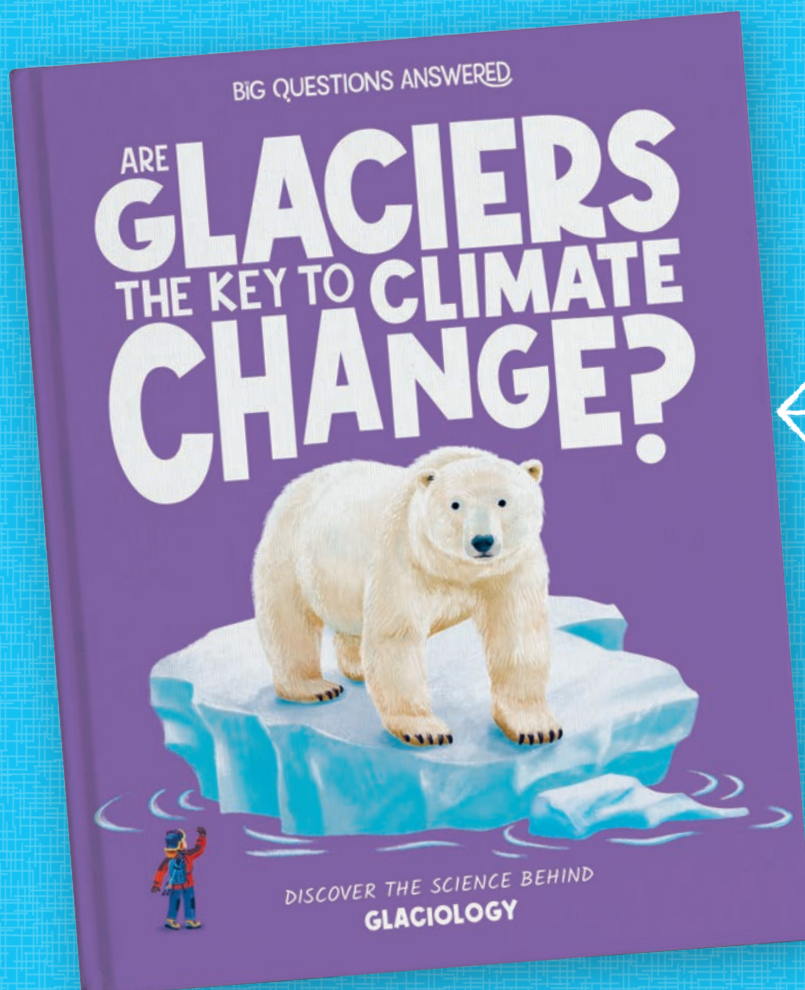


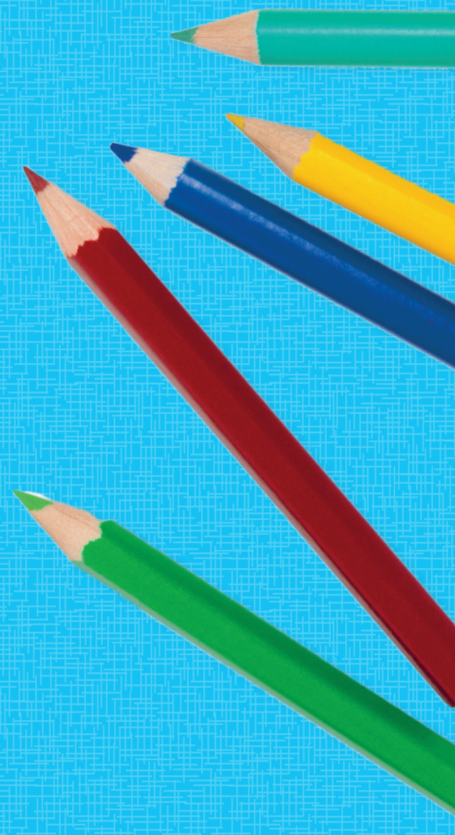
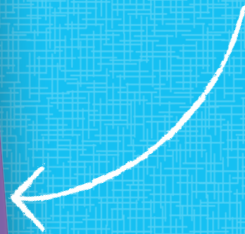
THE BIG QUESTIONS ANSWERED

YOUNG GLACIOLOGISTS'

# ACTIVITY PACK



*Full of fun and  
exciting activities to  
accompany this book!*



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(t = top, b = bottom, m = middle, l = left, r = right)

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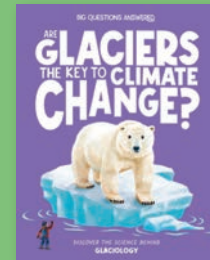




## ARE GLACIERS THE KEY TO CLIMATE CHANGE?

For reference to the Teachers' & Parents' Resources, this goes with 'Drilling into Ice: Scene 2'.

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## SNEAKY SCIENTISTS

These sneaky scientists are trying to catch us out! Can you spot the 10 differences between the two scenes? Circle them when you spot them.

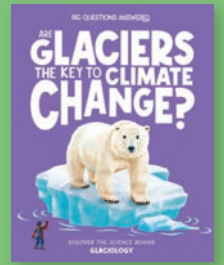




# ARE GLACIERS THE KEY TO CLIMATE CHANGE?

For reference to the Teachers' & Parents' Resources, this goes with 'Clues Hidden in Ice Cores: Scene 3'.

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## A MESSAGE IN THE ICE

You are on an expedition studying glacier ice cores when you spot a piece of paper that's been hidden inside the ice for years and years! Can you use the code below to work out what it says?

A	B	C	D	E	F	G	H	I	J	K	L	M

N	O	P	Q	R	S	T	U	V	W	X	Y	Z

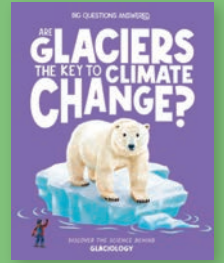
,   
 ,



## ARE GLACIERS THE KEY TO CLIMATE CHANGE?

*For reference to the Teachers' & Parents' Resources, this goes with 'Icy Animals: Scene 4'.*

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## DESIGN YOUR OWN ICY DISCOVERY

Scientists have found some amazing things hidden in underground ice! Imagine you have made your own discovery of something hidden in ice and draw a scene to show it.

