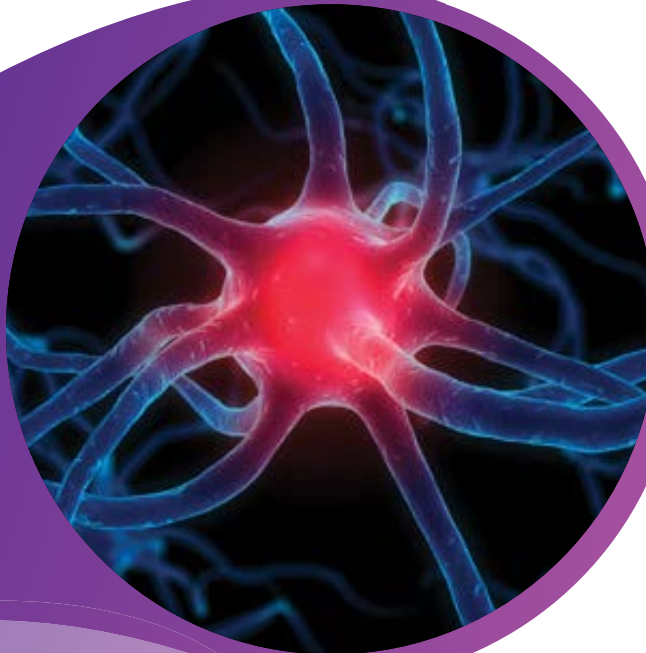




Build your own cell

Cells are the basic building blocks of all living things and one of the key scientific ideas that pupils encounter in secondary science. Understanding what cells do, their requirements, and their specialisation into tissues and organs, helps pupils to understand why complex living organisms are the way they are. Scientists have been able to explain many biological processes, such as respiration, photosynthesis and genetic inheritance, due to cell biology.

Suitable for Key Stage:



Key Information

Teacher

Contents

02	Key information
04	Student Sheet - Literacy exercise
05	Student Sheet - Build your own plant cell
07	Student Sheet - Build your own animal cell
09	Wordsearch
10	Crossword
11	Glossary

View online



Scan the QR Code.

Science topics

Cells

Resources

Age



11-13 years old

Duration

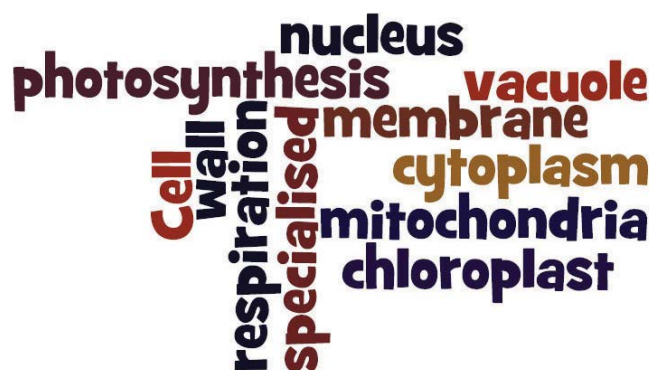


40 minutes

- Student worksheets
- Wordsearch
- Crossword
- PowerPoint presentation

Keywords

Cell, membrane, nucleus, mitochondria, cytoplasm, chloroplast, cell wall, vacuole, specialised, respiration, photosynthesis.



Learning outcomes

Students will be able to:

- Describe that all living things are made up of cells
- Name the parts of plant and animal cells
- Explain the function of the parts of plant and animal cells
- Make models of plant and animal cells
- Compare animal and plant cells
- Describe a feature of a specialised cell
- Relate features of specialised cells to the function of the cell

Teacher preparation

What you will need



Scissors



Glue

Photocopy or print the student sheets. Students can make their own plant and animal cells by cutting and pasting the parts of the cell onto the cell templates. They might also try the literacy exercise, wordsearch or crossword using the cell facts page as a guide.

