OpenUpScience

Issue 2

Welcome to OpenUpScience, the weekly magazine from Cambridge Science Centre. In this issue, we're thinking about Plants. We have experiments, quizzes and challenges to explore these amazing living things.

On our planet, all living things are sharing the chemicals they need to survive and grow. Everything is being recycled or changed from one thing into another and back again. At the heart of all this is our sun, which provides the energy to do some of these changes. The sun gives plants the energy to make sugar from carbon dioxide and water. In turn, many animals eat plants to get that sugar for themselves.

Plants have chlorophyll in their leaves and stems – it's what makes them look green. Chlorophyll absorbs sunlight and uses the energy to produce a sugar called glucose. This process is called photosynthesis.

Find out more with the fun activities inside!

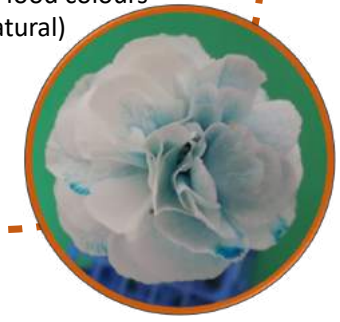
Spark, Ignite, Fuel, Illuminate

Colour your own flowers

Change white flowers into coloured ones without using paint or a brush, and learn some science along the way. Which colours are you going to try?

What you'll need

- Fresh white flowers (carnations work well, as do daisies, tulips and roses)
- A container for each colour, e.g. a cup, glass jar or similar
- Different food colours (100% natural)
- Water



Like us, plants need water to survive. Water is sucked in through their roots, moved up the stem, and into the leaves and petals. It escapes the leaves by a process called transpiration. Usually you can't see this happening, but if you put food colouring in the water, the coloured water will go right up into the leaves and flowers, changing their colour – just like magic!

What to do

1. Half fill each cup with water and add 10 drops of food colouring until you get a strong colour. Use different colours in different cups.
2. Cut off the bottom of each flower stalk to leave around 15-20 cm.
3. Put a flower in each of your cups and put them in a safe, sheltered place.

– What do you think will happen to the flowers? –
(Scientists call this a hypothesis.)

4. Check on your flowers after an hour. Do they look the same or different?
5. Keep checking your flowers. What happens the longer you leave them in the coloured water?

Green Sudoku

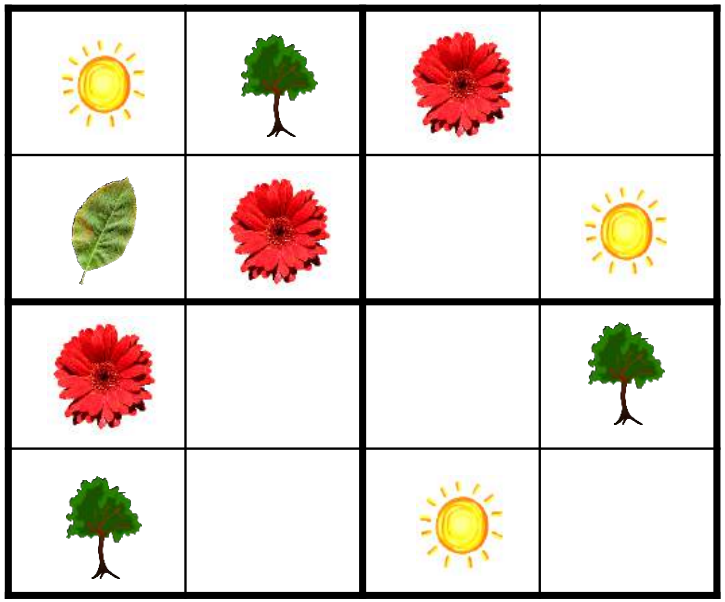
Instructions

Draw in the pictures shown underneath the Sudoku following these rules:

1. Each column, row and 2x2 block must contain all 4 pictures.

2. You cannot have more than one of the same picture in each row, column or 2x2 block.

3. You cannot change the pre-filled squares.



Plant Quiz

(Answers on back page)

1.Where do plants get their energy from?

A. The sun B. The moon
C. The wind D. The ocean

2. What do auxins help plants do?

A. Grow in the dark B. Grow without water
C. Grow towards water D. Grow towards light

3. What colour is chlorophyll?

A. Blue B. Green
C. Red D. Yellow

4. Some plants have roots that grow above the ground, what are they called?

A. Sky roots B. Flying roots
C. Aerial roots D. Air roots

Did you know…?