*Draw your discovery in here!*

Have you discovered a new type of animal or plant? If so, give it a name!

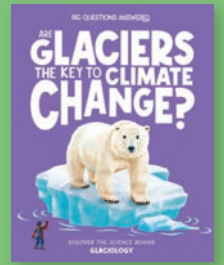




# ARE GLACIERS THE KEY TO CLIMATE CHANGE?

*For reference to the Teachers' & Parents' Resources, this goes with 'Back in Time: Scene 5'.*

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## PREHISTORIC MIX-UP

Learning about animals that lived thousands of years ago can be complicated. Can you match up the photograph of each prehistoric animal with its name and description?

Draw a line to match up the picture with the correct name.

**Fact:**

My body was covered in bony plates and I had a huge shell on my back which helped keep me safe from predators.



**Fact:**

I'm related to elephants, but my body was covered in thick fur to keep me warm in ice ages.



**Fact:**

I was much bigger than my relatives that live today; I was the biggest mammal that has ever walked on two legs!



**Fact:**

I was a fierce meat-eating predator and used my huge canine teeth to attack and eat prey.



*I am...*

**A GIANT  
GROUND SLOTH**



*I am...*

**A SABRE-  
TOOTHED CAT**



*I am...*

**A WOOLY  
MAMMOTH**



*I am...*

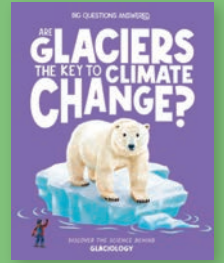
**A GLYPTODON**



## ARE GLACIERS THE KEY TO CLIMATE CHANGE?

*For reference to the Teachers' & Parents' Resources, this goes with 'Ice Age – Then and Now: Scene 6'.*

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## INCREDIBLE ICE AGES

Can you use the words below to fill in the blanks and uncover some amazing ice age facts? Each answer can only be used once.

glaciers

thousands

erupt

sabre-toothed

fossils

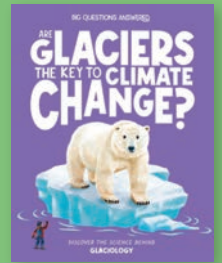
1. Ice ages are periods of time where the world is much colder and \_\_\_\_\_ expand to cover much bigger areas.
2. Scientists have found evidence that Earth has always gone through ice ages and warm periods. These cycles can last for \_\_\_\_\_ of years.
3. It's thought that ice ages can be caused by different things, including how much sunlight reaches Earth, how much greenhouse gas is in the air, and how often volcanoes \_\_\_\_\_.
4. Scientists learn about ice ages by studying rocks and \_\_\_\_\_ hidden inside them. These things hold clues about the movements of glaciers long ago.
5. The last ice age ended about 11,500 years ago. Many large animals, like mastodons, \_\_\_\_\_ cats, and giant ground sloths, that had lived on the ice went extinct as the world got warmer.



# ARE GLACIERS THE KEY TO CLIMATE CHANGE?

For reference to the Teachers' & Parents' Resources, this goes with 'Discovering Climate Change: Scene 7'.

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## HIDDEN EVIDENCE

Scientists use all sorts of evidence to learn about climate change! Can you find and circle the words listed below, in the grid. Words can be found in any direction (including diagonals) and can overlap each other.

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

NATURE  
EARTH  
ENVIRONMENT  
CLIMATE

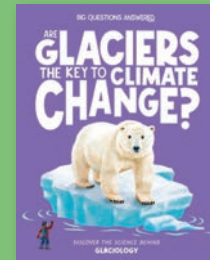
WEATHER  
RAINFALL  
TEMPERATURE  
SAMPLE

FOSSILS  
POLLEN  
ROCKS  
TREE TRUNK

## ARE GLACIERS THE KEY TO CLIMATE CHANGE?

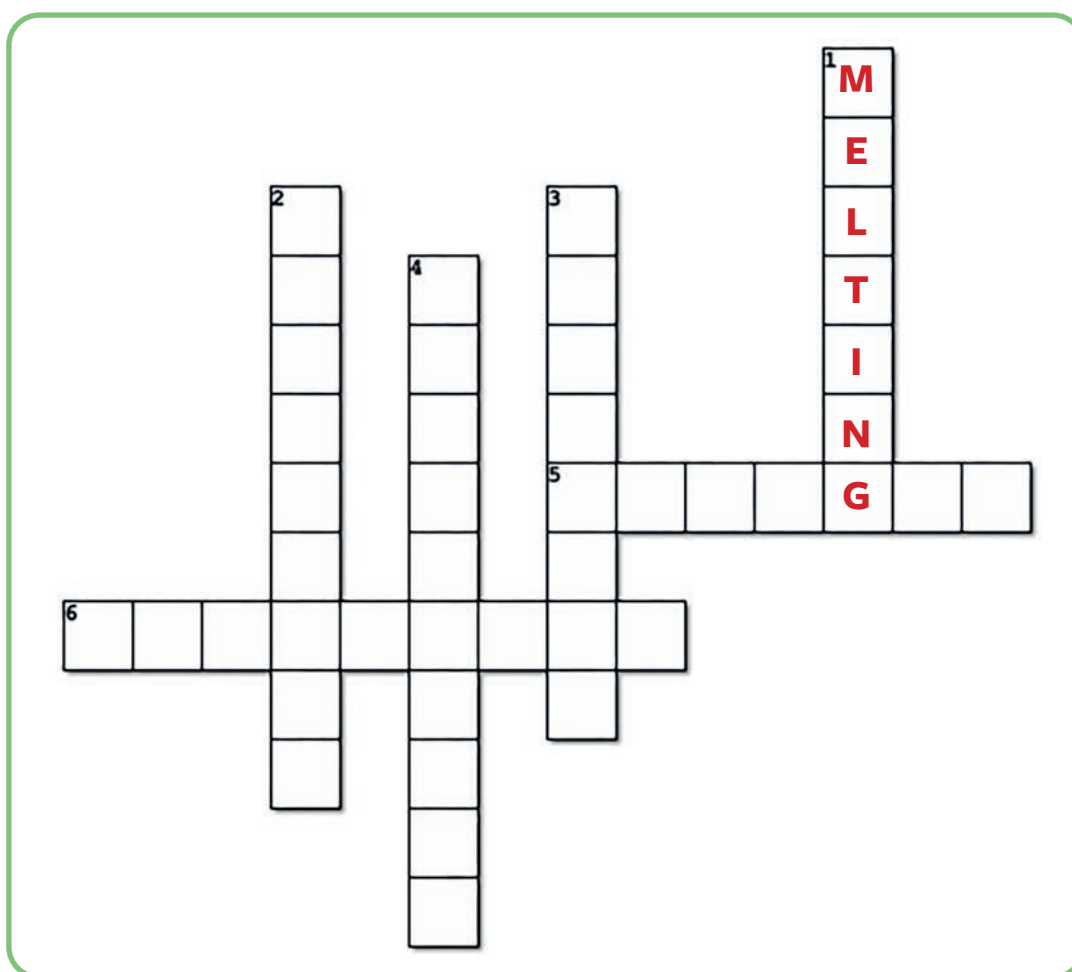
*For reference to the Teachers' & Parents' Resources, this goes with 'Humans and Global Warming: Scene 8'.*

