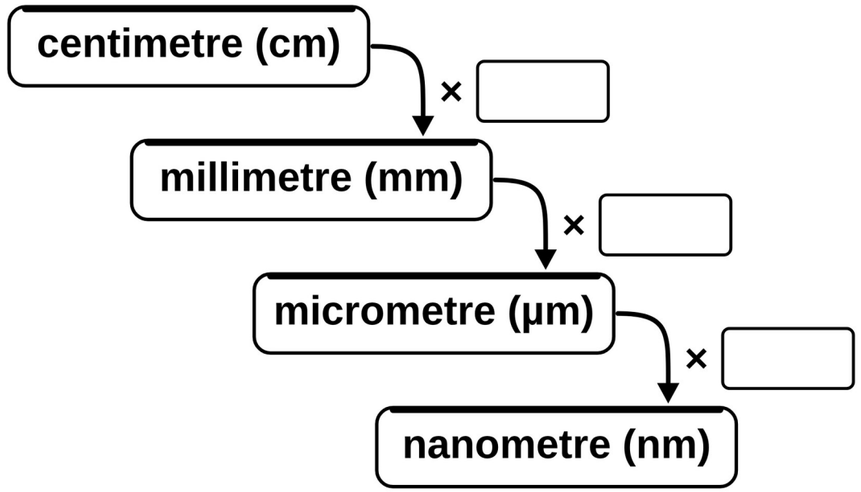
B1 L4 Mandatory worksheet: Magnification and cell size

Name: _____ Class: _____

A. Units for tiny things

Help: online screen 3 [8]

(a) Complete the units staircase. Write the missing number in each box. [3]



(b) Convert these lengths. [5]

1. 6 mm = _____ µm
2. 80 µm = _____ mm
3. 3 µm = _____ nm
4. 4000 nm = _____ µm
5. 1.5 cm = _____ mm

B. Fill in the gaps

Help: online screens 4 and 6 [4]

Use words from the box. Use each word once. Two words are not needed.

bigger	ruler	same	scale bar	smaller	unit

1. Magnification tells you how many times _____ the image is than the real object.
2. You measure the size of an image with a _____.
3. Magnification has no _____.
4. The real size of a cell is _____ than its image.

C. Which is bigger?

Help: online screen 3 [6]

Tick (✓) the bigger length in each row. Change them into the same unit first.

	Length A	Length B	A is bigger	B is bigger
1	1 mm	100 µm		
2	500 nm	1 µm		
3	0.5 mm	600 µm		
4	2000 nm	3 µm		
5	0.01 mm	5 µm		
6	1.2 µm	900 nm		

B1 L4 Mandatory worksheet: Magnification and cell size

Name: _____ Class: _____

D. Short answers

Help: online screens 1, 2, 4, 6, 9, 10 and 11 [8]

1. A micrograph is labelled × 1000. What does × 1000 tell you? [1]

_____

2. Complete the equation.
real size = _____ ÷ _____ [1]

3. Why are air bubbles left out of a biological drawing of cells? [1]

_____

4. Give one way a biological drawing is different from the view down the microscope. [1]

_____

_____

5. What is the field of view? [1]

_____

6. A picture has a scale bar labelled 20 µm. What does the scale bar show? [1]

_____

7. Write 1 µm in metres, in standard form. [1]

1 µm = _____ m

8. A plant cell is two orders of magnitude bigger than a bacterium. How many times bigger is it? [1]

_____ times

E. Calculate

Help: online screens 6 and 7 [3]

Use: **real size = image size ÷ magnification** **1 mm = 1000 µm**

A drawing of a yeast cell is 21 mm long. The magnification is × 3000. Calculate the real length of the yeast cell in µm. Show your working. [3]

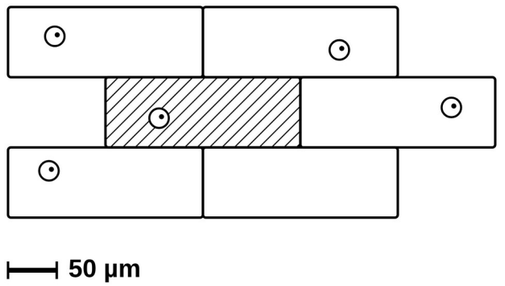
_____ µm

F. Use a scale bar

Help: online screens 4 and 9 [4]

The drawing shows onion cells. A student measured the drawing with a ruler. The 50 µm scale bar was 12 mm long. The shaded cell was 48 mm long.

(a) Calculate the real length of the shaded cell in µm. Use: real size = size on the picture ÷ length of the scale bar × value of the scale bar. [2]



_____ µm

(b) Change your answer to (a) into mm. [1] _____ mm

(c) The scale bar is 12 mm long and stands for 50 µm. Calculate the magnification of the drawing. Use: 12 mm = 12 000 µm. [1]

magnification = × _____