

## Year 9

All numbered points refer to specification points

Timing	Unit Title	Key Question	Knowledge	Assessing understanding
Autumn	<b>1.1 Cells and cell structure</b> <b>1.2 Cell division and reproduction</b>	<b>How are cells organised</b>	<ul style="list-style-type: none"> <li>1.1.1 Eukaryotes and prokaryotes</li> <li>1.1.2 Animal and plant cells</li> <li>1.1.3 Cell specialisation</li> <li>1.1.4 Cell differentiation</li> <li>1.1.5 Microscopy</li> <li>1.1.6 Culturing microorganisms (biology only)</li> <li>1.2.1 Chromosomes</li> <li>1.2.2 Mitosis and the cell cycle</li> </ul> <p><i>Students should understand that meiosis leads to non-identical cells being formed while mitosis leads to identical cells being formed.</i></p> <ul style="list-style-type: none"> <li>1.2.3 Stem cells.</li> </ul> <p>A stem cell is an undifferentiated cell of an organism which is capable of giving rise to many more cells of the same type, and from which certain other cells can arise from differentiation. Students should be able to describe the function of stem cells in embryos, in adult animals and in the meristems in plants.</p> <p>Stem cells from human embryos can be cloned and made to differentiate into most different types of human cells.</p> <p>Stem cells from adult bone marrow can form many types of cells including blood cells.</p>	<p><b>How understanding is assessed</b></p> <p>Students will be assessed on their ability to:</p> <ul style="list-style-type: none"> <li>Recall the knowledge covered</li> <li>Interpret graphical and experimental data,</li> <li>Make connections between different areas of understanding, explain the Biological processes covered.</li> </ul> <p>Assessment will take the form of written questions in a test.</p> <p><b>Students will also be assessed on their ability to effectively carry out the following :</b></p> <p><u>Required practical 1</u> : use of a light microscope to observe, draw and label a selection of plant and animal cells</p> <p><u>Required Practical 2</u>: Aseptic techniques (streak plate method)</p> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>Graphical interpretation</li> <li>Making connections</li> <li>Explanations</li> <li>Description</li> <li>Scientific literacy</li> </ul>

			<p>Meristem tissue in plants can differentiate into any type of plant cell, throughout the life of the plant.</p> <p>Knowledge and understanding of stem cell techniques are not required.</p> <p>Treatment with stem cells may be able to help conditions such as diabetes and paralysis.</p> <p>In therapeutic cloning an embryo is produced with the same genes as the patient. Stem cells from the embryo are not rejected by the patient's body so they may be used for medical treatment.</p> <p>The use of stem cells has potential risks such as transfer of viral infection, and some people have ethical or religious objections.</p> <ul style="list-style-type: none"><li>• 6.1.4 DNA and the genome</li><li>• 6.1.5 DNA structure (biology only)</li></ul>	<ul style="list-style-type: none"><li>• Use of microscope</li><li>• Planning and carrying out an investigation</li><li>• Graph drawing</li><li>• Data analysis.</li></ul>
--	--	--	---	---

Spring 1	<b>1.3 Cell movement</b>	<b>How do substances move into and out of cells?</b>	<ul style="list-style-type: none"> <li>• 1.3.1 Diffusion</li> <li>• 1.3.2 Osmosis</li> <li>• 1.3.3 Active transport</li> </ul>	<u>Required practical 3</u> : investigating the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.
Spring 2	<b>4.2 respiration and 4.1 photosynthesis</b>	<b>How organisms get their energy from the sun and transfer that energy into useable forms</b>	<ul style="list-style-type: none"> <li>• 4.4.1.1 Photosynthetic reaction</li> <li>• 4.4.1.2 Rate of photosynthesis</li> <li>• 4.4.1.3 Uses of glucose from photosynthesis</li> <li>• 4.4.2.1 Aerobic and anaerobic respiration</li> <li>• 4.4.2.2 Response to exercise</li> <li>• 4.4.2.3 Metabolism</li> </ul>	<p><b>How understanding is assessed</b> Students will be assessed on their ability to:</p> <ul style="list-style-type: none"> <li>• Recall the knowledge covered</li> <li>• Interpret graphical and experimental data,</li> <li>• Make connections between different areas of understanding, explain the Biological processes covered.</li> </ul> <p>Assessment will take the form of written questions in a test.</p> <p><b>Students will also be assessed on their ability to effectively carry out the following :</b></p> <p><u>Required practical 6</u> : investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such a pond weed</p> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Graphical interpretation</li> <li>• Making connections</li> <li>• Explanations</li> <li>• Description</li> <li>• Scientific literacy</li> <li>• Planning and carrying out an investigation</li> </ul>

				<ul style="list-style-type: none"><li>• Graph drawing</li><li>• Data analysis.</li></ul>
--	--	--	--	--