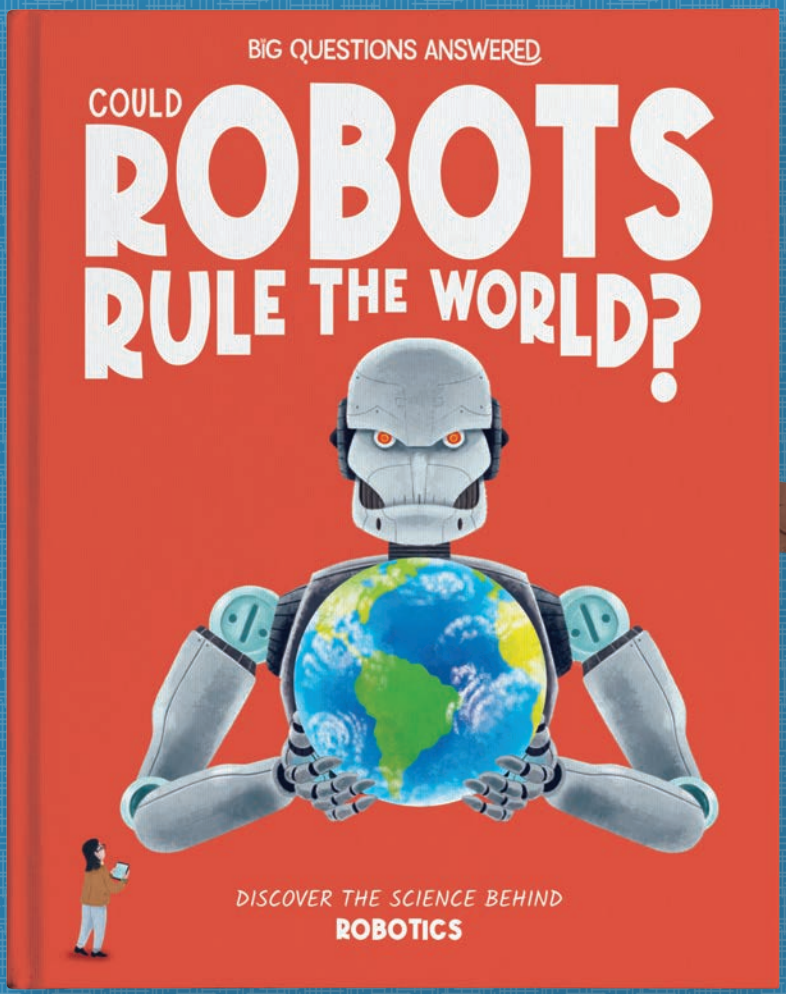
BIG QUESTIONS ANSWERED®

TEACHERS' & PARENTS' RESOURCES

Full of thought-provoking questions and fascinating extra information to accompany this book!



CONTENTS:

INTRODUCTION

NOTES FOR TEACHERS, HOME EDUCATORS AND PARENTS

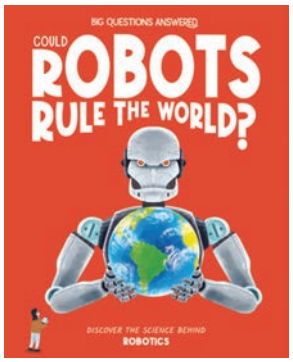
Inspire children's natural curiosity, improve literacy, and have fun learning about different sciences with The Big Questions Answered. Each book in the series is accompanied by a selection of fantastic, **FREE** downloadable resources.

Our **Teachers' and Parents' Resources** booklets are full of ideas for discussions, extra facts, and links to hands-on activities – all great ways to help children explore each field of science and the key topics surrounding them.

Our **Young Scientists' Activity Packs** are a real bonus. They're full of soft-learning, fun activities, all subtly linked to the field of science, that will encourage independent learning. Visit the 'Kids' Zone' to find out more.

Don't forget, on the website you can also download our **'Meet the Scientist' pages** – there's one to accompany each book – and sign up to our newsletter to follow what's coming up next for The Big Questions Answered. Download all these and more at: **www.thebigquestionsanswered.com**

Could Robots Rule the World? book



Young Roboticists' Activity Pack

KEY CURRICULUM TOPICS

The resources related to *'Could Robots Rule the World?'* tie in with key curriculum topics including:

- Animals, including humans
- Computing
- Earth and space
- Electricity
- Everyday materials
- Geography
- Light
- Living things and their habitats
- Plants
- Working scientifically

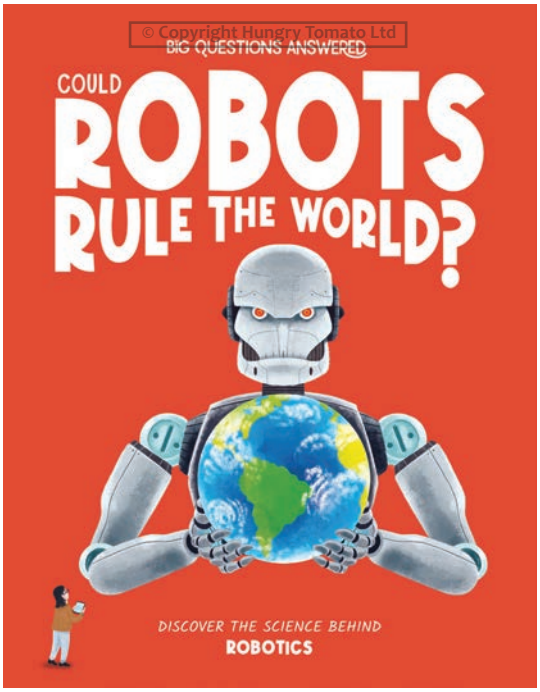
The most relevant topics are indicated throughout this guide.

