

**Science**  
**Skills**  
**5**  
**Pupil's Book**

by  
Jocelyne Churchill

 **CAMBRIDGE**  
UNIVERSITY PRESS

# SCIENCE SKILLS 5



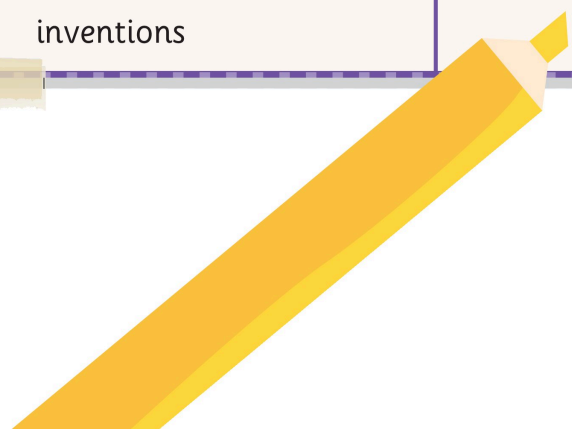
## Contents

<b>Welcome</b> Page 4		
<b>1 Living things</b> Page 6	<ul style="list-style-type: none"> <li>• Animal and plant cells</li> <li>• Cells, tissues, organs, organ systems</li> <li>• The five kingdoms</li> </ul>	<ul style="list-style-type: none"> <li>• Dichotomous keys</li> <li>• Weird and wonderful organisms</li> </ul>
<b>2 Ecosystems</b> Page 18	<ul style="list-style-type: none"> <li>• Elements of an ecosystem</li> <li>• Grassland ecosystems</li> <li>• Forest ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>• Desert ecosystems</li> <li>• Aquatic ecosystems</li> <li>• Urban ecosystems</li> </ul>
<b>3 The biosphere</b> Page 30	<ul style="list-style-type: none"> <li>• Food chains</li> <li>• Food webs</li> <li>• Threats to biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>• Protecting species</li> </ul>
<b>4 Energy</b> Page 42	<ul style="list-style-type: none"> <li>• Different forms of energy</li> <li>• Energy transformations</li> <li>• Renewable energy sources</li> </ul>	<ul style="list-style-type: none"> <li>• Non-renewable energy sources</li> </ul>
<b>5 Sound, light and heat</b> Page 54	<ul style="list-style-type: none"> <li>• Properties of sound</li> <li>• Light sources and properties of light</li> </ul>	<ul style="list-style-type: none"> <li>• Reflection</li> <li>• Refraction</li> <li>• Properties of heat</li> </ul>
<b>6 Electricity</b> Page 66	<ul style="list-style-type: none"> <li>• Electrical charges</li> <li>• Static electricity</li> <li>• Current electricity</li> </ul>	<ul style="list-style-type: none"> <li>• Edison and the lightbulb</li> <li>• Famous inventors and inventions</li> </ul>

**Questions and Study aids**



Page 78





## Projects and experiments

## Documentaries

<ul style="list-style-type: none"><li>• Make a <i>Book of life</i></li><li>• Discover why plants have a cell wall</li></ul>	<ul style="list-style-type: none"><li>• Living or non-living?</li></ul>
<ul style="list-style-type: none"><li>• Do a presentation on an ecosystem</li><li>• Investigate how animals survive the cold of the Arctic tundra</li></ul>	<ul style="list-style-type: none"><li>• Amazing adaptations</li></ul>
<ul style="list-style-type: none"><li>• Create and promote your own nature reserve</li><li>• Find out the best way to clean up an oil spill</li></ul>	<ul style="list-style-type: none"><li>• Cooperation is key</li></ul>
<ul style="list-style-type: none"><li>• Create a plan to save energy at home</li><li>• Discover how important light is for plants</li></ul>	<ul style="list-style-type: none"><li>• Shine on sunny sun</li></ul>
<ul style="list-style-type: none"><li>• Design a campaign warning about the risks of too much energy</li><li>• Investigate how sound travels and why telephones used to have cords</li></ul>	<ul style="list-style-type: none"><li>• Hear energy, see energy, feel energy</li></ul>
<ul style="list-style-type: none"><li>• Design and build a light-up board game</li><li>• Find out what happens when you change components in an electrical circuit</li></ul>	<ul style="list-style-type: none"><li>• Electricity everywhere</li></ul>

