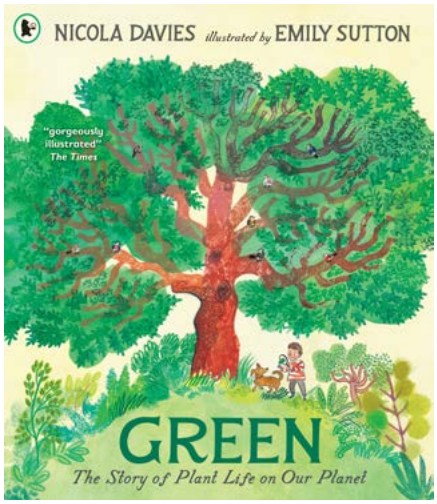
Green: the story of plant life on our planet

This is one of a series of activity sheets to use alongside the books which have been shortlisted for the Royal Society Young People's Book Prize 2025.

CENTRE *for* INDUSTRY EDUCATION COLLABORATION



Each activity sheet contains ideas for activities to do with your pupils, provides information relating to careers, and has a maths focus to help pupils understand the importance of mathematics education across the curriculum.

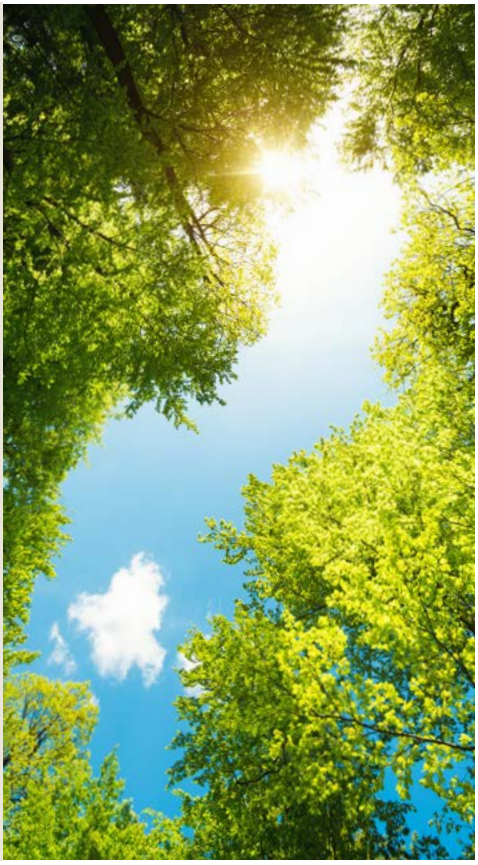
Working with scientists

These investigations can be done as standalone activities or carried out as an in-depth sequence to develop pupils' disciplinary and substantive knowledge. The deeper learning and science capital development of your pupils could be made more memorable through collaboration with a scientist such as a climate scientist or botanist. You could do this by applying for a Royal Society Partnership Grant of up to £3,000. For more information, visit: **royalsociety.org/grants/partnership-grants.**

The importance of green

The final page of the book tells us that green is the most important colour in the world. What do pupils think about this? Ask them to discuss it in small groups, highlighting some examples from the book of the importance of green, such as plants as food, oxygen production, and shelter from the hot sun. Groups each choose one idea they feel strongest about and explain it to the class. Pupils then vote on whether they agree, partly agree, or disagree, giving reasons for their choices. Ideas might include plants feeding almost every animal on Earth, or simply that without green plants, humans couldn't survive. Finish by asking pupils to write one sentence about what the colour green now means to them, and consider having them write onto pre-cut green paper leaves. This would make a wonderful display.

When discussing plant functions, take care to keep explanations appropriate to your pupils' stage of learning. For younger pupils, focus on simple ideas like 'plants help keep the air healthy' rather than detailed scientific processes. If working with older pupils, you may choose to explore these concepts in more depth in line with their curriculum.



Plant powers

Provide a range of plant samples for your pupils to draw. Make sure to include whole plants so root structures can be viewed (see the list below for interesting examples). Ask pupils to spend a few quiet minutes observing their specimen closely, noticing shape, texture, colour and any tiny details such as veins or edges. You could make hand lenses or digital microscopes available to support close observation.

dandelion • clover • moss • succulents • radish • fern • grass • daisy • nasturtium

Pupils will then make a careful scientific drawing, labelling features like the stem, veins and leaf surface. As they draw, prompt pupils to jot down what environmental jobs this plant might do, for example, providing food or shelter, protecting soil, or helping clean the air. Once finished, pupils share their drawings in small groups and compare the different roles their plants might play in the environment. Display the drawings as a 'plant powers gallery' to celebrate how many jobs plants do quietly around us every day.

