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TEACHER NOTES:

MAKING A MODEL CELL

NATIONAL CURRICULUM LINKS

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
- the role of diffusion in the movement of materials in and between cells
- the structural adaptations of some unicellular organisms.

TASK:

Make a model of a plant or animal cell.

SUGGESTED APPROACH:

Please read the introduction to this book to get the most out of this task. It is unusual in its format as it requires learners to make a 3D model. Set homework to make a cell, then label it and make a legend in class, using the ACE Learning Ladder as a guide. Ask learners to do a short presentation about their model cell.

To ensure that the assessment is formative, learners could either make improvements (after teacher, self or peer assessment) to their exhibit or the teacher could set specific tasks to aid progression. For example: a worksheet to label a diagram of a plant or animal cell, or match cell parts to their jobs. These types of task are available in most published schemes.

RESOURCES:

None if set as a homework. For class activity, a variety of materials for making model cells, for example: plastic and cardboard cartons, cling film, dried peas, golf balls or ping pong balls, wallpaper paste (optional: make appropriate risk assessment), plastic bags, scissors, glue.

PRIOR LEARNING EXPERIENCE:

Before students attempt this task, they must be familiar with:

- observing cells under a microscope
- simple structures of animal and plant cells
- adaptations in specialised cells.

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TASK SHEET:

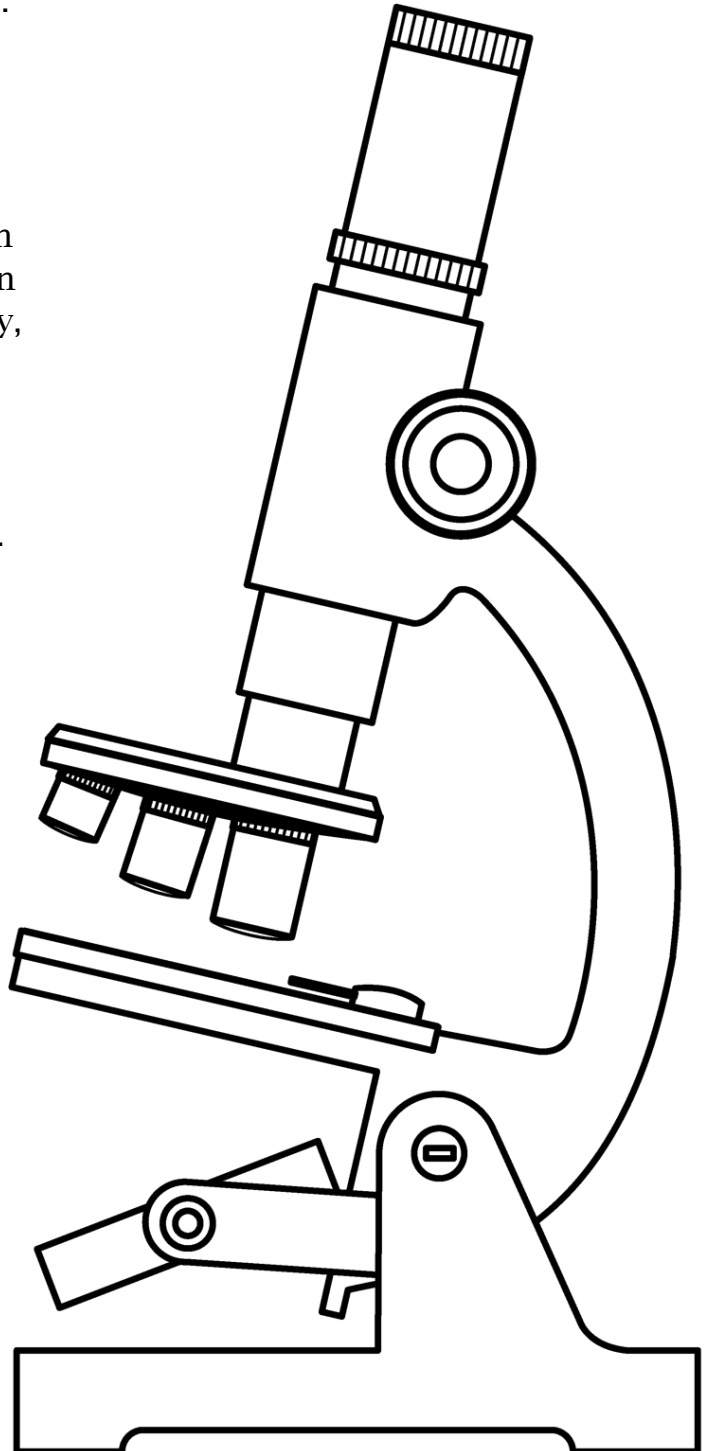
MAKING A MODEL CELL

Imagine the Science Museum has asked you to make a model cell for a display. Make a model of one of the following:

- an animal cell
- a plant cell
- a specialised cell.