Curriculum links

Key Stage 3 Biology

Structure and function of living organisms

Cells and organisation

- Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope
- The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts
- The similarities and differences between plant and animal cells

Research links

Bioimaging at the Pirbright Institute
pirbright.ac.uk/FrontStories/2012/Bioimaging.aspx



Build Your Own Cell

Student

Cell Facts

All cells have:

- A Cell Membrane
- A Nucleus
- Lots of Mitochondria
- Lots of Ribosomes
- Cytoplasm

Plant cells also have:

- Lots of Chloroplasts
- Thick Cell Walls
- Vacuole

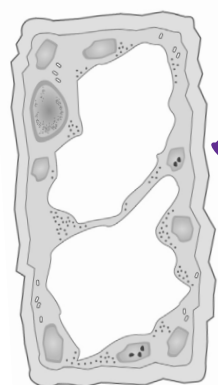
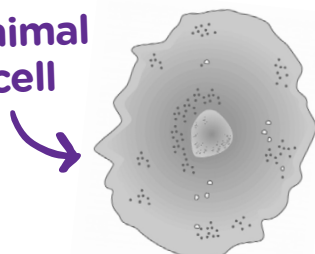
Animal cells also have:

- Lots of Lysosomes

Some specialised animal cells have:

- Lots of Cilia

Animal cell



Plant cell

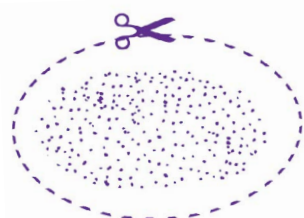
To find out more about what each part of a cell does, fill in the gaps below. The capital letters and the dashes give you clues.

The **N** _____ contains the instructions to make everything in the cell (like a computer). The **C** ____ **M** _____ keeps everything together (like the glass of a fish tank).

The **C** _____ is where many of the cell's reactions occur. The **M** _____ produce energy in a useful form for the rest of the cell (a bit like a battery) through a process called respiration. **R** _____ make proteins which do lots of jobs (like a machine in a factory which makes things). The **C** _____ in the plant cell collect light energy from the sun (like solar panels) and convert it into sugar through a process called photosynthesis.

L _____ break down old proteins and recycle them (like glass collected in a bottle bank is recycled and made into new useful products). Plant cells have thick **C** ____ **W** ____ to strengthen and protect the cell. The **V** _____ is a storage space filled with water, sugar and nutrients that is only found in plant cells. Some specialised cells, like those in your nose, have **C** ____ waving on their surfaces (like a row of children waving their hands). Cilia trap bacteria and particles of dust in a sticky mucus, cleaning the mucus away from the lungs and the nose and wafting it to the back of the throat so that it can be swallowed.

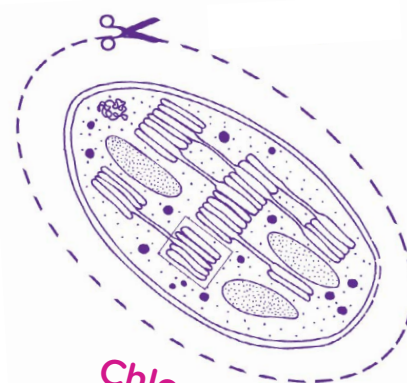
In the box below are all the parts you need to make your own poster of a **plant cell**. Cut them out, stick them onto your cell outline and label each one. You might like to colour in your picture or stick different materials onto it to make a collage. Chloroplasts are usually coloured green because they are filled with a green pigment.



