Zig Zag Education

Science T Level (Level 3) | NCFE | 603/6989/9

Topic Tests

for NCFE T Level Technical Level 3 in Science

Paper B: Sections A–C

(Includes Element B1)

Update v1.1, October 2023

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Contents

Teacher's Introduction

This resource is for use with the T Level in **Science (603/6989/9)**, and covers content for **Paper B, Sections A–C:**

- Section A: Biology
- Section B: Chemistry
- Section C: Physics

Remember!
Always check the exam board website for new information, including changes to the specification and sample assessment material.

Each topic test starts with quick, short-answer questions that ensure the core fundamental ideas of each topic are understood by the student. Questions then increase in difficulty and culminate with either longer, essay-style questions or detailed activities which are engaging and help consolidate learning, giving students the opportunity to practise applying their knowledge to case study scenarios. A range of question styles has been used to expose students to different question types and to give variety in the activities.

Mark allocations and answers are provided, which are useful for peer- and self-assessment as well as providing you, the teacher, with an opportunity to assess students' strengths and weaknesses in order to inform the teaching and learning process.

Specification Reference Tables
These tables can be used to identify which specification points you are teaching and select the appropriate topic test to suit your needs.

Tests are, on average, worth 24–48 marks in total and take approximately 30–45 minutes to complete. However, some tests are slightly longer or shorter, depending on the content covered by that test.

Section A: Biology:

Topic Test	Topic Test Title	Spec Points to Include	Total Marks
1	**Cells and Tissues**	B1.1–B1.6	48
2	**Large Molecules – Proteins, Carbohydrates and Lipids**	B1.7–B1.8	35
3	**Exchange and Transport Mechanisms**	B1.10–B1.12	48
4	**Genetic Information**	B1.13–B1.19	29
5	**Microbiology ***	B1.20–B1.23	43
6	**Immunology**	B1.24–B1.32	47

** Topic Test 5 (Microbiology) also covers content from the units section (B1.62–B1.64). A calculator may be used in this test.*

Section B: Chemistry:

Topic Test	Topic test title	Spec Points to Include	Total Marks
1	Structure of Materials and the Relationship with Physical and Chemical Properties	B1.33–B1.35	41
2	Acids/Bases and Chemical Change, and Rates of Reaction and Energy Changes	B1.36–B1.41	36
3	Chemical Analysis of Substances*	B1.42–B1.44	37

** Topic Test 3 (Chemical Analysis of Substances) also covers content from the units section (B1.62–B1.64). A calculator may be used in this test.*

Access to a copy of the period table of elements will be required for some questions.

Section C: Physics:

Topic Test	Topic Test Title	Spec Points to Include	Total Marks
1	**Electricity***	B1.45–B1.49	29
2	**Magnetism and Electromagnetism**	B1.50–B1.52	42
3	**Waves**	B1.53–B1.56	24
4	**Particles and Radiation**	B1.57–B1.61	41

** Topic Test 1 (Electricity) also covers content from the units section (B1.62–B1.64). A calculator may be used in this test.*

June 2022

Update v1.1, October 2023:

- Functions of cell-surface membrane, smooth and rough endoplasmic reticulum, Golgi apparatus and cell vacuole updated to match 2023 specification on Test 1 Q3a on pages 2 and 51, and in answers on page 78

Section A: Biology

1. Cells and Tissues

1. **True or false? Circle the correct answer.**

   a) All cells arise from pre-existing cells.

   True **False**

   b) Yeast are examples of prokaryotic cells.

   True **False**

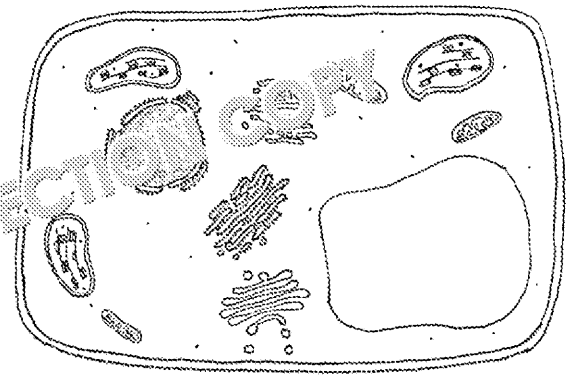
2. Fill in the missing boxes in the scale hierarchy:

   _____ → Cells → _____ → _____ → _____ →

3. a) Match up the boxes for each organelle, its features and its function in the

   b) Label each organelle in the cell diagram below with the corresponding in the first column.