COULD ROBOTS RULE THE WORLD?

This book explores the extraordinary world of robotics. As well as covering what a robot is and the different components that they are made of, this book also explores the different uses – both present and future – that robots have, from delivering medicine inside the human body to searching for survivors after natural disasters.

PRE-READING QUESTIONS

Engage in discussion about the general topic of robotics with the suggested questions below.

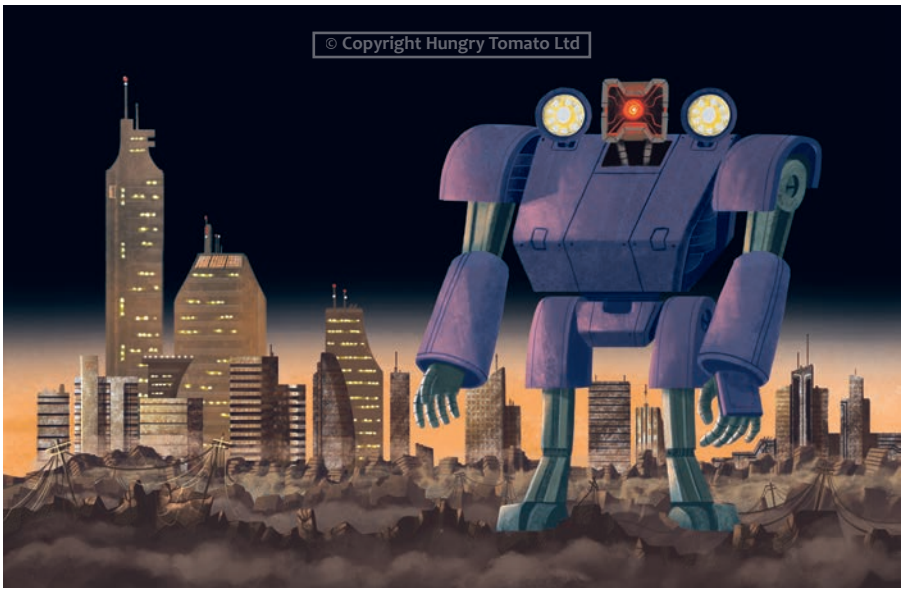


- **Do you think robots could rule the world?**
- **What do you know about robotics already?**
- **What things are robots used to do?**

IT'S A ROBOT WORLD: SCENE 1

The material for this scene can be linked to curriculum topics, including:
computing; Earth and space; electricity; everyday materials.

Introduce children to the incredible world of robotics and ask them to share what they know about robots. Encourage them to picture what the future of robotics might look like.



DISCUSSION PROMPTS

- **What is a robot?**
Information overleaf

- **What is a roboticist? What do they do?**
Information overleaf

- **How would you feel if robots were to take over the world? How do you think the world might look like?**
Encourage children to discuss what they think a robot-led world might look like, how they might feel about robots taking over, and how they think life would be different compared to today.

ACTIVITY

Corresponding activity on page 3 of the activity pack: 'Robot Replica' is a symmetry drawing activity which children must complete the drawing of the robot.

IT'S A ROBOT WORLD: SCENE 1

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

WHAT IS A ROBOT?

A robot is a **machine** that has been designed to carry out tasks **autonomously** without any help from a human.

They can come in lots of diferent shapes and sizes, depending on the task that they have been designed to do.

Some robots, like ones meant to help crop pollination, are only the size of insects.

Other robots, like ones designed to help build plane wings, are much bigger.

The parts of a robot can be divided into two main categories – **hardware** and **software**:

- Hardware is the physical parts of the robot. This includes its **body**, **motors**, and **sensors**.

- Software is the **programs**, or instructions, that tell the hardware what to do.

WHAT IS A ROBOTICIST?

Roboticists work alongside **engineers** to design and build robots.

They write the **computer code** that goes into the robot's software. This will vary from robot to robot depending on what it has been designed to do.

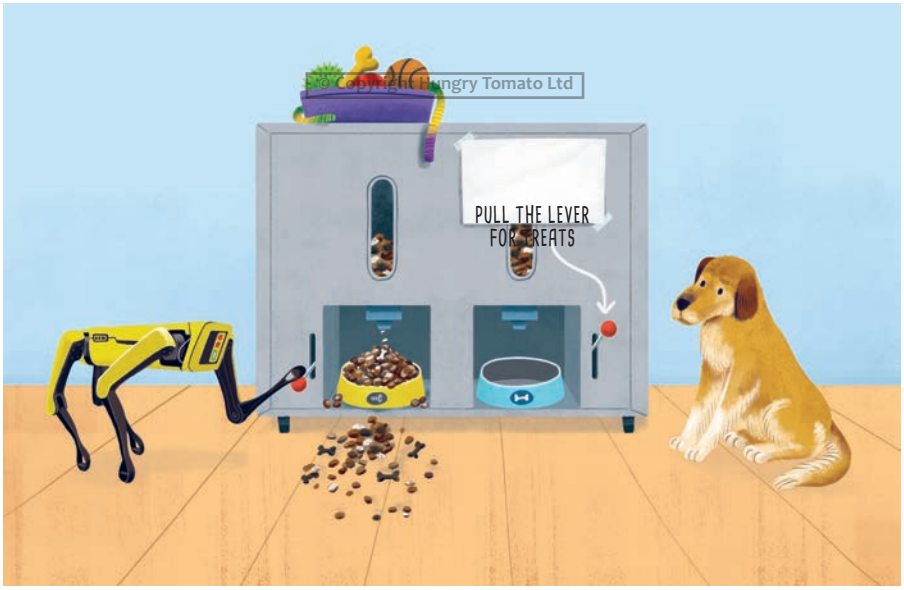
They have to make sure that it is built from the right **materials** to make sure it is suitable for the **environment** that it will be working in.