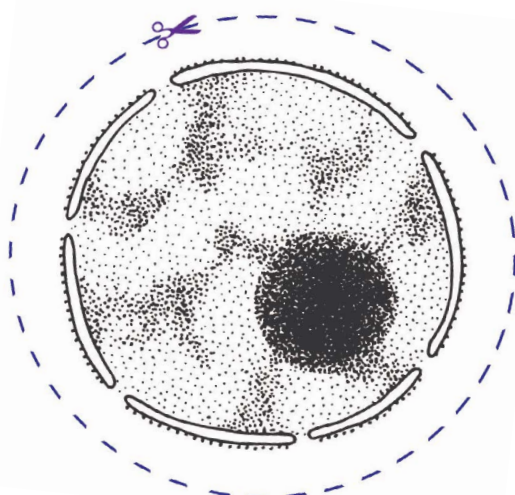
Ribosomes



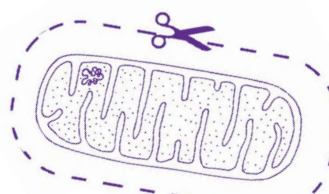
Mitochondrion



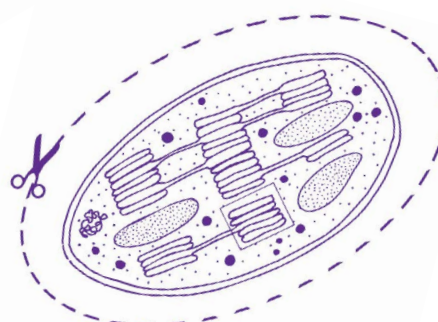
Chloroplast



Nucleus

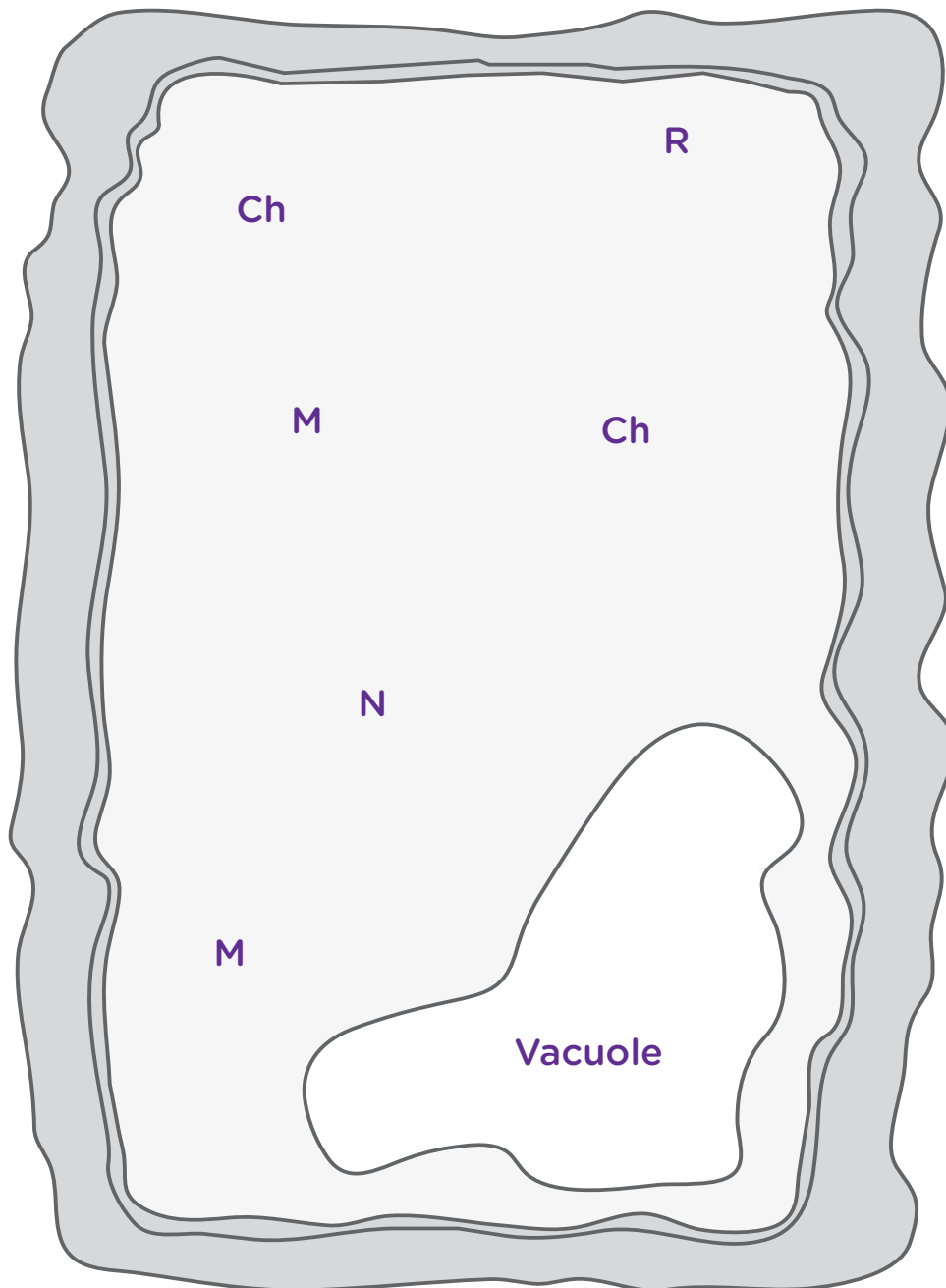


Mitochondrion



Chloroplast

This is a plant cell. It has a thick outer cell wall which gives it strength.

