

# The big picture

Ready? This is going to cover a lot of ground! We don't know for sure whether dinosaurs still roamed the Earth when the events that led to the Causeway began, but there's only a few million years in it!

## 250 million years ago

All the Earth's land is clumped together in one massive super continent called 'Pangaea'.

This skull is from an amphibian that lived about 250 million years ago.



## 80 million years ago

Ireland is covered in a warm shallow sea, full of single-celled sea creatures. The skeletons of these creatures, billions and billions of them, settle to the sea floor and turn into a mineral called limestone or chalk. Chalk is the foundation of the Causeway landscape.



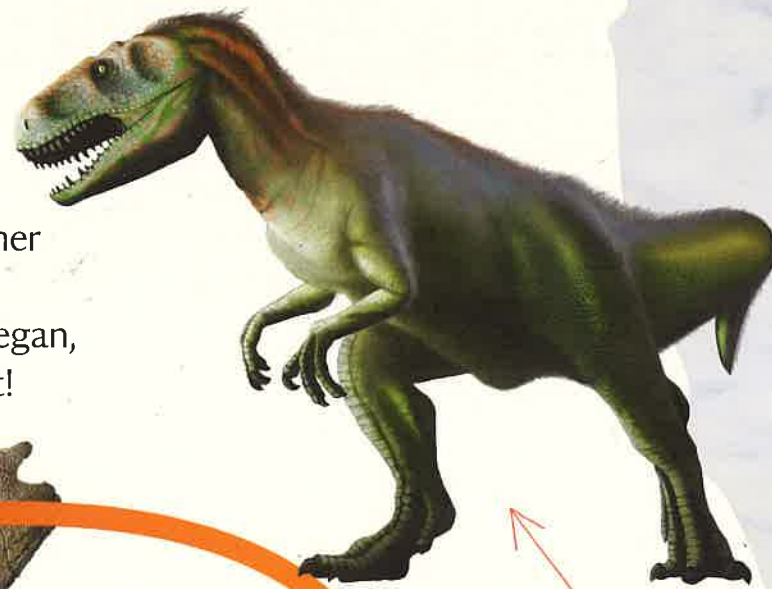
You can find fossils along the Antrim coastline that date from the Jurassic period. Whitepark Bay, a 10-minute drive from the Causeway, is full of beautiful examples. Why not start your fossil hunt there? This beauty, called a palaeochiceras, was found there—it's around 140 million years old!

## 200—145 million years ago

The Jurassic period, or 'The Age of Reptiles'.



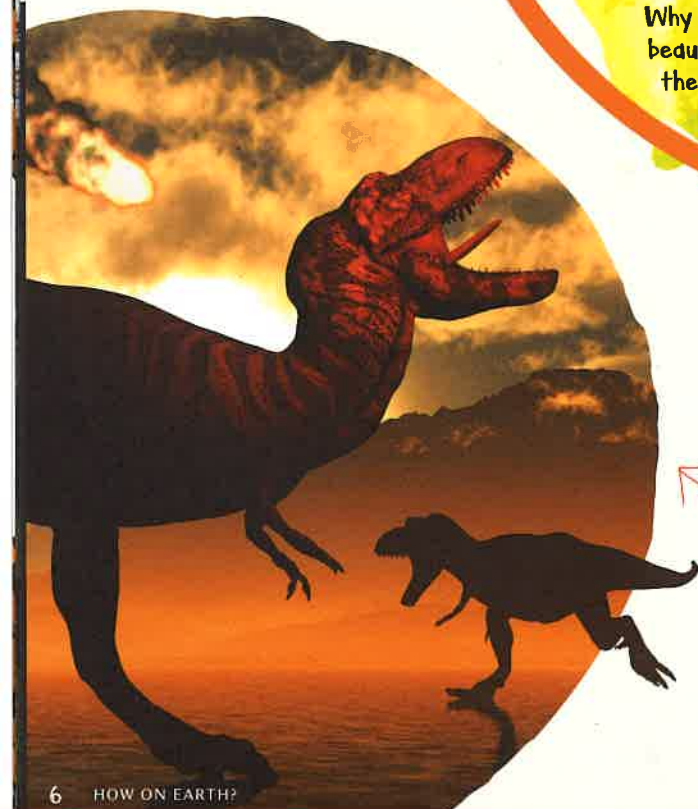
Megalosaurus lived 166 million years ago in what is now southern England. Scientists think that megalosaurus may have been covered in fine feathers, particularly along its back and belly.



## 65 million years ago

Volcanic eruptions all over the world chuck massive amounts of earth into the atmosphere changing the climate. Plants don't grow, so the herbivorous (veggie) dinos die out and the meat-eaters eventually starve. And if things weren't bad enough, a huge asteroid strikes the Earth near Mexico and finishes them off.

A dinosaur's-eye view of the asteroid strike.



