

BTEC Level 3 Applied Science Extended Certificate

Taster Session 2022



The Applied Science course is taught in units, as below:

Unit 1: Principles and Applications of Science I (Exam)

This unit covers some of the key science concepts in biology, chemistry and physics.

Unit 2: Practical Scientific Procedures and Techniques (Assignments)

This unit covers quantitative laboratory techniques, calibration, chromatography, calorimetry and laboratory safety, which are relevant to the chemical and life science industries.

Unit 3: Science Investigation Skills (Marked Investigation)

This unit covers the stages involved and the skills needed in planning a scientific investigation: how to record, interpret, draw scientific conclusions and evaluate.

Unit 9: Human Regulation and Reproduction (Assignments)

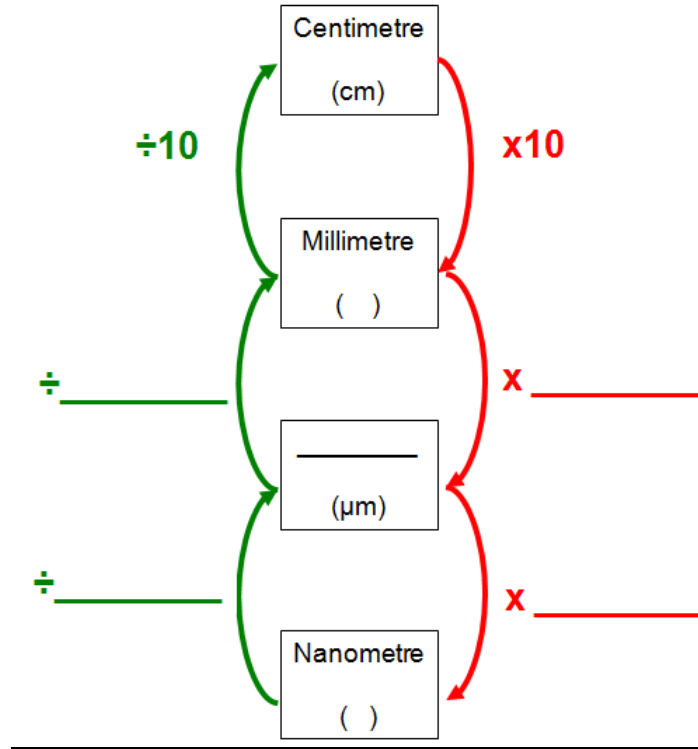
This unit will focus on how the internal environment of the human body is regulated and controlled, including how the nervous system controls the cardiovascular and respiratory systems and the role of hormones in the reproductive system.

Overall, the assessment is 25% exam, 33% supervised assessment and 42% coursework

Taster Lesson Materials

Units of Measurement

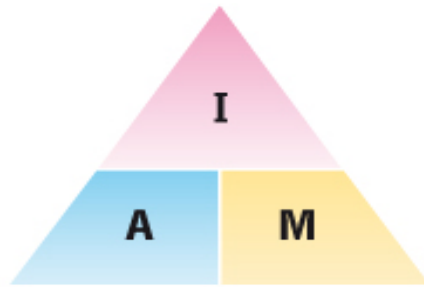
- 1) Complete the diagram below to show: names of the units of measurement, unit symbols, mathematical operations for converting between units.



- 2) Complete the table below to show the corresponding value nanometres, micrometres and millimetres for the measurements given in each row. The first row has been completed for you. Ensure that your answers use the correct unit symbols.