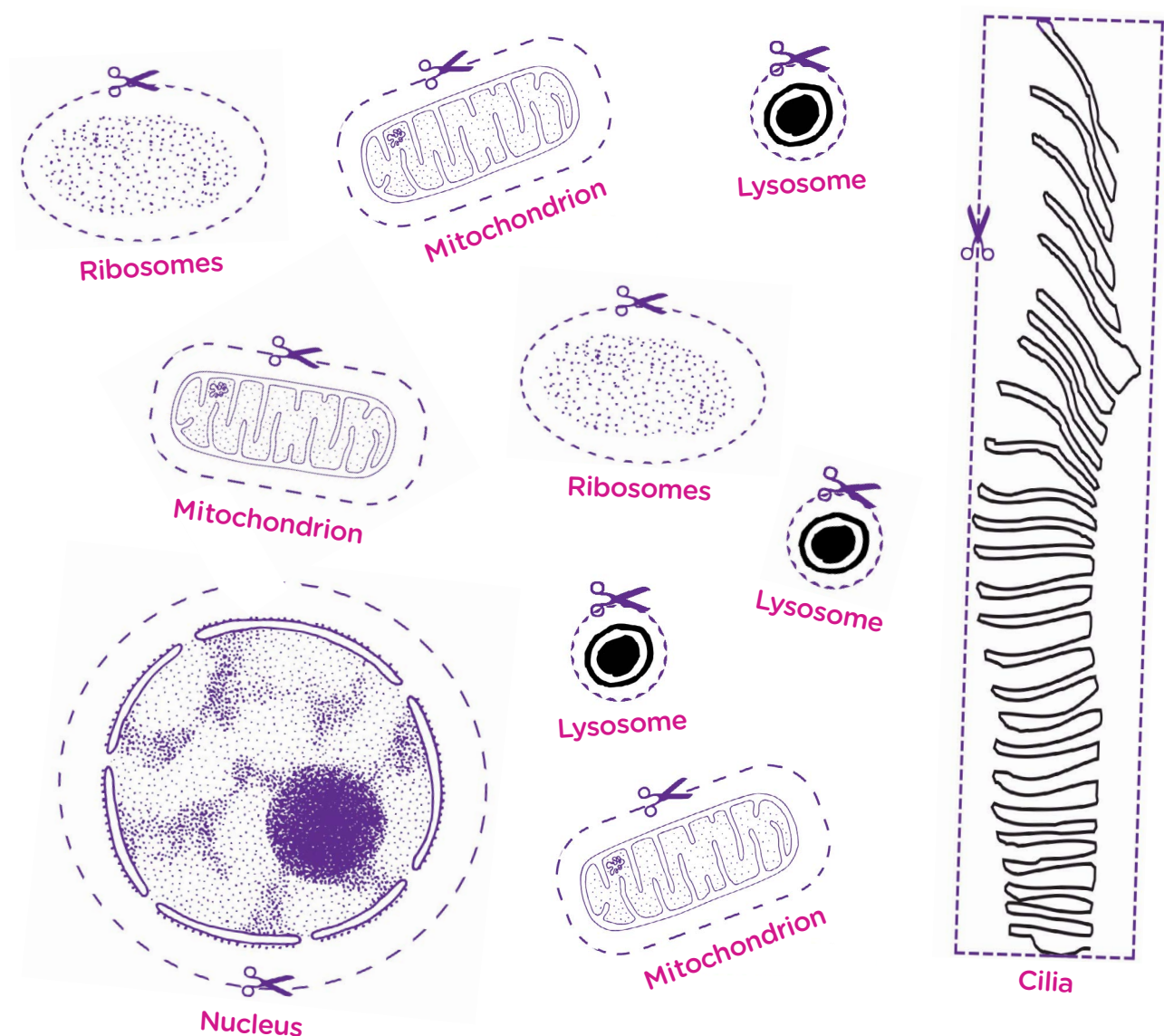


Name:

Animal Cell Kit

Student

Below are all the parts you need to make your own poster of an **animal cell**. Cut them out, stick them onto your cell outline and label each one. You might like to colour in your picture or stick different materials onto it to make a collage. Add the cilia to the outside of your animal cell to make it a specialised cell.