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



# CHANGING WORLD

Earth's climate is constantly changing, but when it gets really warm really fast, the impact can be felt around the world. Use the clues below to work out the different things that can happen as a result of climate change and fill in the boxes. The first one has been done for you.



## FLOODING

~~MELTING~~

## WILDFIRES

## HURRICANE

## DROUGHT

## EXTINCTION

## ACROSS

5. When places get hotter, drier, and there's hardly any rain.

6. A type of tropical storm that has strong winds, rain, thunder, and lightning.

## DOWN

~~1. Something that can happen to glaciers if Earth gets too hot.~~

2. A type of natural disaster that can spread quickly in hot, dry forests.

3. When places become covered in water due to lots of rain and sea levels rising.

4. When a type of plant or animal no longer exists.

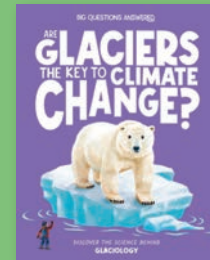




# ARE GLACIERS THE KEY TO CLIMATE CHANGE?

For reference to the Teachers' & Parents' Resources, this goes with 'Investigating Glaciologists: Scene 9'.

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## GLACIOLOGISTS' TOOLKIT

Glaciologists use lots of tools and wear protective clothing when working on glaciers.  
Match the name of the tool or protective clothing to the correct description.

**SUNGLASSES**

**CRAMPONS**

**HAT & GLOVES**

**MEASURING STICK**

**FIELD NOTEBOOK**

**CAMERA**

Strong metal hooks that attach to the bottom of boots to help grip slippery ice.

Something that is used to measure the length or depth of a hole in the glacier.

Something that is used to take photos of things.

Something that is used for writing and sketching things in.

Things that are worn to keep you warm.

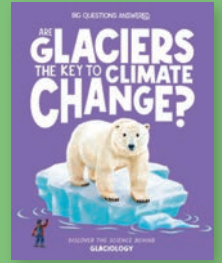
Something that is worn to protect your eyes.



## ARE GLACIERS THE KEY TO CLIMATE CHANGE?

*For reference to the Teachers' & Parents' Resources, this goes with 'Staying Cool: Scene 10'.*

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## UNEARTHING ICY SECRETS

Can you use what you've learnt about glaciers and planet Earth to work out which of the sentences are true and which are false?

	SENTENCE	TRUE	FALSE
1	The scientists who study glaciers are called astrobiologists.		
2	Glacier ice can be more than one thousand years old.		
3	Glaciologists study glaciers by pulling out big, long tubes of ice.		
4	Scientists can't learn about the past by looking at glaciers.		
5	Glaciers move faster than cars or boats.		

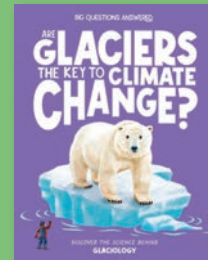




## ARE GLACIERS THE KEY TO CLIMATE CHANGE?

*For reference to the Teachers' & Parents' Resources, this goes with 'Stormy Seas: Scene II'.*

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## WAVE JUMBLE

Oh no! A huge storm has swept in and mixed up a bunch of words! Test your word-solving skills by trying to unscramble the words. They are all related to stormy seas. There is a list of the correct words below to help you.

**SAWEV**

**NEACO**

**RENCURT**

**HOLOPWIRL**

**SIHCKWREP**

**DOFLO**

**RATESWEA**

SHIPWRECK

FLOOD

OCEAN

WHIRLPOOL

CURRENT

WAVES

SEAWATER

---

## EXTRA ACTIVITY - WORD WITHIN WORDS

How many words can you find within the word 'underwater'?

1. You can only use the letters within the word 'underwater'.
2. Each of these letters can only be used once: U, N, D, W, A, T.
3. 'Underwater' has two letter E's and two letter R's so you can use them twice each.
4. You can't use any other letters from the alphabet.

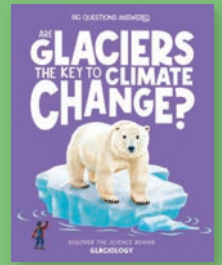
EXAMPLE: you can make the word DEER using the letters in UNDERWATER.

