

FANTASTICALLY GREAT WOMEN SCIENTISTS *and their* STORIES

Kate Pankhurst

MINI PROJECTS
TO CELEBRATE
SCIENTIFIC
ACHIEVEMENTS!

Dear fantastically great reader,

We're very pleased to share with you these templates for a selection of activities that have been designed to encourage children to celebrate scientific achievements throughout history as well as in the present day – particularly in the context of the pandemic, when science is more important than ever!

These resources are perfect for use in the classroom or for home schooling.

The activities were inspired by the brilliant female scientists featured in Kate Pankhurst's ***Fantastically Great Women Scientists and Their Stories!*** We hope you have fun learning about these wonderful women and what made them fantastically great!

ABOUT THE BOOK

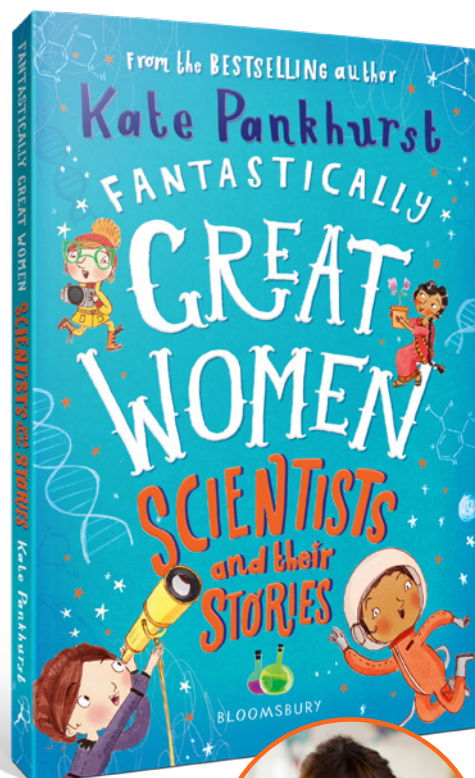
Prepare to be inspired with this fantastically great new series for young readers. In this first book, read the true stories of amazing scientists and discover things that are out of this world.

Women have been responsible for many of the world's most groundbreaking scientific discoveries. Kate Pankhurst, descendent of Emmeline Pankhurst, tells the stories of some incredible female scientists whose hard work and persistence changed our understanding of science, and transformed people's ideas of what women can do.

As a child Mae Jemison imagined herself reaching for the stars and that's exactly what she did: she became the first African-American woman to go into space. When Elizabeth Blackwell was told women weren't allowed to be doctors, she didn't take no for an answer. Tu Youyou spent months on a remote island during the Vietnam War to try and invent a treatment for malaria - and she did it.

Including comic strips, family trees, maps and more, *Fantastically Great Women Scientists and Their Stories* is a celebration of women who made some of the world's most important scientific breakthroughs.

Women featured: Mae Jemison, Marie Curie, Elizabeth Blackwell, Janaki Ammal, Caroline Herschel, Katia Krafft, Tu Youyou and Rosalind Franklin.



Author
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MINI-PROJECT 01:

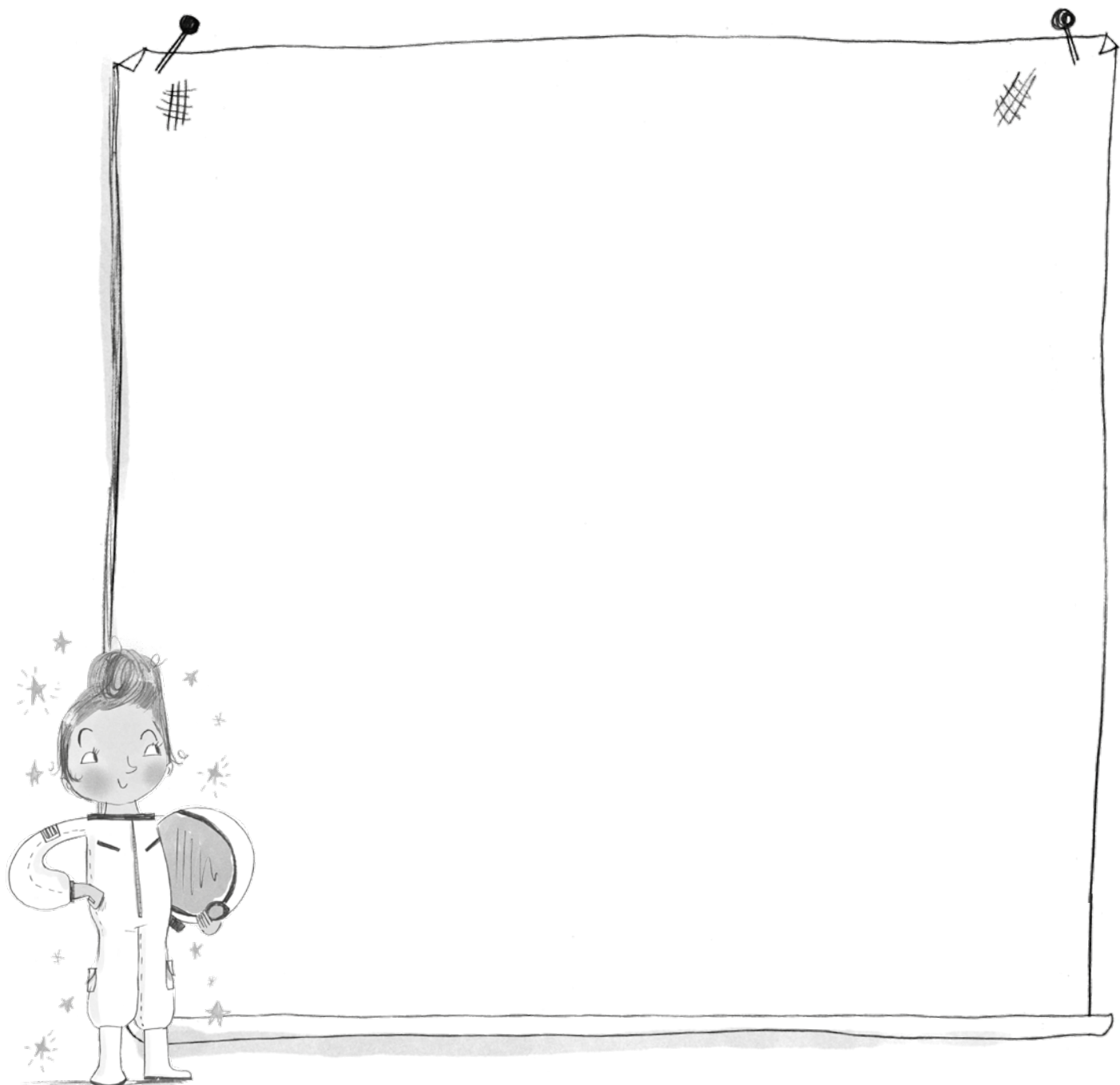
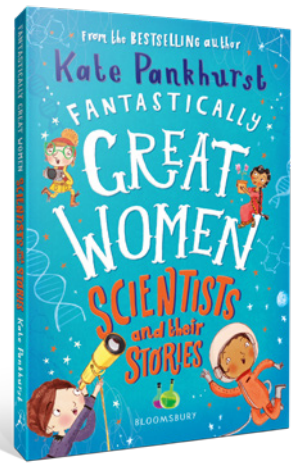
INSPIRED BY MAE JEMISON (Pages 5–24)