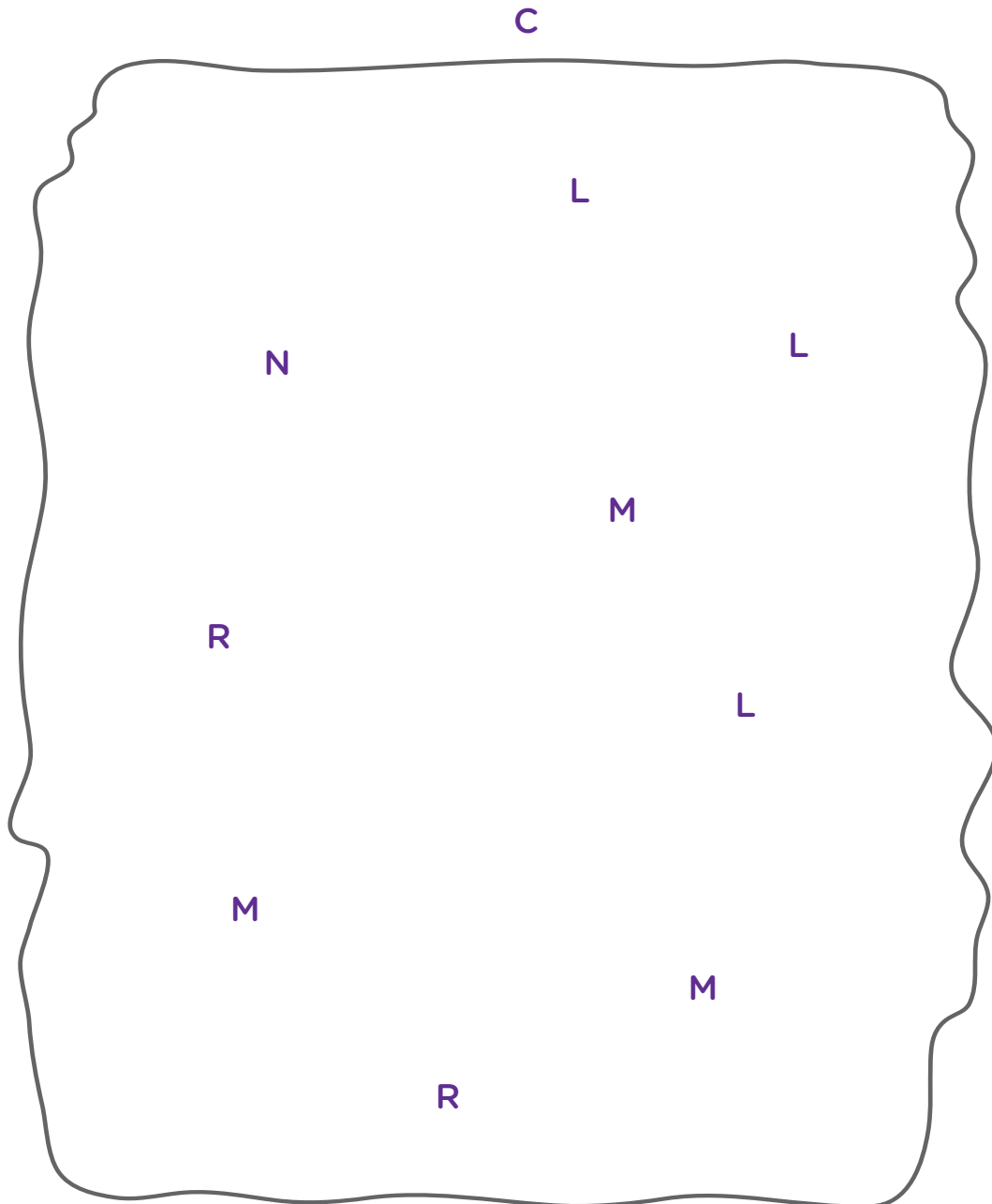


Build Your Own Cell

Student

This is a plant cell. It has a thick outer cell wall which gives it strength.

It has hairs which it waves to keep itself clean.



