# B1 L5 Challenge worksheet: Specialised cells



Name: _____ Class: _____

## A. Mitochondria in cells

Help: online screens 4 and 6 [6]

A scientist counted the mitochondria in four types of animal cell. Table 1 shows the results.

Table 1

| Cell | What the cell does | Mean number of mitochondria in one cell |
|---|---|---|
| **A** | contracts all day and night to pump blood | 5000 |
| **B** | carries out many chemical reactions | 1500 |
| **C** | swims to an egg cell | 70 |
| **D** | stores fat | 30 |

(a) Which cell, A, B, C or D, is likely to release the most energy? Give a reason for your answer. [2]

_____

_____

(b) Calculate how many times more mitochondria cell B has than cell D. [2]

_____ times

(c) Cell C is a sperm cell. Its mitochondria are packed into a short section just behind the head, where the tail starts. Suggest why. [2]

_____

_____

## B. Sizes and magnification

Help: online screen 7 [5]

(a) A nerve cell runs from the bottom of the spine to a toe. It is 0.9 m long. Its cell body is 90 µm across. Calculate how many times longer the nerve cell is than the width of its cell body. Give your answer in standard form. Use 1 m = 1000 mm and 1 mm = 1000 µm. [3]

_____ times

(b) In a textbook, the cell body is drawn 27 mm across. Calculate the magnification of the drawing. Use: magnification = size of image ÷ size of real object. [2]

Magnification = × _____

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## C. Apply what you know

Help: online screens 10 and 11 [4]

(a) Gland cells in the pancreas make enzymes. Enzymes are proteins. Use what you learnt about ribosomes in B1 L1 Animal and plant cells. Suggest why these gland cells have many ribosomes. [2]

(b) A tree is cut down to a stump. A few weeks later, new shoots with leaves grow from the stump. Explain what this shows about plant cells. [2]

## D. Extended response

Help: online screens 2, 3 and 9 [6]

Water moves from the soil into root hair cells, then up the plant in the xylem to the leaves. Explain how root hair cells and xylem cells are adapted to do their jobs. [6]

In your answer, describe the structure of each type of cell and explain how it helps the cell to do its job.