DAY 1

1. The diagram shows a simple representation of DNA replication.
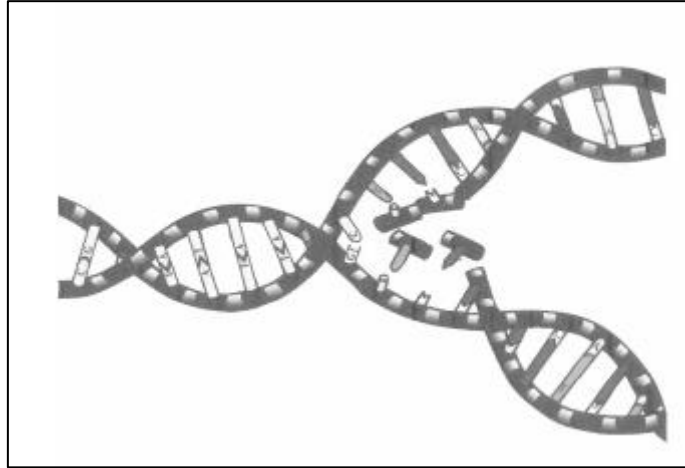
Name the enzyme that:
(i)   unwinds the DNA helix.

(ii)   bonds the base pairs together.

2. a. The base sequence on one strand of DNA is: A T A G G T C A T C A G
   Give the **base sequence** on the corresponding strand.

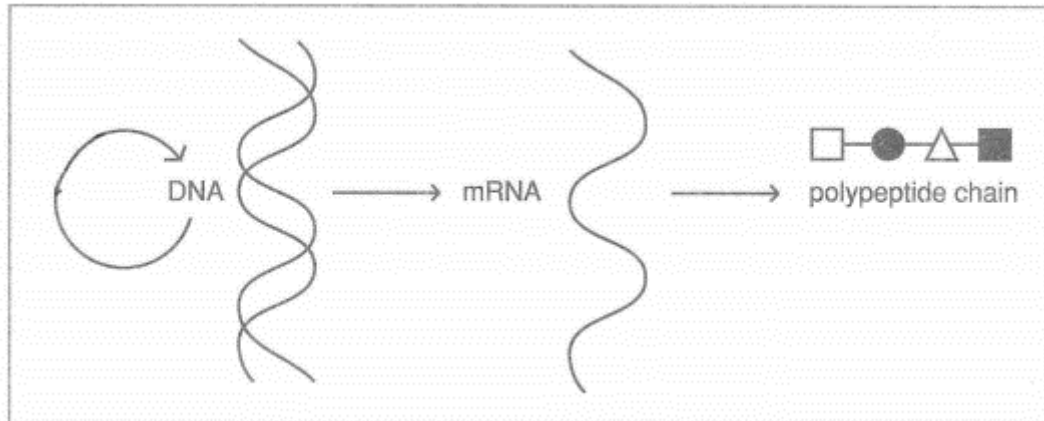   b. Give the base sequence on mRNA if the DNA strand in (a) is transcribed.

c. Use the codon dictionary above to name the amino acids coded for by this mRNA(b).

 d. State how mRNA signals the end of a polypeptide chain.

DAY 2

1. The diagram below shows the flow of genetic information that results in the formation of a polypeptide chain.

Write 2 paragraphs describing how the code in DNA results in the formation of the polypeptide chain. (i.e. explain the steps of protein synthesis).

DAY 3

1. The **CFTR** gene in humans is on chromosome 7 and is about 230 000 bases long. It codes for a protein involved in the production of mucus. A mutated form of the CFTR gene causes cystic fibrosis as the protein formed from the mutated allele does not function properly and the affected person produces thick, sticky mucus that cannot be removed from the lungs.

The normal allele has the following base sequence on part of its DNA: T T A T A G T A G A A A C C A The corresponding section of the DNA of the cystic fibrosis allele is: T T A T A G T A G C C A

(a) **Define** a gene.

(b) **Define** an allele and **state** how the alleles for a particular gene are different from each other.

2. In Drosophila fruit flies, normal length wings (N) are dominant to vestigial (very short) wings (n); grey bodies (G) are dominant to black bodies (g).

Figure 3: Normal winged fly

Figure 4: Vestigial winged fly

A grey, normal winged fly (pure breeding for both traits) is crossed with a black, vestigial winged fly.

(a) Give the genotype and phenotype of the offspring (F1 generation).

