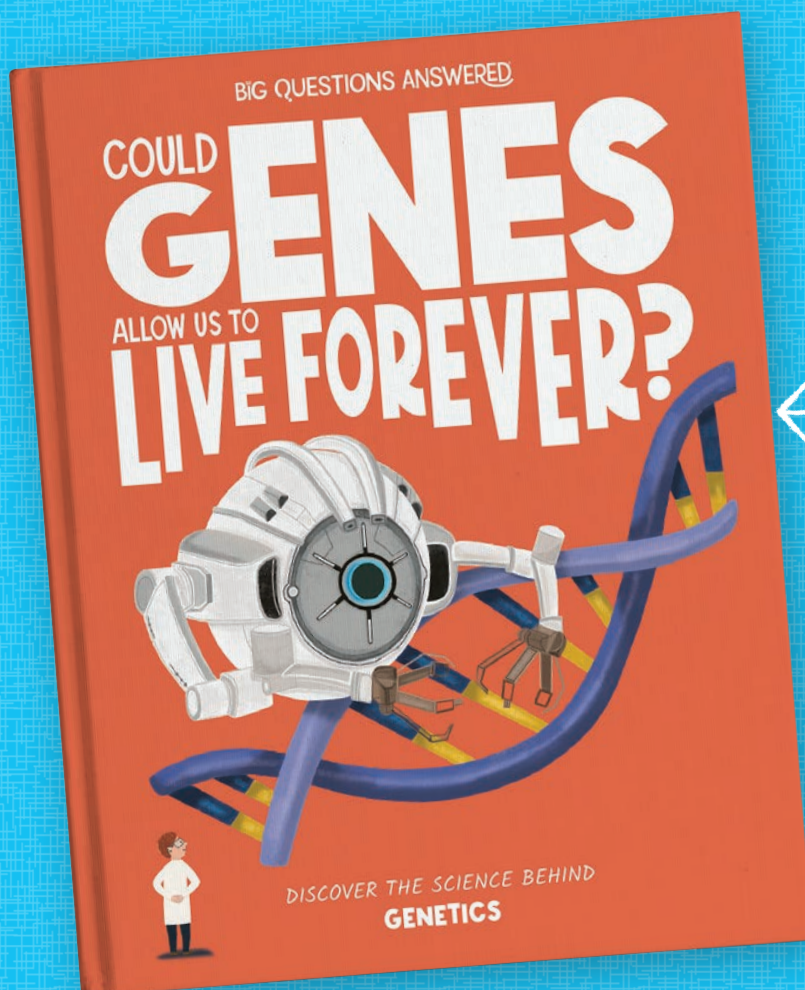


# YOUNG GENETICISTS' ACTIVITY PACK



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

# CONTENTS:

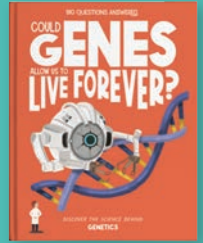
|  |    |
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| <b>Fantastic Features:</b> Crossword                     | 4  |
| <b>Drawing DNA:</b> Finish the Drawing                   | 5  |
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# COULD GENES ALLOW US TO LIVE FOREVER?

*For reference to the Teachers' & Parents' Resources, this goes with 'The Immortal Jellyfish: Scene 1'.*

*www.thebigquestionsanswered.com*



## DIARY ENTRY

Imagine you were on an expedition when you discovered a new animal that can live forever because of its genes. Use the space below to write a diary entry all about it.

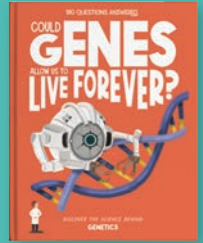
A large, light orange, torn-edge rectangular area containing 15 horizontal lines for writing a diary entry.



**Feeling stuck? Try some of these...**

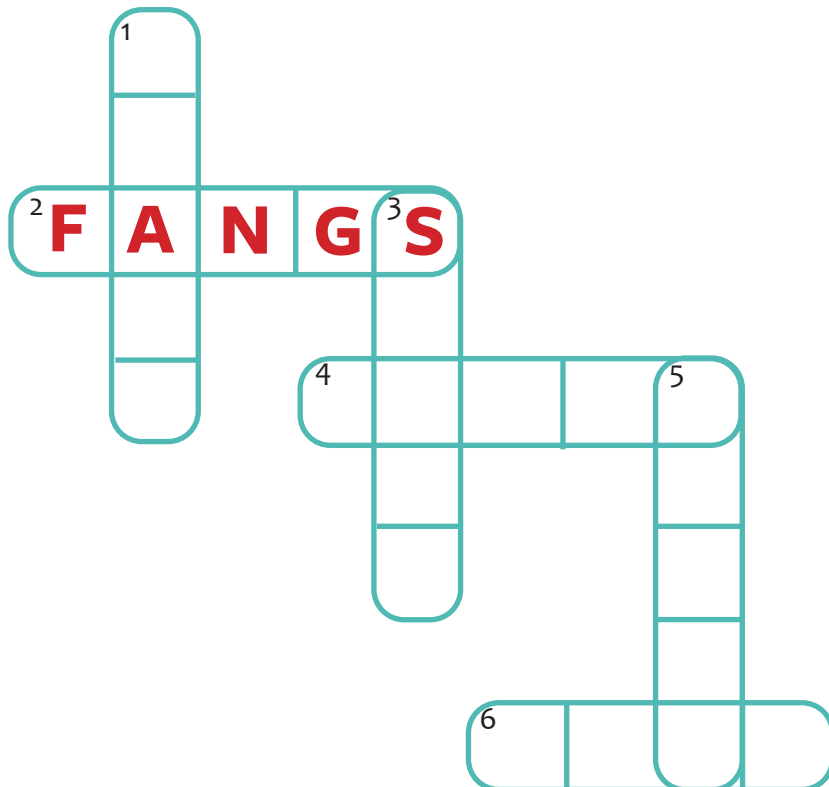
- **Describe the place you found the animal.**  
Where were you? What was around you at the time?
- **Describe what the animal looks like.**  
Think about the size, colour, and the features it had.
- **Describe how you would be feeling.**  
Would you be excited, nervous, or something else?





## FANTASTIC FEATURES

Many amazing creatures live on Earth, but survival is tough! Animals must use their body features to help them thrive. Use the clues below to work out the different body part and fill in the boxes. The first one has been done for you.