Nanometre	Micrometre	Millimetre
5	0.005	0.000005
1		
	1	
		1
	3	
7		
		0.5

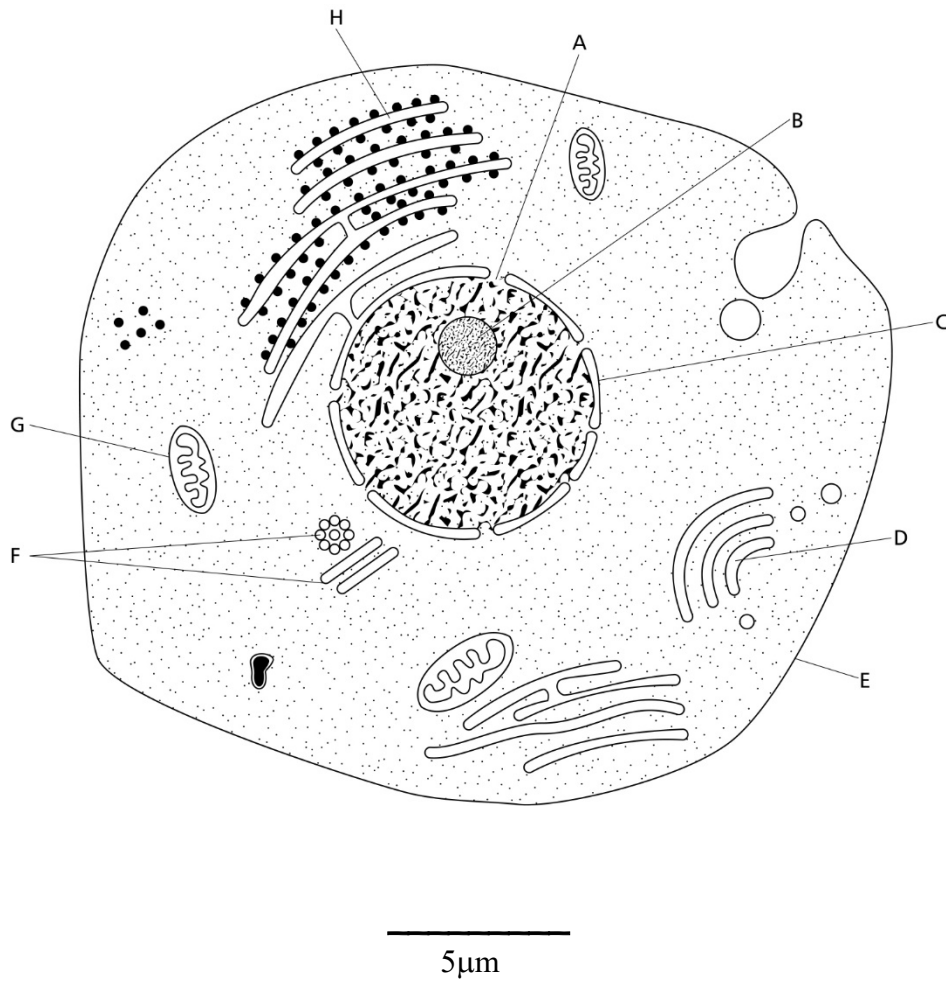
Calculating Cell Magnification from Images



