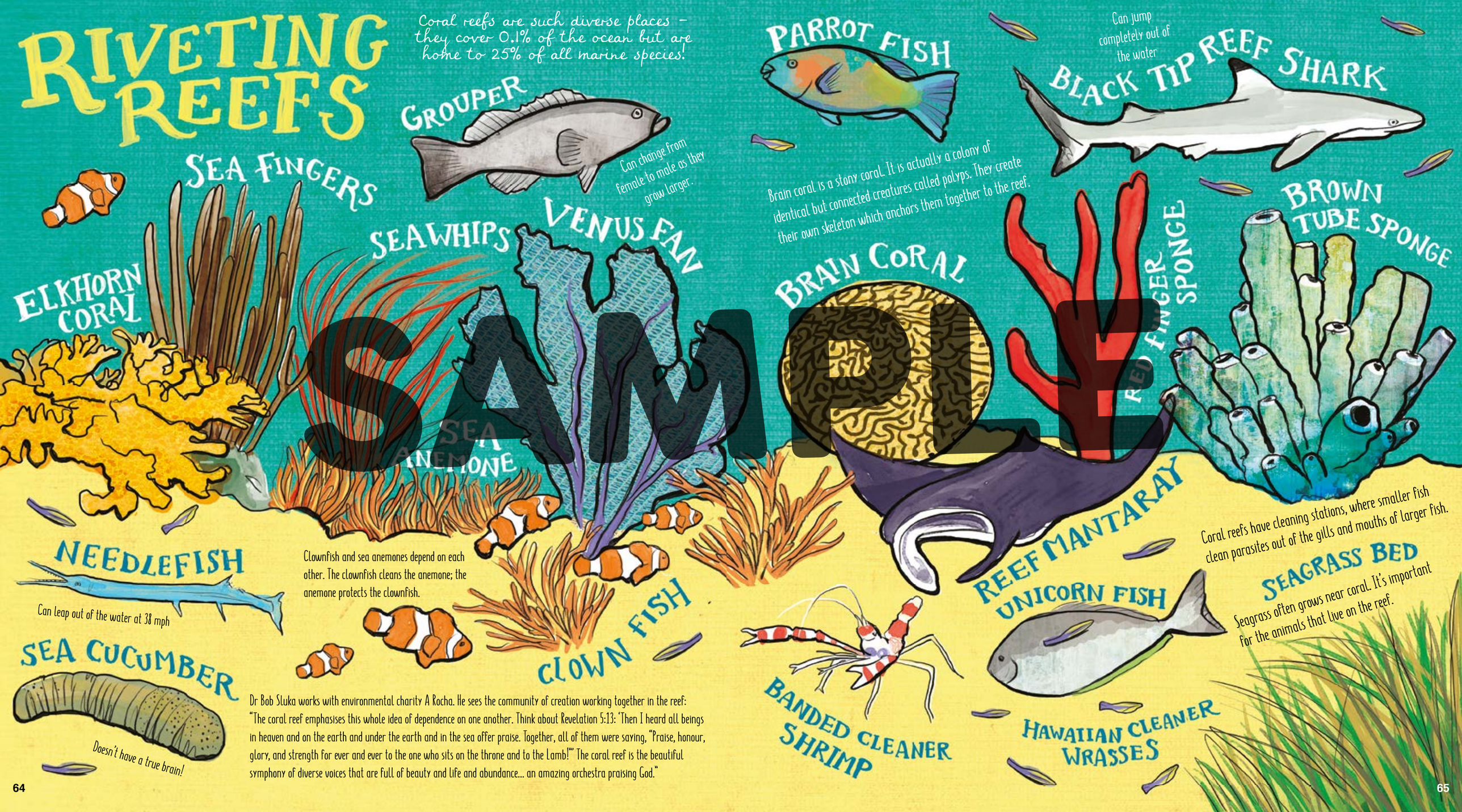
But they were frightened and amazed. They said to each other, "Who is this? He can give orders to the wind and the waves, and they obey him!"

If you were in the boat with Jesus, how would you have answered the question "Who is this?"?