TEETH

~~FANGS~~

HORNS

SHELL

CLAWS

NOSE

### ACROSS

2. ~~Extra long, sharp teeth that can deliver venom to attacking animals!~~
4. Hard bones inside the mouth that help animals eat.
6. A body part that helps animals sniff out their prey.

### DOWN

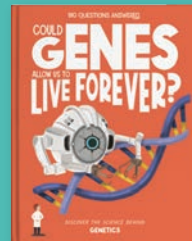
1. A sharp body part, often found on the end of an animal's fingers or toes.
3. A hard casing that protects an animal's body that they can sometimes hide inside.
5. Spikes that can be used to fight off attackers.



## COULD GENES ALLOW US TO LIVE FOREVER?

*For reference to the Teachers' & Parents' Resources, this goes with 'The Shape of DNA: Scene 3'.*

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



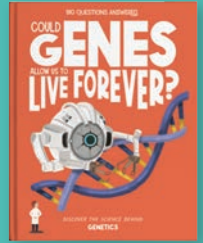
### DRAWING DNA

Scientists have discovered that DNA is shaped like a twisted ladder with lots of little rungs. Can you complete the drawing of this strand of DNA by drawing the rest of it? Finish the picture by colouring it in.



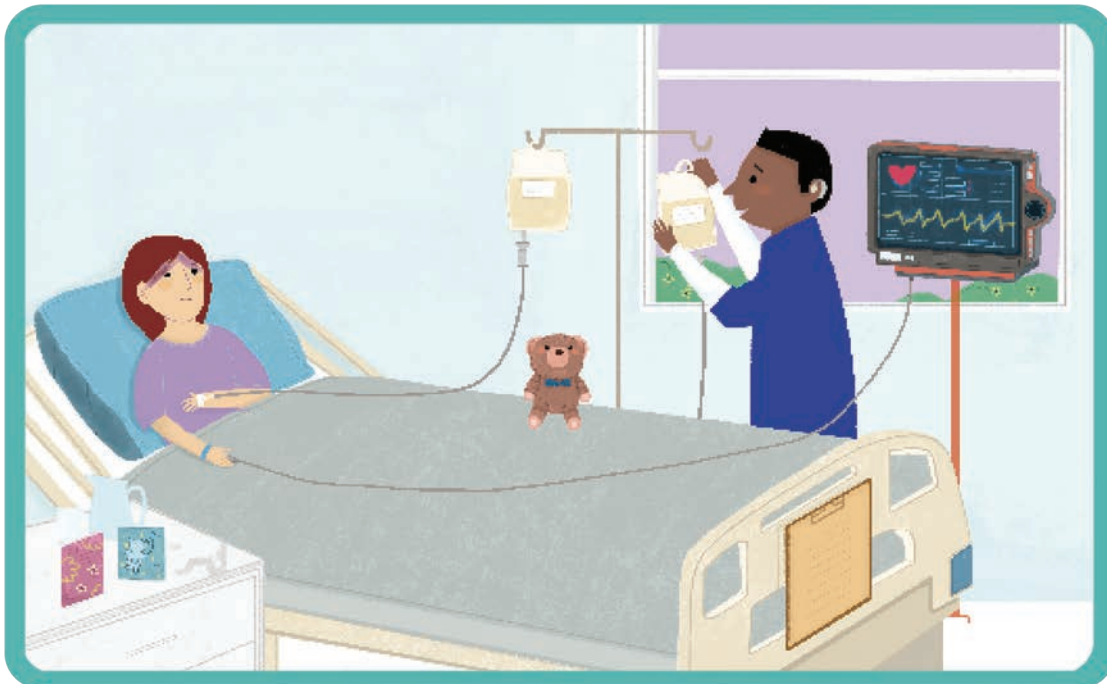
What's your favourite fact about DNA?

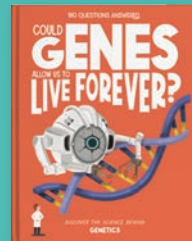




## HOSPITAL ROOM HUNT

Can you spot the 9 differences between the two scenes? Circle them when you spot them.





## ELEPHANT SECRETS

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

|          | SENTENCE  | TRUE | FALSE |
|----------|---|------|-------|
| <b>1</b> | Scientists who study genes are called genies.                   |      |       |
| <b>2</b> | Elephants and humans are the only animals that have genes.      |      |       |
| <b>3</b> | Genes are passed down from parents to children.                 |      |       |
| <b>4</b> | Elephants have a clever, cancer-fighting gene.                  |      |       |
| <b>5</b> | Genes are a new invention that have only existed for 100 years. |      |       |



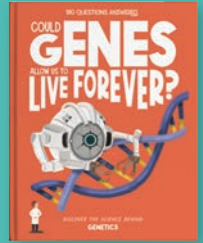




# COULD GENES ALLOW US TO LIVE FOREVER?

*For reference to the Teachers' & Parents' Resources, this goes with 'Genetically Modifying Animals: Scene 6'.*

*www.thebigquestionsanswered.com*



## GENETIC PUZZLE PIECES

The future of genetic studies is very exciting and scientists still have lots to learn. What do you think about it? Read the questions below and think about your own opinions before filling in your answers.

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

.....

.....

.....

**Do you think genetic modifications are a good idea or a bad idea? Why?**

.....

.....

.....

**If you were a geneticist, what would you most enjoy – learning about animals' genes or working on experiments to modify genes?**

.....

.....

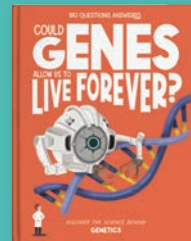
.....

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

.....

.....

.....



## IMPRESSIVE MODIFICATIONS

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

flooding

resistant

plants'

global warming

unique

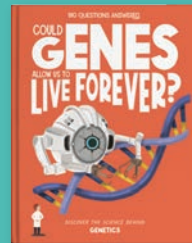
genetic modifications

1. The process of scientists changing something's genes is called \_\_\_\_\_. This is very complicated to do!
2. Almost every living thing in the world has genes that are \_\_\_\_\_ – they're not the same as anyone else's.
3. Scientists don't just modify animals' genes, they can modify \_\_\_\_\_ genes too.
4. Plants' genes can be changed to make them have more vitamins, grow faster, and cope better with extreme weather like \_\_\_\_\_.
5. They can also be made to be \_\_\_\_\_ to disease and pests. This means farmers don't have to use as many harsh chemicals on them, which is better for the environment.
6. Flooding, hurricanes, and heatwaves may all get worse because of \_\_\_\_\_. That's why scientists think genetic modifications are important.