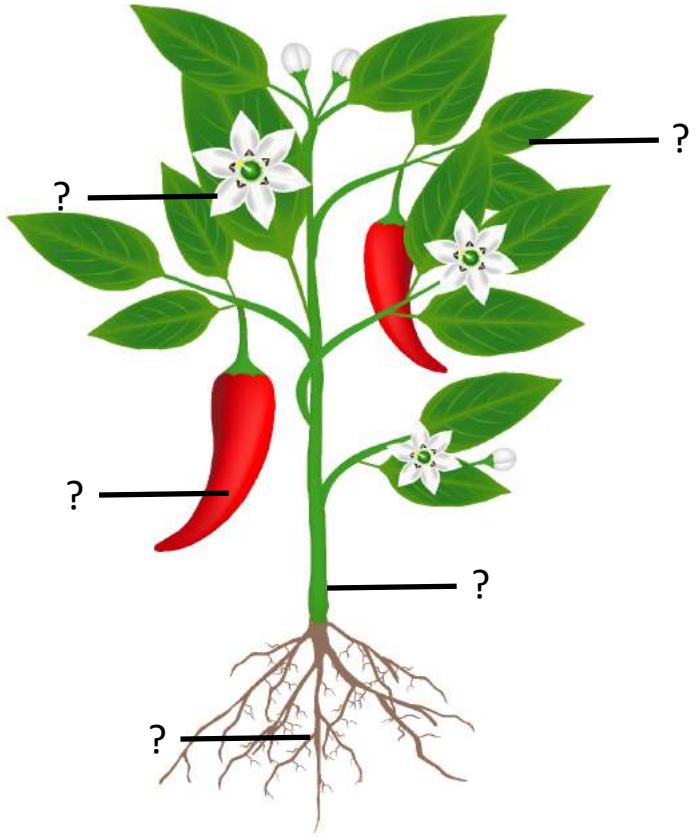
Plants can also sense Gravity, that means they know which way up and down are. Plants use this so that they grow their roots down into the soil (where the nutrients are), and their stems and leaves up towards the surface (where the light is).

Q: What kind of tree can fit in your hand?

A: A palm tree!

Plant parts

Can you identify these parts of this chilli plant?
(The words are at the bottom to help you.)



leaf, stem, root, flower, fruit

The photosynthesis of tiny ocean plants called phytoplankton makes half of the world's oxygen.

Making a mini greenhouse

It's fun to plant seeds in a pot or a flowerbed and wait for the stems and leaves to appear, but do you know what's really going on under the soil?

Some plants have roots that grow above ground – called aerial roots.
In strawberry plants, these roots are searching for other areas of soil to grow in to.
Mistletoe, has roots that attach to another plant so that they can steal water and nutrients!

What you'll need

- A clear plastic CD case
- Some soil
- Tape
- 1 or 2 bean seeds (or any type of seed)
- A dropper for watering
- Water

What to do

1. Soak the seeds overnight to help them sprout quickly.
2. Take the plastic bit that holds the CD out of the case – you don't need it.
3. Put moist soil in the CD case at the end opposite to the hinge so that it is about one-third full. The hinge will be at the top of your mini greenhouse.
4. Make little holes in the soil about halfway down , and place one seed in each hole.
5. Close the CD case and tape up the sides but not the hinged end.
6. Place your mini greenhouse on a sunny windowsill and water the soil a little bit every day using the dropper through the gap at the hinge.
7. Watch your seedlings grow. When they get too big for the greenhouse you can move them to a small flowerpot.

Make a plant maze

Plants need sunlight to survive, so they will grow towards it. They will even grow round obstacles so that they can get their leaves into the light!

What you'll need

- Bean or pea seeds
- A yoghurt pot for the plants
- Water
- A large cardboard box and pieces of cardboard
- Scissors
- Sticky tape and glue
- Pens, paint or decorations for your maze
- A helpful adult

Plants have hormones called auxins, which make them grow. Auxins do not like being in the light, so the side of the plant's stem in the shade has more auxins than the side in the light. This means the shady side of the stem grows more than the light side. This makes the plant lean toward the light, like in the picture above.

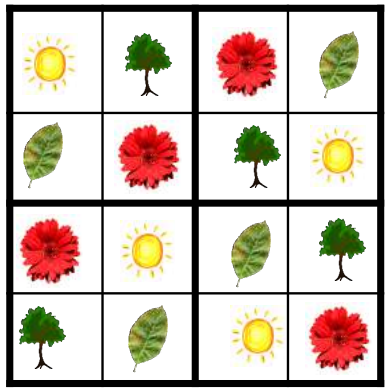
What to do

1. Soak 2 or 3 seeds overnight in water.
2. Plant your seeds in the yoghurt pot and add a thin layer of moist soil or compost. Place in a sunny spot.
3. For your maze, make a large hole in the top of your box for the light to get in.
4. Use the cardboard pieces to make some obstacles. Some light must still reach the bottom of the box, or your plant won't know which direction to grow!
5. When one of your seeds germinates (sprouts), put the pot inside the maze and close it, so only the light from the hole can get in.
6. Check on your plants every day, and water them if the top of the soil feels dry.

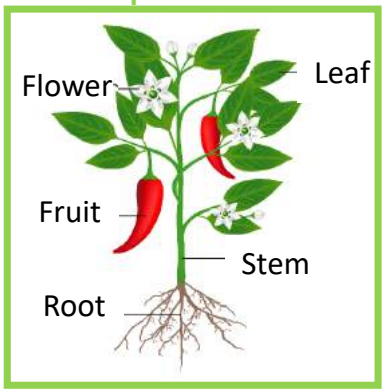
This Week's Challenge

Time for some research: Can you tell us why forests are sometimes called "the lungs of the earth"? Does this description fit some forests more than others? Let us know what you find out, send your answers to OpenUpScience@cambridgesciencecentre.org

Green Sudoku - solution



Plant parts - solution



Send us things! - OpenUpScience@cambridgesciencecentre.org

We'd love to see how you got on with our activities and puzzles. And, do you have any questions for us? Let us know! We'll answer some of your questions in Science@6 - our YouTube series, every Monday at 6 pm.

Next Issue: Light

What do you know about the fastest thing in the universe?

Find out what else we're up to:

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Quiz Answers: Q1 – A, Q2 – D, Q3 - B, Q4 - D