## 2.6 million—11,500 years ago

The Earth cools down. Over this time, there are 20 separate cold episodes (ice ages). Very roughly, there was an ice age every 100,000 years or so.



## 65—60 million years ago

By now Ireland has emerged from the sea and vegetation covers its chalky soils. But this peaceful scene is shattered by cracks opening up in the ground and lava flowing out over the land. Lava cools and solidifies. This happens many times during this period of intense volcanic activity: leak, flow, cool, repeat.



This gigantic deer, *Megaloceros giganteus*, used to roam in Ireland during the last ice age, around 11,500 years ago.

## 2 million years ago

Distant ancestors of humans evolve in East Africa, descended from animals called 'southern apes'.

Does this remind you of anyone you know? This is *Australopithecus africanus*, or the 'southern ape', and she's related to every one of us!

## 70,000 years ago

Out of six species of humans, *Homo sapiens* (our relations) come out on top. Go us!

## The present day

Modern *Homo sapiens* (that's you and me and everyone we know) come to the Giant's Causeway to wonder at the millions and millions and millions of years of earth-shattering history that has gone on right here!

## 25,000 years ago

Ice sheets cover this part of the world. As they move over the surface of the Earth, they carve out valleys and reveal formations such as the Giant's Causeway.





# Fire and ice

Looking around today all you see are craggy cliff-faces, crazy paving and crashing waves. It's hard to imagine this place looking any other way, but it has looked very, very different over its long history. For starters, try to imagine it as a deep river valley with a tropical climate and dinosaurs! And then try to imagine the Earth's plates moving under the dinos, sliding apart and letting lava flood out. No wonder they didn't hang around!

## COOL SHAPES

Around 60 million years ago the river valley started filling up with lava, lava that has a temperature of between 700 and 1,200°C! (A hot cuppa is about 70°C!) When it came into contact with the air, the surface of the lava quickly cooled, forming a crust. This crust acted like a blanket, stopping the lava below from cooling so quickly, and this slow cooling is what caused the shapes you see today. Because the rock cooled slowly and evenly, it was able to make best use of the space. Think of a honeycomb, another natural structure, which uses five- and six-sided shapes to cram in as much material as possible while keeping the whole thing strong. Another name for the middle part of the Causeway is the Honeycomb Causeway.



The hexagon is a good, strong shape that crops up elsewhere in nature – here in a honeycomb!



Things were once seriously hot around here! Lava started flowing about 60 million years ago.

## SCHOOL OF ROCK

The Giant's Causeway was the result of not just one lava flow but of many that happened over many millions of years. That's a lot of cooled lava – which we call basalt by the way – and it's not just the Giant's Causeway that's made of basalt, but most of County Antrim is made of the stuff. In fact, there were so many lava flows that in places the basalt is over 1,000 metres thick!

All this happened over a huge amount of time and there was a period of about two million years when there were no lava flows. The climate of the time was warm and wet, and it weathered the basalt, creating deep red soil. This is called laterite and you can see layers of it in the cliffs, sandwiched between the dark basalt, showing the break between flows.

BBBBBBBBRRRRRR!!!!!!

Millions of years after all this intense volcanic activity, the climate was very different. It had cooled dramatically and there were times when much of the Earth's surface was covered in ice. Very roughly, there was an ice age every 100,000 years or so. When people talk about the Ice Age today, if they don't mean the movie, they're generally referring to the most recent one, which was at its iciest about 21,000 years ago and finally thawed out about 11,000 years ago.

## THE BIG THAW

All that ice over all those ice ages froze and expanded, melted and shrank, moving out from the poles over the surface of the Earth and carving away the land beneath. This happened at the Giant's Causeway, the earth being scraped away to reveal the pillars of basalt in that ancient river valley. Things warmed up some more, sea levels rose and waves started to wear away the rock.

And there you have it – how to make a Giant's Causeway in 60 and a bit million years!



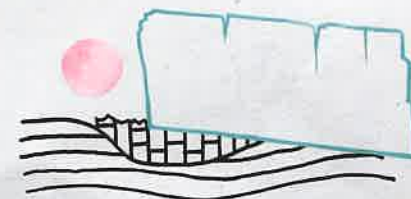
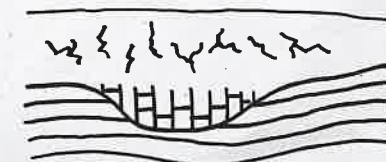
From lava flows fast-forward a few million years and it was a very different scene! But when the ice started to melt it revealed interesting things beneath!



## Anyone order a causeway?

Here's our very brief illustrated history of the Giant's Causeway. Can you match the events with the captions that describe them?

- 1 Once upon a time, over 60 million years ago, there was a river running through a valley that was covered with plants and trees.
- 2 Around 60 million years ago, cracks open up in the Earth's crust and out oozes lava. This happens not just once, but lots of times, over time filling up the river valley.
- 3 The lava in the river valley cools, solidifies and turns into rock, quickly at the top and slowly at the bottom. The slowly cooling lava cracks in even patterns.
- 4 Things get really chilly. Lots of the Earth's surface is covered in massive, slow-moving glaciers that scrape away at the top layers of rock.
- 5 Things start to warm up again, the ice melts, the sea levels rise and waves wear away at the rock. When the sea levels drop again, the Causeway is revealed in all its glory!