## COULD GENES ALLOW US TO LIVE FOREVER?

*For reference to the Teachers' & Parents' Resources, this goes with 'Plastic-Eating Bacteria: Scene 8'.*

*www.thebigquestionsanswered.com*



# SUPER-BACTERIA

Scientists have designed plastic-eating bacteria that could help clean up our environment. If you could design your own plastic-eating bacteria, what would it look like? Draw it below!

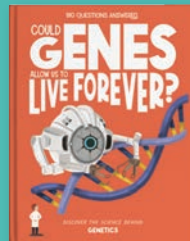
A large, empty rectangular box with a teal border, intended for drawing a plastic-eating bacterium.

Feeling stuck? Try some of these hints...

- What shape do you think it would be?  
Would it have arm-like parts that stick out or
- suction-like parts like a vacuum?
- What colour do you think it would be?  
Is it the same all over?

*Draw your design in here!*





## SUPER-BACTERIA

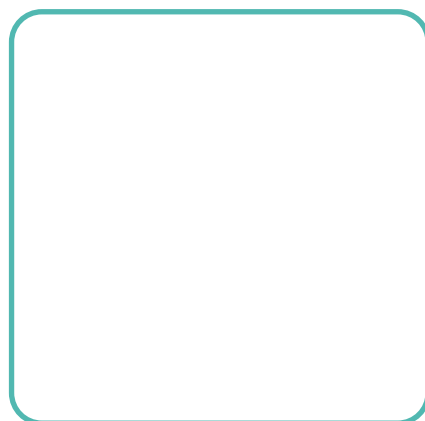
Now you have drawn what your super plastic-eating bacteria looks like, it's time to go on an adventure. Below are some sentences; draw an image to match each sentence to create your own comic.



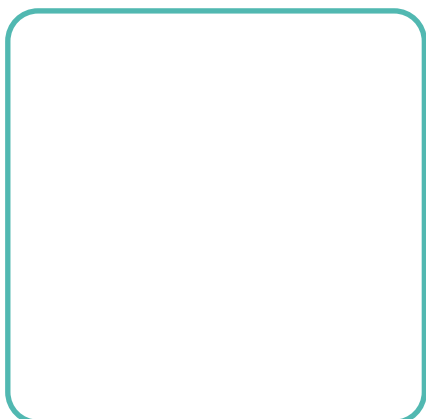
A boat drives across the ocean.  
The ocean is filled with plastic  
bottles and bags.



The captain spots a hungry  
seabird trying to catch a fish, but  
it can't reach because there's too  
much plastic in the water.



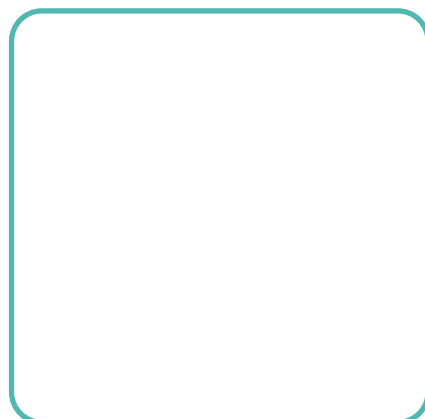
The scientists on the boat tell the  
captain not to worry – they have  
the solution.



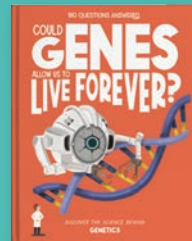
The scientists pour a bucket  
full of their super plastic-eating  
bacteria into the water.



The plastic-eating bacteria start  
munching on all the plastic in the  
ocean around the boat.