THE ASTRONAUT WHO REACHED FOR THE STARS

'Mae made it her mission to encourage more CHILDREN to study science. She set up an international science camp for children, where students learn to think like a scientist and tackle BIG QUESTIONS about how we live, how science works in our daily lives and the future of the planet.'

Q: Why do you think there are still a lot fewer women than men working in science and engineering?

Use your creative writing skills and an eye-catching design to create a poster encouraging more girls to consider a science or engineering career in 2021.



MINI-PROJECT 02:

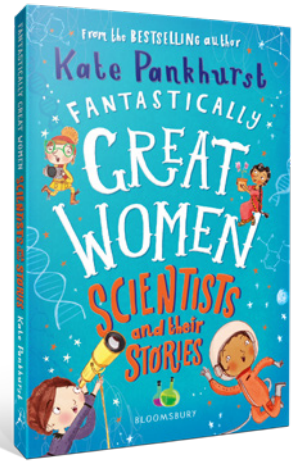
INSPIRED BY MARIE CURIE (Pages 25–45)

THE SCIENTIST IN HER ELEMENT

In 1903, Marie Curie became the first woman to win the Nobel Prize for her work on Becquerel rays. In 1911, she won it again for her discovery of radium and polonium. She was the first person ever to be awarded two Nobel Prizes.

Q: Why are Marie Curie's achievements so inspiring for scientists today? Do you think it is important to commemorate the work of great scientists? Why?

Create a new Science Prize for your school inspired by a Fantastically Great Women Scientist.



MINI-PROJECT 03:

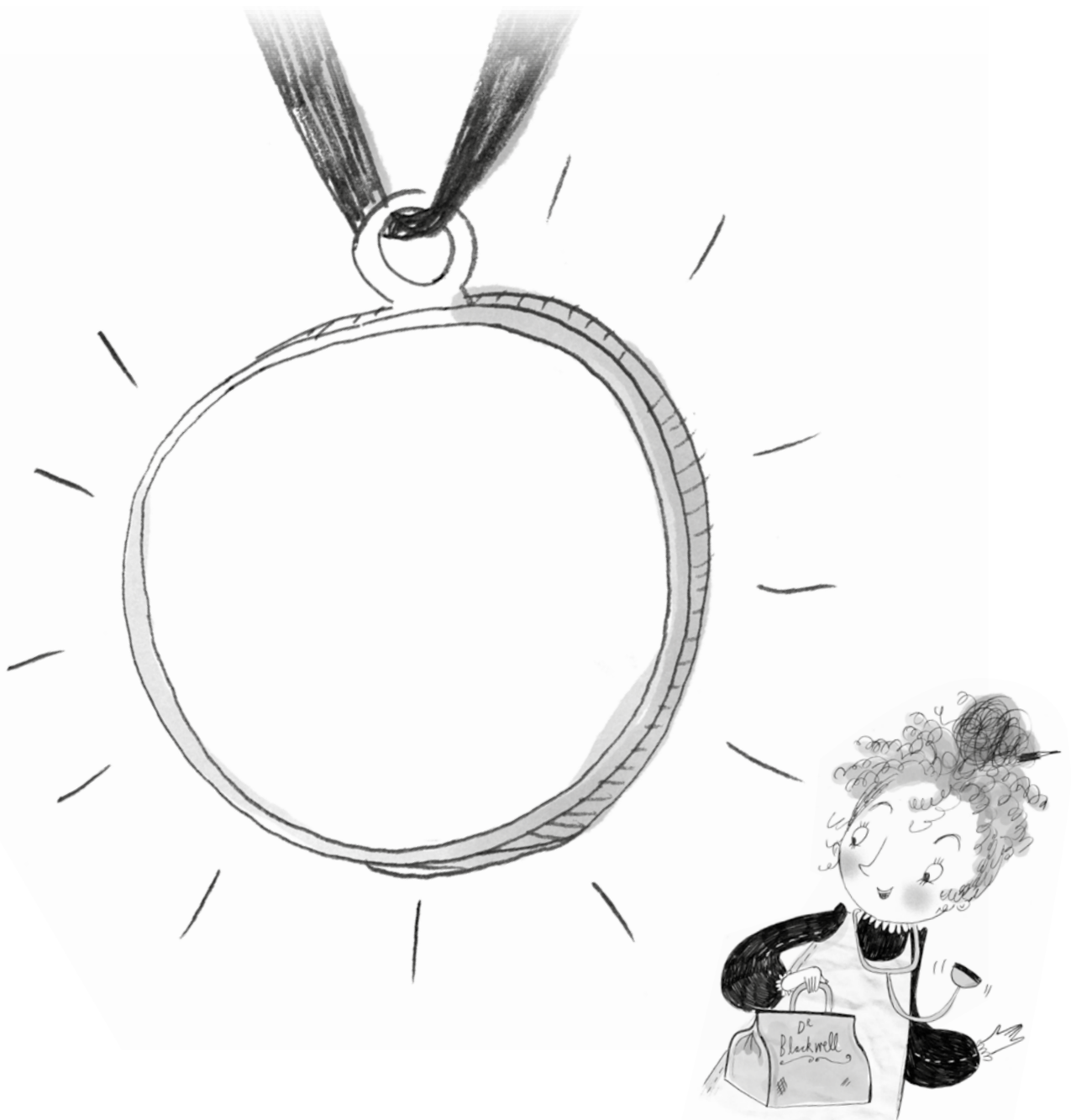
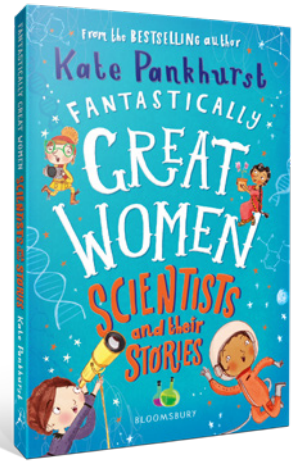
INSPIRED BY ELIZABETH BLACKWELL (Pages 46–63)

THE DOCTOR WHO SHOWED WOMEN ARE CAPABLE TOO

'Elizabeth personally inspired over 470 women to become doctors in the UK alone, and showed the world that women could be just as good doctors as men. An ELIZABETH BLACKWELL MEDAL is awarded to a woman doctor in the USA every year.'

Q: Why is it important to celebrate the achievements of our fantastic doctors and nurses, especially during the pandemic throughout 2020 and 2021?

Create a medal of your own to commemorate doctors and nurses – or someone you know personally who works for the NHS.



MINI-PROJECT 04:

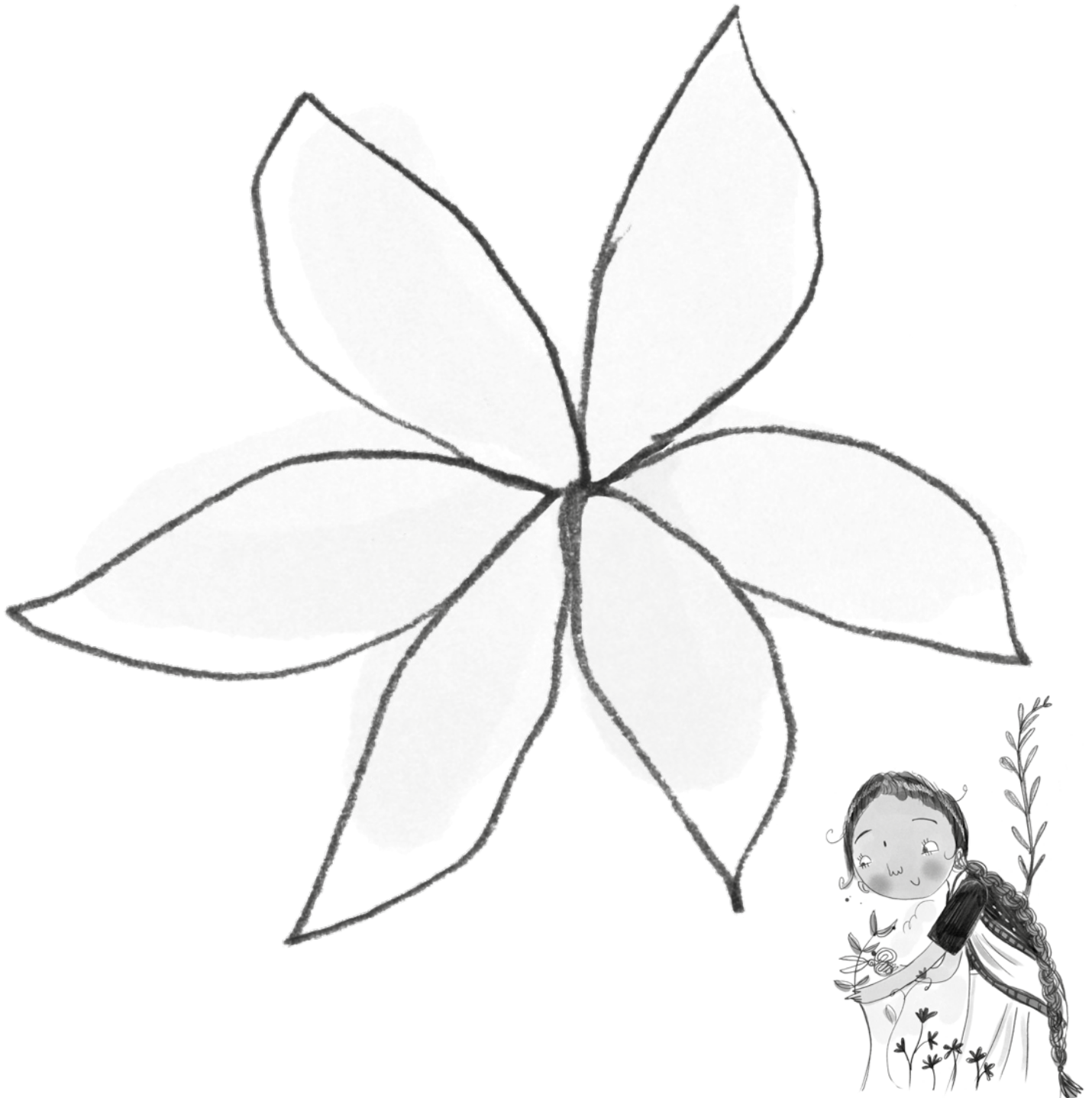
INSPIRED BY JANAKI AMMAL (Pages 64–79)

THE BOTANIST WHO MADE THE WORLD A SWEETER PLACE

'Janaki is known for her work on the magnolia. She planted magnolias on Battleston Hill in Wisley and they can still be seen flowering there every March. She even had a kind of magnolia named after her – the Magnolia kobus 'Janaki Ammal.'

Q: What work would you like to be known for? What would you like to investigate or change?

Create a flower of your own. On each petal, write a scientific goal for yourself or the world.



MINI-PROJECT 05:

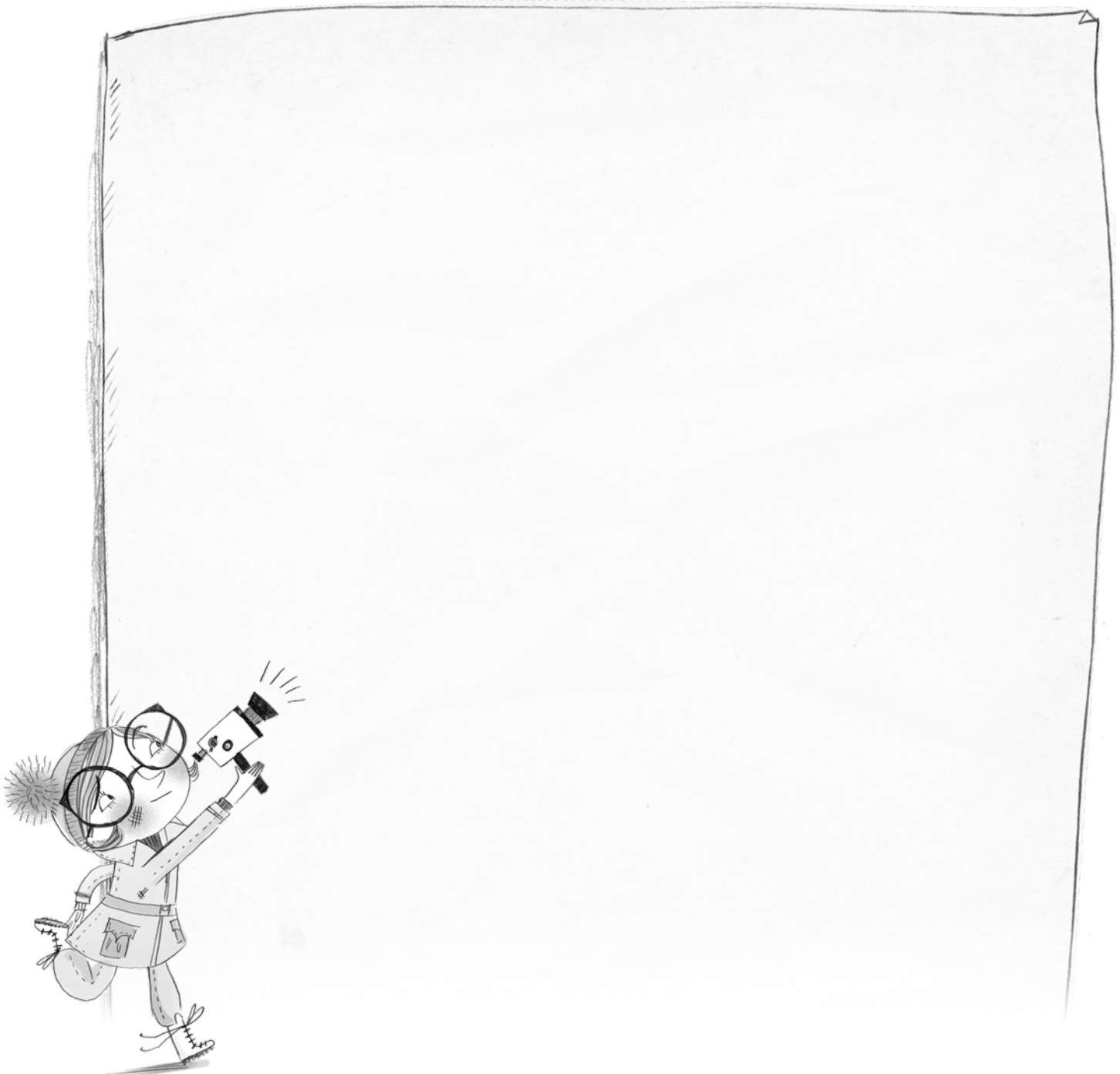
INSPIRED BY KATIA KRAFFT (Pages 80–103)