They also have to do lots of testing with the robot to make sure that it runs safely and won't make mistakes.

PRESENT-DAY ROBOTS: SCENE 2

The material for this scene can be linked to curriculum topics, including:
computing; Earth and space; everyday materials.

Introduce children to examples of robots that they might already be familiar with and even have in their homes. Discuss which planet has the most robots exploring it and the kinds of things these robots are searching for.



DISCUSSION PROMPTS

- **What is an example of a robot that people might have in their homes?**
  Information overleaf

- **Which planet has the most robots currently exploring it?**
  Information overleaf

ACTIVITY

Corresponding activity on page 4 of the activity pack: 'Rogue Robot' is a spot the difference activity where children must spot the ten differences in the two scenes provided.

PRESENT-DAY ROBOTS: SCENE 2

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

ROBOT VACUUM CLEANERS

Doing household chores can be a very time-consuming task.

Thankfully, more and more robots are being **invented** that can do these jobs for us!

Robot vacuum cleaners are an example of a 'home robot'.

The idea of a robot vacuum cleaner that could vacuum and mop the floor at the same time was thought up for the first time in 1956 – although the first one wasn't actually built until the late 1990s.

These robots use **sensors** to follow a certain path around a room, make sure they don't bump into furniture, and also stop them from falling down the stairs!

THE RED PLANET

Six rovers have successfully landed on Mars – the most of any **planet**!

Rovers are robotic vehicles designed to explore the surface of other planets.

They are a lot bigger than something like a robot vacuum cleaner – the Perseverance Rover, for instance, is the size of a small car!

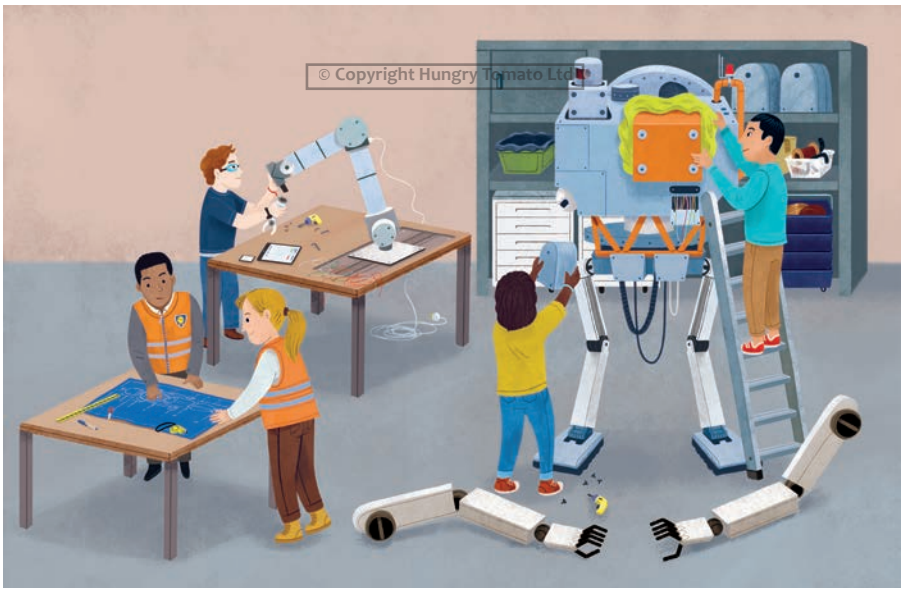
Perseverance was programmed to search for any signs of **ancient** life on Mars, as well as study its surface and **climate**.

It uses its cameras, **instruments**, and sensors to study the rocks and landscape around it, and help scientists work out if humans could one day live on Mars!

BUILDING ROBOTS: SCENE 3

The material for this scene can be linked to curriculum topics, including:
computing; everyday materials; history.

Introduce children to some record-breaking robots and what they were used for. Discuss the different possible uses that robots have.



DISCUSSION PROMPTS

- **What was the first robot ever built?**
  Information overleaf

- **What is the largest robot?**
  Information overleaf

- **Do you think it's easy or difficult to build a robot? Why?**

ACTIVITY

Corresponding activity on page 5 of the activity pack: 'A Day in the Lab' is a creative writing activity where children must write a diary entry as if they were a roboticist building a new robot.

BUILDING ROBOTS: SCENE 3

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

THE FIRST ROBOTS

There are a few possible answers to the question of what the first robot was.