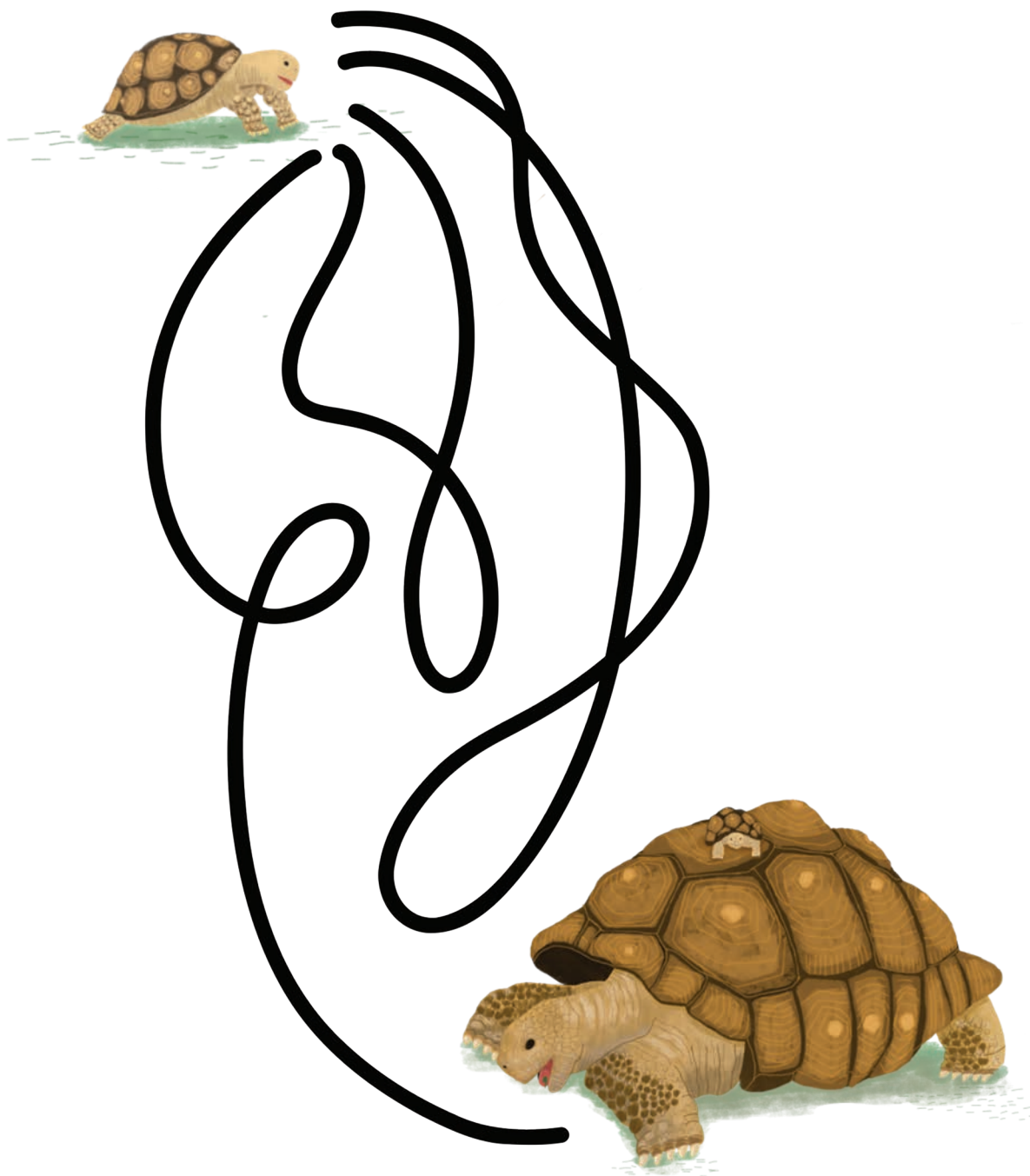


The plastic is gone! The seabird  
can now catch a fish for its  
dinner. The scientists have  
saved the day!



# LOST IN THE GRASS

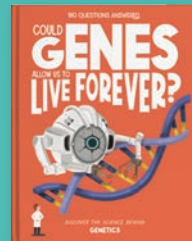
The baby land tortoise has been separated from its parent and is trying to find its way back home. Can you help the baby tortoise find its way back to its parent?



## COULD GENES ALLOW US TO LIVE FOREVER?

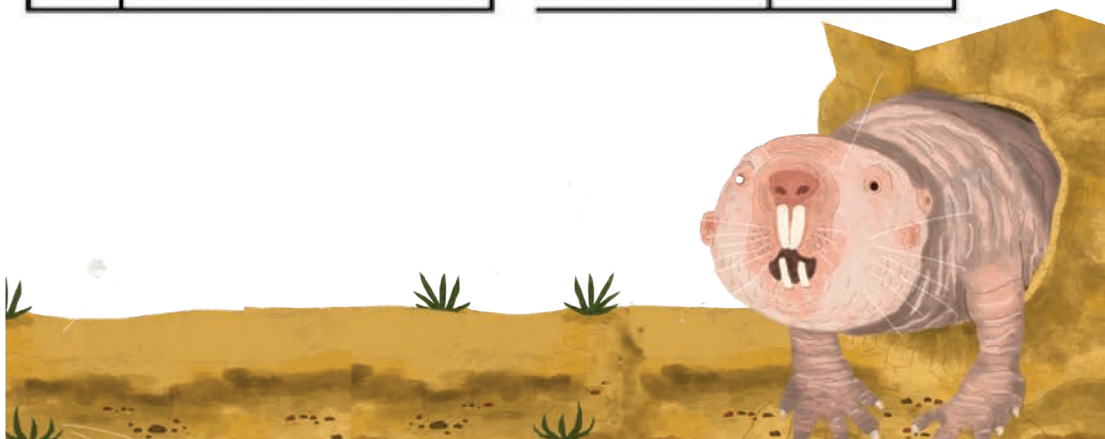
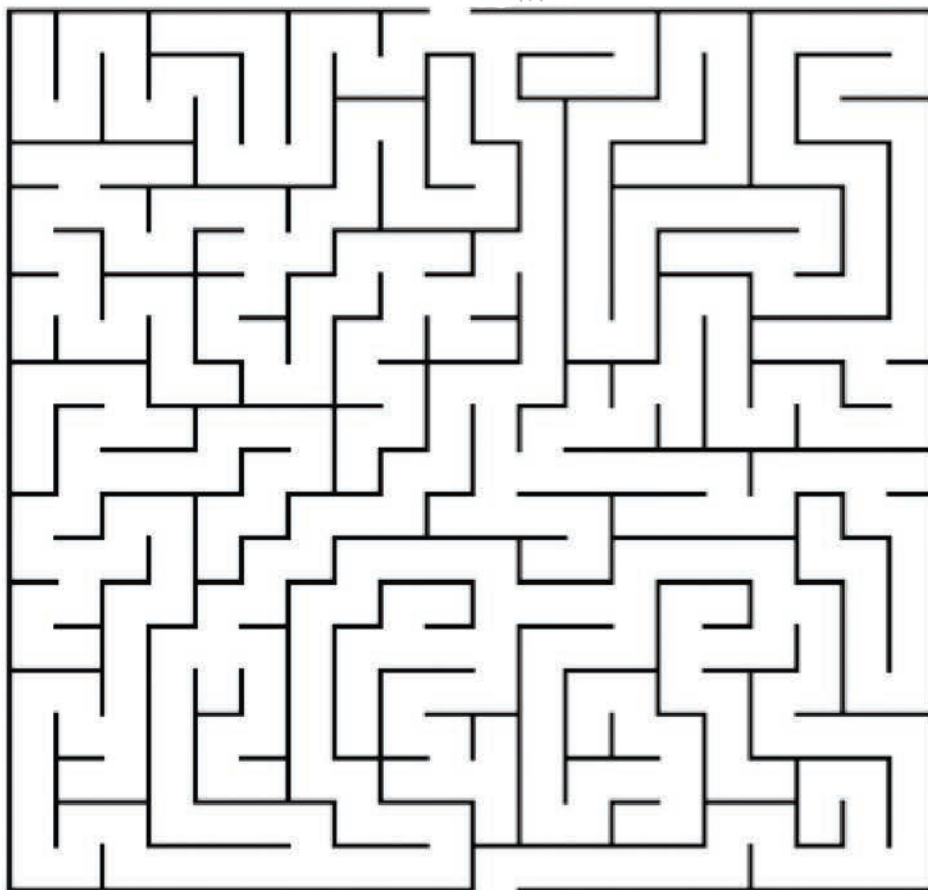
For reference to the Teachers' & Parents' Resources, this goes with 'DNA-Repairing Genes - Naked Mole-Rats: Scene 10'.

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



## SAFETY IN NUMBERS

This naked mole-rat has burrowed too far and needs to find its way back to its pack where it's safe! Can you help it follow the maze and reach safety?