# That's not the story I heard!

Massive movements in the Earth's crust, fiery fields of lava, ice ages and glaciers carving their way over the Earth over millions of years.... That's what the scientists would have us believe, but if you've heard of the Giant's Causeway it's likely you've heard of the giant after whom it's named – Finn McCool.

## A TALL TALE?

Finn McCool was a giant who, for the most part, lived a quiet life with his wife and baby son here on the Northern Irish coast. But there were rivals, other giants, and there was one in particular Finn didn't much like the look of. You know the sort of thing – big warty nose, one massive eyebrow, knuckles that grazed the floor. This was his Scottish neighbour, Benandonner, and Finn decided to challenge him to do battle.

But as Benandonner lived all the way over in Scotland, Finn had to build a causeway across the sea to reach him – it's a well-known fact that giants hate getting their feet wet! So that's what he did but once Finn's rocky road had reached Scotland, he got a closer look at Benandonner and realised that he was much bigger, uglier and stronger than he'd looked from across the water! Finn decided he didn't want to fight Benandonner after all and ran back home as fast as he could – so fast that he lost a boot! – but not before Benandonner had spotted him and began chasing after him.

Finn got home, found his wife Oonagh and explained the terrible mistake he had made. Oonagh, being the cleverer one, had the idea of dressing Finn up as a baby and putting him into their son Oisín's cot.



Just then there was a loud banging at the door – Benandonner! 'Where's Finn?' he demanded, 'I want to fight him!' 'Calm down!' said Oonagh, 'Finn's out looking after his cows. Why don't you come and wait for him and I'll make you a cup of tea?' So Benandonner had his cup of tea but grew impatient. 'Where's Finn?' he roared. Oonagh explained again, 'He's out herding the cows but while you're here why don't you say hello to our son Oisín?'

When Benandonner saw the MASSIVE baby in the cot he got scared. He thought, if that's the size of the baby, how big is the daddy?! Benandonner immediately ran out of the house and home across the Causeway, tearing it up behind him to way to make sure the baby's dad couldn't follow him.

Sounds like a fairy tale? Well, there's evidence to prove that Finn really built his bridge all the way to Scotland. You can see the other end of Finn's Causeway across the water on the Scottish island of Staffa (or you can just look on page 12).



Read all about it!

Imagine the giants had met and done battle. Who do you think would have won? How would you have reported it? Include eye-witness accounts and, of course, a picture!

## THE Causeway Chronicle

Max 11°C / Min 5°C

Sunday 1 April 2018 / no. 7194

Since 1688

## GIANTS GO TO WAR!

Handwriting practice lines for the article 'GIANTS GO TO WAR!'.



The warrior Finn McCool appears in many myths. He was famously fair-haired – his Irish name *Fionn* means 'fair'. He was the leader of the Fianna, a band of warriors. Finn loved animals, especially his dog, who was an Irish wolfhound called Bran.



# Flows around the world



## Where in the world?

Can you label the map to match up with the numbered descriptions of these formations? X marks the spot of our Causeway!

The Giant's Causeway is amazing but not unique. Here are some other famous formations, some many, many miles away but all formed as a result of the same earth-shattering movement of plates that caused the North Atlantic Ocean to open up.

### 1 Doon Point, Rathlin Island, Northern Ireland

A close relation of the Giant's Causeway just across the water. These columns are thought to be even older than the Causeway.

PACIFIC OCEAN

### 2 Fingal's Cave, Island of Staffa, Scotland

Further away, across the North Channel (the bit that connects the Irish Sea with the Atlantic Ocean), is Fingal's Cave. Fingal is the Scottish version of the Causeway giant – Finn McCool. Proof of the legendary bridge that Finn built to do battle with Benandonner?

### 3 The Faroe Islands

You'll find these halfway between Iceland and Norway, although they actually belong to Denmark! There are 18 rocky, volcanic islands that formed after a series of lava flows, just like those at the Causeway but even more so – these built up to a depth of nearly 3,000 metres!

### 4 Svartifoss, Iceland

A hard name to say without giggling, Svartifoss translates from the Icelandic as 'The Black Falls'. It's one of many such formations on this icy island just outside the Arctic Circle.

### 5 Disko Island, Greenland

Does this sound like the coolest place or what?! Well inside the Arctic Circle, it's cooler than cool and it's the most northerly point of that break in the tectonic plates that created the Atlantic Ocean.

