

**Higher Human Biology**

**Human cells: Division and Differentiation in Human Cells (Key Area 1)**

By the end of this topic I will be able to:

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| 1. State that differentiation is the process by which a cell expresses certain genes to produce proteins characteristic to that type of cell.
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| 1. List some examples of specialised cells and tissues
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| 1. Define the term stem cell
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| 1. Name the two main types of stem cell and describe the source from which each can be obtained
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| 1. Define the terms pluripotent and multipotent.
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| 1. State that cells of the early embryo (blastocyst) are pluripotent.
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| 1. State that tissue stem cells are multipotent and are involved in growth, repair and renewal of cells in the tissue in which they are located.
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| 1. Explain what is meant by the term somatic cell and give some examples.
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| 1. Describe the genetic make up of a somatic cell and name the process by which they divide.
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| 1. State that germline cells include the gametes and the cells that produce gametes.
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| 1. State that germline cells can divide by mitosis to form identical daughter cells (diploid) or can divide by meiosis to form gametes (haploid).
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| 1. Describe some therapeutic applications of stem cells and state that stem cells can also be used in research as model cells to study how diseases develop and for drug testing.
2. Discuss some of the ethical issues surrounding stem cell research.
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| 1. State that cancer cells are cells that divide excessively to form a mass of abnormal cells, referred to as a tumour.
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| 1. Describe what happens if cells in a tumour fail to attach to each other
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