In the 1470s **Leonardo da Vinci** created a wooden **cart** that could be considered to be the first ever robotic vehicle.

Like a wind-up toy, it could **propel** itself across the floor without being pushed and without a driver. It could also steer itself, although only to the right!

Scientists have noted that it looks similar to the modern rovers exploring Mars!

The first robot designed to be used for **manufacturing** things was **invented** in the 1960s. It was called the 'Unimate'.

Unimate was a mechanical arm and was more like the robots that we know today.

It could carry out tasks that human workers would have found too difficult, dangerous, or **repetitive**.

AUTOHAUL

The record for the heaviest robot in the world belongs to AutoHaul.

AutoHaul is an **autonomous** train that runs in Australia.

The locomotive itself is 21.9 metres (72 feet) long and weighs 197 tonnes (217 tons) .

Two or three of these **locomotives** are put together to pull 240 cars containing **ore**. The entire train can be 2.4 km (1.5 miles) long!

It travels distances of over 800 km (497 miles) in just one journey – all without a driver onboard!

SOPHIA THE ROBOT: SCENE 4

The material for this scene can be linked to curriculum topics, including:
computing; everyday materials; history.

Introduce children to the concept of humanoids and androids, and what the differences between the two are. Explore what the first humanoid might have been, and what the most advanced one in the world today is.

DISCUSSION PROMPTS

- **What is a humanoid?**
Information overleaf

- **What can Sophia the humanoid do?**
Information overleaf

- **If you had the chance, would you want to talk to a humanoid robot? What would you ask it?**

Encourage children to discuss how they feel about robots that look like humans, and the kinds of questions that they would want to ask if they had the opportunity to talk with one.

ACTIVITY

Corresponding activity on page 6 of the activity pack: 'A Jumbled Message!' is a decoding challenge where children must figure out the hidden message using the code provided.

SOPHIA THE ROBOT: SCENE 4

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

HUMANOID ROBOTS

Humanoids are robots that are resemble humans.

They have a head, two **sensors** that are designed to look like eyes, a **torso**, arms, and legs.

Humanoids have lots of different uses. They can help to lift heavy objects, clean, help to develop **prosthetics** – and so much more.

One day in the future, they could even replace astronauts on missions that are considered too dangerous for humans!

As well as inventing what could be seen as the first robotic vehicle, **Leonardo da Vinci** also possibly created the first humanoid – all the way back in the 1400s.

It looked like a knight in a suit of armour and used a series of **pulleys** to make it move like a human would. It could sit, stand, move its arms, and even move its jaw.

SOPHIA THE ANDROID

Sophia is one of the most advanced **humanoid** robots in the world.

It is a type of humanoid called an **android**, which are designed to look and act as much like humans as possible.

Its face is made from a special material that **mimics** human skin, allowing it to make different facial expressions.

It uses **AI** to recognise faces, understand speech, and hold conversations – it even has a sense of humour and can sing!

ROBOTS AT WORK: SCENE 5

The material for this scene can be linked to curriculum topics, including:
computing; everyday materials; working scientifically.

Introduce children to nanotechnology and how tiny robots could be used to help treat sick people. Explore the world's largest factory and how it uses robots to build planes.

DISCUSSION PROMPTS

- **Where do you think the biggest factory in the world is?**
Information overleaf

- **What do you think nanotechnology is?**
Information overleaf

- **What do you think nanobots can be used for?**
Information overleaf

ACTIVITY

Corresponding activity on page 7 of the activity pack: 'Look Out for the Nanobot!' is an odd one out activity where children must spot the nanobot that stands out from the rest.

ROBOTS AT WORK: SCENE 5

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

THE WORLD'S BIGGEST FACTORY

The world's largest factory – and also the world's largest building of any kind by **volume** – is in the United States and is used to build aircraft.

It covers almost 100 **acres** and also has its own fire station, museum, theatre, and 19 shops and restaurants!

It's so big that people working inside have to use bicycles to get from one place to another!

Robots work alongside humans in the factory to build the planes. One of these robots is used to paint the planes once they have been built. It takes only 24 minutes for the robot to finish the entire plane – it takes human workers four hours.

However, some of the robots are not used anymore because they weren't as **precise** as the human workers!

DELIVERING MEDICINE

Nanotechnology is the design and production of extremely small objects, including nanobots.

Nanobots – also called nanorobots – are robots that are smaller than the width of a human hair!

Scientists are researching whether nanobots could be used to help treat illnesses.

They think nanobots could deliver medicine directly to where in the body it is needed most. This would make treating hard-to-reach areas easier and more **accurate**, and could also reduce the possibility of **side effects**.

ROBOTS TO THE RESCUE: SCENE 6

The material for this scene can be linked to curriculum topics, including:
computing; geography; history; working scientifically.

Introduce children to what the largest earthquake in recorded history was and the damage that it caused. Explore how robots could help search for and help survivors after an earthquake.

DISCUSSION PROMPTS

- **What was the largest earthquake ever recorded?**
Information overleaf

- **How can robots be used to help people after an earthquake?**
Information overleaf

- **What can robots do that humans can't?**
Encourage children to discuss the differences between humans and robots, and how robots can be used after natural disasters. For instance, robots can work a lot longer than humans without getting tired.

ACTIVITY

Corresponding activity on page 8 of the activity pack: 'Design Your Own Robot' is a creative drawing activity where children can get creative and draw their own robot.