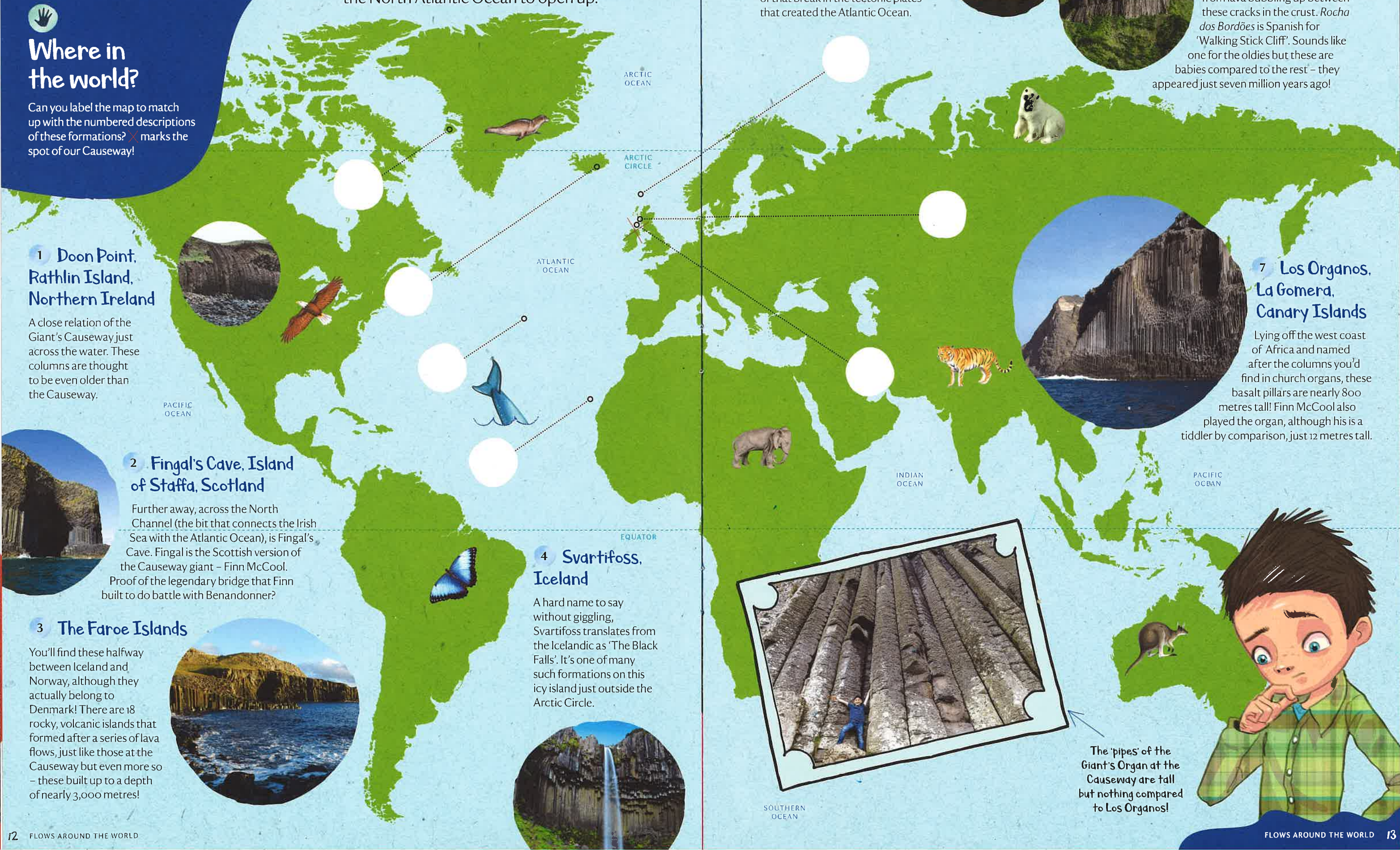
### 6 Rocha dos Bordões, Flores Island, Azores

Sitting in the middle of the Atlantic Ocean at a point where not two but three tectonic plates meet, the islands of the Azores formed from lava bubbling up between these cracks in the crust. Rocha dos Bordões is Spanish for 'Walking Stick Cliff'. Sounds like one for the oldies but these are babies compared to the rest – they appeared just seven million years ago!

### 7 Los Organos, La Gomera, Canary Islands

Lying off the west coast of Africa and named after the columns you'd find in church organs, these basalt pillars are nearly 800 metres tall! Finn McCool also played the organ, although his is a tidder by comparison, just 12 metres tall.

The 'pipes' of the Giant's Organ at the Causeway are tall but nothing compared to Los Organos!





# Discovery!



Obviously the locals knew about the Giant's Causeway since forever – it's pretty hard not to notice! But it took a while for the rest of the world to find out about this place and of course they were amazed. Like a lot of people who come to see the Causeway today, they couldn't quite believe this wasn't man-made.

## THE FIRST TOURIST

The first person to write about the Giant's Causeway was a man called Robert Redding. That was in 1688. He'd clearly seen nothing like this before! He wrote: "there are a vast quantity of Hexagonal Pillars of stone about 8 Inches side.... These Columns are so regularly ranged and fitted one to the other that it seems rather the work of art than nature."