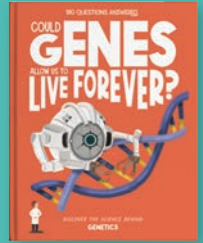




## COULD GENES ALLOW US TO LIVE FOREVER?

*For reference to the Teachers' & Parents' Resources, this goes with 'Repairing Cells with Nanobots: Scene II'.*

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



# THE FUTURE OF GENETICS

The future of genetics research is going to be very exciting, but scientists have a lot of work to do! Can you find and circle the words listed below, in the grid? Words can up and down, left to right, and can overlap each other.

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

GENES  
GENETICS  
GENETICIST  
NANOBOTS

MACHINES  
CELLS  
EDITING  
REPAIRING

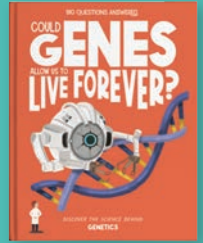
DAMAGE  
HELIX  
MICROSCOPE  
SAMPLE



## COULD GENES ALLOW US TO LIVE FOREVER?

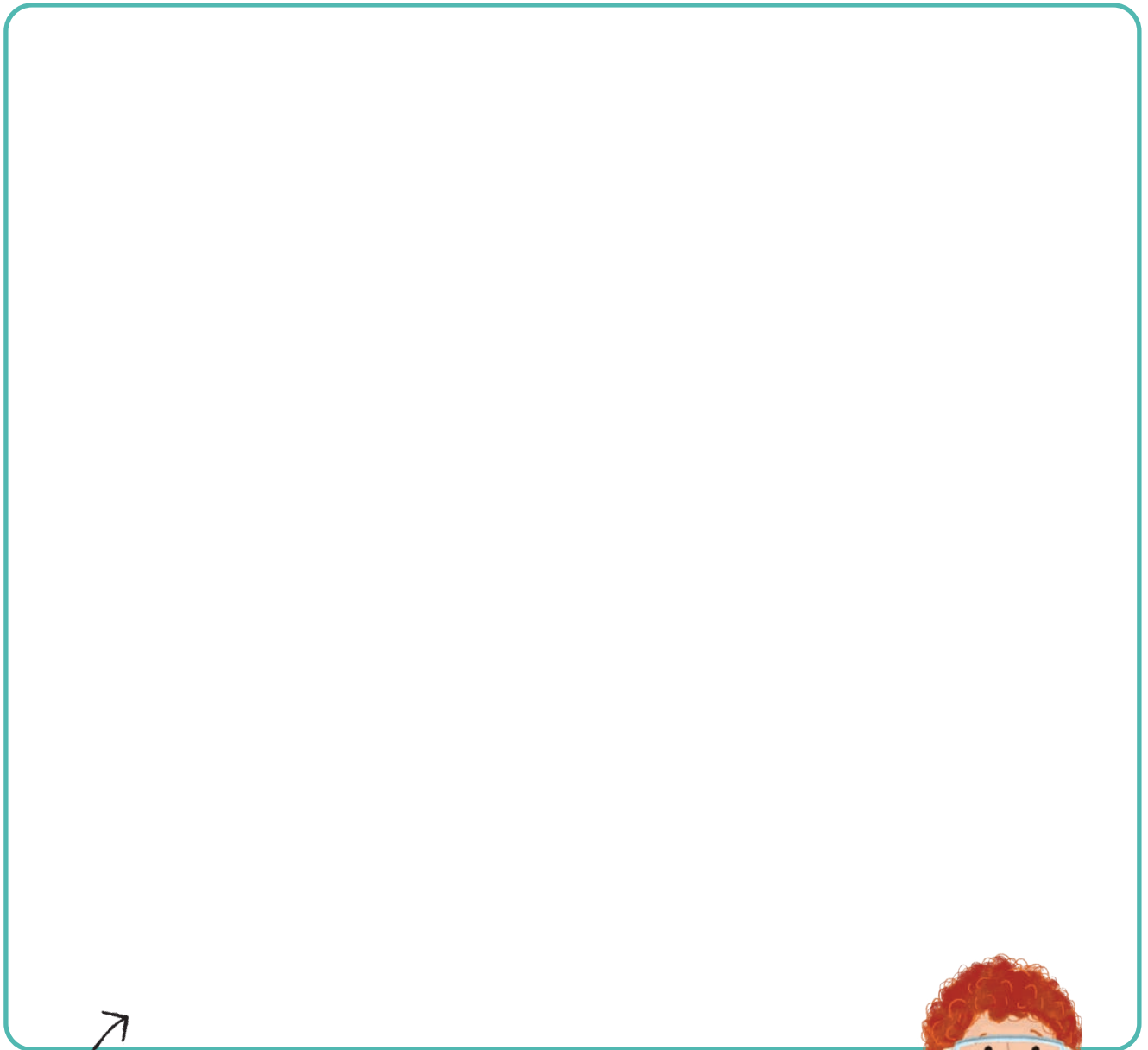
*For reference to the Teachers' & Parents' Resources, this goes with 'The Future of DNA: Scene 12'.*

*www.thebigquestionsanswered.com*



# DRAW YOUR OWN DNA-EDITING ROBOT

Scientists might one day create robots that can edit DNA. Design your own DNA-editing robot and draw it in a scene to show it in action!



*Draw your creation  
in here!*

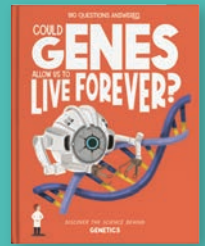
What will you call this new  
type of robot?



# COULD GENES ALLOW US TO LIVE FOREVER?

For reference to the Teachers' & Parents' Resources, this goes with 'Animals with Record-Breaking Genes: Scene 13'.

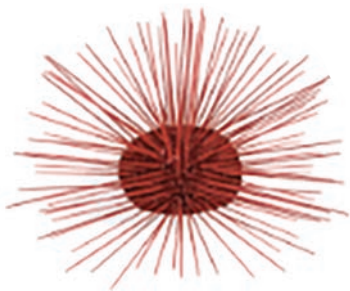
[www.thebigquestionsanswered.com](http://www.thebigquestionsanswered.com)



## LONG-LIVING ANIMALS

Some animals live incredibly long lives because of their genes. Cut along the dotted lines, then match each animal with its name and fact. Then glue them in order on another piece of paper, from the shortest to the longest living.