ROBOTS TO THE RESCUE: SCENE 6

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

SHAKING THE EARTH

The strongest earthquake ever experienced by humans took place in 1960.

It was a **magnitude** 9.5 and struck just off the coast of southern Chile.

It released over twice as much **energy** as the second largest earthquake ever, which was a magnitude 9.2.

Sadly over 1,600 people died, and another two million lost their homes.

Because the **epicentre** of the earthquake was so near the coastline, it also triggered a **tsunami**.

It even damaged towns in New Zealand, the Philippines, and Japan – which are countries on the other side of the Pacific Ocean!

ROBOTS TO THE RESCUE!

Robots have lots of potential uses when it comes to rescuing people after an earthquake.

- A long, narrow robot that looked like a snake was used after an earthquake in Mexico to search for survivors in a collapsed building. It could fit in very small spaces that a human couldn't.

- **Drones** could use their **sensors** to spot people even if it's very dark.

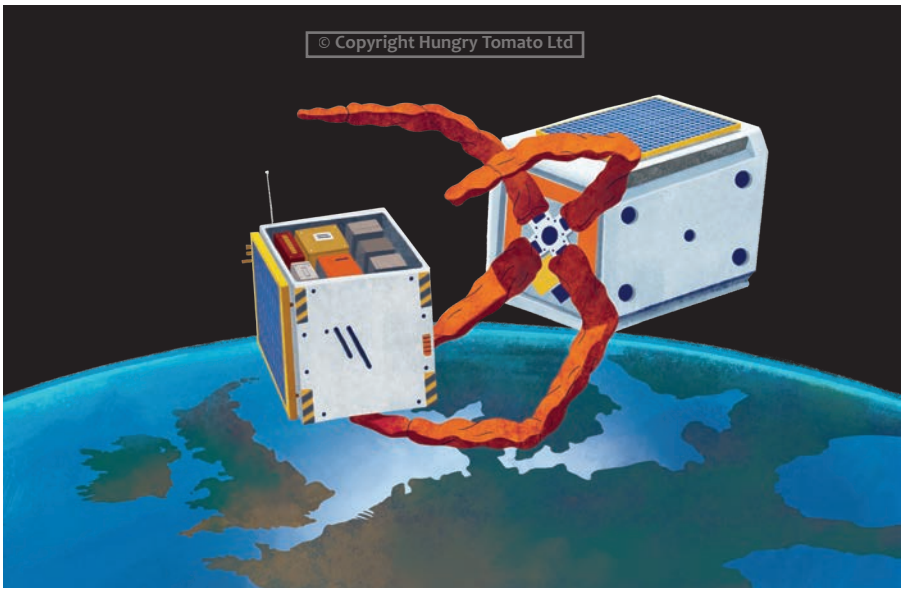
- Larger robots could use their strength to lift heavy bits of **debris**.

One of the best things about using robots to help in earthquake rescue missions is that they never get tired and can work for a lot longer than humans. When it comes to rescuing people after an earthquake, moving quickly is very important!

ROBOTS IN SPACE: SCENE 7

The material for this scene can be linked to curriculum topics, including: computing; Earth and space; history.

Introduce children to satellites and the jobs that they do in orbit around Earth. Explore what the first satellite was and how it changed the world.



DISCUSSION PROMPTS

- **What are satellites?**
Information overleaf

- **What was the first satellite launched into space?**
Information overleaf

- **If you could design a satellite, what would it be able to do? Where would it travel to?**
Encourage children to imagine that they had designed a satellite. Discuss with them what its job would be and where it would fly. Would it travel to the other side of the solar system or stay in orbit around Earth?

ACTIVITY

Corresponding activity on page 9 of the activity pack: 'Chasing Satellites' is a line maze activity where children must help the robot spacecraft reach the old satellite.

ROBOTS IN SPACE: SCENE 7

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

WHAT ARE SATELLITES?

There are two types of satellites: **natural** and **artificial**. Both kinds **orbit** planets.

Natural satellites include things like **moons**, which are kept circling around their planet by the planet's **gravity**.

Artificial satellites are made by humans and launched into space using **rockets**.

These kinds of satellites have many uses. They can send television signals to our homes, monitor the weather, help scientists to study Earth and other planets – and more.

There are over 10,000 working satellites **orbiting** Earth at the moment, and many more that are still in space but aren't active anymore.

To get the power that they need to work, satellites rely either on **batteries** or on **solar panels** that turn light from the Sun into **electricity**.

SPUTNIK 1

Sputnik 1 was the first human-made object to orbit Earth. It was launched by the Soviet Union (now Russia) in 1957 and changed the world forever!

Sputnik 1 was a small, shiny sphere with four **antennas**. It circled Earth at a speed of around 17,500 miles per hour (28,000 km per hour), completing one orbit in 96 minutes.

The satellite didn't carry any scientific **instruments** onboard, but instead let out a steady radio signal that could be picked up by radio operators on Earth.

Its success sparked the **Space Race**, a period of competition between the Soviet Union and the United States to achieve major milestones in space exploration. Sputnik 1 proved that humanity could reach beyond our planet.

ROBOTS IN THE WILD: SCENE 8

The material for this scene can be linked to curriculum topics, including:
animals, including humans; climate change; living things and their habitats; plants.

Introduce children to what ecosystems can be found all across Earth. Explore what climate change is and the impact that it is having on the planet.