Name:



Wordsearch

Student

L	X	B	U	S	E	M	O	S	O	S	Y	L	O	H
A	F	A	V	C	C	L	Z	C	B	C	S	P	N	P
Y	G	Y	I	A	C	S	E	V	M	A	R	T	S	C
Q	Q	L	D	X	C	L	C	V	X	R	G	M	W	Y
Q	I	U	V	X	L	U	Y	Z	I	N	Y	G	M	T
A	Z	A	W	W	X	M	O	B	L	S	L	O	Q	O
N	P	P	A	Z	F	O	O	L	M	F	T	J	J	P
E	O	L	C	H	X	S	S	N	E	M	D	F	Z	L
E	L	M	I	T	O	C	H	O	N	D	R	I	A	A
I	C	F	K	M	Y	X	I	L	R	B	A	J	N	S
H	H	V	E	F	P	A	B	X	G	R	E	U	A	M
X	X	S	G	X	F	I	Q	T	N	H	V	X	Q	G
N	U	C	L	E	U	S	C	M	A	I	F	S	J	M
M	O	C	E	L	L	M	E	M	B	R	A	N	E	C
S	T	S	A	L	P	O	R	O	L	H	C	M	K	J

Cell Membrane

Nucleus

Cytoplasm

Vacuole

Mitochondria

Ribosomes

Chloroplasts

Cell Wall

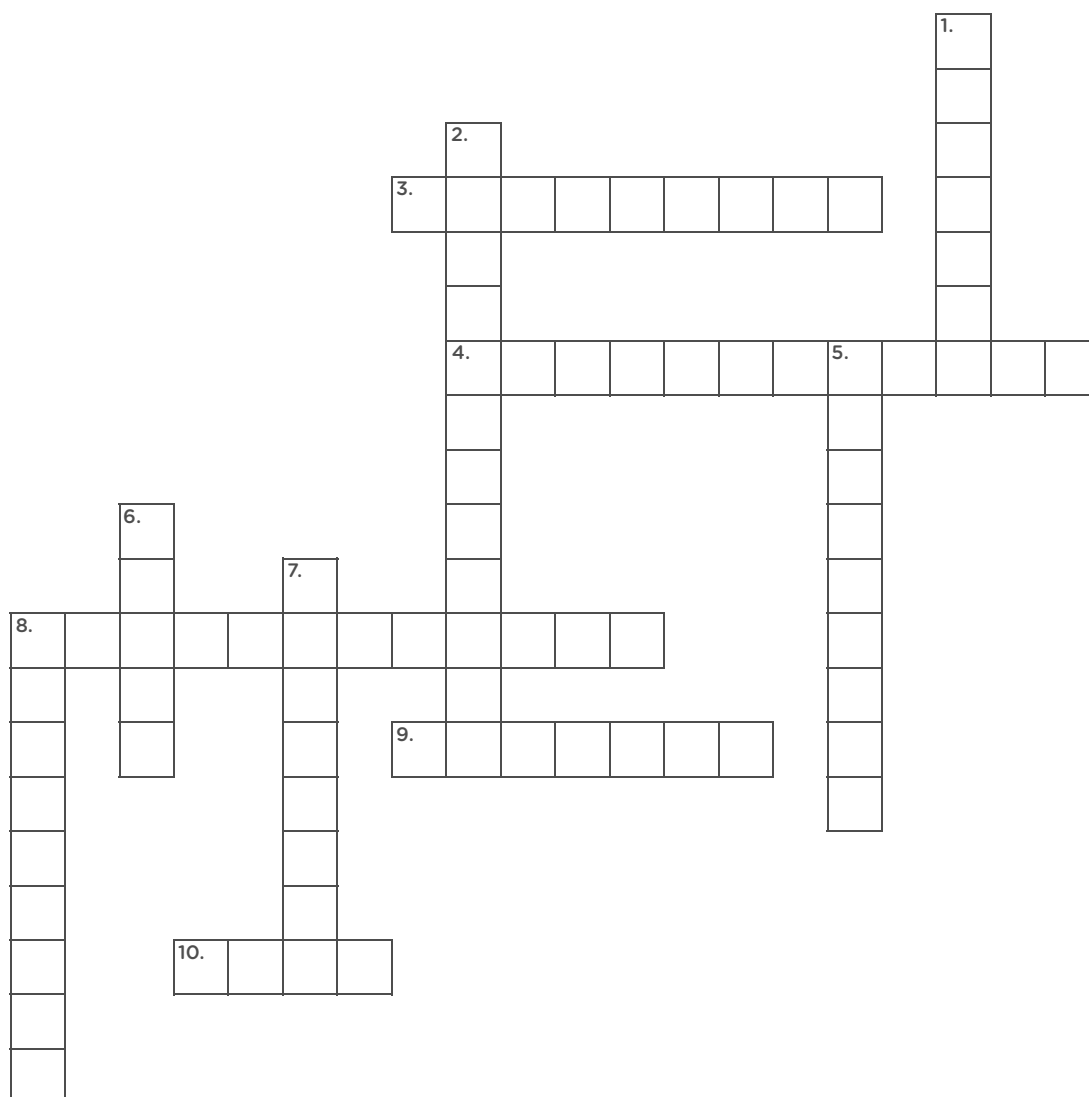
Lysosomes

Cilia



Crossword

Student



Down

1. Provides the instructions for the cell
2. The battery of the cell
5. Recycling centres of the cell
6. Wave back and forth to move mucus along
7. Provides strength and support to plant cells
8. A jelly-like substance where many of the cell's reactions occur

Across

3. The part of the cell that makes proteins
4. Collect light energy to use in photosynthesis
8. Controls what enters and leaves the cell
9. A storage space filled with sap that is only found in plant cells
10. Smallest unit of a living thing

Cell Membrane

Surrounds the outside of the cell holding the cell together and controlling what enters and leaves.

