

Build-a-cell activity: Background!

What are cells?

- Cells are the **building blocks** of your body- they form every part of you!
- There's an estimated 37 trillion cells in the average human body!
- Cells are basically teeny tiny sacs of liquid, (imagine teeny see-through water balloons) containing lots of different parts.
- In the same way that your organs (e.g. heart, lungs and brain) help you to breathe and live, **cells have their own tiny versions of organs called 'organelles'**.
- Each cell part (organelle) has it's own job to do, so that a cell can stay alive and carry out the important jobs to keep you alive!

The main cell parts (organelles):

<p>Plasma membrane (one per cell) (Plas-ma-mem-brain)</p>		<p>This is the outer part of a cell (like the outer balloon part of a water balloon). It contains lots of different molecules- fats, lipids and carbohydrates!</p>
<p>Nucleus and nuclear envelope (most cell types have just one) (Noo-blee-us)</p>		<p>The nucleus holds the instructions that tell a cell what to do. the instructions are written in the form of a chemical called DNA (DeoxyriboNucleic Acid), so the nucleus is like a mission control centre! The outer wall of this control centre is called the nuclear envelope!</p>
<p>Mitochondria (multiple in one cell) (Mite-o-con-dree-a)</p>		<p>These are the 'powerhouses' of the cell- they provide the fuel/energy (power) that a cell needs to function!</p>
<p>Ribosomes (millions per cell) (Ri-bo-soam-s)</p>		<p>These are protein-making machines. proteins provide the cell with a lot of its structure and the machinery to stay alive.</p>
<p>Endoplasmic Reticulum (ER) (long structure) (En-dough-plas-mick-ret-ic-u-lum)</p>		<p>This maze-like structure helps to add more cool features onto proteins coming from the ribosomes. while helping to transport proteins to where they need to go next!</p>
<p>Golgi (looks like piles of pitta bread) (Gol-gee)</p>		<p>This is similar to the ER. it adds more features (like fancy sugary parts) to proteins coming from the ER and packages them to go to the plasma membrane or to be released from the cell!</p>
<p>Centrioles (2 per cell) (Sen-tree-oles)</p>		<p>These are two tiny cylinder-shaped structures in the cell. There is a bigger 'mother' and smaller 'daughter' centriole. They help cells to 'divide'. Cell division is when a cell forms two new cells. reproducing itself.</p>

Build-a-cell activity!

Cell-building materials you will need:

- Scissors
- Sticky dots, glue or Sellotape to stick your cell parts down!
- Coloured pens or pencils for drawing and labelling cell parts.
- Paper plate (if you don't have one, you can use a normal plate to trace around on white plain paper and cut out a plate-shaped circular piece of paper).
- Coloured paper or card (it doesn't really matter which colours, but it might be good to keep each part of the cell the same colour!)
- Pipe cleaners, if you don't have these you can draw on the shapes instead. Or you can use straws, roll up some paper into long tubes, or use old hairbands or elastic bands- whatever works best!

Once you've got the materials, you can try building a cell something like the one I made below, and if you're on paper, try labelling the different parts!



You may have spotted a bonus cell part here...

Vacuole: this acts as a kind of storage box inside the cell where nutrients and cell waste can be kept!

Alternative activities:

Jingle cells. Jingle cells...Why not make smaller versions of cells and hang them on the Christmas tree?

Cell cookies... Grab some icing and baking decorations, you can make plain cookies and add yummy cell parts on top!

1) Fun fact about my work as a scientist: my research looks at cells of the immune system

The **immune system** is a group of special cells, that travel around your body through your blood, with the important job of killing any harmful germs like bacteria and viruses that can enter your body and cause you to fall ill!

2) Fun fact about my work as a scientist: my research studies how the immune system interacts with cancer cells

A normal cell turns into a **cancer cell** when the set of instructions (DNA) inside the normal healthy cell is damaged by things like toxic chemicals from cigarette smoke, or UV light from the sun. These **cancer cells divide (reproduce themselves) too quickly**, and without control, which can form solid lumps of cancer cells in the body called 'tumours'. These tumours can damage organs, so I'm studying how we can kill off cancer cells using the immune system as a cancer-killing weapon!

Excellent examples from past cell-builders!