Did you know the New Testament part of the Bible was written in Greek? When the Holy Spirit is talked about, the Greek word *pneuma* is used; *pneuma* also means wind. Like the wind, the Holy Spirit is everywhere. We may not be able to see the Holy Spirit but we can see the difference he makes - just as we can with the wind!

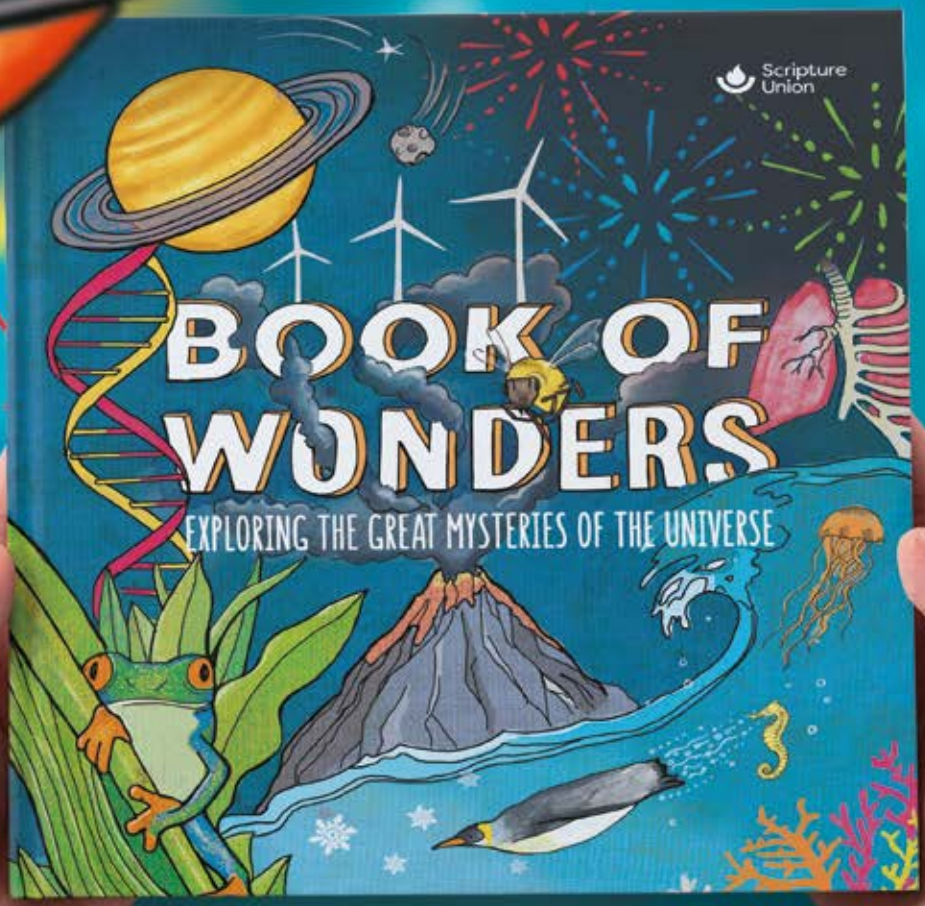
RIVETING REEFS

Coral reefs are such diverse places – they cover 0.1% of the ocean but are home to 25% of all marine species!



Dr Bob Sluka works with environmental charity A Rocha. He sees the community of creation working together in the reef: "The coral reef emphasises this whole idea of dependence on one another. Think about Revelation 5:13: 'Then I heard all beings in heaven and on the earth and under the earth and in the sea offer praise. Together, all of them were saying, "Praise, honour, glory, and strength for ever and ever to the one who sits on the throne and to the Lamb!"' The coral reef is the beautiful symphony of diverse voices that are full of beauty and life and abundance... an amazing orchestra praising God."

Scripture Union



"I DIDN'T KNOW THERE WERE SO MANY DIFFERENT THINGS IN THE BODY"

Amelia, aged 9

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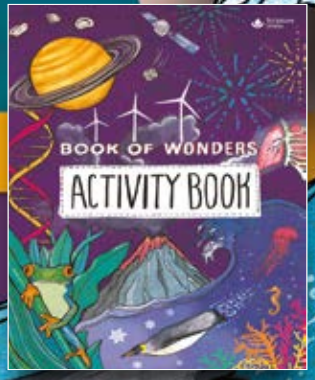

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