



## Summer Transition Tasks

**Section A** Complete the 3 tasks (guidance time = 1.5 hours)

**Section B** Write an essay on the following: (guidance time = 3 hours)

- “Discuss 5 named examples of proteins and how they function in the human body”

Name:

**Section A** Complete the 3 tasks below: (guidance time = 1.5 hours)

Use the biological terminology below to complete the definitions in the table.

Some terms have not been included to provide an extra challenge..

tissue photosynthesis cytoplasm living organisms high homeostasis internal concentrated	enzyme active transport DNA diffusion protein identical similar	bacteria nucleus active site low dilute water chain
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Scientific word	Definition
Activation energy	Energy needed to make a reaction take place
.....	Place on the enzyme molecule where the substrate fits
A..... t.....	Movement of substance against a concentration gradient requiring .....
.....	A single-celled micro-organism with no nucleus
Cell	Fundamental building block of .....
Chromosome	Made up from ....., found in the nucleus
C.....	Found in all living cells where chemical reactions take place
Denatured	When the shape of an enzyme molecule changes so it is not able to function
D.....	Net movement of molecules from an area of ..... concentration to one of ..... concentration
E.....	Biological catalyst that ..... the rate of reaction
Food .....	Feeding relationship between different organisms in an ecosystem
Gene	A part of DNA that codes for a .....
H.....	Maintaining a constant ..... environment
Mitosis	Cell division in which two ..... daughter cells are produced
N.....	An organelle that contains the genetic material and controls cell activity

Osmosis	Diffusion of ..... from a ..... to a more ..... solution
P.....	Process carried out by ..... in which light ..... is used to produce glucose
Respiration	Process where g..... is broken down to provide energy in all cells
T.....	A group of cells that have a ..... structure and function

### Why are units important in Biology?

In Biology you will be making many observations and measurements that need appropriate units; it is therefore important that a universal system is followed. *Le Système International d'Unités* (abbreviated to SI) is a metric system that is used in science. It ensures that all scientists work in the same standard units.

Name	Unit	Symbol
area	square metre	m <sup>2</sup>
concentration	moles per cubic decimetre	mol dm <sup>-3</sup>
energy	Joule	J
length	metre	m
mass	kilogram	kg
pressure	Pascal	Pa
temperature	degree centigrade	°C
time	second	s
volume	cubic decimetre	dm <sup>3</sup>

### What do prefixes mean?

A prefix can be used for units. This is usually a multiplier for that unit, such as 'kilo', which is 1,000 multiples of the unit – you could have kilometre, kilograms and kilojoules, for example. Below is a list of the units (some with prefixes) you will need to know.

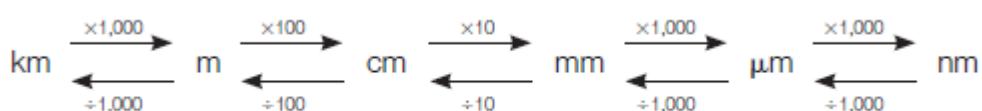
Name	Symbol
kilometre	km
metre	m
centimetre	cm
millimetre	mm
micrometre	$\mu\text{m}$
nanometre	nm

From the table, you can see that nm is the smallest measurement used by the A-level biologist.

- To convert mm to m, you need to divide by 1,000.
- To convert m to nm, you need to multiply by 1,000,000,000 ( $1 \times 10^9$ )
- To convert m to mm, you need to multiply by 1,000.
- To convert nm to m, you need to divide by 1,000,000,000 ( $1 \times 10^9$ )

An easy way to remember whether you need to divide or multiply by 1,000 is to...

- 1 Look at the figure and decide if it needs to be made bigger or smaller.
- 2 Then look at the units it needs to be converted into.
- 3 If the figure needs to be made bigger... **MULTIPLY by 1,000 (or 100).**
- 4 If the figure needs to be made smaller... **DIVIDE by 1,000 (or 100).**



You will also need to be confident at recognising each of the units when they are written as **powers of ten** (length has been used in the following table to illustrate this).

Name of unit	Multiple or fraction of a metre
kilometre (km)	$10^3 = 1000\text{m}$
metre (m)	1m
centimetre (cm)	$10^{-2} = 0.01\text{m}$
millimetre (mm)	$10^{-3} = 0.001\text{m}$
micrometre ( $\mu\text{m}$ )	$10^{-6} = 0.000001\text{m}$
nanometre (nm)	$10^{-9} = 0.000000001\text{m}$

## Task and Questions

### Task

Complete the table below showing conversions between different units. Some have already been done for you, and these should help you to fill in the blanks.

Unit	m	cm	mm	$\mu\text{m}$	nm
Height of a rosebush		145			
Length of a fingernail			16		
Diameter of a liver cell				25	
Diameter of a cell membrane					10

### Calculation questions

- 1 Convert 75m into mm\_\_\_\_\_
- 2 How many nm are there in 450mm?\_\_\_\_\_
- 3 Write 84m in mm\_\_\_\_\_
- 4 Susan uses an optical microscope to look at a liver cell that is 4mm in diameter
  - a) How would she write this figure in cm?\_\_\_\_\_
  - b) How would she write this figure in m?\_\_\_\_\_
- 5 Write 180m as mm\_\_\_\_\_
- 6 Write 0.2mm in m\_\_\_\_\_
- 7 Convert 2.5m into mm\_\_\_\_\_
- 8 George measures the size of the nucleus in a plant cell as 30mm.  
What is this value in nm?\_\_\_\_\_
- 9 The length of a salmon was 0.5m. Convert this into mm\_\_\_\_\_
- 10 A holly leaf was measured and had a diameter of 6.5cm
  - a) What is its diameter in mm?\_\_\_\_\_
  - b) What is its diameter in m?\_\_\_\_\_
  - c) What is its diameter in nm?\_\_\_\_\_

**Section B** Write an essay on the following: (guidance time = 3 hours)

**“Discuss 5 named examples of proteins and how they function in the human body”**

use internet research

write between 800 and 1000 words

include 5 different named examples of protein examples could include: Haemoglobin, Keratin, Collagen, Named enzyme, Antibodies etc

include a bibliography of all references used

**\*\* All work must be submitted in the first Biology lesson in September \*\***