**UNDERWATER**

## ARE GLACIERS THE KEY TO CLIMATE CHANGE?

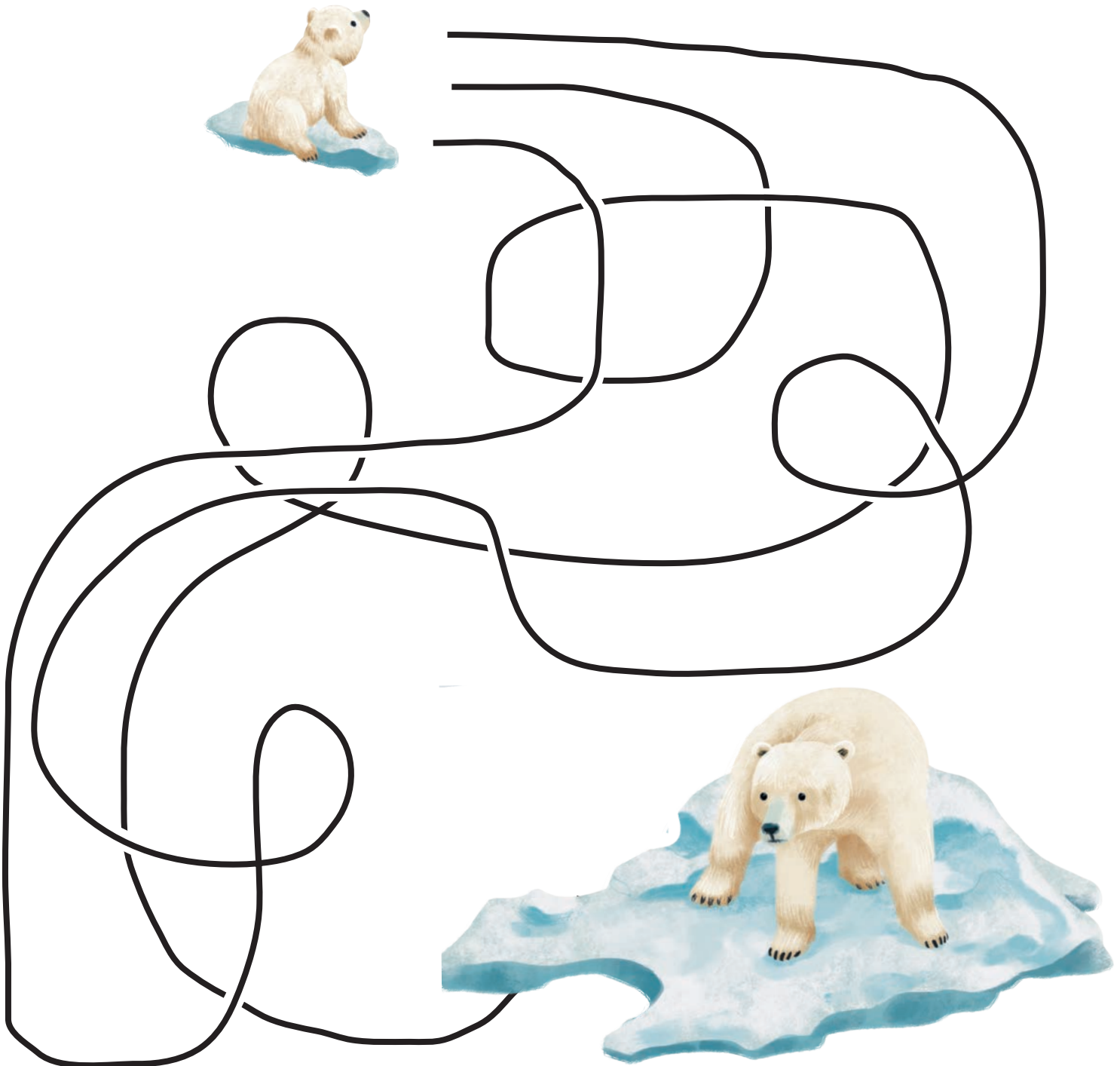
*For reference to the Teachers' & Parents' Resources, this goes with 'Unhappy Habitats: Scene 12'.*

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



# LOST IN THE SNOW

The baby polar bear has been separated from its parent and is trying to find its way back home. Can you help the baby bear find its way back to its parent?

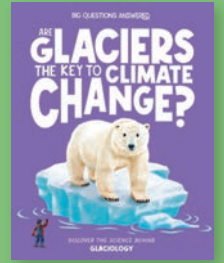




# ARE GLACIERS THE KEY TO CLIMATE CHANGE?

*For reference to the Teachers' & Parents' Resources, this goes with 'The Power of Glaciers: Scene 13'.*

[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## POLAR PERSPECTIVE

Read the questions below and think about your own opinions before filling in your answers.

**What do you find most interesting about glaciers?**

.....

.....

.....

**Would you like to live near a glacier? Why or why not?**

.....

.....

.....

**If you were a glaciologist, what would you most enjoy – going on expeditions or working in the lab?**

.....

.....

.....

**What would be your big question about glaciers?**

.....

.....

.....





# **MORE FUN GLACIOLOGY ACTIVITIES**

## **COLOURING SHEETS & MORE!**

The following activities aren't based on any specific scenes in the book. They can be used on their own or alongside the book as extra activities.

# FIND THE SCIENTIST

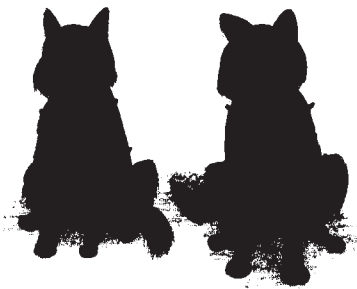
There are lots of different scientists below. Can you find the glaciologist?  
Circle them when you find them – there's only one!





# MATCH THE SHAPE

Can you match each shadow to the correct picture? Draw a line to connect them.



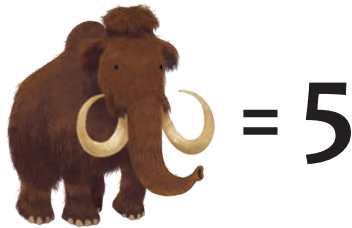
# SIMPLE SUMS

Below are 3 objects which represent different numbers.

Work out the sum based on what each object represents and write your answers in the boxes.



= 2



= 5



= 3



+



-



=



-



+



=



+



+



=



+



-



=

## COLOUR ME IN!

This colouring sheet is based on scene 3: Clues Hidden in Ice Cores.





## COLOUR ME IN!

This colouring sheet is based on scene 4: Icy Animals.