**Ocean Quahog Clam**  
This creature lives for up to 500 years!



**Bowhead Whale**  
This creature lives for over 200 years!



**Red Sea Urchin**  
This creature lives for up to 200 years!



**Hydra**  
This creature may live forever!



**Greenland Shark**  
This creature lives for up to 400 years!



**Rougheye Rockfish**  
This creature lives for over 200 years!



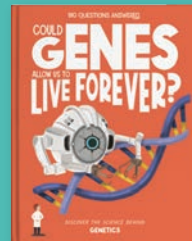




## COULD GENES ALLOW US TO LIVE FOREVER?

*For reference to the Teachers' & Parents' Resources, this goes with 'Post-Reading Questions'.*

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



# WRITE YOUR OWN GENETICS STORY

Can you write a story of your own about genetics, making sure to include the 3 key words below?

GENES

YEARS

GENETICIST

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# **MORE FUN GENETICS 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 geneticist?  
Circle them when you find them – there's only one!



## 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.



= 3



= 1



= 5



+



-



=



+



-



=



+



+



=



+



+



=

## COLOUR ME IN!

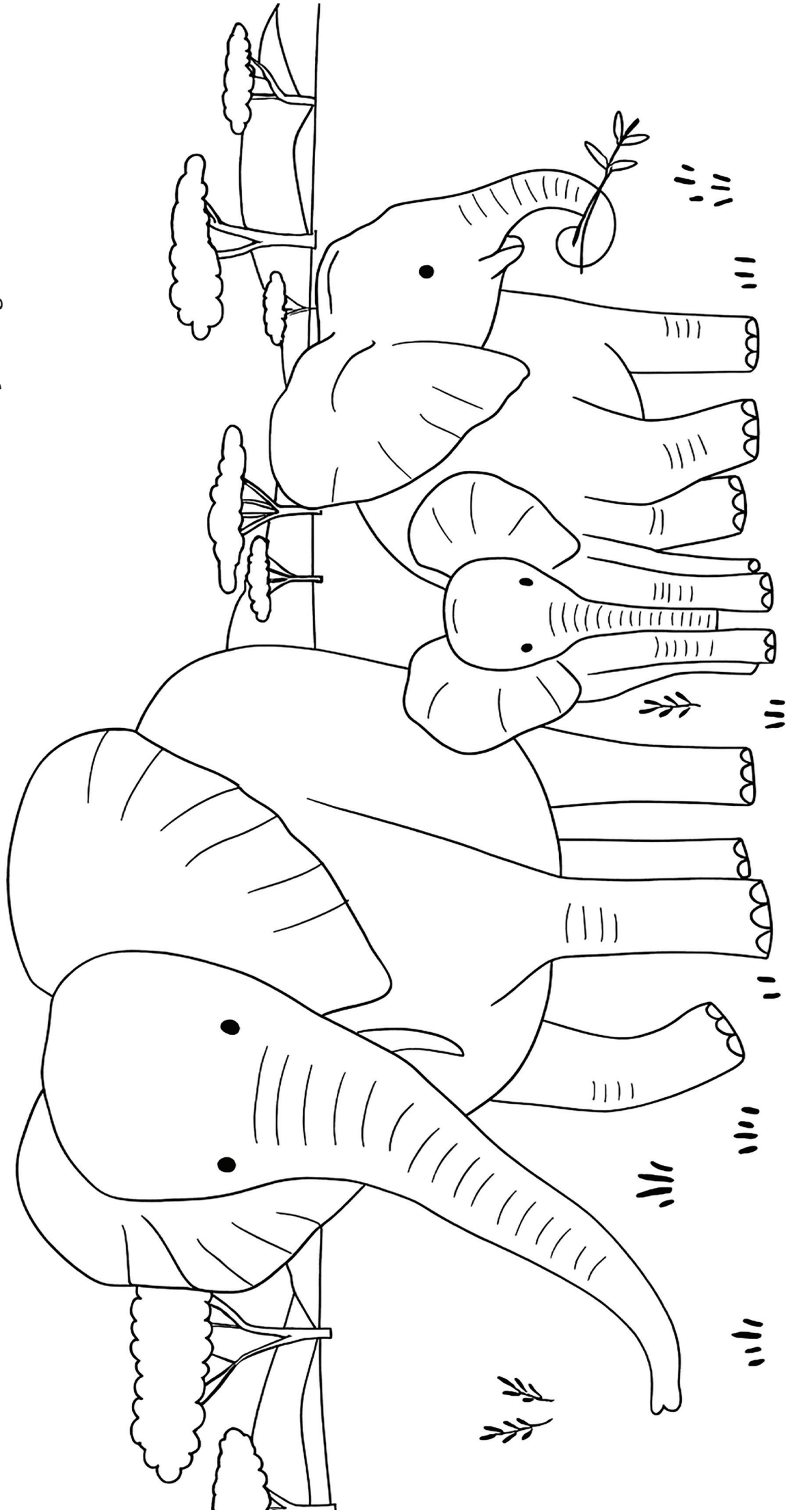
This colouring sheet is based on scene 2: Inside All Living Things.





## COLOUR ME IN!

This colouring sheet is based on  
scene 5: Turning Genes On and Off.



