Advanced Level Biology
BRIDGING WORK 2019

The bridging work MUST be completed for each of your Advanced Level subjects by the time you start your course.

Your work will be assessed in September.

Anyone not completing the work or producing such poor quality will be re-interviewed about their place on the course.

The aims are for you to understand if you like the subject and for you to be ready to start learning at Advanced Level.

The Seven Principles of Learning

Remember you learn best when:-

1. Use your initiative, have a go and clarify later; it's your ideas that matter.
2. Take a risk and be creative.
3. Talk about what you are learning and what you know.
4. Work together to explore how you would solve a problem.
5. Reflect on your needs and how you learn best in terms of interests, abilities and styles of learning. Make changes if necessary.
6. Respond positively to feedback from your teachers and your peers.
7. Take responsibility for your own learning.

Advanced Level BIOLOGY

Bridging Work

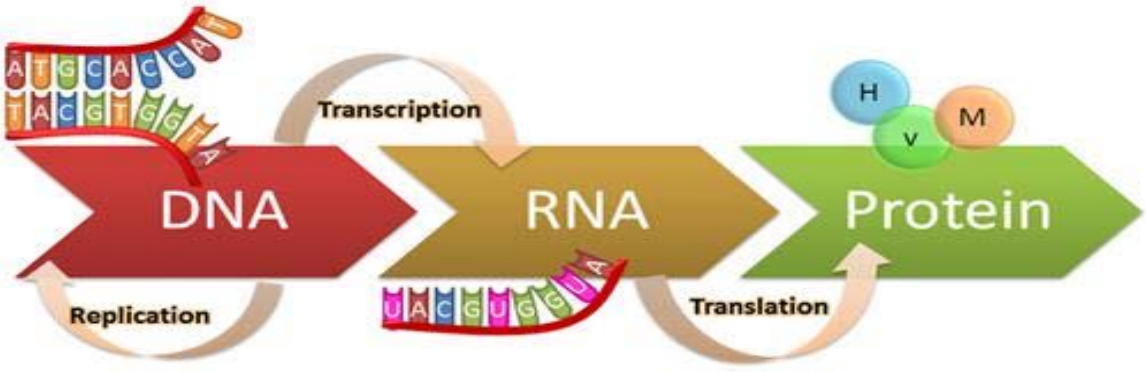
The purpose of this task is to prepare you for your Advanced Level Biology journey. You will be expected to use prior knowledge from GCSE and research skills throughout the Biology course in order for you to be successful.

Introduction

Cell Structure, Protein Structure and Synthesis

From your GCSE course you will have learned that all living organisms are made of cells which all carry out specific functions. Cells contain DNA in their nucleus which codes for proteins. Proteins are vital chemicals; they play a variety of functional roles, ranging from enzymes like catalase, used to break down harmful hydrogen peroxide, to antibodies like immunoglobulin G, which is made by B –cells and helps to recognise foreign bodies such as viruses and bacteria. Other proteins are structural, forming important parts of the body such as collagen in your skin and keratin in your hair.

You may also remember how proteins are made in cells by protein synthesis, although the description at GCSE is fairly brief.

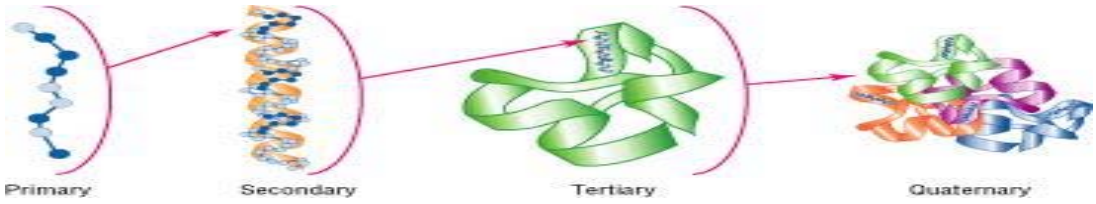


Task 1 ~ **Protein Structure**

a) Find and draw a generalised structure of an **amino acid**:

b) Give a general **comparative** description of the primary, secondary and tertiary structure of a protein.

[Include terms such as:- polypeptide chains; alpha helices; beta pleated sheets; hydrogen bonds; ionic bonds; disulphide bonds; hydrophobic R-groups; Hydrophilic R-groups; prosthetic groups; conjugated proteins]



Stretch & Challenge 1 ~ Use your GCSE knowledge and research skills to answer the following questions on Protein Synthesis

(a) **Table 1** shows some of the events which take place in protein synthesis.