# COLOUR ME IN!

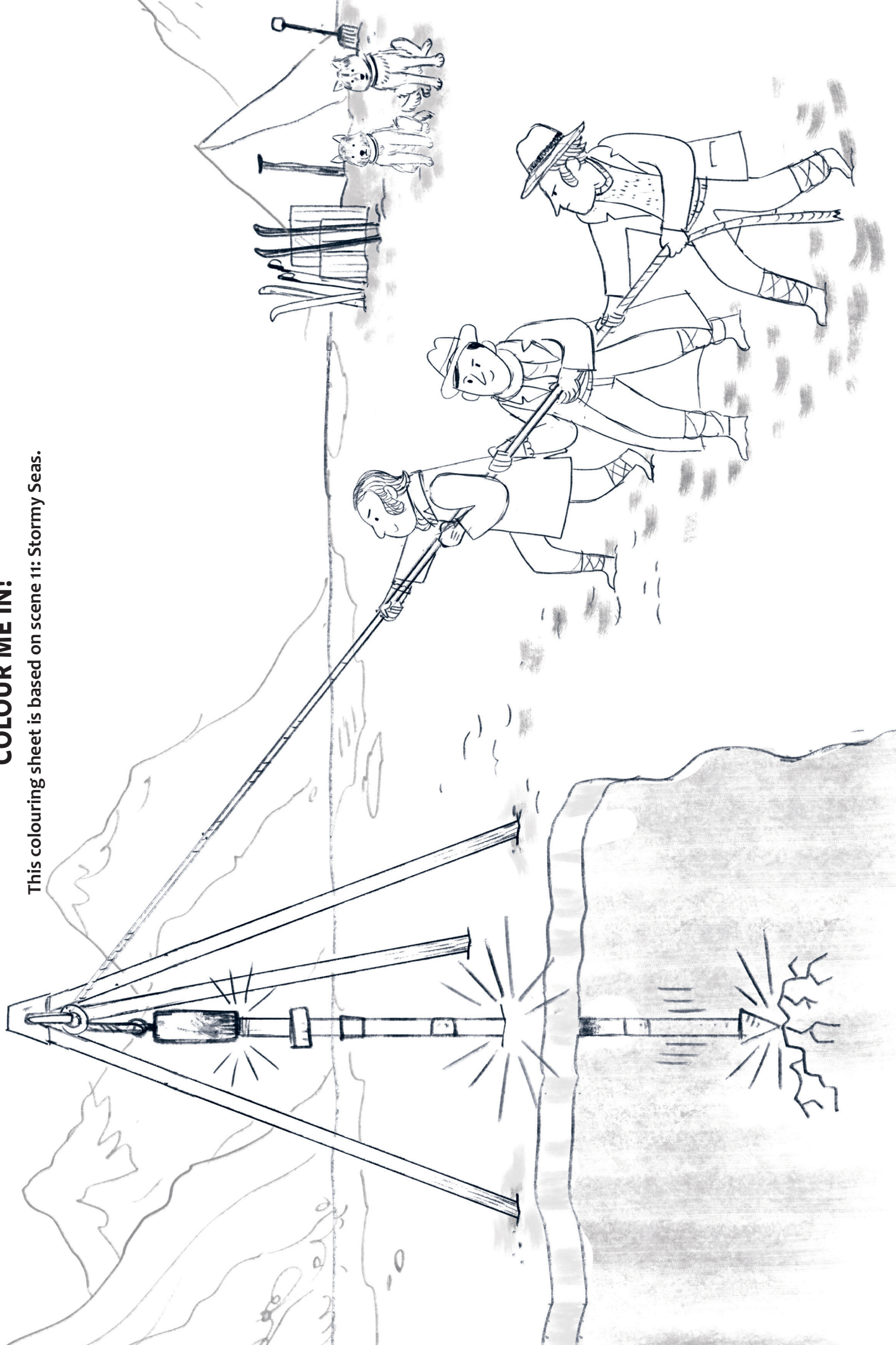
This colouring sheet is based on scene 5: Back in Time.





## COLOUR ME IN!

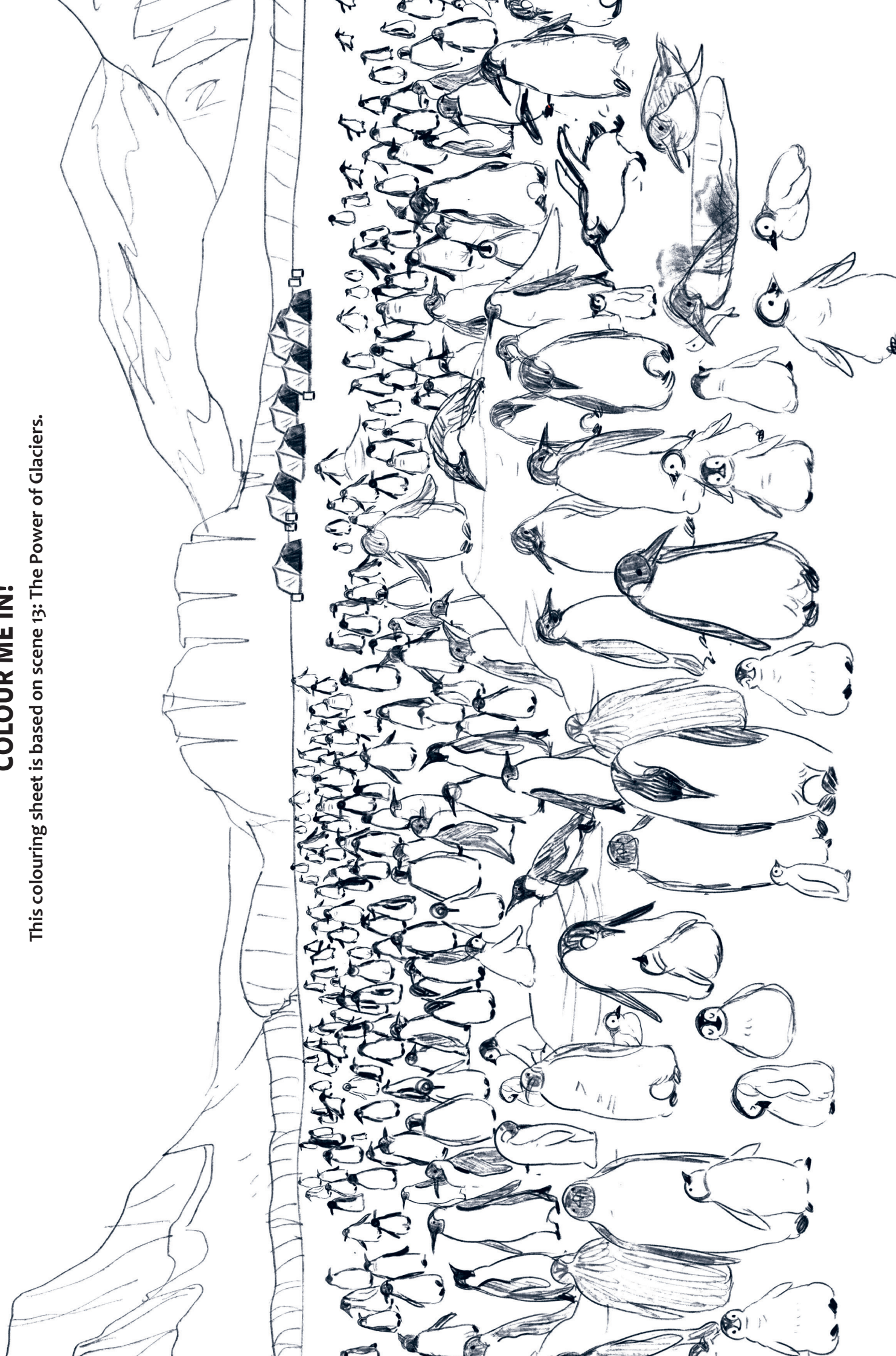
This colouring sheet is based on scene 11: Stormy Seas.





