## STEM GLOBAL



Written by Gerry Bailey Illustrated by Yuliya Somina

## Content5

#### 4-5 A 'ROGKY' WORLD

\* Getting inside \* How deep? \* Magnetic Earth

#### 6-7 CRACKS ON THE CRUST

- \* Moving plates \* A lively place
- \* Slide and grind

#### 8-9 VOLCANO ALERT

- \* Not just another mountain
- \* Volcanic activity

#### 10-11 THE 'GREAT ESCAPE'

\* A volcano erupts \* Magma to lava

## 12-13 FIND A VOLCANO

\* Where to look

#### 14-15 THE RING OF FIRE

- \* Band of flame
- \* An active place

## 16-17 LIVING WITH A VOLCANO

\* Mount Merapi \* Gassy rocks

#### 18-19 SUPERVOLCANOES

- \* Underground heat \* An empty crust
- \* A famous supervolcano

#### 20-21 THE GROUND QUAKES

- \* Jolts and tremors \* My town
- \* Shock waves \* Aftershocks

#### 22-23 SPREADING WAVES

- \* The Richter scale \* Collecting data
- \* A seismograph \* Moment magnitude

#### 24-25 QUAKE-PROOF

- \* Stop the shaking! \* Bend and stretch
- \* Quake drill \* During an earthquake

#### 26-27 AVALANCHE!

\* Sliding slabs

#### 28-29 SNOW RESCUE!

- \* Mountain rescue \* Rescue dogs
- \* Special breeds



#### 30-31 STORMY SEA

\* Storms at sea \* Early warning!

\* Rogue winds

#### 32-33 SEA RESCUE!

\* Disaster at sea

## 34-35 KILLER WAVES

- \* Under the sea \* Crash!
- \* Coming in fast \* Warning!
- \* Harbour wave

## 36-37 MOVING THE EARTH

\* A great shift \* Facts and figures

## 38-39 SLIDING LAND

- \* Falling fast \* Cutting off supplies
- \* Reducing the risk

## 40-41 GAPING HOLES

- \* Land leaks \* Worn by water
- \* Swallow holes

## 42-43 HIGH WINDS

- \* Danger on the move
- \* Huge hurricanes

## 44-45 TORNADOES

\* Whirling winds \* Tri-state Twister

#### 46-47 DUST STORMS

\* Sandstorms \* Haboobs \* Dust devils

## 48-48 LIGHTNING STRIKE

- \* Lighting up the sky
- \* What makes lightning?

## 50-51 BUSY PLANET

\* Do your bit! \* Send help!

#### 52-53 RELIEF WORK

\* International aid \* A helping hand

## 54-55 FOLLOW THE ANMALS!

\* Earthquake toads \* Flee the waves \* Snake alert!

## 56-57 START AGAIN!

- \* Replant! \* Restock! \* Rebuild!
- \* Reinvent! \* Reuse! \* Replace!

#### 58-59 LET'S MOVE PLANET!

\* The search \* Planet 9

#### 60-64 GLOSSARY, INDEX and CREDITS

## A 'ROCKY' WORLD

Our planet Earth may have been around for more than four billion years, but it's not the most reliable place to be. It isn't a hard, firm ball of rock, strong and steady. Far from it!

## Getting inside

4

Our planet is made up of several layers. At its heart lies a solid iron and nickel ball, about as hot as the surface of the Sun. This is known as the inner core. It is about threequarters the width of our moon. The inner core spins at its own rate, turning just a little faster than the layers above it.

Surrounding the iron ball is an ocean of liquid iron and nickel known as the outer core.

Surrounding the core is the mantle made of semi-molten, sometimes plastic-like, rock. The Earth's crust forms the top layer.

Apart from its hard core, or centre, most of it is a churning, shifting cauldron of red-hot, liquid rock and minerals.





## Magnetic Earth

Our planet is also a magnet. This means it gives off a magnetic force, one that attracts other objects to it.

5

crust

Earth's magnetic field comes from the outer core's ocean of iron, which is electrically charged and in constant motion. In fact, it rotates faster than the rest of the planet. This movement means that Earth's magnetic field can expand or grow smaller, and this in turn causes the north and south magnetic poles to drift – and occasionally even swap positions.



Magnetic forces radiate from the Earth's magnetic poles.

# CRACKS ON THE CRUST

The planet's surface, its upper mantle and crust, isn't a thick protective skin, but many large, cracked pieces of rock that constantly shift position, sliding and bumping against each other as they move.

## Moving plates

In fact, the crust is made up of a number of plates that move like rafts across its surface. They are called tectonic plates.

These plates – seven major ones and a number of smaller ones – are always moving. Each one forms at one edge, moves along and is destroyed at another edge. And the land that makes up the world's continents is carried along on these ever-changing plates.





## A Lively place

As a result of this, the Earth is a lively, action-packed place where volcanoes, geysers, earthquakes, avalanches, floods and tsunamis affect many people's lives.

Earth's crust is made up of tectonic plates that float on its mantle.

6



The planet's surface rests on 11 large plates and many smaller ones. Each coloured section shows a different tectonic plate.





KEY WORDS: tectonic plates continent volcano earthquake flood tsunami

## SLIDE and grind



Two tectonic plates may slide apart from each other. This is known as spreading. Ocean floors can spread in this way causing small volcanoes and earthquakes, even the giant waves known as tsunamis.



When two plates slide, or perhaps more accurately, grind past each other, strong earthquakes will occur.



Two plates can also slide toward each other and collide, forcing one plate to move underneath the other.