A	tRNA molecules bring specific amino acids to the mRNA molecule
B	mRNA nucleotides join with exposed DNA bases and form a molecule of mRNA
C	The two strands of a DNA molecule separate
D	Peptide bonds form between the amino acids
E	The mRNA molecule leaves the nucleus
F	A ribosome attaches to the mRNA molecule

Table 1

(i) Write the letters in the correct order to show the sequence of events during protein synthesis, starting with the earliest.

....

(2)

(ii) In which part of a cell does **C** take place?

.....

(1)

(iii) Which of **A - F** are involved in translation?

.....

(1)

Cont'd

(b) **Table 2** shows some mRNA codons and the amino acids for which they code.

mRNA codon	Amino acid
GUU	Valine
CUU	Leucine
GCC	Alanine
AUU	Isoleucine
ACC	Threonine

Table 2

(i) A tRNA molecule has the anticodon UAA. Which amino acid does the tRNA molecule carry?

.....

(1)

(ii) Give the DNA base sequence that codes for threonine.

.....

(1)

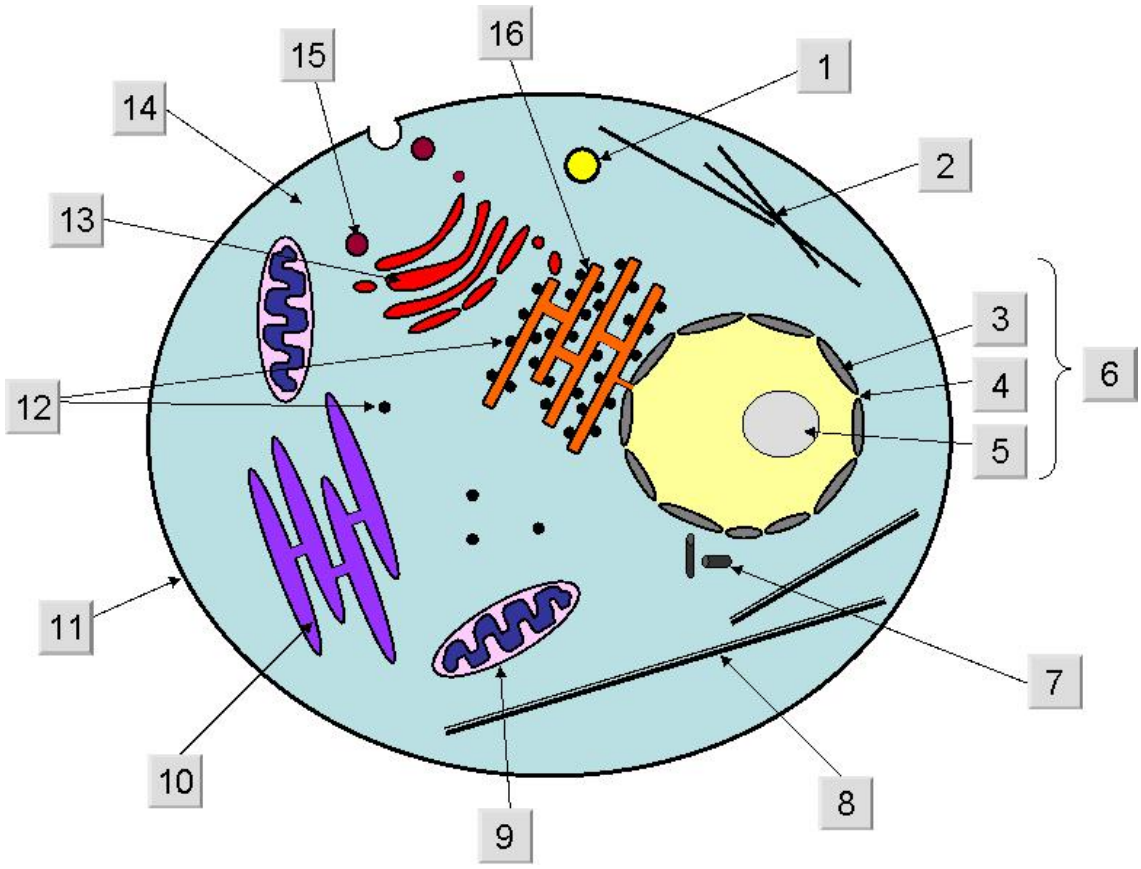
(Total 6 marks)