DISCUSSION PROMPTS

- **What are ecosystems?**
Information overleaf

- How many different ecosystems can you think of?

Encourage children to name different ecosystems that are found around the world. There is also information overleaf.

- **What do you know already about climate change?**
Information overleaf

ACTIVITY

Corresponding activity on page 10 of the activity pack: 'Pick a Favourite Ecosystem' is a fact file activity where children must research their favourite ecosystem and find out as many fun facts as they can.

ROBOTS IN THE WILD: SCENE 8

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

THE WORLD'S ECOSYSTEMS

Ecosystems are communities of both living and non-living things all existing together in one area. There are lots of different types of ecosystems, and several main categories, including:

- **TUNDRA**: Tundras, like ones in the Arctic and Antarctic, have the lowest temperatures of any ecosystem. They also get very little **precipitation**. Only very few plants or animals can survive here.

- **DESERTS**: Deserts also don't get much precipitation – in fact, they get the least of any ecosystem. They can be either very hot or very cold.

- **FORESTS**: Forests are covered in trees. There are three different kinds: tropical forests (or rainforests) are warm and **humid**; temperate forests are much **milder**; boreal forests are the coldest and driest.

- **GRASSLANDS**: These are large, flat areas with lots of grass, relatively few trees, and litle rainfall. Animals like elephants, giraffes, and lions live here!

- **AQUATIC**: Aquatic biomes are the largest of all. 70% of Earth is covered by water, and more animals live in the water than they do on dry land!

WHAT IS CLIMATE CHANGE?

Earth's **climate** changes naturally over time, but humans burning things like **fossil fuels** has caused it to change much quicker than normal over the last few hundred years.

When burnt, fossil fuels release **gases** like **carbon dioxide** into the **atmosphere**. These trap heat and make the climate hotter around the world.

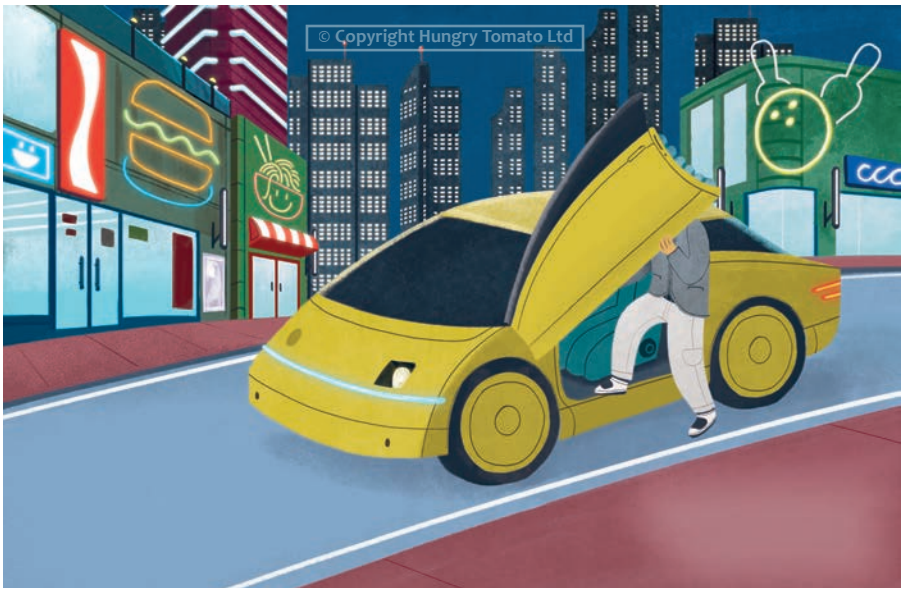
This can have have a negative impact on many **ecosystems**, as well as on humans, as they struggle to **adapt** to the increasing temperatures.

Robots could have a very important role to play in fighting climate change. They could help monitor the health of forests, identify **pollution** in the oceans, and build cars that don't rely on fossil fuels as much.

ROBOTIC CARS: SCENE 9

The material for this scene can be linked to curriculum topics, including: computing; electricity.

Introduce children to robotic cars and the way that they work. Explore how they navigate around towns and cities, as well as arguments both for and against them.



DISCUSSION PROMPTS

- **How would you feel if you got in a car and found out that it was robotic?**

Encourage children to discuss how they would feel about riding in a car that didn't have a driver. Would they find it strange, relaxing, or something else?

- **How do robotic cars know where to go?**

Information overleaf

- **Do you think robotic cars are good or bad? Why?**

Encourage children to share their opinions. There is also information overleaf.

ACTIVITY

Corresponding activity on page 11 of the activity pack: 'Remarkable Robot Words' is a fun and engaging word search activity that introduces children to robot-related words.

ROBOTIC CARS: SCENE 8

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

A GOOD SENSE OF DIRECTION

Without a driver, robotic cars need another away to tell where they are supposed to go. The answer is a combination of **artificial intelligence** (AI) and **GPS** tracking.

GPS is short for Global Positioning System. It uses information gathered by **satellites** in space to pinpoint the exact location of something.

Thanks to GPS, the robotic car knows its location, where it is going to, and the best way of getting there.

Artificial intelligence, meanwhile, is used by the robotic car to 'see' its surroundings. It can spot obstacles in its path and safely navigate to its destination.

