Assessment Schedule – 2007

Biology: Describe the transfer of genetic information (90163)

Evidence Statement

Question	Achievement	Achievement with Merit	Achievement with Excellence
One (a)	Defines dominant allele as: The allele/form of the gene that is always expressed / always shows (when it is present).		
(b)	Both genotypes with words or symbols correct. Homozygous dominant / DD **AND** Heterozygous / Dd		
(c)	Correct Punnett square using D and d to represent alleles. 		D	d	 	D	DD	Dd	 	d	Dd	dd	 **AND** States the correct fraction / percentage / proportion/ratio. $\frac{3}{4}$ or 0.75 or 75% or 3:1		
(d)	Identifies kittens without PKD as homozygous recessive/dd.	Gives a reason as to how two cats with PKD can have kittens without PKD, eg: (PKD) parents are heterozygous/Dd. For a kitten to **not** have PKD it must **inherit** the recessive allele from **both** parents.	
Two (a)	Describes TWO features of a gene. A gene is a sequence of bases / part of a DNA molecule or chromosome, that codes for a characteristic/protein/amino acid sequence.		
(b)	Describes the process as base pairing or using one strand as a template, eg: DNA replication occurs through the process of base pairing. **OR** New DNA molecules contain one strand from the original DNA molecule.	Explains how base pairing to a parent strand ensures accurate replication of DNA.eg: Because of (complementary) base pairing, A-T, C-G, (the order of) the bases in one strand determines (the order of) the bases in the other strand. This ensures that the new DNA molecule is an accurate copy of the old one. **OR** (Free) bases match up, A-T, C-G, with the (exposed) bases (in the order) given by the parent strands. This makes (two) identical strands.	

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(c)	Describes a feature of DNA replication or cell functions that needs to remain the same. Or an effect of a change, eg: Mistakes can cause/a change to the base sequence/a mutation/cancer/cell malfunction. **OR** So that new cells have the same genetic material/function/job as the parent cell. .	Explains why the DNA must remain the same, eg: The sequence of bases in the DNA must stay the same because/ it codes for/amino acids/proteins /a change in the code is a mutation. **OR** DNA must replicate accurately so that each daughter cell can get a complete set of chromosomes/all the genetic material. To be the same function as the parent cell.	Discusses effect of a change in DNA on cell function, eg: The sequence of bases in the DNA must stay the same because it codes for/an amino acid sequence/a protein. A change in the code is a mutation and the cell can no longer carry out its function/can cause cancer/the organism becomes sick/dies. **OR** Before mitosis/a cell divides, each chromosome is replicated, so that each daughter cell can get a complete set of chromosomes/all the genetic material. To be the same as the parent cell/to have the same function.
Three (a)	States the phenotype, e.g.: F is a deaf **male**		
(b)	Describes the concept of a 'hidden' allele in parents / parents 'carrying' allele, eg.: Both parents (A and B / C and D) are not deaf but have a deaf child.	Explains understanding using alleles and phenotypes, eg.: Both parents must carry recessive/deaf allele/ h but it is not shown in their phenotype / they aren't deaf / it is not expressed, so deafness allele must be recessive (to the normal hearing allele).	
(c)	States the genotype of Individual G or a correct Punnett Square using H and h to represent alleles, or the expected proportion of deafness stated, eg: G is heterozygous/Hh **OR** ½/50% of the children expected to be deaf. **OR** |	H	h
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h	Hh	hh
h	Hh	hh		Explains understanding of Individual G's phenotype using alleles or Punnett squares to account for deafness in offspring, eg: Heterozygous mother has deaf children. |	H	h
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h	Hh	hh
h	Hh	hh	 A homozygous mother has no deaf children. 		H	H
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h	HH	Hh
h	Hh	Hh | **OR** Expected ratio explained (using Punnett Square) o, eg: Proportions of 2 deaf and 2 hearing children would be expected from F and G because F is hh and G is Hh (or correct Punnett square).	Discusses separation of alleles during meiosis or fertilisation as a chance event and compares and contrasts the expected ratios (using Punnett Squares) to the actual ratio,eg: Proportions of 2 deaf and 2 hearing children would be expected from F and G because F is hh and G is Hh (or correct Punnett squares). However, they actually only had 1 deaf child out of 4. This is because meiosis separates the h and H alleles (into different eggs in the mother) OR it is random which egg is (released that month) to be fertilised by h sperm from father. OR by chance 3 of the eggs fertilised so far have contained H allele.

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Four (a) (i) (ii)	States that meiosis occurs in the flowers or names a part of a flower where meiosis occurs. **AND** To produce egg / sperm / pollen / gametes for reproduction / halve the number of chromosomes.		
(b)	Describes ONE advantage of asexual reproduction, eg: Asexual reproduction produces genetically identical plants. **OR** Asexual reproduction produces /grows plants very quickly.	Explains how this advantage benefits the **grower**, eg: So this means growers always get the desired phenotype of potato they want to sell. OR So the growers can produce more potatoes to make a bigger profit or more potatoes in a shorter time.	
(c)	Describes how selective breeding could improve potato crop OR describes what selective breeding is, eg: Could make a more disease-resistant crop or firmer/tastier potatoes. **OR** By choosing plants to breed together that have desirable phenotypes/characteristics.	Explains how selective breeding could be used to improve the potato crop, eg: Selective breeding could improve the potato crop by choosing two plants with desirable but different characteristics/phenotypes to produce a new variety.	Explains fully how sexual **and** asexual reproduction could be used to selectively breed a new, improved variety of potato, eg: The potato grower selects two plants with desirable but different characteristics such as increased resistance to disease and firm texture to cross pollinate. The seeds are grown/germinated. The potatoes grown from these seeds that show both desired characteristics can then be reproduced asexually to (quickly) produce a crop.

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
SEVEN questions answered correctly.	NINE questions answered correctly, including at least THREE at Merit level.	TEN questions answered correctly, including at least TWO at Excellence level and at least TWO at Merit level.
Minimum 7 × A	Minimum of 3 × M + 6 × A	Minimum of 2 × E + 2 × M + 6 × A