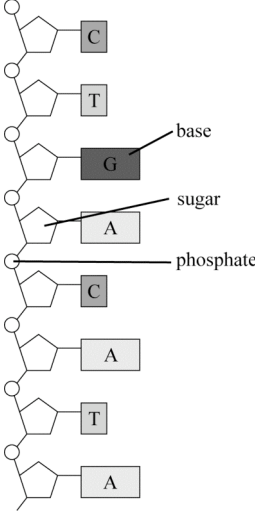## Assessment Schedule – 2008

Biology: Describe the transfer of genetic information (90163)

Evidence Statement

Question	Achievement	Achievement with Merit	Achievement with Excellence
ONE (a)	Describes the lactose intolerant genotype using words OR symbols, ie: Homozygous recessive / ee.		
(b)	Describes the phenotype correctly, eg: They will NOT be lactose intolerant OR they can digest lactose.	Explains the expression of the dominant allele for the digestion of lactose in a person who is heterozygous for this gene, eg: They can digest lactose because they have a dominant allele / form of the gene which is always expressed / the recessive lactose intolerance allele will not show / is carried.	
(c) (i) and (ii)	Parent's **gametes** are correct. <table><tr><td></td><td>E</td><td>e</td></tr><tr><td>e</td><td>Ee</td><td>ee</td></tr><tr><td>e</td><td>Ee</td><td>ee</td></tr></table>	Parent's gametes and Punnett square are correct along with the proportion of lactose intolerance given as a fraction / percentage / decimal / ratio 2/4, ½, 50%, 0.5, 2:2 or similar.	
(c) (iii)	Describe how lactose intolerance is passed on by this male parent due to chance, eg: Which sperm fertilises the egg is due to chance.	Explains how it is possible for this couple to have only one lactose intolerant child, eg: It just happened by chance that only once out of six times did a sperm with an e (allele) fertilised an egg (which always has an e allele) to produce a lactose intolerant child. (Low probability but possible.)	

TWO (a)	Labels all 3 correctly on DNA molecule. 			
(b)	Describes how a gene acts as a code, eg: A gene is a section of a DNA strand containing a **sequence of bases** / nucleotides forming a hereditary code.	Explains how a gene acts as a code for a protein, eg: A gene consists of a sequence of bases / nucleotides that code for a specific **sequence of amino acids in a protein**.	
(c)	Describes how DNA replication ensures a gene remains the **same**, eg: Bases always pair A-T and C-G.	Explains (using diagrams) how the **process** of DNA replication ensures a gene remains the same, eg: During DNA replication, the strands unzip and each side of the DNA acts as a template / pattern for the other side, so new nucleotides / bases can join up complementary / A-T and C-G.	Discusses how the **process** of DNA replication ensures a gene remains the same in **each new body cell**, eg: During DNA replication, the strands unzip and each side of the DNA acts as a template for the other side. Nucleotides / bases join using the base pairing rule A-T and C-G. This ensures that each new strand has the same genes. When the cell divides, one copy of each chromosome carrying the same genes goes into each new body cell.
THREE (a)	Describes how the recessive allele can be expressed, eg: Will only show in the phenotype when no dominant alleles are present / homozygous recessive.		
(b)	Uses a Punnett square to show some possible short-haired parental genotypes ie: (HH × HH) and (Hh × Hh) or (HH x HH) and (HH x Hh) or (HH x Hh) and (Hh x Hh)	Uses Punnett squares to support an answer that explains why the parental genotypes are probably (HH × HH) or (HH × Hh), AND not both heterozygous (Hh × Hh).	

(c)	Describes possible short-haired genotypes and breeding partner correctly, ie: Short-haired guinea pig could be HH or Hh AND Breed with homozygous recessive / hh / long-haired guinea pig.	Explains how one outcome of the trial would prove ONE genotype, eg: Breed short-haired guinea pig with long-haired homozygous recessive guinea pig. If all offspring are short-haired, then original guinea pig must be HH.	Discusses how both possible outcomes of experiment would prove both possible genotypes, eg: Breed short-haired guinea pig with long-haired homozygous recessive guinea pig. If all offspring are short-haired, then original guinea pig must be HH. If any of the offspring are long-haired, then the original guinea pig must have been Hh. Both results must be explained using Punnett squares to show allele combinations.
(d)	Describes the genetic advantage of cloning, eg: Cloning will make guinea pigs that are **genetically identical** to the parent.	Explains the genetic advantage of cloning over selective breeding, eg: Cloning will make guinea pigs that are genetically identical to the parent, but in selective breeding genetic information is combined from two parents so other unwanted characteristics may show up in the phenotype of the offspring, eg an undesirable coat colour / recessive characteristic.	

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
SIX questions answered correctly.	NINE questions answered correctly, including at least THREE at Merit level.	TEN questions answered correctly, including at least ONE at Excellence level and at least FOUR at Merit level.
Minimum 6 × A	Minimum of 3 × M + 6 × A	Minimum of 1 × E + 4 × M + 5 × A