Use the key words below to label each part of the model cell clearly. Make an information card, perhaps using a key, to describe what cells are and the structures they contain.

Your teacher may ask you to give a short presentation about your model.



KEY WORDS

cell, cell membrane, cell wall, chloroplast, cytoplasm, nucleus, mitochondria , vacuole

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ACE LEARNING LADDER: MAKING A MODEL CELL

ACE LEARNING LADDER

Assessment check	What you could include:
Advanced	<p>You will have made a detailed model cell, drawing on detailed scientific knowledge and understanding. You might:</p> <ul style="list-style-type: none"> • Represent the structures found within the cell of your choice approximately to scale or relative size. • Explain the role of each part of the cell shown in detail. • Discuss how different cells are specialised for different roles, and what stem cells are and their potential uses. • Explain the different types of microscopes available and the cell organelles these allow you to observe. • Use a range of appropriate scientific words, symbols and units accurately.
Confident	<p>You will have made a model cell, drawing on scientific knowledge and understanding. You might:</p> <ul style="list-style-type: none"> • Show the structures found within the cell of your choice paying attention to accuracy of shape and location within the cell. • Explain the role of each part of the cell shown. • Discuss how the cell your model shows is similar or different to other cells. • Explain how to use a microscope to observe cells. • Use a range of appropriate scientific words, symbols and units.
Establishing	<p>You will have made a simple model cell, drawing on some scientific knowledge and understanding. You might:</p> <ul style="list-style-type: none"> • Show the structures found within the cell of your choice. • State the name and role for each structure in your model. • List one or two differences between animal and plant cells. • Give a simple description of how to use a microscope. • Use some appropriate scientific words, symbols and units.

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SUPPORT SHEET 1: ESTABLISHING TO CONFIDENT MAKING A MODEL CELL

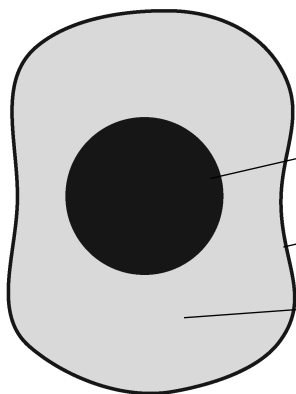
CELLS TO SYSTEMS

Key words

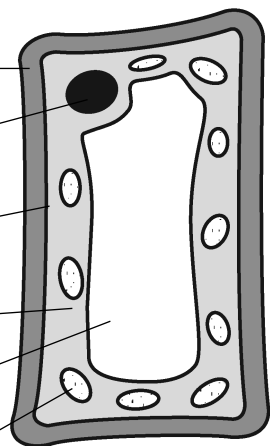
Link the correct job to each cell part.

Parts of cell	Jobs
Cell	controls the cell
Cell membrane	lets some substances in and out of the cell
Cytoplasm	place where respiration (and energy production) occurs
Nucleus	stores cell sap
Mitochondria	place where chemical reactions take place

Animal cell



Plant cell



C W

N

C M

C

V

C

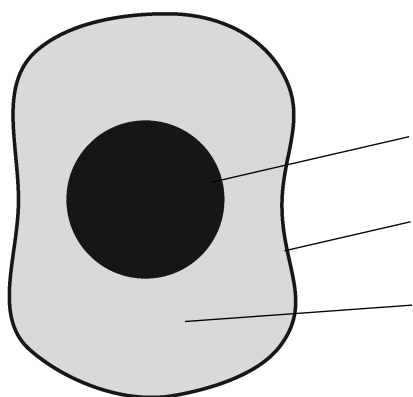
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SUPPORT SHEET 2: CONFIDENT TO ADVANCED MAKING A MODEL CELL

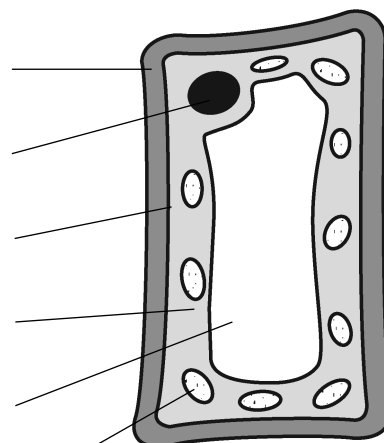
To help you think about some of the cell parts your model should include, fill in the missing cell parts to the table below.

Parts of cell	Jobs
	controls the cell
	lets some substances in and out of the cell
	place where respiration (and energy production) occurs
	stores cell sap
	place where chemical reactions take place

Animal cell



Plant cell



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SUPPORT SHEET 3: ADVANCED EXTEND AND STRETCH **MAKING A MODEL CELL**

- Make a *scale* model of a *specialised* plant or animal cell.
- Label all parts of the cell correctly, including unusual characteristics, explaining their function.
- Explain in detail the importance of understanding cell structure and function.
- Explain how the cell's shape is related to its function.