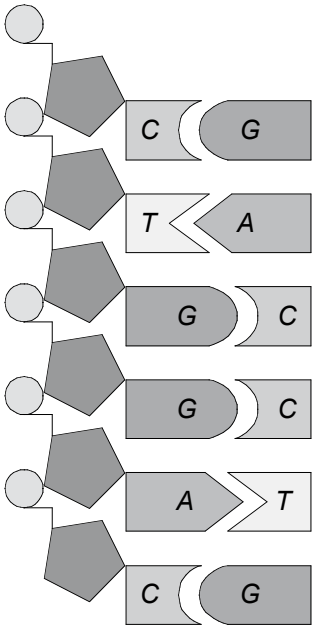
Assessment Schedule – 2005

Biology: Describe the transfer of genetic information (90163)

Evidence Statement

Q	Achievement	Achievement with Merit	Achievement with Excellence
1(a)	Homozygous recessive; homozygous dominant; heterozygous rr; RR; Rr. At least two must be correct, with the corresponding symbols.		
1(b)	Correctly completed Punnett squares 1. R R r | Rr Rr r | Rr Rr Zero (0%) 2. R r r | Rr rr r | Rr rr 1/2 (50%) Both Punnett squares and one of the ratios must be correct.		
1(c)	Different genetic make-ups can give the same flower colour.	Explanation that whilst an allele may be present (in genotype) it may not be seen (in phenotype) thus altering the ratios.	
1(d)	Cross (breed) with a white flowered plant. **OR** Completing a test / back cross	Explains that a test cross involves crossing the red flowered plant with a homozygous recessive (white plant). Plus gives a reason for cross with a white flowered plant of recessive phenotype. Eg If any white flowered offspring are seen the parent must be heterozygous.	Discussion that involves the need for a **back-cross** (**test-cross**), ie crossing the red flower with homozygous recessive to see if any recessive character is shown (white flower) or not. Discusses the significance of the outcome in identifying the parent genotype. Eg the white offspring show that the unknown genotype of the red plant must have included a white allele which combined with the white plants alleles to create the white plant. **OR** discusses fact that a heterozygous genotype can be determined by a test cross but not a homozygous dominant genotype**.**

Q	Achievement	Achievement with Merit	Achievement with Excellence
2(a)	 Diagram completed as above (must be correct pairing) **AND** any TWO of the three correctly identified: phosphate; sugar; nucleotide.		
2(b)	Describes the importance of the code not changing. Eg to give exact / identical copies of the DNA.	Explains how the DNA is replicated ie. the C-G pairs and A-T pairs are vital. (Random pairings would change the code.) **OR** Why identical replication is necessary. Eg. A change to the code will result in a mutation.	
2(c)	Description of how DNA carries information: Eg DNA makes up genes. Recognises DNA as the carrier of the code.	Explanation of how DNA carries information: The order of bases affects the gene properties. Red and white are the result of a different base order / sequence. Combination of bases makes the characteristics.	Discuss the fact that the base sequence is a code for building amino acids / proteins **OR** That the different sequences give different characteristics such as the flower colour. Red and white are different sequences of bases **giving different alleles of the same gene.**
3(a)	For growth and repair.		
3(b)	Mitosis produces the wrong type of cells.	Explanation eg: Sperm or egg cells have to be HAPLOID / half the genetic information. **OR** Mitosis produces cells, DIPLOID / full genetic information, which if combined would give too much information to produce offspring.	

Q	Achievement	Achievement with Merit	Achievement with Excellence
3(c)	Describes that the cells divide twice / produce gametes with half the genetic information / variation is needed in order to produce offspring with a greater chance of survival. **OR** Describe crossing over or segregation.	Explanation that cell division occurs twice / have half genetic information / are haploid. **AND** that this allows for variety, which contributes to an increased chance of survival for the offspring.	Discussion includes the mention of homologous pairs and exchange of material in **crossing over** **OR** the fact that one of each pair of homologous chromosomes goes to a different daughter cell (**segregation**) **AND** the value of variation to provide offspring with a greater chance of survival in successive generations in a changing environment.
4(a)	2/3rds or (66.66%) or 2 out of 3		
4(b)	She is heterozygous. **OR** She is the carrier of the recessive allele	She must be heterozygous because some of her offspring are recessive (CF sufferers). **OR** If she was homozygous, her offspring would carry the dominant allele (be carriers NOT sufferers).	
4(c)	The phenotype of female C is normal / not affected by CF.	The phenotype of female C is normal / not affected by CF **PLUS** Explanation for the appearance of ONE set of children (from normal or carrier male) is correct.	If she has children with B who must be a carrier, then 75% of them would appear normal whilst 25% could show signs of CF. 50% of her children would be carriers but we couldn't tell this from their phenotype. If she has children with a normal male, then all her offspring would appear normal, but 50% of them would be carriers. For male B instead of ratios may use information from Punnett or pedigree.

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
Total of SEVEN opportunities answered at Achievement or higher. 7 × A	Total of TEN opportunities answered. THREE at Merit level or higher *and* SEVEN at Achievement level. 3 × M + 7 × A	Total of TWELVE opportunities answered. TWO at Excellence level *and* THREE at Merit level *and* SEVEN at Achievement level. 2 × E + 3 × M + 7 × A