## COLOUR ME IN!

This colouring sheet is based on scene 13: The Power of Glaciers.





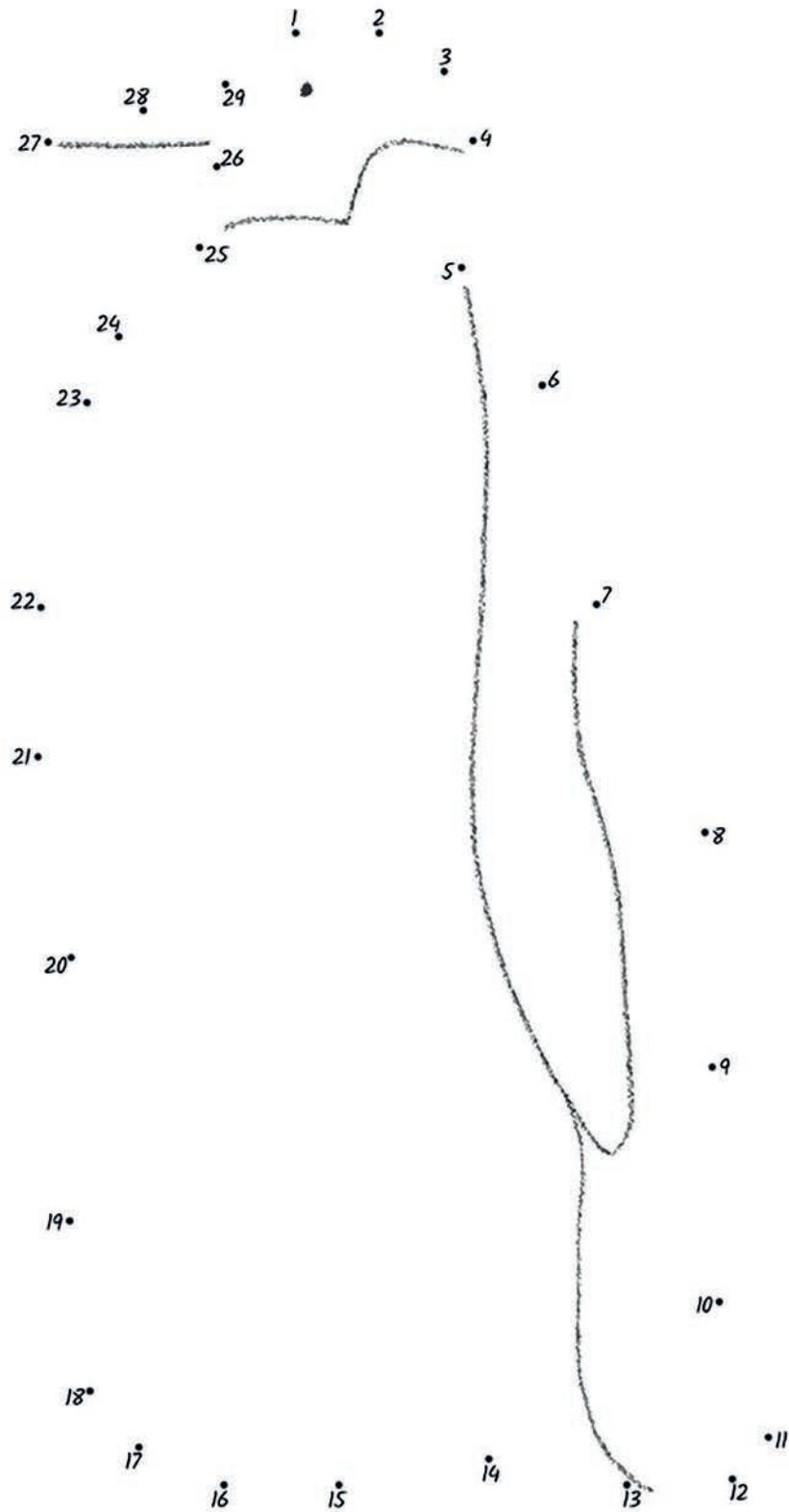
## DOT-TO-DO

Starting from 1, draw a line connecting the numbers to create a picture. Why not colour it in afterwards?



# DOT-TO-DOT

Starting from 1, draw a line connecting the numbers to create a picture.  
Why not colour it in afterwards?



# **YOUNG GLACIOLOGISTS' ACTIVITY ANSWERS**

Find the answers to the activities on the following pages.

# ACTIVITY ANSWERS

Check your answers against the correct answers below!

## SNEAKY SCIENTISTS ANSWERS

The answers below are for the 'spot the difference' activity on page 4.



## A MESSAGE IN THE ICE ANSWERS

The answers below are for the 'decoding challenge' activity on page 5.

I, DOCTOR SMITH,  
WAS THE FIRST PERSON  
TO DISCOVER THIS  
GLACIER. I HOPE IT'S  
NAMED AFTER ME!

## PREHISTORIC MIX-UP ANSWERS

The answers below are for the 'match up' activity on page 7.