Cell Walls

Provide strength and support to plant cells so they can maintain their shape.

Chloroplasts

Capture light using a chemical they contain called chlorophyll and use the energy to make sugars by photosynthesis. They are found in plant cells.

Cilia

Trap bacteria and particles of dust in a sticky mucus, cleaning the mucus away from the lungs and the nose and wafting it to the back of the throat so that it can be swallowed.

Cytoplasm

A jelly-like substance where many of the cell's reactions occur.

Lysosomes

Break down old proteins and recycle them.

Mitochondria

Produce energy in a useful form for the rest of the cell.

Nucleus

Contains genetic information and acts as the control centre of the cell providing instructions on what to make, how to grow, which reactions to carry out and when to divide.

Ribosomes

Make proteins using instructions from the genetic information in the cell.

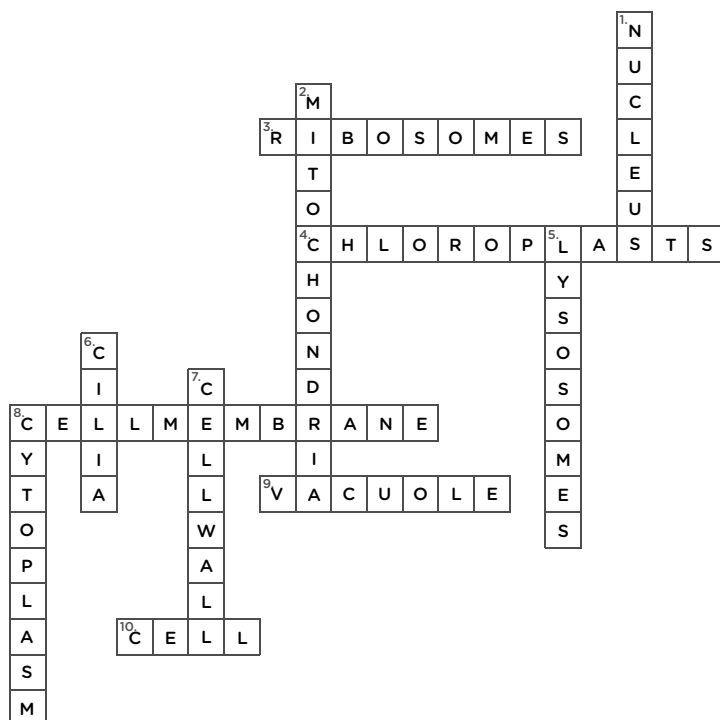
Vacuole

A storage space filled with water, sugar and nutrients termed sap that is only found in plant cells.

Wordsearch | Page 8



Crossword | Page 9





Build Your Own Cell

Teacher

Authors: Dave Cavanagh, Pirbright Institute, Tristan MacLean, BBSRC

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