$$\text{Actual size} = \frac{\text{Image size}}{\text{Magnification}}$$

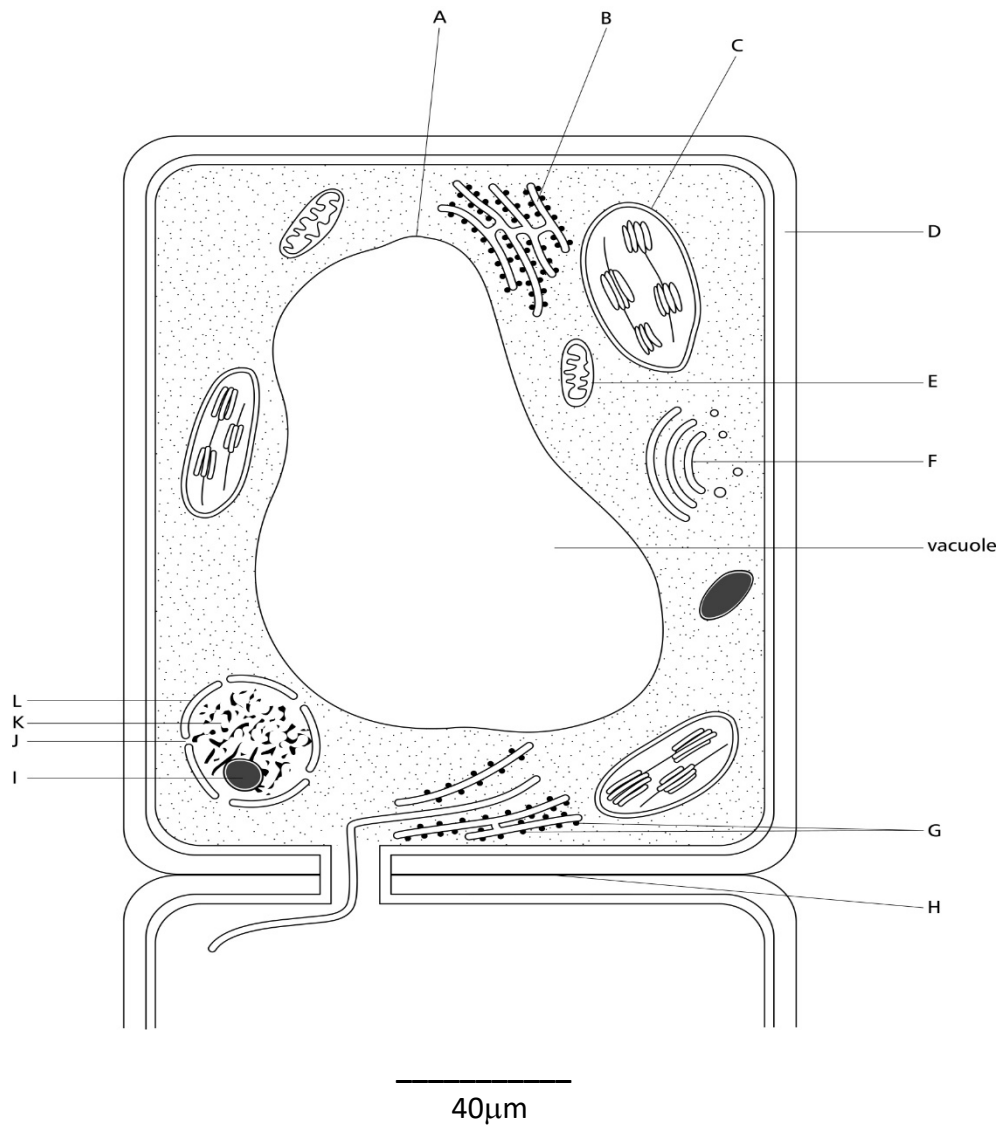
$$\text{Magnification} = \frac{\text{Image size}}{\text{Actual size}}$$

The diagram below shows the general structure of an animal cell as seen under an electron microscope.



- 1) Calculate the magnification factor of the diagram
- 2) Calculate the length of structure G
- 3) Calculate the diameter of the nucleolus (structure B)
- 4) Calculate the diameter of the nucleus
- 5) Calculate the diameter of the cell at its widest point

The diagram below shows the general structure of a plant cell when viewed under an electron microscope.



- 1) Calculate the magnification factor of the diagram
- 2) Calculate the thickness of the cellulose cell wall.
- 3) Calculate the length of the cell.
- 4) Calculate the length of structure C.
- 5) Calculate the length of the vacuole.

Independent Learning Tasks

These should be brought to the first lesson in September.

Task 1 (Biology)

The diagrams on the following pages should be labelled, and a list of the functions of each feature should be produced.