<p><b>Fact:</b> My body was covered in bony plates and I had a huge shell on my back which helped keep me safe from predators.</p>	<p><b>Fact:</b> I'm related to elephants, but my body was covered in thick fur to keep me warm in ice ages.</p>	<p><b>Fact:</b> I was much bigger than my relatives that live today; I was the biggest mammal that has ever walked on two legs!</p>	<p><b>Fact:</b> I was a fierce meat-eating predator and used my huge canine teeth to attack and eat prey.</p>
I am... <b>A GIANT GROUND SLOTH</b>	I am... <b>A SABRE-TOOTHED CAT</b>	I am... <b>A WOOLY MAMMOTH</b>	I am... <b>A GLYPTODON</b>

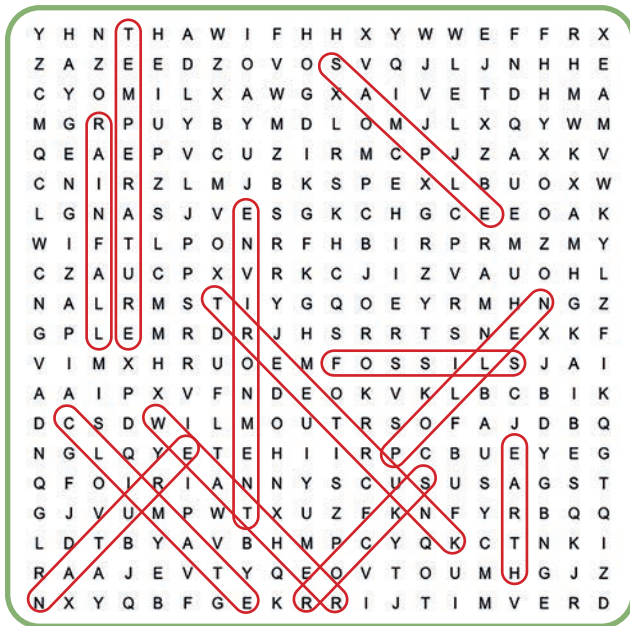
## INCREDIBLE ICE AGES ANSWERS

The answers below are for the 'fill in the blanks' activity on page 8.

- Ice ages are periods of time where the world is much colder and **glaciers** expand to cover much bigger areas.
- Scientists have found evidence that Earth has always gone through ice ages and warm periods. These cycles can last for **thousands** of years.
- It's thought that ice ages can be caused by different things, including how much sunlight reaches Earth, how much greenhouse gas is in the air, and how often volcanoes **erupt**.
- Scientists learn about ice ages by studying rocks and **fossils** hidden inside them. These things hold clues about the movements of glaciers long ago.
- The last ice age ended about 11,500 years ago. Many large animals, like mastodons, **sabre-toothed** cats, and giant ground sloths, that had lived on the ice went extinct as the world got warmer.

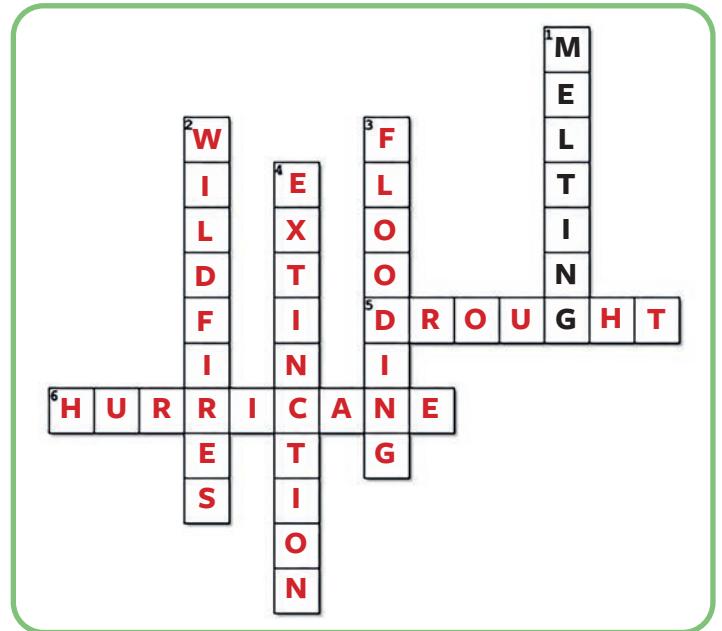
## HIDDEN EVIDENCE ANSWERS

The answers below are for the 'word search' activity on page 9.



## CHANGING WORLD ANSWERS

The answers below are for the 'crossword' activity on page 10.



## GLACIOLOGISTS' TOOLKIT ANSWERS

The answers below are for the 'cut and stick' activity on page 11.

### SUNGLASSES

Something that is worn over to protect your eyes.

### HAT & GLOVES

Things that are worn to keep you warm.

### CRAMPONS

Strong metal hooks that attach to the bottom of boots to help grip slippery ice.

### MEASURING STICK

Something that is used to measure the length or depth of a hole in the glacier.

### CAMERA

Something that is used to take photos of things.

### FIELD NOTEBOOK

Something that is used for writing and sketching things in.



## UNEARTHING ICY SECRETS ANSWERS

The answers below are for the 'true or false' activity on page 12.

	SENTENCE	TRUE	FALSE
1	The scientists who study glaciers are called astrobiologists.		<b>FALSE</b>
2	Glacier ice can be more than one thousand years old.	<b>TRUE</b>	
3	Glaciologists study glaciers by pulling out big, long tubes of ice.	<b>TRUE</b>	
4	Scientists can't learn about the past by looking at glaciers.		<b>FALSE</b>
5	Glaciers move faster than cars or boats.		<b>FALSE</b>