## A WORK OF ART

Word spread of this wonder of nature and along with scientists seeking answers came artists seeking inspiration. Susanna Drury came from Dublin to paint the scene and her watercolours are the first accurate views we have of the Causeway. As well as details of the columns, she included people in her paintings wearing the fashions of the day, which was around 1740. You can see ladies in their best dresses with huge skirts – not the best thing to wear in the winds that usually whip around the Causeway!

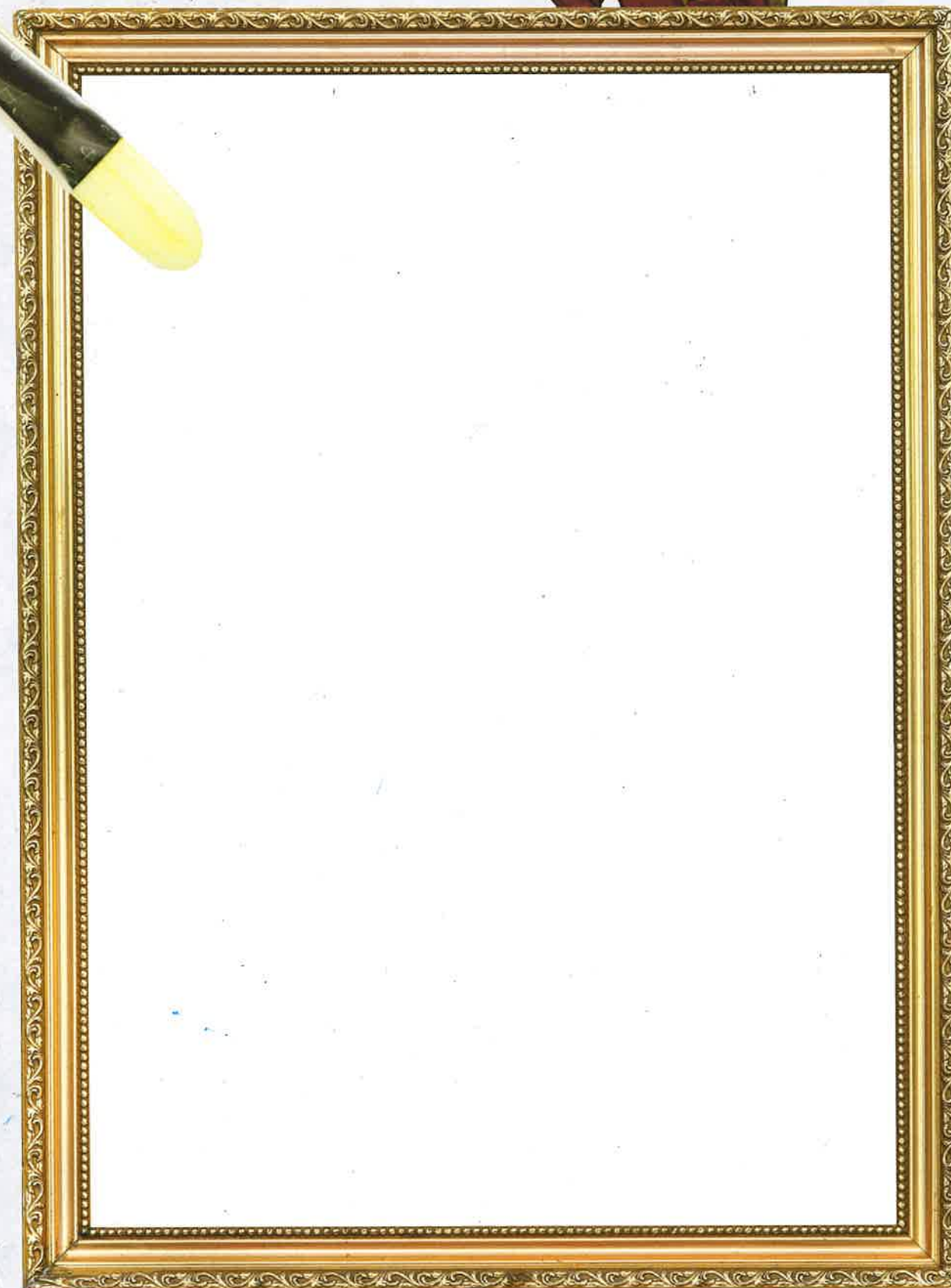
One of Susanna Drury's award-winning watercolours.

Susanna's paintings went down so well with the Dublin Society that she won prize money of £25!



## Create your own Causeway

Susanna Drury's paintings helped bring the Giant's Causeway to the world's attention and even won her a prize! Can you create your own work of art to rival hers? (Sorry, we're not offering any prizes here!)





# Rocks in the post

Does your mum or dad work from home? Well so did the scientist famous for making the Causeway, er, famous!