Task 2 ~ **Cell Structure**

Watch the video from the link below

Video: https://www.youtube.com/watch?v=cj8dDTHGJBY

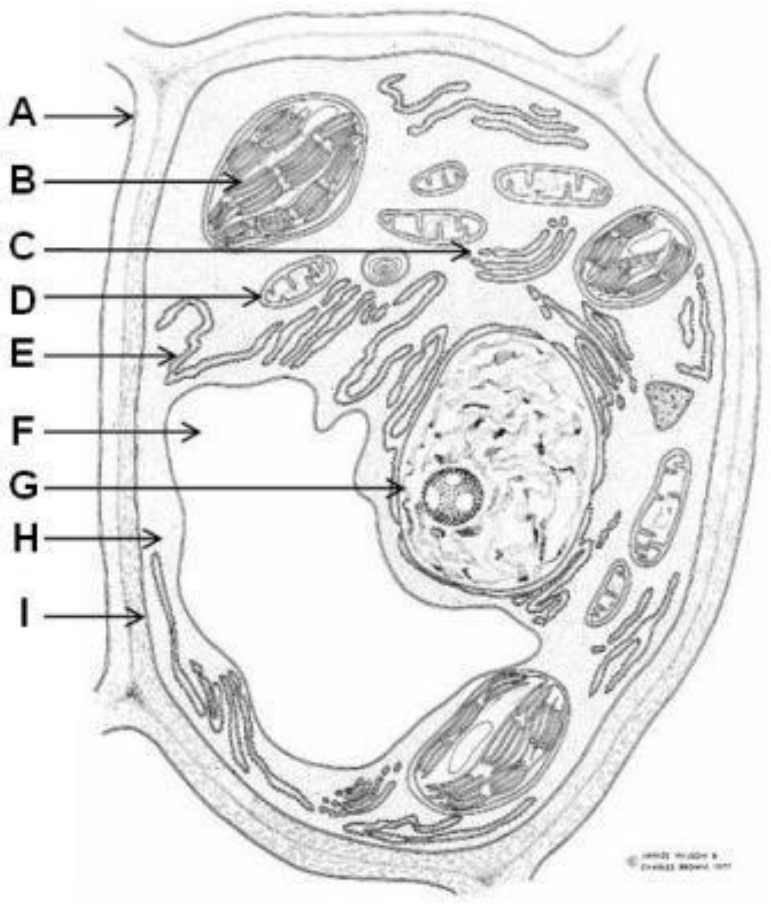
a) This is a diagrammatical representation of an **animal cell** showing its ultrastructure. Try to identify structures 1-16



1)	9)
2)	10)
3)	11)
4)	12)
5)	13)
6)	14)
7)	15)
8)	16)

Task 2 ~ **Cell structure (Continued)**

b) This is a diagrammatical representation of a **plant cell** showing its ultrastructure. Try to identify structures A-I



A)
B)
C)
D)
E)
F)
G)
H)
I)

Task 3- **Organelle Structure and Function**

Match the cell structure with its function in the table below. Record your answers in the table below.

Structure	**Function**
1. Plasma membrane	a. Releasing energy
2. Golgi body	b. Making proteins from amino acids
3. Lysosome	c. Controlling what enters and leaves the cell
4. Nucleus	d. **Modifying**, enclosing and dispatching proteins
5. Cytoplasm	e. Breaking down and recycling bacteria and worn out organelles
6. Centrioles	f. Making, storing and transporting proteins
7. Smooth endoplasmic reticulum (SER)	g. Surrounding the nucleus
8. Rough endoplasmic reticulum (RER)	h. Organising the spindle in cell division
9. Ribosomes	i. Controlling the activities in the cell
10. Mitochondrion	j. Making and transporting fats

Answers (write the correct number(Structure)) letter (Function) next to the corresponding				
1.	2.	3.	4.	5.
6.	7.	8.	9.	10.

Stretch & Challenge 2 ~ Research task

In 1962 **Francis Crick** and **James Watson** won the Noble Prize in Medicine for their discovery of the structure of DNA. Discuss the **significance** of their discovery in today's society.

Ensure you reference at least three **relevant sources** which you have used in your research and discuss the **validity** of these sources.

Please present this in the form of a poster (One side of A3 Maximum).

(Hint : Use the space below for research notes and remember Pictures tell

a thousand words)