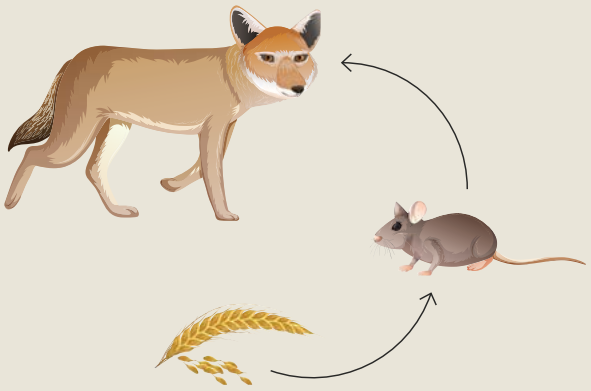
Food chain challenge

Look at the food chain illustration on page 8 of the book. Draw attention to how the arrows point to what each creature eats. Explain in a scientific diagram, the arrows go the opposite way and point to what each thing 'is food for'. For example, a dead leaf is food for an earthworm, and an earthworm is food for a sparrow.

Print, or ask pupils to create, a set of cards featuring the plants and animals shown in the illustration on page 8 of the book. Challenge them to arrange the cards to make as many different food chains as they can, or the longest food chain possible. They can sketch their findings, then annotate their sketches using the phrase 'is food for' to demonstrate their understanding.

Take pupils into the school grounds or local park for a live food-chain hunt, finding real plants, and noting what each plant 'is food for'. Pupils count how many complete food chains they can find. For any incomplete food chains, they can carry out research back in the classroom.

Once finished, discuss how all the animals ultimately rely on plants for survival, highlighting how humans' actions and habitat loss could disrupt these chains. Finish by asking pupils to suggest actions they could take to protect plants in their local environment.



Fossil fuel timeline

On pages 17 – 18, the illustration depicts the process of plants dying and becoming fossil fuels over many millions of years. On page 21 we learn the startling fact that, "In just 200 years we have released all the carbon dioxide that those ancient forests had locked up in over 60 million years!" Give pupils a sense of the scale of time over which fossil fuels were formed versus the alarming rate at which they are being consumed. Are pupils aware of the things we use fossil fuels for in our daily lives? Explain that they are used to generate electricity, power vehicles, heat buildings, cook food, and create many products we use every day.

Stretch a long rope across the playground or hall, marking one end as '4 billion years ago' and the other as 'Today'. Mark each metre along the way; each mark represents 400 million years. Give pupils cards showing key events: first plants, first forests, formation of coal deposits, early dinosaurs, first humans, first use of coal, and widespread oil and gas use. In small groups, pupils decide where each card should go on the rope, spacing them according to how far apart the events were in real time. Discuss their ideas and agree on final placement. Then pupils walk the rope from start to finish to experience how tiny the section is where humans use fossil fuels compared to the vast time it took for those fuels to form.

Finish by asking pupils to place one more card: 'Future Choices'. They discuss and identify actions they can take to reduce their reliance on fossil fuels. Can they expand any of their ideas to include actions for their family, school, or wider community? Pupils could present their ideas to the school council or head teacher.

Here are some approximate scaled placements for the events using a 10m rope:

First plants appear

470 million years ago
1.2m from the start

First forests form

385 million years ago
1.5m from the start

Coal deposits begin forming

300 million years ago
1.7m from the start

Early dinosaurs appear

230 million years ago
1.9m from the start

First humans

2-3 million years ago
9.9m from the start

First use of coal by humans

Few thousand years ago
9.99m from the start

Widespread oil and gas use

150 years ago
A few mm from today

Career links

- **Environmental logistics engineers** are master planners who figure out the best way to move things from one place to another. They make sure products travel safely and arrive on time whilst looking for smarter, faster, and greener ways to deliver everything. Their green solutions might include using vehicles that run on electricity or cleaner fuels, and planning routes that use less fuel by avoiding traffic or reducing the distance.
- **Sustainability specialists** help organisations, including schools, find ways to look after the planet while getting their work done. They might look at how to save energy, reduce waste, protect local wildlife, or choose materials that are better for the environment. Their job is to come up with practical ideas that help people make greener choices every day.
- **Sustainable packaging technologists** are problem solvers who design bottles, boxes, and wrappers to keep products fresh and safe; testing different materials to make sure things don't break, or spill. They work to reduce packaging and make it kinder to the planet by using less plastic and more recyclable materials like paper and bioplastics which aim to be biodegradable.

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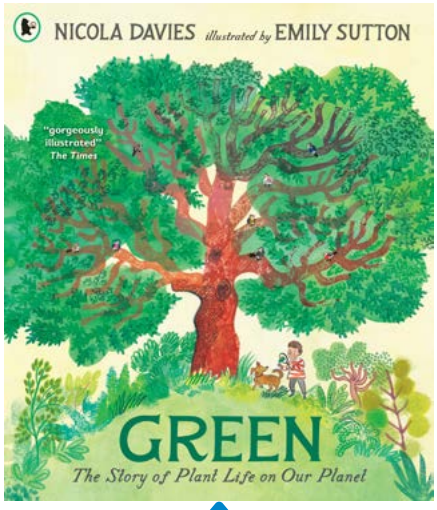
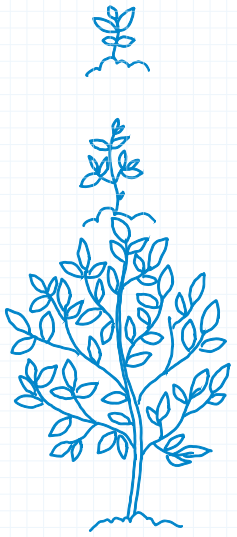


"In just 200 years we have released all the carbon dioxide that those ancient forests had locked up in over 60 million years!"