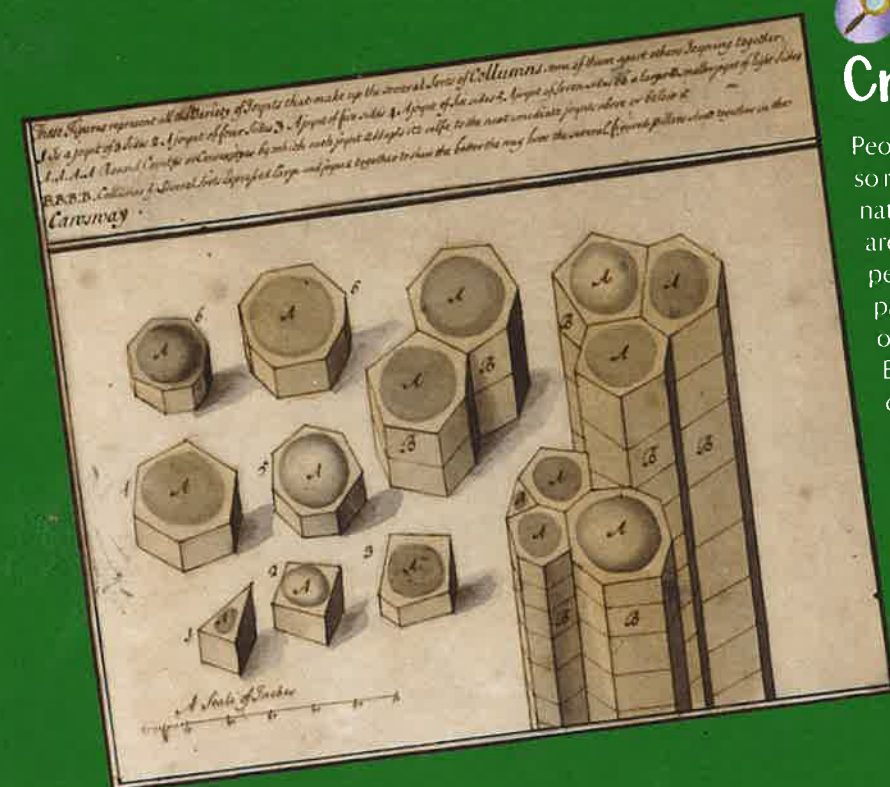
## POOR POSTMAN!

Sir Thomas Molyneux was the first person to seriously study the Giant's Causeway and for that his name's known to this day. But amazingly, he never saw the Causeway for himself! He lived in Dublin about 150 miles away, a tricky but not impossible journey in those days, but he preferred to stay at home in his study. There he'd read his weighty, leather-bound books and write letters. To help him learn about the Causeway he had someone local send him descriptions and even break off bits of rock and post them to him. Can you imagine receiving a whole load of rocks in the mail?!

## DETAILED DRAWINGS

Sir Thomas Molyneux was good at getting other people to do things for him. He paid an artist called Edwin Sandys to produce some drawings of the rocks at the Giant's Causeway. These beautiful and detailed drawings (here and on the next page) showed a special feature of the columns – that they were made of sections that stacked up and fitted together in a particular way. The top of one section curves in like a bowl and the section above it bulges at the bottom, so they fit together really snugly. This is called a ball and socket joint, the sort of joint you have in your body, like where your arm slots into your shoulder.

You can tell from the big wig and fancy silk gown that this guy's important. He's Sir Thomas Molyneux, the man who brought the Causeway to the world's attention.



## Crazy shapes!

People have struggled to believe that something so regular and geometric could have happened naturally. But geometry and mathematical patterns are actually found throughout nature – think of the perfect symmetry of a snowflake, or the repeated patterns in a peacock's tail. Here's the geometry of the Giant's Causeway. In this detail from Edwin Sandys' drawing you can see all the different shapes that the columns come in.