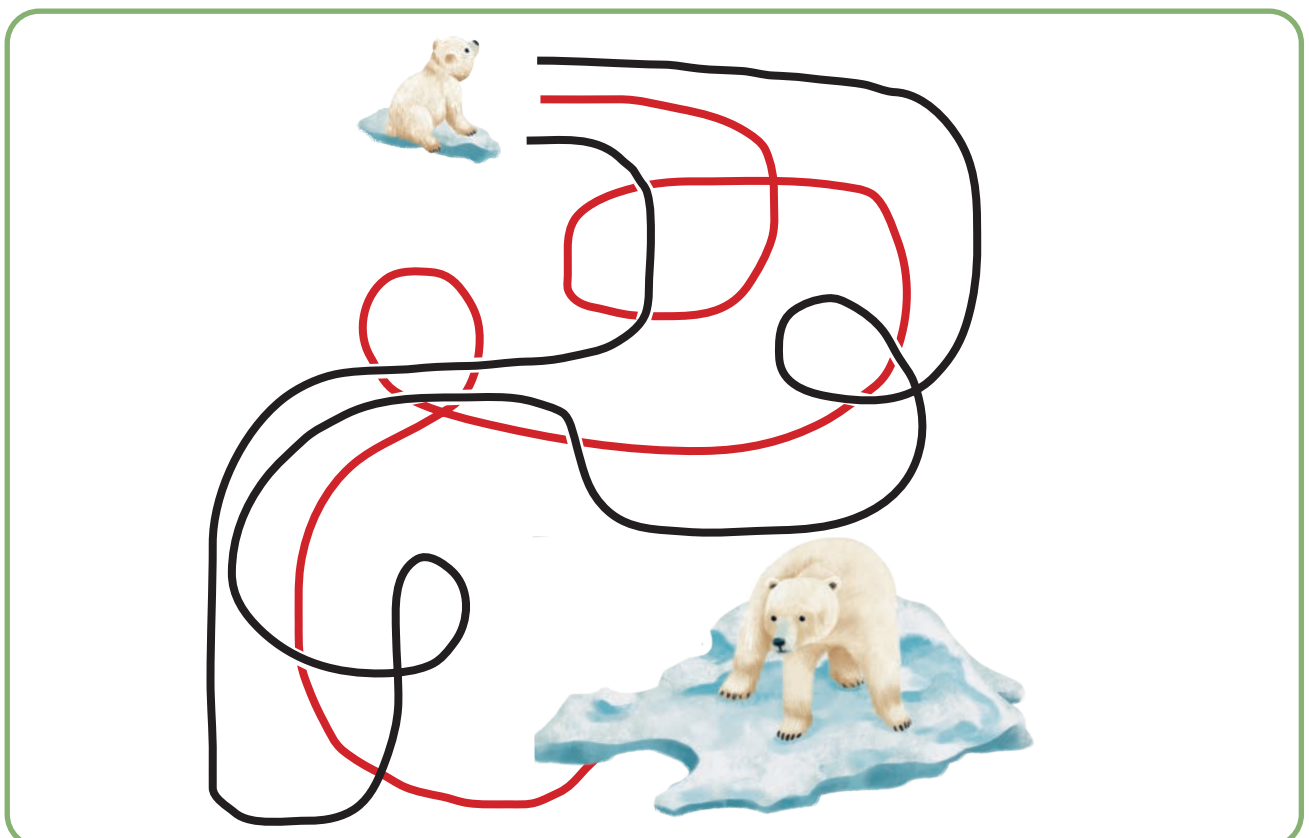
## WAVE JUMBLE ANSWERS

The answers below are for the 'word scramble' activity on page 13.

**SAWEV** ——— **WAVES**  
**NEACO** ——— **OCEAN**  
**RENCURT** ——— **CURRENT**  
**SIHCKWREP** ——— **SHIPWRECK**  
**DOFLO** ——— **FLOOD**  
**RATESWEA** ——— **SEAWATER**

## LOST IN THE SNOW ANSWERS

The answers below are for the 'line maze' activity on page 14.

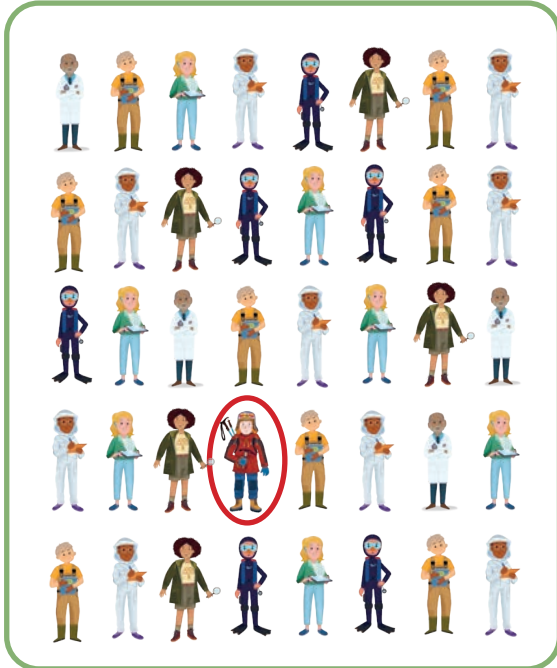


# EXTRA ACTIVITY ANSWERS

Check your answers against the correct answers below!

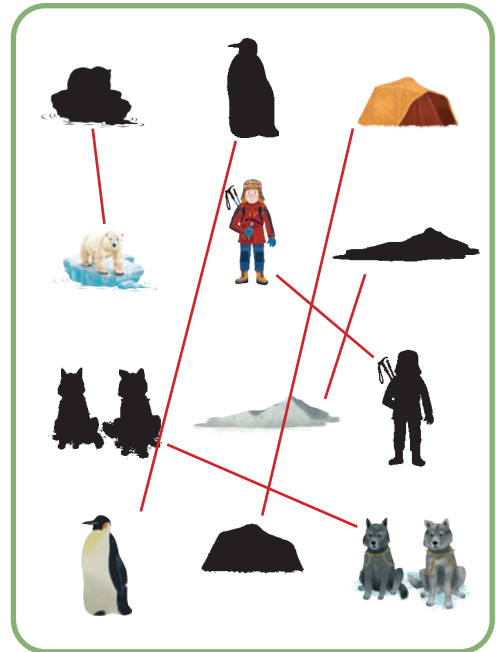
## FIND THE SCIENTIST

The answers below are for the activity on page 18.















## MATCH THE SHAPE

The answers below are for the activity on page 19.



## SIMPLE SUMS

The answers below are for the activity on page 20.

	+		-		=	<div style="border: 1px solid black; padding: 5px; display: inline-block;">1</div>
	-		+		=	<div style="border: 1px solid black; padding: 5px; display: inline-block;">4</div>
	+		+		=	<div style="border: 1px solid black; padding: 5px; display: inline-block;">8</div>
	+		-		=	<div style="border: 1px solid black; padding: 5px; display: inline-block;">6</div>