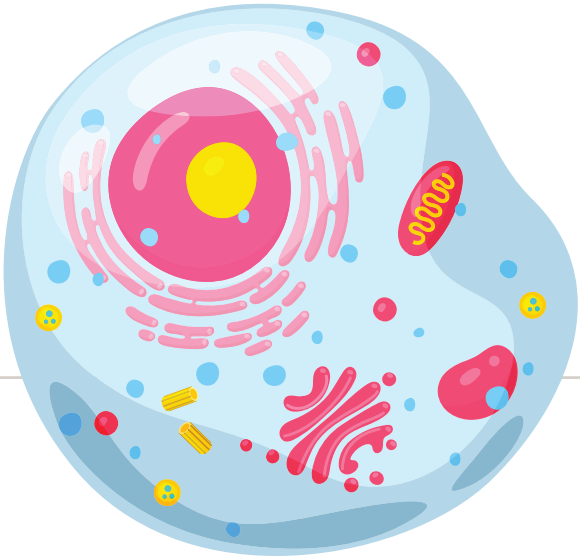

Who hacked the cell?

A rogue scientist has been caught bioengineering supercells and now the lab's in lockdown. Your students are the investigation team tasked with decoding the chaos: hybrid cells with chloroplasts in animal DNA, missing nuclei and a suspicious surplus of vacuoles. Using See-Through Cell Models they'll compare, decode and expose what went wrong in this microscopic crime spree.

Curriculum Links

Australian Curriculum v9:
Year 8 – Biological Sciences

AC9S8U01
Cells are the basic units of living things and have specialised structures and functions.

AC9S8H01
Consider ethics, sustainability and personal responsibility in science-based decisions.

AC9S8I03
Communicate ideas, methods and findings using appropriate representations.

Activity Idea:

Mad Science: The Cell Switch Scandal

Theme link: Decoding cellular systems and the consequences of tampering with nature

You'll need:

- [ ] See-Through Animal Cell Model
- [ ] See-Through Plant Cell Model
- [ ] Printed "Supercell Project Memo" and swap cards for organelles
- [ ] Optional: Role cards (CEO, lab assistant, whistleblower), whiteboards for pitches

1. Present a fictional lab memo: a startup has tried to build a "supercell" for maximum energy output and minimal waste.
2. Students examine the animal and plant cell models to identify which features belong where and which were "swapped."
3. Challenge: What happens if animal cells have chloroplasts? Or plant cells lose their vacuole?
4. Students create two reports: What went wrong? and How would the cell function differently?

Extend

Ask them to "pitch" a genetically modified cell, but only if it's backed by scientific reasoning.

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Mad Science:
The Cell Switch Scandal

Background briefing: Lab alert

A private biotech startup has been caught experimenting with cell modification to create so-called ‘supercells’ for energy production and waste reduction. In the rush to go to market, critical organelles were swapped, removed or duplicated between animal and plant cells. You’ve been called in as the scientific investigation team to decode what went wrong and what it could mean for life as we know it.

Materials

- [ ] See-Through Animal Cell Model
- [ ] See-Through Plant Cell Model
- [ ] Swap cards (provided below)
- [ ] Worksheet and report template
- [ ] Your scientific mind!

Your Mission

1. Compare standard plant and animal cell structures.
2. Identify which features were modified or swapped.
3. Predict the impact on cellular function.
4. Create a short pitch for a genetically engineered cell, only if it makes scientific sense.

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Part 1
Spot the Switches

Below are organelles found in typical animal and plant cells. Using the cell models, label which cell type normally contains each one. Then identify which ones were swapped or duplicated in the ‘supercell’.

Chloroplast	**Nucleus**	**Large Vacuole**	**Mitochondria**
Cell Wall	**Cell Membrane**	**Lysosome**	**Golgi Apparatus**

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Part 2
What went wrong?

Choose at least two modifications and describe:

What was changed?

What impact would this have on cell function?

Would the cell survive? Why or why not?

Part 3
Supercell Pitch

You're the lead scientist presenting your version of a genetically engineered cell to a board of investors.

It must be:

- Biologically possible
- Ethically justifiable
- Clearly communicated

Write a short pitch (3–5 sentences) explaining:

- What makes your cell unique
- Why it's useful
- How it still functions as a living cell

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Organelle Swap Cards

Cut out each card and use them in the ‘Mad Science: Cell Switch Scandal’ activity.

Chloroplast

Normally found in plant cells. Enables photosynthesis by capturing sunlight.

Large Vacuole

Typically in plant cells. Stores water and maintains cell pressure.

Cell Wall

A rigid outer layer in plant cells that provides structure..

Lysosome

Usually in animal cells. Breaks down waste and cellular debris.

Cilia

Found in some animal cells. Used for movement or sensing the environment.

Nucleus

Found in both. Controls cell functions and contains DNA.

Mitochondria

In both cell types. Converts glucose into usable energy (ATP).

Golgi Apparatus

In both. Packages proteins and sends them to the right place.

Endoplasmic Reticulum

In both. Helps with protein and lipid synthesis.

Cell Membrane

In all cells. Controls what enters and leaves the cell.

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Cell Switch Scandal Role Cards

Cut out and assign these roles to students for group-based investigation or pitch activities.

Lead Scientist

You're in charge of the cell modification experiment. Explain the choices your team made and defend them using science.

Whistleblower

You noticed something was wrong with the experiment and reported it. Raise concerns about scientific ethics and safety.

CEO of BioCell Corp

You want this 'supercell' on the market fast. Ask questions about benefits and market value — but be ready to justify the risks.

Student Researcher

You've studied both plant and animal cells. Share what the original cells looked like and identify what's changed.

Data Analyst

You're responsible for recording changes and observations during the investigation. Present clear evidence and patterns.

Science Communicator

You'll present your group's findings to the public. Create a clear, simplified explanation of what went wrong and what it means.

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