THE VOLCANOLOGIST WHO WASN'T AFRAID OF FIRE!

'Katia and Maurice travelled the world to document volcanic eruptions [...] Some of the film they took is hard to believe. In one particularly famous film, Katia is shown standing with a huge fountain of red-hot molten rock splashing behind her.'

Q: Scientific work is often dangerous. What dangers do you think scientists working in 2021 might face?

Create a newspaper report documenting an important scientific discovery in 2020 or 2021.



MINI-PROJECT 06:

INSPIRED BY CAROLINE HERSCHEL (Pages 104–122)

THE CINDERELLA WHO SWEEP THE SKY

'Caroline loved her work. She called it "minding the Heavens" – and she had quickly become a star amongst astronomers. She discovered eight comets!'

Q: Why is it important to continue to explore the world around us, despite the challenges of a global pandemic?

Create a 'Star Mobile' to remind you of scientists who have inspired you. Write down or draw a different scientist on each star, decorate them, and hang them by string from the ceiling!



MINI-PROJECT 07:

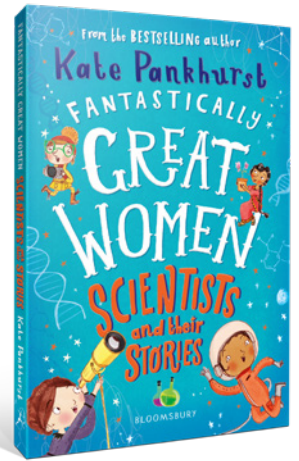
INSPIRED BY TU YOUYOU (Pages 123–146)

THE CHEMIST WHO SAVED MILLIONS OF LIVES

Tu Youyou was a chemist who saved millions of lives. She was the first Chinese woman to be awarded a Nobel Prize, for her work in helping to create an anti-malaria medicine.

Q: What similarities can you see between Tu Youyou's achievements and the achievements of scientists working today, in 2021?

Create a list of the ways that scientists are transforming (even saving) our lives.
Write a letter of thanks to a scientist in 2021.



MINI-PROJECT 08:

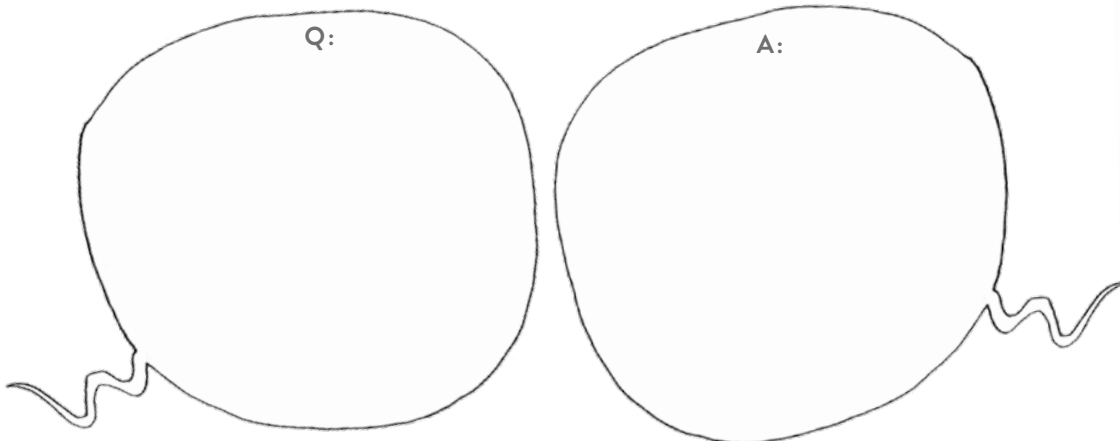
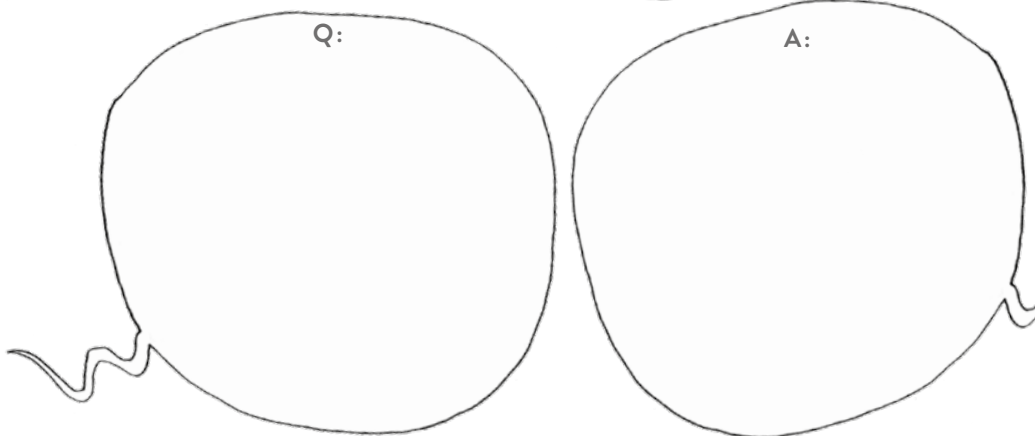
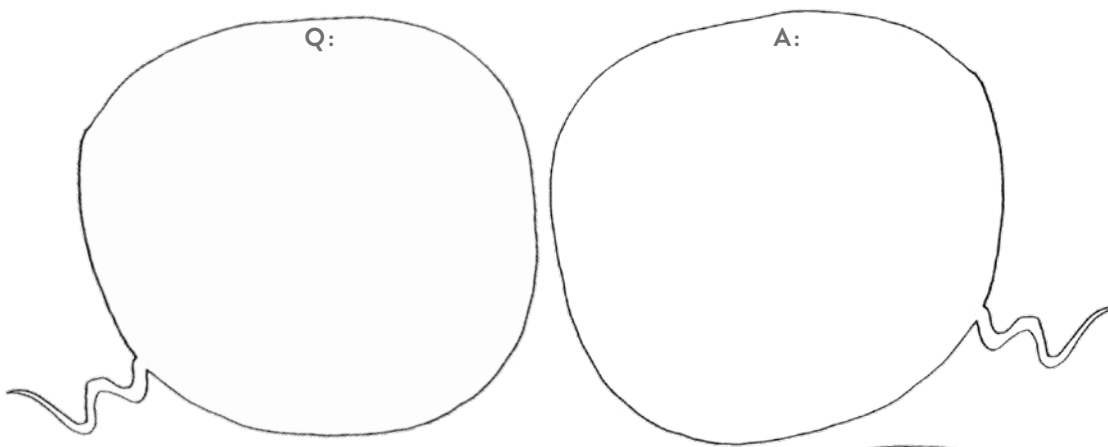
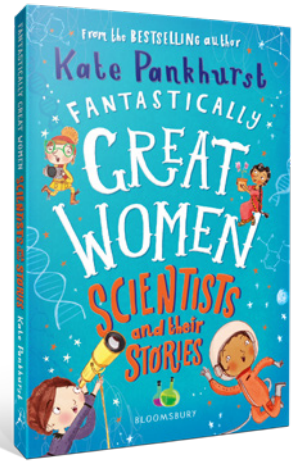
INSPIRED BY ROSALIND FRANKLIN (Pages 147–169)

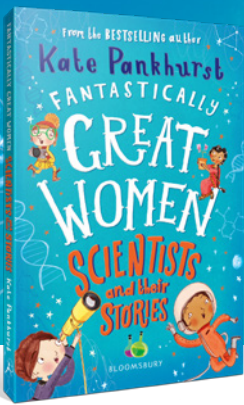
THE CHEMIST WHO DISCOVERED THE SECRET OF LIFE

Rosalind Franklin did a lot of important work on the structure of DNA. She also made several important discoveries about the structure of viruses, along with a scientist called Aaron Klug.

Q: Does it surprise you that scientists have been studying viruses for a long time? Why is it important to keep studying things like this?

Imagine you could ask Rosalind Franklin or another scientist featured in the book one question. What would you ask? How might the scientist reply? Act out your questions and answers!





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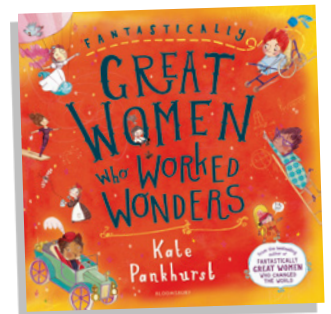
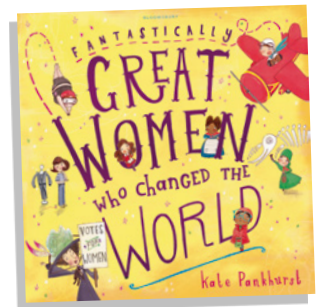
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Other Fantastically
Great books you
might not want
to miss ...



WANT TO DISCOVER MORE?

Then be sure to watch this video of Kate Pankhurst answering questions all about *Fantastically Great Women: Scientists and Their Stories*. The questions are asked by a selection of Fantastically Great readers – just like you!