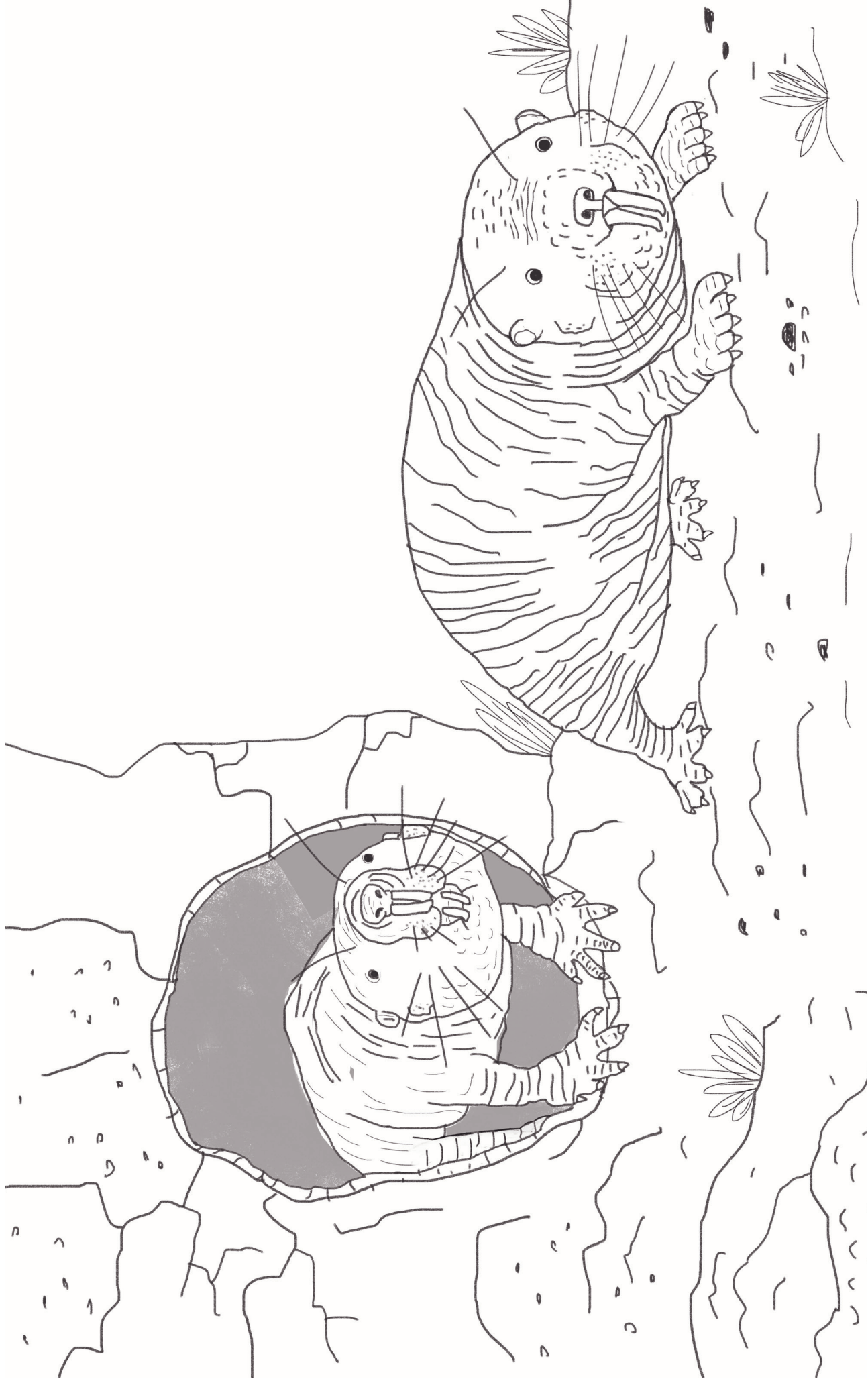
## COLOUR ME IN!

This colouring sheet is based on scene 6: Genetically Modifying Animals.



## COLOUR ME IN!

This colouring sheet is based on scene 10: DNA-Repairing Genes – Naked Mole-Rats.



# **YOUNG GENETICISTS' ACTIVITY ANSWERS**

Find the answers to the activities on the following pages.

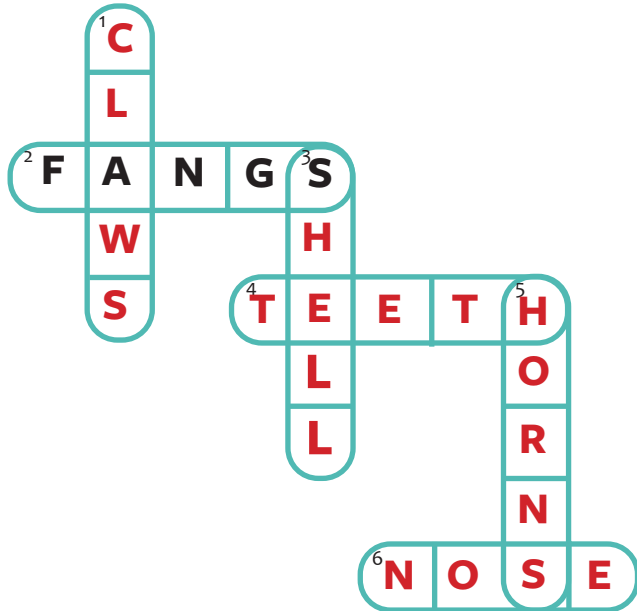


# ACTIVITY ANSWERS

Check your answers against the correct answers below!

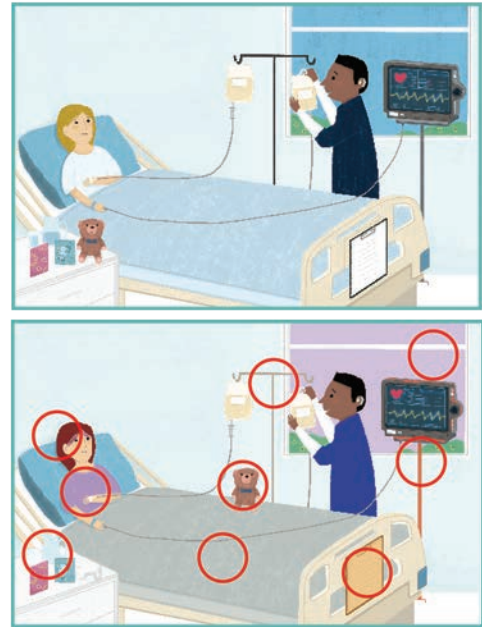
## FANTASTIC FEATURES ANSWERS

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



## HOSPITAL HUNT ANSWERS

The answers below are for the 'spot the difference' activity on page 6.



## ELEPHANT SECRETS ANSWERS

The answers below are for the 'true or false' activity on page 7.

|   | SENTENCE  | TRUE | FALSE |
|---|---|------|-------|
| 1 | Scientists who study genes are called genies.                   |      | FALSE |
| 2 | Elephants and humans are the only animals that have genes.      |      | FALSE |
| 3 | Genes are passed down from parents to children.                 | TRUE |       |
| 4 | Elephants have a clever, cancer-fighting gene.                  | TRUE |       |
| 5 | Genes are a new invention that have only existed for 100 years. |      | FALSE |

