

2.1.1 Cell structure

- (a) the use of microscopy to observe and investigate different types of cell and cell structure in a range of eukaryotic organisms
To include an appreciation of the images produced by a range of microscopes: light microscope, transmission electron microscope, scanning electron microscope and laser scanning confocal microscope.
HSW1, HSW7
- (b) the preparation and examination of microscope slides for use in light microscopy
Including the use of an eyepiece graticule and stage micrometer. **PAG1** HSW4
- (c) the use of staining in light microscopy
To include the use of differential staining to identify different cellular components and cell types. **PAG1** HSW4, HSW5
- (d) the representation of cell structure as seen under the light microscope using drawings and annotated diagrams of whole cells or cells in sections of tissue
PAG1
- (e) the use and manipulation of the magnification formula
$$\text{magnification} = \frac{\text{object size}}{\text{image size}}$$
M0.1, M0.2, M0.3, M1.1, M1.8, M2.2, M2.3, M2.4
- (f) the difference between magnification and resolution
To include an appreciation of the differences in resolution and magnification that can be achieved by a light microscope, a transmission electron microscope and a scanning electron microscope.
M0.2, M0.3 HSW7, HSW8
- (g) the ultrastructure of eukaryotic cells and the functions of the different cellular components
To include the following cellular components and an outline of their functions: nucleus, nucleolus, nuclear envelope, rough and smooth endoplasmic reticulum (ER), Golgi apparatus, ribosomes, mitochondria, lysosomes, chloroplasts, plasma membrane, centrioles, cell wall, flagella and cilia.
M0.2
- (h) photomicrographs of cellular components in a range of eukaryotic cells
To include interpretation of transmission and scanning electron microscope images.
- (i) the interrelationship between the organelles involved in the production and secretion of proteins
No detail of protein synthesis is required.
- (j) the importance of the cytoskeleton
To include providing mechanical strength to cells, aiding transport within cells and enabling cell movement.
HSW2
- (k) the similarities and differences in the structure and ultrastructure of prokaryotic and eukaryotic cells.
PAG1