ROBOTIC CARS: THE GOOD AND THE BAD

Robotic cars are still a relatively new invention. Some people are very excited about their development, while others have concerns.

Arguments for robotic cars:

- More **environmentally friendly** because they are usually electric-powered and therefore produce less **fossil fuels**.
- Less traffic, due to GPS and AI telling them the busy routes to avoid.
- More time and comfort for the passengers.

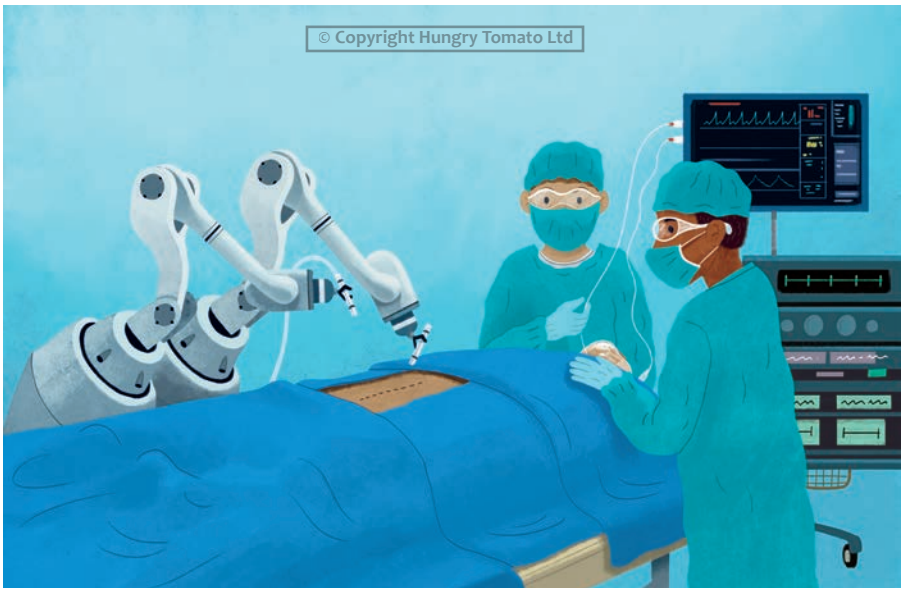
Arguments against robotic cars:

- Worries about relying on technology in difficult situations. What if the GPS satellites stop working?
- Worries about techology being hacked, causing dangerous situations as well as privacy issues.
- Taxi and delivery drivers losing their jobs.

ROBOTIC SURGERIES: SCENE 10

The material for this scene can be linked to curriculum topics, including:
animals, including humans; computing; working scientifically

Introduce children to how robots can be used in medicine to help treat sickness. Discover what the first robotic surgery was and why it is so important for surgeons to wear masks and gloves.



DISCUSSION PROMPTS

- **What was the first robotic surgery to be performed?**
Information overleaf

- **Can you think of different ways that robots can help doctors and people staying in hospitals?**
Information overleaf

- **Why are the surgeons in the scene wearing masks and gloves?**
Information overleaf

ACTIVITY

Corresponding activity on page 12 of the activity pack: 'Machine Mix-Up' is a word scramble and word within words activity where children must unscramble the robot-related words.

ROBOTIC SURGERIES: SCENE 10

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

THE FIRST ROBOTIC SURGERY

In 1985, a robot called PUMA 560 was used during surgery on a person's brain.

Surgeons wanted to carry out a **biopsy**, which is when a small piece of **tissue** is removed from the body to see how far a **disease** has spread.

Because the brain is so delicate, one wrong move could have massive consequences.

To reduce the risk of error from human hand **tremors**, PUMA 560 was used instead!

LIFE-SAVING ROBOTS

Robots of varying kinds are already used a lot in medicine! Here are just some examples:

- A '**germ**-zapping' robot is used in hospitals to **disinfect** entire rooms in minutes. This gets rid of **bacteria** and reduces the risk of **infection** in patients.

- Larger robots carry medical supplies around the hospital. This saves doctors a job and means they can spend more time caring for their patients.

- Not all robots have to even look like robots. There is a robot designed to look like a baby seal – complete with fur! It is designed to comfort elderly and sick patients.

IMPORTANT SURGERY TOOLS

Doctors performing surgery will always wear a mask, **disposable** gloves, and clean gowns.

This is to stop germs from transferring from themselves to patient, helping to significantly lower the risk of the patient or their wounds becoming infected.

THE ETHICS OF ROBOTICS: SCENE 11

The material for this scene can be linked to curriculum topics, including:
animals, including humans; computing

Introduce children to the different kinds of jobs that robots could be used for, from the ordinary to the extraordinary. Discuss the differences between humans and robots, and explore which jobs humans likely will always be better at.

DISCUSSION PROMPTS

- **The robots in this scene are helping to pack canned food into boxes. What other kinds of jobs do you think robots are able to do?**
Information overleaf

- **What are humans better at than robots?**
Information overleaf

- **Which jobs do you think humans are better suited to than robots? Why?**
Information overleaf

ACTIVITY

Corresponding activity on page 13 of the activity pack: 'Runaway Robot' is a maze activity where children must help the robot find the box that it has left behind.

THE ETHICS OF ROBOTICS: SCENE 11

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

ROBOTS AT WORK

As robots become more advanced, the number of jobs that they are able to do increases.