Scan the QR Code to watch the video or follow this link:

<https://youtu.be/7WzGzuQsJwY>

WATCH VIDEO





FANTASTICALLY GREAT WOMEN SCIENTISTS *and their* STORIES

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SCIENCE
EXPERIMENTS
FOR AT HOME
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Dear fantastically great reader,

We're very pleased to share with you a selection of fun Challenge Cards that have been inspired by Kate Pankhurst's **Fantastically Great Women Scientists and Their Stories!** These three challenges are simple science experiments that children can do in the classroom or at home.

They have been designed to be easy and fun and require simple materials like paper, scissors, recycled items and kitchen staples!

Children are encouraged to behave like real scientists by recording their experiments and their ideas on the **FANTASTICALLY GREAT EXPERIMENT SHEET** at the end of the document.

SAFETY ADVICE:

These activities are designed to be carried out by children working with a parent, guardian or other appropriate adult. The adult involved is fully responsible for ensuring that the activities are carried out safely*. Please read the instructions fully before starting and let the scientific fun begin!



ABOUT THE BOOK

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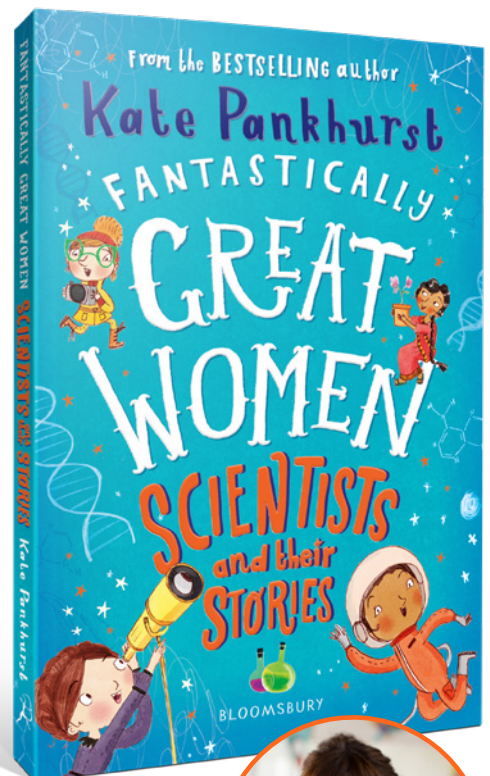
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Women featured: Mae Jemison, Marie Curie, Elizabeth Blackwell, Janaki Ammal, Caroline Herschel, Katia Krafft, Tu Youyou and Rosalind Franklin.

* Bloomsbury Ltd. assume no liability with regard to injuries or damage to property that may occur as a result of using the information and carrying out the practical activities contained in this resource.



Author
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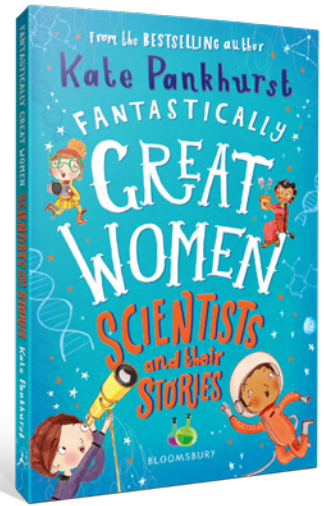
CHALLENGE CARD 01:

INSPIRED BY KATIA KRAFFT (Pages 80–103)

Katia Krafft was a **VOLCANOLOGIST**. She was fourteen years old when she fell in love with volcanoes!

THREE FACTS ABOUT KATIA KRAFFT!

- She loved exploring volcanoes despite the dangers involved.
- She travelled the world to document volcanic eruptions and make new discoveries.
- She died in a blazing eruption on Mount Unzen in Japan, doing what she loved.



THE BRIEF: CREATE A COLOURFUL UNDERWATER VOLCANO!

MATERIALS:

String
Scissors
Empty Salt Shaker
A Large Jar
Food Colouring

THE METHOD:

1. Create a handle to lower your salt shaker. With an adult, cut a 60cm length of string with a pair of scissors. Tie a knot around the neck of a salt shaker with one end of the string. Ensure the knot is secure. Repeat this process with the other end of the string.
2. Empty and clean a large jar. Fill the clean jar about three quarters full with cold water.
3. With an adult, fill the salt shaker with hot water – as hot as you can get from your tap – to just below the neck. Add 3–4 drops of food colouring to the water in the salt shaker.
4. Hold your salt shaker over the mouth of the jar by the string handle. Slowly lower the salt shaker into the jar until the shaker is completely submerged and resting upright on the bottom of the jar. Watch how the coloured water erupts from the shaker into the cold water!

Get ready to go!



THE SCIENCE: This experiment shows how convection currents work. A convection current is the way that heat rises and falls in liquids and gases. Convection currents in the Earth's mantle cause the Earth's crust to move. Where convection currents **diverge** near the Earth's crust, the plates that make up the crust move apart. Where convection currents **converge**, plates move towards each other. The movement of the plates, and the activity inside the Earth, is called plate tectonics. Plate tectonics cause earthquakes and – you guessed it – volcanoes!

MORE THINGS TO RESEARCH: Plate Tectonics; The Dangers of Volcanoes!