**Extra  
activities**

Page 90

# WHAT IS NATURAL SCIENCE?



**Science** helps us understand how the world works. It helps us solve problems and can make life easier.



How are the people in the photos using science?



Look around you. Where is science being used?



Which photo is being described? Listen and guess.



Do you ever wonder how something works, why something happens or how changing something would make a difference?

Scientists use the **scientific method** to understand the world around us. It always starts with a **question**.

I wonder why / how ...?

How does ... work?

What would happen if ...?



Scientists then decide how to answer the question by thinking of an **experiment**. Before carrying out the experiment, they guess what will happen. This guess is called a **prediction** or a **hypothesis**.



Scientists draw **conclusions** from their observations and the **results** of their experiments. These conclusions help us to understand the world we live in.

# 1

## LIVING THINGS

### Look and discuss...

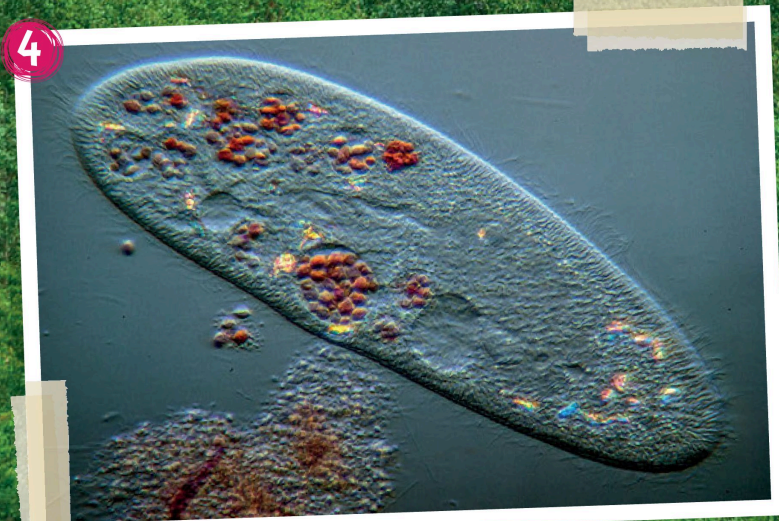
Which kingdom is each organism from?  
Which kingdom is missing?

Life has done extremely well here on Earth. Scientists estimate several million species live on our planet!

I think this organism belongs to ...



Yes, I think so, too. / I'm not sure about that.



Plant 1, 7; Animal 2, 8, 6;  
Fungus 3, 5; Protist 4, 6;  
missing kingdom: Monera



**Song**  
Cells, tissues, organs, systems



Can you name the seven characteristics of living things?

**DOCUMENTARY**  
Living or non-living?

# Explore

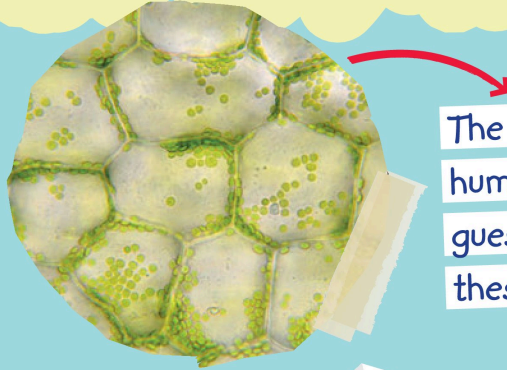
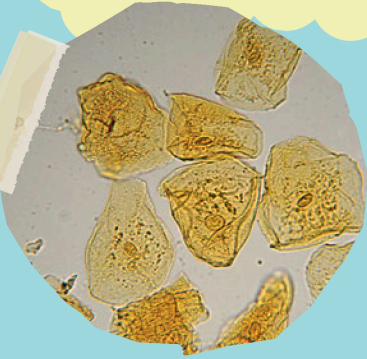
- Make a *Book of Life*. You will:
- learn about different types of cells.
  - research information and take notes about an interesting organism.
  - organise facts and share information with others.
  - present the information you have collected.