Roboticists think that robots could do jobs like:

- Manufacturing jobs
- Shop checkouts
- Translation
- Exploring dangerous places on Earth, such as volcanoes, caves, and the deep sea
- **Nuclear** disaster response or clean-up tasks
- Search and rescue missions
- Bomb disposal

... and so much more!

HUMANS VS ROBOTS

There will always be some differences between robots and humans. Robots can be designed to do a lot of things, but they will never be able to fully understand things like emotions, **empathy**, or creativity – things that make humans the way we are.

Because of this, there will always be some jobs that humans are better suited to than robots. Humans can use their personal experiences and thoughts to make decisions. Robots wouldn't be as good at jobs that deal with:

- Art and literature
- Music
- Physical and emotional therapy
- Health and beauty
- Classroom teaching
- Leadership

THE FUTURE OF ROBOTICS: SCENE 12

The material for this scene can be linked to curriculum topics, including:
geography; history; light.

Introduce children to the wonders of the world's oceans. Explore Challenger Deep and the fascinating creatures that live there, as well as the world's most famous shipwreck.

DISCUSSION PROMPTS

- **Do you know where the deepest point in the ocean is? How deep do you think it is?**
Information overleaf

- **Can you think of any famous shipwrecks?**
Information overleaf

ACTIVITY

Corresponding activity on page 14 of the activity pack: 'Incredible Robots' is a crossword activity where children use clues to name some of the places that robots could be sent to explore.

THE FUTURE OF ROBOTICS: SCENE 12

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

CHALLENGER DEEP

Challenger Deep is the deepest point in the oceans. It is almost 11,000 metres (36,000 feet) beneath the surface of the water – that's deeper than Mount Everest is tall!

It is part of the Mariana Trench, a chasm in the Pacific Ocean that runs for over 2,500 km (1,500 miles).

For a long time, scientists thought that it was impossible for living things to survive so far underwater because of the **pressure**, cold temperatures, and lack of sunlight.

However, there are actually plenty of animals who have **adapted** to live in the depths. This includes:

- The telescope octopus, which is **translucent** and almost entirely colourless!
- The hadal snailfish, which is the deepest-living **vertebrate** in the world.
- A certain kind of shrimp-like **crustaceans** called amphipods that **scavenge** for food left over by **predators** in shallower waters.

THE 'UNSINKABLE' TITANIC

Arguably the most famous **shipwreck** in the world is that of the RMS Titanic.

Titanic was a very luxurious **ocean liner** that set off on its maiden voyage in 1912. It was due to sail across the **Atlantic Ocean** from Southampton in the UK to New York in the USA.

One night, Titanic struck an iceberg and sank – despite many people thinking it was unsinkable! It came to rest 3,800 metres (12,500 feet) below sea level.

Several robotic **submersibles** have explored the wreck in the decades after the sinking.

SO, WILL ROBOTS RULE THE WORLD?: SCENE 13

The material for this scene can be linked to curriculum topics, including: computing; working scientifically.

Introduce children to the advantages and disadvantages of building robots. Encourage them to reflect on what they have learned through reading this book and decide whether robots will rule the world or not!

DISCUSSION PROMPTS

- **Do you think robots will rule the world? Why or why not?**

Encourage children to discuss what they have learned while reading this book and come to their own conclusions about whether robots will one day rule the world.

- **Overall, do you think robots are a good invention or not?**

Information overleaf

- **If you could build a robot, what would you design it to do?**

Encourage children to discuss the possible uses of robots and what they would use one for if they could build it.

ACTIVITY

Corresponding activity on page 15 of the activity pack: 'A Robotic Future' is a reflective writing task where children think about their opinions on a number of robot-related questions.

SO, WILL ROBOTS RULE THE WORLD?: SCENE 13

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

ROBOTS: GOOD OR BAD?

Because robotics is growing and developing so quickly, there is still a lot to learn about robots. They have their advantages and disadvantages, just as any other new technology does. This includes:

GOOD

- Unlike humans, robots don't get tired. This reduces the risk of errors and mistakes.
- They can also do the same task over and over again without getting bored.
- They can work in dangerous environments that humans never could.
- By helping out with everyday tasks, robots could give people more time to spend doing things that they enjoy.

BAD

- Unlike humans, robots can't **improvise**. If something goes wrong, they aren't able to **adapt** like we can.
- Robots can be very expensive to build, and take a long time to program. They can also cost a lot money to fix if they break.
- They lack the 'human touch' and aren't capable of **empathy**. This makes them unsuitable for certain kinds of jobs.
- In some cases, robots can take away jobs from people.

POST-READING QUESTIONS

Engage in discussion about the journey taken throughout the book and the facts that were uncovered, with the suggested questions below.

- **Were you surprised to learn that robots will help to shape Earth's future?**
- **Did anything else in the book surprise you?**
- **What's the coolest thing you've learnt from this book?**

ACTIVITY

Corresponding activity on page 16 of the activity pack: 'Write Your Own Robotics Story' is a creative writing activity which encourages children to write a story about robotics using three key prompt words.

DISCLAIMER:

Every effort has been made to ensure the information in this booklet is correct as of the time of publication, Autumn 2025.

THE BIG QUESTIONS ANSWERED

Explore the many diverse fields of science, discovering captivating stories and incredible discoveries with The Big Questions Answered, an exciting new science series for inquisitive kids.

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