







## 1.1 Cell Division, Growth and Repair

At the end of this sequence of lessons I can:

			
1. I can state that cells are the basic units of living things.			
2. I can explain the purpose of staining animal and plant cells			
3. I can describe the structural similarities and differences between animal and plant cells.			
4. I can state that cell division is a means of increasing the number of cells in an organism.			
5. I can state that cell division is essential to allow organisms to grow and repair damaged parts, eg. cuts, broken bones.			
6. I can state that the nucleus of the cell controls cell activities including division.			
7. I can state that during cell division, the parent cell divides to produce two identical cells.			
8. I can state that each of the two cells produced by cell division contains the same number of chromosomes in their nuclei as the parent cell.			
9. I can identify the correct sequence of stages of mitosis.			
10. I can describe the stages of mitosis.			
11. I can explain why it is important that the chromosome complement of daughter cells in multicellular organisms is maintained.			
12. I can state that cancer occurs as a result of uncontrolled cell division.			




## 1.2 DNA, Genes and Chromosomes

At the end of this sequence of lessons I can:

			
1. I can state that genes are located on chromosomes in the nucleus.			
2. I can state that genes are made of DNA which carries the instructions to make proteins.			
3. I can state that each individual's DNA is unique.			
4. I can state that genes are passed on from parents to offspring.			




## 1.3 Therapeutic use of Cells

At the end of this sequence of lessons I can:

			
1. State that during genetic engineering genes can be transferred from one organism to another.			
2. Give examples of the products of genetic engineering and their applications.			
3. Describe stem cell technology and explain the benefits of this technology.			




### 1.4 Properties of Enzymes and use in Industry

At the end of this sequence of lessons I can:

			
1. State that enzymes are found in living cells.			
2. State that enzymes speed up chemical reactions.			
3. State that enzymes remain unchanged by the reaction.			
4. State that enzymes build up and breakdown molecules.			
5. State that enzymes are specific.			
6. Give an example of how enzymes are used in biotechnological industries.			

### 1.5 Properties of Microorganisms and use in Industry

At the end of this sequence of lessons I can:

			
1. State that microorganisms grow very quickly			
2. State that microorganisms are used to produce a wide range of products.			
3. State that yeast is a type of microorganism involved in baking and brewing.			

4. State that bacteria is a type of microorganism involved in the production of yoghurt and cheese			
5. State that microorganisms are involved in the breakdown of sewage.			




## **1.6 Photosynthesis**

At the end of this sequence of lessons I can:

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1. State that green plants make their own food which may be stored as starch.			
2. State that green plants convert light energy to chemical energy.			
3. State that carbon dioxide and water are raw materials use in the production of glucose with oxygen as a by-product.			
4. State that photosynthesis occurs in the presence of chlorophyll and light.			
5. State that there are several factors that can limit the rate of photosynthesis in a plant.			
6. State that a limiting factor in photosynthesis is anything which, when in short supply, reduces or limits the rate of photosynthesis taking place			
7. State that light intensity, carbon dioxide and temperature can be limiting factors in photosynthesis.			

## 1.7 Respiration

At the end of this sequence of lessons I can:

			
1. State that all cells need energy for movement, growth, cell division, chemical reactions etc			
2. State that respiration is used to release energy for use in cells.			
3. State that respiration is a series of enzyme controlled chemical reactions.			
4. State that respiration in the presence of oxygen is called aerobic respiration			
5. State that during aerobic respiration animal, plant and yeast cells use glucose and oxygen to produce carbon dioxide and water.			
6. State that some cells can respire without oxygen and this is called anaerobic respiration.			
7. State that without oxygen plant and yeast cells use glucose to produce ethanol and carbon dioxide.			
8. State that without oxygen animal cells use glucose to produce lactic acid.			