(c) Two of the F1 offspring are crossed. Complete a Punnett square to show the cross and genotypes of the F2 generation.
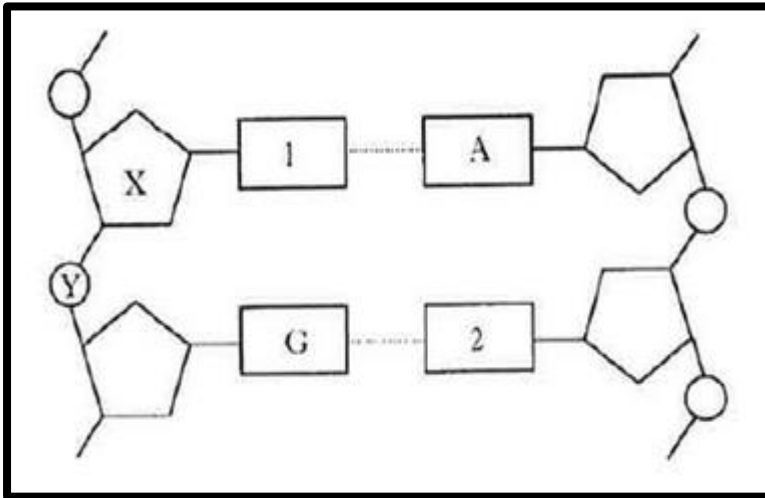
Give the expected phenotype ratio of these offspring.

Cross: _____

Punnett:

|			

Expected phenotype ratio: _____

DAY 4

1. The diagram below represents part of deoxyribonucleic acid (DNA) molecule. The letter 'A' represents adenine and 'G' represents guanine

i)   State the letters that represents bases 1 and 2

ii)   Name the two components represented X and Y on the diagram

iii) After the double stranded DNA molecule unwinds, what is the next event in the process of DNA replication?

2. In chickens, the trait for frizzled feathers (F) and the trait for straight feathers (S) are co-dominant. When they are inherited together, the result is a slightly frizzled chicken.

(i)   In a punnett square show the cross between a slightly frizzled hen and a slightly frizzled rooster.

(ii) In a population of 20 chicks from the cross in (i) above, how many chicks are expected to have straight feathers.

DAY 5

1. The following figure represents a portion of a plant cell.
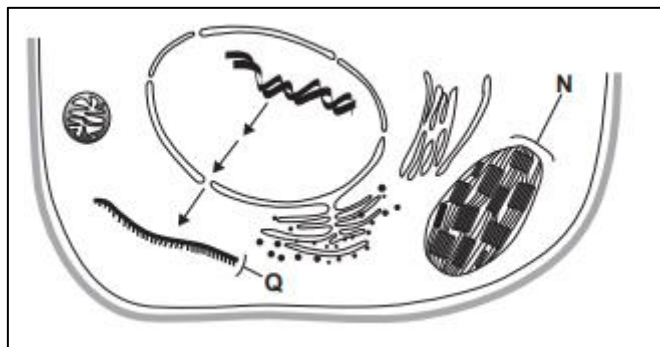
Examine the figure above and complete the following table given below.

	Type of nucleic acid found in structure	Specific function of the nucleic acid
Structure N		
Structure Q		

2. The following diagram represents a portion of an unknown macromolecule found in cells. The remaining portion of the molecule contained the same repeating unit.
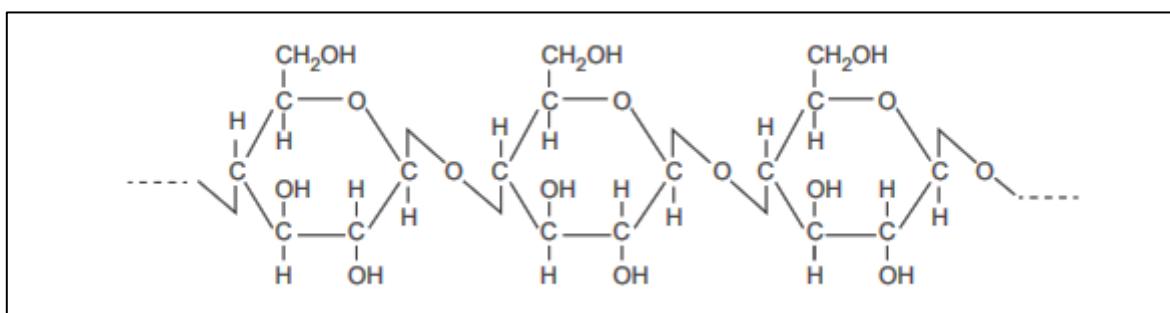
Two students were discussing this diagram. Sally suggested it represents cellulose. Toby disagreed. He suggested that the diagram represents the enzyme cellulase.
Name the **student** who is **correct** and explain **why.**

THE END
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