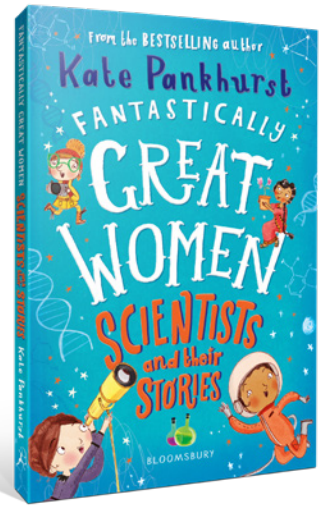
CHALLENGE CARD 02:

INSPIRED BY JANAKI AMMAL (Pages 64–79)

Janaki Ammal was a **BOTANIST** who made the world a sweeter place. She was born in Kerala, India, the tenth of thirteen children in the family!

THREE FACTS ABOUT JANAKI AMMAL!

- She is sometimes called the 'first Indian woman botanist'.
- She gained a Ph.D in botany and 'cytogenetics' – the study of the genes inside cells.
- She was an advocate for protecting India's native plants, like sugarcane.



THE BRIEF: CREATE SWEET MULTI-COLOURED FLOWERS!

MATERIALS:

Flowering Plants with White Petals
(e.g. Carnations)
Scissors
x4 Clear Plastic Cups of Water
Food Colouring

THE METHOD:

1. Mix each cup of water with a different food colouring.
2. With an adult, cut the stems of each flower (lengthways) under running water.
3. Place a split flower stem into each of the coloured liquids and leave overnight.
4. Which colour shows through the petals the best?



THE SCIENCE: Plants take water through their roots. The water contains the nutrients (the food) the plants need to grow. The water moves up through the plant to the leaves, carrying nutrients to all parts of the plant where they are needed. Plants then release water vapour into the atmosphere. This process is called transpiration. As water evaporates from the leaves, more water is pulled up from the roots to replace it!

MORE THINGS TO RESEARCH: Chromosomes; Cross-breeding!



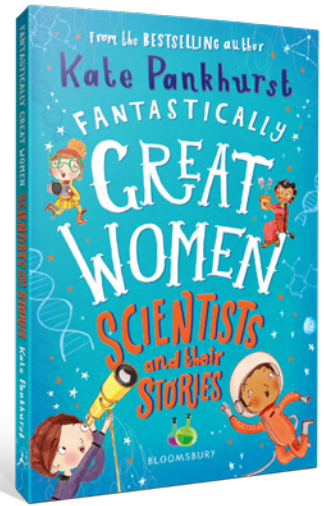
CHALLENGE CARD 03:

INSPIRED BY MAE JEMISON (Pages 5–24)

Mae Jemison was an **ASTRONAUT** who reached for the stars.
She was the first black woman to travel into space.

THREE FACTS ABOUT MAE JEMISON!

- She went to Stanford University aged 16 to study engineering.
- She travelled into space in 1992 on board the space shuttle 'Endeavour'.
- She made it her mission to encourage more children to study science.



THE BRIEF: CREATE A MINI-BOTTLE ROCKET!

MATERIALS:

Small 500ml Plastic Bottle
Cork (fits tightly into the bottle neck)
Half a Piece of Kitchen Roll
1tbsp of Baking Soda (bicarbonate of soda)
Vinegar or Lemon Juice
x3 Straws
Tape

WARNING! Make sure you have a clear empty space and keep observers well back from the launch site as the rocket can shoot up quickly. If nothing happens at first, give it time.

THE METHOD:

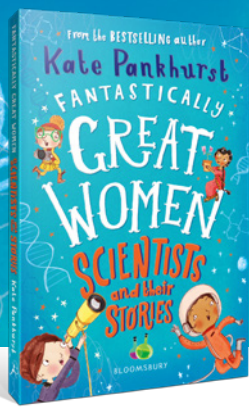
1. Use the tape to attach the 3 straws to the side of the bottle so it stands up when it is upside down.
2. Pour about 2 cm of vinegar or lemon juice into the bottle.
3. Wrap the baking soda up in the kitchen roll to make a little parcel. Choose a launch site outside. It needs to be on a hard surface.
4. Adults only (wearing safety goggles): when you're ready to launch, drop the baking soda parcel into the bottle, add the cork, put the rocket down upside down and stand back!



THE SCIENCE: The chemical reaction used to launch Blast-Off Bottle Rockets produces enough carbon dioxide to propel the bottle high into the sky! When the vinegar and baking soda react one of the bi-products of the reaction is the production of carbon dioxide gas. When we cork the bottle while the reaction is occurring, the gas has nowhere to escape. It builds up inside the bottle until it reaches a point where the pressure inside the bottle is great enough to push the cork out and launch the bottle into the sky – just like a rocket!

MORE THINGS TO RESEARCH: Gravity; Stars and Planets.





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FANTASTICALLY GREAT EXPERIMENT RECORD SHEET

<p>EQUIPMENT (What I needed)</p> 	<p>METHOD (What I did)</p> 
<p>What I found out:</p> 	<p>A drawing of my experiment:</p> 





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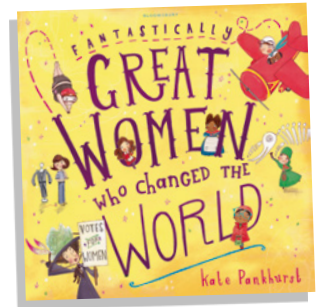
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