# WHAT ARE CELLS MADE UP OF?

## Discover...

what the jelly-like substance inside a cell is called.

All living things are made up of **cells**. Although we can only see them with a microscope, they are very important.



The cells on the far left are human cheek cells. Can you guess what type of organism these cells belong to?

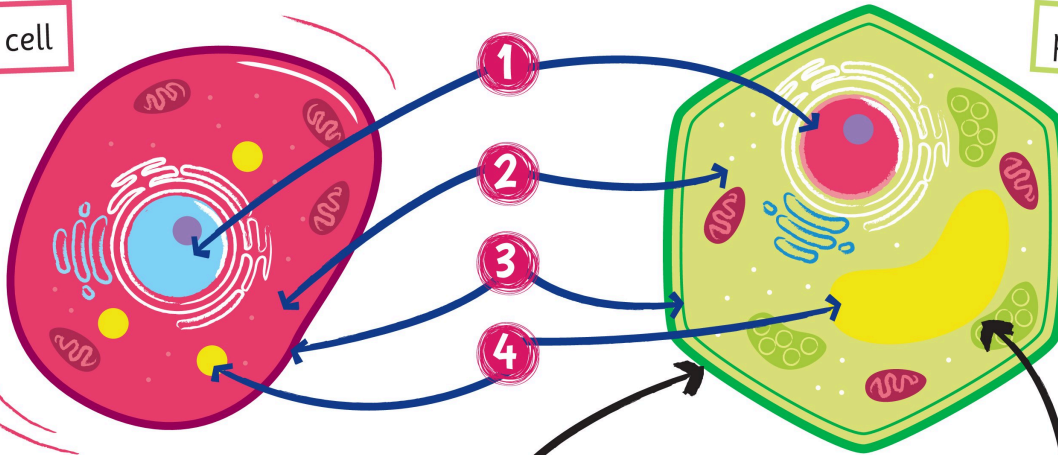
**Cells** may look very different from one another, but they have got several similar characteristics and structures.

**1 Nucleus:** controls what happens inside the cell and contains all the genetic information.

**2 Cytoplasm:** jelly-like substance which helps give the cell shape and is where all the cell structures are found.

animal cell

plant cell



**3 Cell membrane:** controls the movement of substances in and out of cells.

**Cell wall:** gives structural support to the cell.

**4 Vacuole:** a storage space for the cell.

**Chloroplasts:** help the plant make food from sunlight and water.

Find out about other structures within a cell. What jobs do they do?

# WHY HAVE PLANT CELLS GOT A RIGID WALL?

Find out more...

Discover...

the differences between plant and animal cells.



**Background:** There are some similar structures in animal and plant cells, but only plant cells have got a cell wall.

**Hypothesis:** Why have plants cells got a cell wall? Write your hypothesis in your notebook.

**Materials:** eight balloons, four shoe boxes



**Step 1:** Blow up the balloons (not too big). Put one balloon in each shoe box and leave the rest out.

**Step 2:** Build two towers, one using only the balloons and the other using the shoe boxes with balloons inside.

Reflect 1

What do the balloons represent?  
What do the shoe boxes represent?

Reflect 2

Which tower is easiest to build?

**Conclusion:** What is the function of a plant cell wall?

Animal cells haven't got a cell wall. Compare the human body with a tree. What has the human body got to help with support that a tree hasn't?

Cell walls provide ...

The human body has got ... ,  
whereas a tree ...