

## Answers for extension worksheet – Chapter 2

- 1**
- a** The drawing of the bacterium should be approximately 10 mm across. (1)
  - b** The drawing of the mitochondrion should be approximately 10 mm across. (1)
  - c** A typical animal cell at this magnification would be approximately 20 cm across. (1)
  - d** A membrane is approximately 10 nm thick, so to be drawn at 10 mm a magnification of  $\times 1,000,000$  ( $1 \times 10^6$ ) would be required. (1)
- 2** (8)

Structure	Prokaryotic cell	Eukaryotic cell
Golgi apparatus	✗	✓
ribosomes	✓	✓
mitochondria	✗	✓
cell membrane	✓	✓
endoplasmic reticulum	✗	✓

- 3** (4)

Description	Organelle
rod-shaped structure, 1 $\mu\text{m}$ wide and approximately 7 $\mu\text{m}$ long, with a double membrane, the inner membrane is folded into cristae	mitochondrion
disc-shaped structure, about 1 $\mu\text{m}$ across and 5 $\mu\text{m}$ long, which contains a system of thylakoids	chloroplast
structure surrounded by a double membrane, which contains the cell's genetic material	nucleus
round organelle, 25 nm in diameter, consisting of RNA and protein	ribosome

- 4**
- a** Membranes all have similar structures but cells (such as endocrine cells) that take in or secrete many different substances will have a greater proportion of protein channels. A red blood cell does not do this so will have a lower proportion of protein compared with other cells. (2)
  - b** Mature human red blood cells do not contain a nucleus or other organelles so they are very suitable for studying the cell surface membrane. (1)  
  
Cell membrane extracts from other types of cell would be contaminated with other membranes from organelles found in the cell. (1)
  - c** The proteins might form channels, or parts of enzymes or electron carriers, or parts of cell surface receptors. (2)



- 5**
- a** A = interphase, B = mitosis (2)
  - b** during the S phase of interphase (1)
  - c** The quantity of DNA doubles as chromosomes replicate during interphase. (1)
  - d** cell growth, division of some organelles (1)