AS Core Material				
Theme	**Topic**	**You should be able to:**	**Checklist**	**Comments**
A. Cell structure	The microscope in cell studies Cells as basic units of living organisms Detailed structure of animal and plant cells, as seen under the electron microscope Outline functions of organelles in plant and animal cells Characteristics of prokaryotic and eukaryotic cells	• *use an eyepiece graticule and stage micrometer scale to measure cells and be familiar with units (millimetre, micrometre, nanometre) used in cell studies; • explain and distinguish between resolution and magnification, with reference to light microscopy and electron microscopy; • describe and interpret drawings and photographs of typical animal and plant cells, as seen using the electron microscope, recognising the following: rough endoplasmic reticulum and smooth endoplasmic reticulum, Golgi body (Golgi apparatus or Golgi complex), mitochondria, ribosomes, lysosomes, chloroplasts, cell surface membrane, nuclear envelope, centrioles, nucleus, nucleolus, microvilli, cell wall, the large permanent vacuole and tonoplast (of plant cells) and plasmodesmata. (knowledge that ribosomes occurring in the mitochondria and chloroplasts are 70S (smaller) than those in the rest of the cell (80S) should be included. The existence of small circular DNA in the mitochondrion and chloroplast should be noted); • outline the functions of the structures listed in (c); • *compare the structure of typical animal and plant cells; • *draw and label low power plan diagrams of tissues and organs (including a transverse section of stems, toot and leaves) • *calculate linear magnification of drawings and photographs; • *calculate actual sizes of specimens from drawings and photographs; • outline key structural features of prokaryotic cells (including: unicellular, 1-5μm diameter, peptidoglycan cell walls, lack of membrane-bound organelles, naked circular DNA, 70S ribosomes) and compare and contrast the structure of		

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		prokaryotic cells with eukaryotic cells (reference to mesosomes should not be included).		

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E. Cell and nuclear division	Replication and division of nuclei and cells Understanding of chromosome behaviour in mitosis	• explain the importance of mitosis in the production of genetically identical cells, growth, repair and asexual reproduction; • outline the cell cycle, including growth, DNA replication, mitosis and cytokinesis; • describe, with the aid of diagrams, the behaviour of chromosomes during the mitotic cell cycle and the associated behaviour of the nuclear envelope, cell membrane, centrioles and spindle (names of the main stages are expected); • explain how uncontrolled cell division can result in the formation of a tumour and identify factors that can increase the chances of cancerous growth; • explain the meanings of the terms *haploid* and *diploid* (see section 5) and the need for a reduction division (meiosis) prior to fertilisation in sexual reproduction (note: descriptions of homologous chromosomes are not required for AS Level).		