1. Nucleus	a) Flattened sacs that bud into vesicles	i)	
2. Mitochondrion	b) Double membrane with pores	ii)	
3. Golgi apparatus	c) Small vesicle	iii)	
4. Lysosome	d) Double membrane, free DNA	iv)	
5. Ribosome	e) Thin tube with many v[illegible]	v)	
6. Rough endoplasmic reticulum	f) Phospholipid bilayer with embedded proteins	vi)	
7. Smooth endoplasmic reticulum	g) Thin tube coated in ribosomes	vii)	
8. Cell vacuole	h) Large sac of liquid	viii)	
9. Chloroplast	i) Made partly out of proteins; can be 70S or 80S	ix)	
10. Cell wall	j) Rigid cellulose/ chitin polymers	x)	
11. Cell-surface membrane	k) Folded inner cristae	xi)	



   c) Name the paired cylindrical-shaped organelle in eukaryotes with a role in n

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4. a) Give **one** example of a specialised animal cell and **one** example of a spe
explain for each how it is adapted to its specific function.

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b) Name the type of undifferentiated cells that are able to differentiate into c

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5. Suggest what function cells are adapted to if they ha

a) A large number of mitochondri

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b) A lot of rough endoplasmic reticulum and Golgi apparatus

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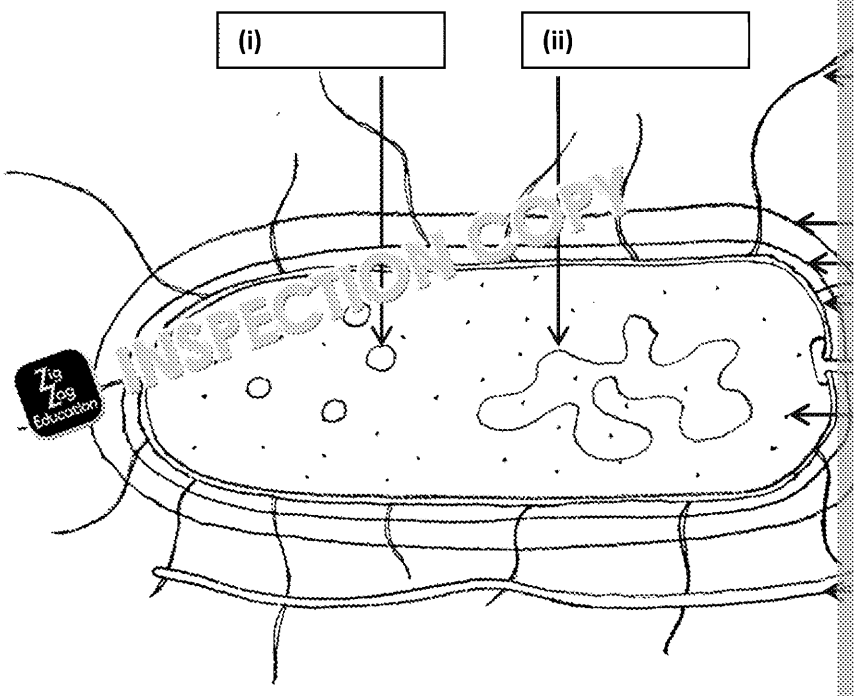
6. a) Label the features of the prokaryotic cell:



b) State the material that feature (vi) above is made from.

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7. Describe **four** differences between eukaryotic and prokaryotic cells.

1. .....

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2. .....

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3. .....

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4. .....

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Preview of Questions Ends Here

2. Large Molecules – Proteins, Carbohydrates and Li

1. Small, single molecular unit (1) that provides building block of polymers (1)

2. a) Amine group / Amino group (1)
   b) R group/side chain (1)
   c) Acid group / Carboxyl group (1)

3. R group/side chain (1)

4. A *dipeptide* (1) is formed from two amino acids. A *peptide* (1) bond is created th
   If more amino acids are joined together, it forms a *polypeptide* (1).

5.

Funct... protein type	Examples	Features
Fibrous	Collagen, keratin, elastin	i) *Long and insolu*
iii) *Globular*	Haemoglobin, amylase, insulin	Compact and solu

6. Monosaccharide [accept glucose] (1)

7. Glucose (1)

8. If two monosaccharides react to form a bond, a *disaccharide* (1) is formed. If mo
   polysaccharide (1) is formed.

9. a) Sucrose (1)
   b) Galactose (1)
   c) Maltose (1)

10. Glycogen, (1) used for storage (1)
    Cellulose, (1) used struct... / ... support (1)

11. Carbon ...dioxide (1) and oxygen (1)

12. a) [Any four from:]
    - Cell membranes (flexibility/transport)
    - Waterproofing
    - Insulation
    - Protection
    - Energy storage

    b) Lipids are insoluble in water (1)

13. Triglycerides (1)
    Phospholipids (1)

Preview of Answers Ends Here