## IMPRESSIVE MODIFICATIONS ANSWERS

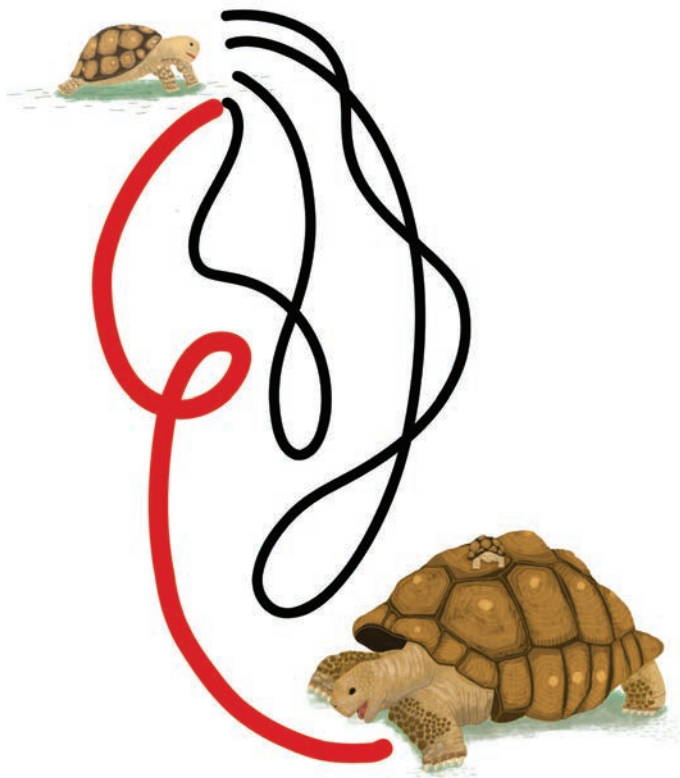
The answers below are for the 'fill in the blanks' activity on page 9.

- The process of scientists changing something's genes is called **genetic modifications**. This is very complicated to do!
- Almost every living thing in the world has genes that are **unique** – they're not the same as anyone else's.
- Scientists don't just modify animals' genes, they can modify **plants'** genes too.
- Plants' genes can be changed to make them have more vitamins, grow faster, and cope better with extreme weather like **flooding**.
- They can also be made to be **resistant** to disease and pests. This means farmers don't have to use as many harsh chemicals on them, which is better for the environment.
- Flooding, hurricanes, and heatwaves may all get worse because of **global warming**. That's why scientists think genetic modifications are important.



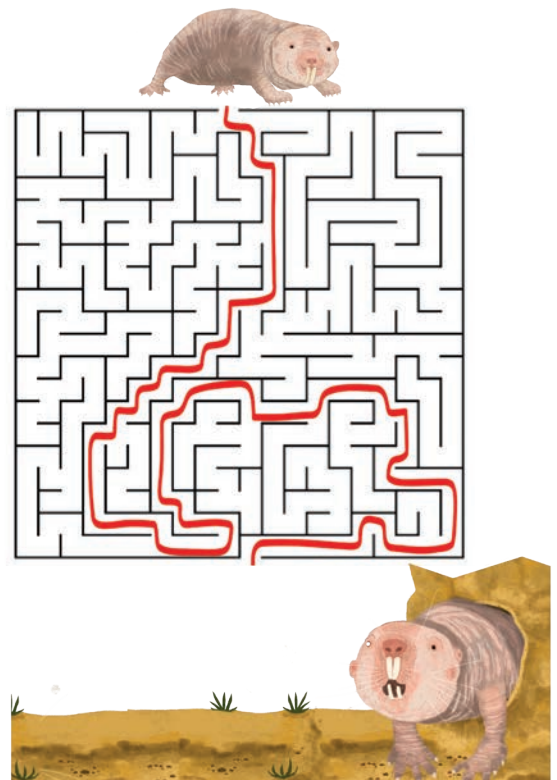
## LOST IN THE GRASS ANSWERS

The answers below are for the 'line maze' activity on page 12.



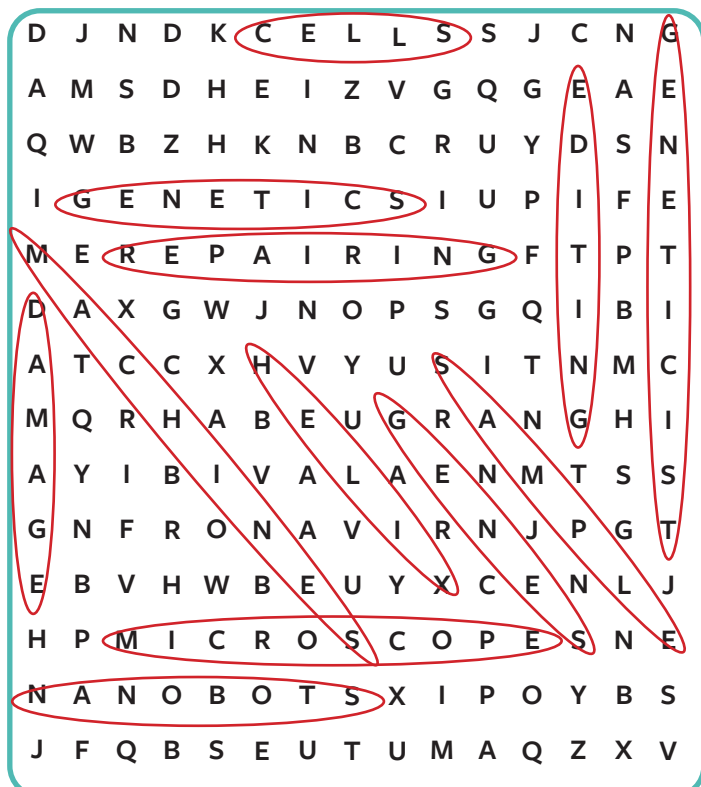
## SAFETY IN NUMBERS ANSWERS

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



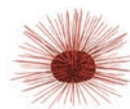
## THE FUTURE OF GENETICS ANSWERS

The answers below are for the 'word search' activity on page 14.



## LONG-LIVING ANIMALS ANSWERS

The answers below are for the 'cut and stick' activity on page 16.



**Red Sea Urchin**  
This creature lives for up to 200 years!



**Bowhead Whale**  
This creature lives for over 200 years!



**Rougheye Rockfish**  
This creature lives for over 200 years!



**Greenland Shark**  
This creature lives for up to 400 years!



**Ocean Quahog Clam**  
This creature lives for up to 500 years!



**Hydra**  
This creature may live forever!

# EXTRA ACTIVITY ANSWERS

Check your answers against the correct answers below!




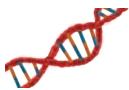








## FIND THE SCIENTIST

The answers below are for the activity on page 19.



## SIMPLE SUMS

The answers below are for the activity on page 20.

|   |   |   |   |   |   |           |
|---|---|---|---|---|---|-----------|
|  | + |  | - |  | = | <b>5</b>  |
|  | + |  | - |  | = | <b>3</b>  |
|  | + |  | + |  | = | <b>5</b>  |
|  | + |  | - |  | = | <b>11</b> |