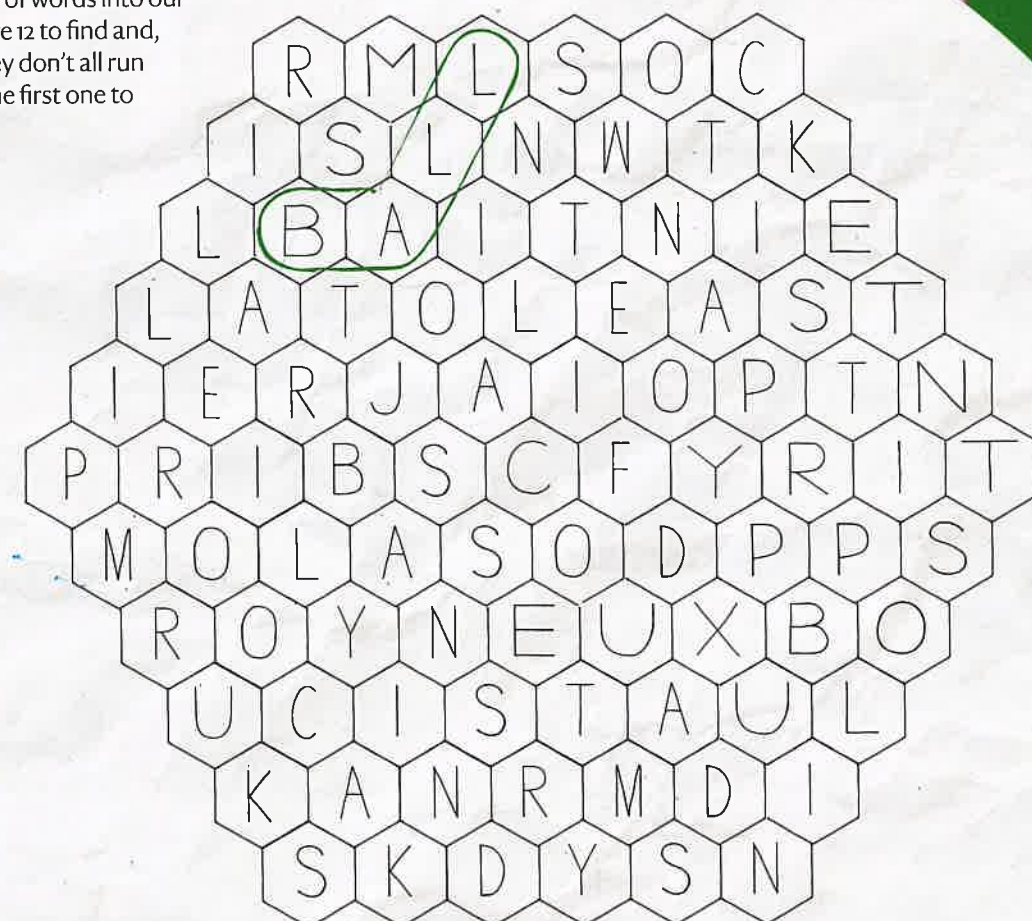
- Three-sided (triangular)
- Four-sided (quadrilateral)
- Five-sided (pentagonal)
- Six-sided (hexagonal)
- Seven-sided (heptagonal)
- Eight-sided (octagonal)



## Hexagon wordsearch

Do you see how in Edwin Sandys' drawing that some columns of the Giant's Causeway are lots of hexagons locked into a pattern like a honeycomb? Here we've locked a whole load of words into our very own honeycomb. There are 12 to find and, to make things a bit trickier, they don't all run in straight lines. We've found the first one to get you started.

- BALL
- SOCKET
- STUDY
- MOLYNEUX
- PILLAR
- POST
- DUBLIN
- BASALT
- ROCK
- SANDYS
- JOINT
- SCIENTIST





# MASSES of MYTHS

The Irish are some of the best storytellers around, and something like the Giant's Causeway inspires all sorts of stories. You've heard one version of what happened here, but there are plenty more.

→ Which would you believe?

## A TRAGIC LOVE STORY?

Some soppy folk reckon Finn built the Causeway to reach a fair Scottish maiden he'd fallen in love with. But his Granny didn't think much of his running off with this girl, so after Finn had spent the day busily building, she used her witchy powers to stir up the sea and destroy what he'd done. The next day he'd start building over, and Granny did it again. This happened time and time again until, one day, Finn keeled over dead from exhaustion. Granny clambered up a hill to see how Finn was getting on and, when she saw what she'd done, she was so horrified she turned to stone. If you look, you'll see her standing there still to this day.

## CAMEL CABS

One story goes that Finn found himself far from home and needed to get back in a hurry. So what did he do? He hailed a giant galloping camel of course! Once he got home, Finn had clearly taken a liking to his camel and decided to keep him. He called him Humphrey and he's still here!

Handily, Finn's laces were long enough to build this rope bridge eight miles along the coast.

Cinderella had her glass slipper. Finn had this ugly old boot!



## Where's the evidence?

Myths they may be, but there are some clues lying about that back up parts of the story. See this massive stone polished smooth by the sea? Well, what if we told you it wasn't a stone but the left boot of a giant in a big hurry? In our original story Finn ran as fast as he could away from bug-ugly Benandonner, so quickly that his boot came off and he didn't stop to pick it up. The laces came loose too and got washed up further along the coast where they were used to build the rope bridge at Carrick-a-Rede. People have studied the evidence and worked out with this size of boot – 93½ to be precise – Finn must have been over 16 metres tall!



Humphrey is in fact a hard type of rock called dolerite that has worked its way up between softer rocks. Over the years the wind and waves have shaped him into the Humphrey we know and love!

Humphrey resting after giving Finn a back-breaking lift home!

## Another fishy tale

There's another story about Finn that explains how he got to be so clever and could keep one step ahead of his opponents. (Hang on, wasn't that his wife?)