The information can be found on www.cellsalive.com

Task 2 (Chemistry)

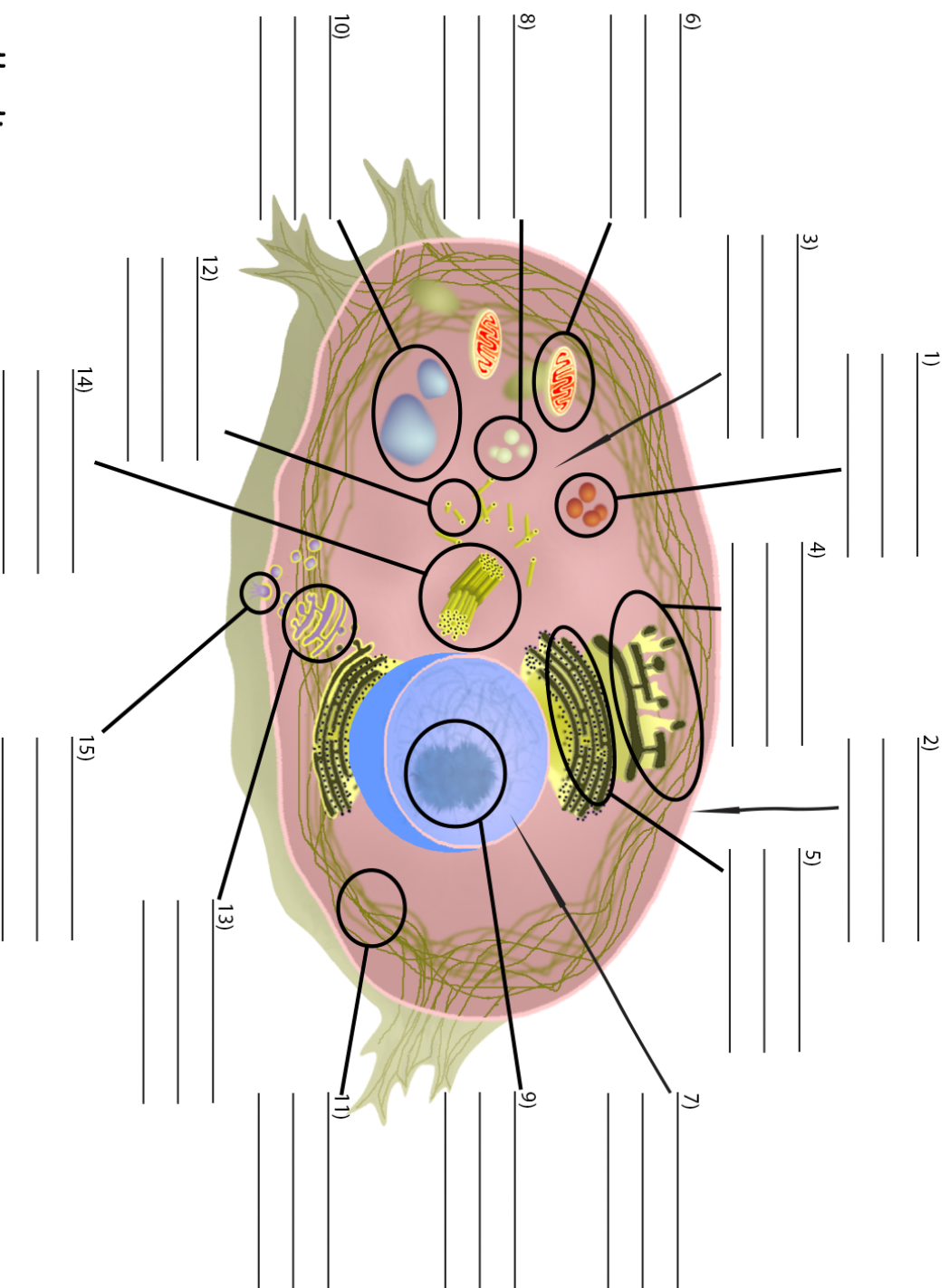
Describe and explain the Bohr theory of atomic structure, with examples.

Task 3 (Physics)

Write an essay about the uses of fibre optics in medicine and communication. This should include:

- Endoscopes
- Broadband
- Analogue and digital signals

CELLS alive! - Animal Cell Worksheet



CELLS alive! - Plant Cell Worksheet

A) _____

B) _____

C) _____

D) _____

E) _____

F) _____

G) _____

H) _____

I) _____

J) _____

K) _____

L) _____

M) _____

N) _____

O) _____

P) _____