Green: the story of plant life on our planet tells the story of how plants first appeared on Earth, how they make their own food using sunlight, and how they shaped our whole planet. They even created the fossil fuels we use today. It shows how every leaf, tree and tiny plant plays a vital role in keeping our planet alive. If you like discovering the wonders of nature, this book will draw you in from the very first page.

Mathematics challenge: One... two... tree!

Find a tree and select a small twig. Estimate how many leaves are on it, then check your guess by counting to see how close you were. Use that number to estimate how many leaves might be on a whole branch and then scale up again to imagine how many leaves could be on the whole tree. Keep going by estimating how many leaves might be in a woodland or forest, or on all the trees you can see from your window or in a local park. Challenge yourself to make a bold final estimate for all the trees in your town, country, or even the world, explaining how you made each jump. Finish this challenge by writing one sentence about which estimate surprised you the most and why.



Plant detective

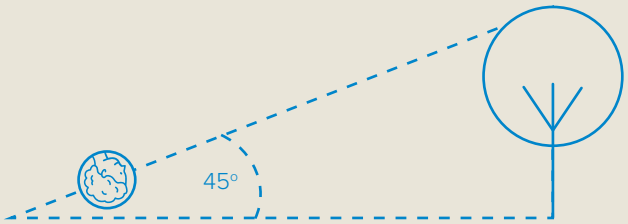
This activity can act as a follow up to the Plant powers activity or can stand alone. Go on a plant-hunt in your garden, or go with an adult to your local park. Try to spot at least five different plants including trees. For each one, sketch it or take a quick note of its size, leaf shape, and where it's growing. Write down what you think its environmental 'jobs' might be, such as providing food or shelter to animals, keeping soil in place, or providing shade. Focus on one plant you think is especially important and explain why in a short paragraph or a video diary. Compare your notes on all the plants to see how many different ways plants help the environment without us noticing. Decide on one small action you could take at home to help protect the plants around you.

Measuring trees at 45 degrees

What do climate scientists need to know about trees? Knowing a tree's height helps them understand how much carbon it can store; taller, larger trees usually hold more carbon. So how can they measure trees? One way is called the 45-degree angle method.

Facing away from a tree, bend forwards to view the tree through your legs. If you're close to the tree your view will be mainly trunk or a collage of leaves and branches, depending on the species. Walk several paces and repeat the viewing. Now you'll see higher up branches and perhaps some sky. When you can just about see the top of the tree upside-down, stop. You have reached the optimal viewing angle of approximately 45°.

The distance from your standing position to the tree is roughly equal to the tree's height. Mark your spot and measure the distance to the tree and record the estimated height. Try this method on a range of trees with different heights and compare the results, reflecting on which trees might store the most carbon and why. Healthy, tall trees also provide more habitats for wildlife and contribute more to cooling the environment by providing shade. Use your data and observations to design a poster to raise awareness of the importance of protecting mature trees for our planet.



How long does a leaf last?

After your Fossil fuel timeline activity in school, collect a handful of fallen leaves and place them in two jars: one kept dry, and one slightly damp but not soggy. Leave both in a safe spot. Each week observe how the leaves change, break down, or stay the same, sketching what you notice. Does the material change shape, texture, or colour as it slowly breaks down? After several weeks, compare the jars and think about which one changed fastest and why this might be. You'll see firsthand how long leaves take to decay. Fossil fuels, formed from ancient plants, were buried under heat and pressure for far longer than your compost needs. Imagine how many millions of years of being buried underground would be needed before plant material could ever turn into fossil fuels!

Safety tips: Keep your jars closed once your investigation begins, wash your hands after handling the jars, and place them somewhere out of the way so they won't be easily knocked over.

Scientist profile

Nicola Davies is a writer with the curiosity of a scientist and the heart of an explorer. Before becoming an author, she trained as a zoologist and spent years studying animals in the wild, from tiny insects to giant whales. Her scientific work and time as a presenter for *CBBC*'s *The Really Wild Show* took her around the world, helping her understand how living things survive, grow, and depend on their habitats. That knowledge shines through in her books, including *Green: the story of plant life on our planet,* where she explains complex ideas in ways that make sense to young readers. Nicola believes science belongs to everyone, and she uses storytelling to show how amazing (and fragile) our planet really is.

In September 2025, Nicola was appointed the Children's Laureate for Wales where she promotes children's literature and poetry. Reflecting on her hopes for her time in the role, she said: 'I want all children in Wales to experience the pleasure of reading, the superpower of writing, and to find their own voices as creative change-makers and advocates for a fairer, and more sustainable future.'