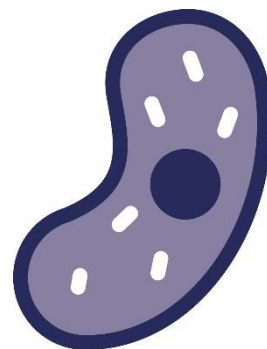




## Growth and Differentiation

*How do bacteria spread? What does a virus look like under a microscope? How do substances move between cells? What causes cancer?*



All living things are made of cells, with many working together as tissues, organs and organ systems. The exchange of substances between cells and their environment allows the life processes to occur, fuelled by the organelles within. Differentiated cells allow living things to thrive in a huge variety of habitats.

This is the **second** unit we are studying as part of the big idea: **Cells are Alive**

In this unit, we will learn more about cell structure and specialisation. We will learn to classify cells as eukaryotic or prokaryotic according to some basic features and revisit the function of the main organelles (e.g. nucleus). We will learn how scientists now use electron microscopes to study cells in more detail. We will then learn about the three main methods of cell transport: diffusion, osmosis and active transport. We will study how different cells are adapted for efficient exchange and apply this learning about methods of cell transport to different examples.

Finally, we will study cell specialisation and learn how cells divide by mitosis to allow for growth and repair. We will learn that cancers are a group of diseases that can arise from uncontrolled cell growth. We will also learn how scientists use stem cells to study and treat different diseases.

We will develop our mathematical skills when we practise using the equation for calculating magnification. We will also learn how to use calculations to represent how rapidly bacteria can divide.

We will develop our practical enquiry skills by investigating bacterial growth using agar plates. We will practise using aseptic technique to safely grow bacteria. We will also have another opportunity to use microscopes to investigate cells. Finally, we will investigate how osmosis causes plant tissue to swell.

### TASKS:

What subject will this unit focus on? BIOLOGY  
(circle the correct subject)

CHEMISTRY

PHYSICS

There are lots of keywords underlined above. List these into the two columns:

Words I know	Words I haven't seen before





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**To answer before the unit:**

1. What are you most excited to learn about in this topic?

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2. What do you already know about this topic?

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3. Why do you think it's important to learn that cells are alive?

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4. What knowledge from previous science lessons might help us?

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5. What questions do you have about this topic?

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**To answer at the end of the unit:**

1. Tick off any words in the 'words I haven't seen before' column that you are now confident with. Circle any you still need more practice to use.
2. What have you most enjoyed about this unit?



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3. What more would you like to learn about as part of the big idea: 'cells are alive'?
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Teacher guidance:

The purpose of this resource is to provide students with an overview at the beginning and end of each unit. It is designed to create a discussion about the unit prior to the sequence of lessons.

The unit scope should be read as a guided reading activity. Tier 3 vocabulary has been highlighted. It may need to be adapted further for LPAs or pupils with different reading ages.

There are a range of ways to use this resource.

1. Display on a slide for students to read as a class. Direct students to complete the activities in their book.
2. Print off for students to stick into their book at the beginning of the unit along with their knowledge organiser. Complete as a guided reading task together. Direct students to complete the activities.
3. Have students complete as part of a booklet.
4. Set as a homework prior to a unit.

*If you have any feedback about how this resource could be used/improved, please contact the science mastery team: [sciencemastery@arkonline.org](mailto:sciencemastery@arkonline.org)*