When he was young, Finn studied under a druid called Finnéces. After seven years trying to catch the Salmon of Knowledge, Finnéces finally caught it and told his pupil to cook it for him. While cooking the salmon, Finn burned his thumb and, without thinking, stuck it in his mouth. After

that he did a whole lot more thinking – he'd just gained all the knowledge in the world! Not surprisingly, Finnéces was not a happy chappie. The part of the story we know to be true is that eating salmon boosts your brainpower. And we know there are plenty of salmon around here – salmon fishing used to be a major industry on this part of the coast. Go see our friends at Carrick-a-Rede and they'll tell you all about it. For now, join the dots for your catch of the day.





# Shipwrecked!

Ill-tempered giants aren't the only ones to have declared war round here. Back in the summer of 1588 the English and Spanish weren't getting on at all well. The Spanish sent their Armada – a fleet of 130 ships – to invade, but the English navy fought them off using fireships and forced the Spanish to flee. But that was just the start of their problems...



## OUT OF THE FRYING PAN...

Into the fire? Well, actually no, into something much wetter. The Spanish had to get out of hostile English waters, so the surviving ships headed up to and around Scotland, where they got caught up in the storms of the North Atlantic. One of these ships, *La Girona*, met her end on 26 October 1588 after she hit the rocks of Lacada Point, a little way along the coast from the Causeway. Of the 1,300 men on board – many more than there would normally be as they'd picked up sailors from other shipwrecks – just nine survived. After being sheltered for a while in the village of Dunluce, they were taken to safety in Scotland.

This is what *La Girona* would have looked like before being smashed to pieces on rocks near the Causeway!



## A LONG, WATERY WAIT

Nearly 400 years passed. The details of what had happened to *La Girona* had become as murky as the waters in which she lay. Some of the locals actually made up stories about what had happened and where *La Girona* had gone down to throw treasure-hunters off the scent. But then in 1967, a Belgian diver and historian called Robert Sténuit pieced together the clues and found her and all her treasure! In total, over many dives, they spent more than 6,000 hours recovering 12,000 items, including gold, jewellery and cannons.



## Clues in the name?

You don't have to speak Spanish to think there might have been a clue to *La Girona's* watery whereabouts. The name of the bay where it was eventually found? Port na Spaniagh! Err, hello-o! Lacada Point is a funny one as, although it sounds Spanish, it actually comes from the Gaelic *Leac Fhada*, meaning 'long flagstone'.

## FINDERS KEEPERS?

With such an important and valuable discovery, obviously the question of who should keep the treasure came up. Spain claimed it belonged to them, while others argued that it should stay in Northern Ireland. In the end, a court decided that no single owner could be found, so the objects would have to be sold. They were valued at £132,000 and Sténuit agreed a deal for the collection to stay in Northern Ireland and in the Ulster Museum, where you can see the Girona gold on display.



## The hunt for treasure

*La Girona* was carrying all sorts of valuables when she sank close to the Causeway. There's a story that James McDonnell of nearby Dunluce Castle took some treasure from the wreckage to make repairs to his castle! But there were still plenty of precious objects on the seabed when the divers made their discovery nearly 400 years later. Can you find some of the things they did?

LEAD  
GOLD  
SILVER  
RINGS  
CHAINS  
AMULETS

COINS  
BRASS  
JEWELLERY  
CANNON  
SALAMANDER  
RUBIES



This salamander is made with rubies from Burma and gold from South America. At this time Spain ruled over large parts of the world. These creatures were believed to have power over fire, so were carried for good luck by sailors of wooden ships.

D	F	G	H	M	I	R	I	N	G	S	A	F	G	J	S
A	I	O	N	B	M	U	G	X	V	G	U	Y	I	L	D
B	S	F	B	N	A	B	Q	W	G	H	I	O	R	C	F
N	I	A	R	A	M	I	C	D	E	R	A	H	M	H	G
M	T	J	L	W	G	E	A	F	I	J	W	R	T	A	H
K	E	D	N	A	V	S	I	L	V	E	R	D	O	I	J
A	V	D	R	L	M	A	M	G	C	W	L	M	I	N	K
B	R	A	S	S	T	A	S	G	H	E	A	J	F	S	I
G	E	M	O	Q	H	M	N	A	P	L	E	A	D	A	Y
A	J	S	Q	H	U	O	L	D	R	L	A	F	H	L	T
E	K	N	R	T	N	W	D	T	E	E	D	V	N	F	R
U	S	I	H	N	A	T	G	H	K	R	A	V	M	G	E
D	Y	O	A	V	W	S	R	J	A	Y	P	I	L	J	W
X	G	C	S	E	D	H	I	L	M	K	L	U	A	O	S
A	D	B	N	T	L	M	E	S	T	E	L	U	M	A	T
Y	G	O	L	D	V	B	E	M	G	H	I	E	T	K	L

These gold coins were recovered from the wreck of the *La Girona* and are now in the Ulster Museum in Belfast.

