IGCSE Inheritance questions

3 In fruit flies, straight wing (S) is dominant to curled wing (s). Figure 13.2 shows the results of an investigation carried out to examine the phenotypes arising from a single gene cross involving the wing-type gene.

	 straight wing	 curled wing
parents of F_1	6 true-breeding males	6 true-breeding females
F_1	168 flies of both sexes	0
parents of F_2	6 males from F_1	6 true-breeding females
F_2	81 flies of both sexes	87 flies of both sexes

Figure 13.2

a) Present the information in the standard diagrammatic form including a Punnett square in your answer. (4)

b) Explain why no curled-winged flies were produced in the F_1 generation? (1)

c) **i)** What is the expected ratio of straight to curled in the F_2 generation?

ii) What is the expected number of straight to curled in the F_2 generation?

iii) Why do the actual results vary slightly from the expected ones? (4)

4 In tobacco plants the gene for leaf colour has two forms (alleles), green and white, where green (G) is dominant to white (g). A heterozygous green plant was crossed with a white plant.

a) Give the genotypes of these two parent plants. (1)

b) State:

i) the genotypes of the offspring that would be produced

ii) the ratio in which they would be expected to occur. (2)

c) What would be the genotype of a homozygous green plant? (1)

5 Figure 13.3 shows a family tree that refers to tongue rolling. Figure 13.4 shows a family tree that refers to hair type. In humans, the allele for tongue rolling ability (R) is dominant to that for inability to roll the tongue (r) and the allele for wavy hair (H) is dominant to the allele for straight hair (h).

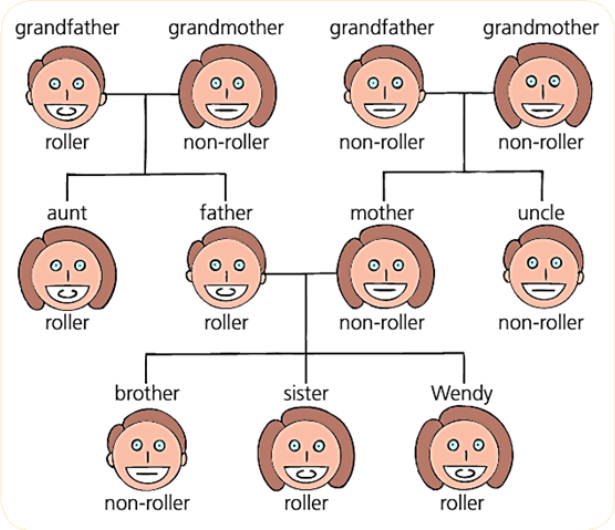

Figure 13.3

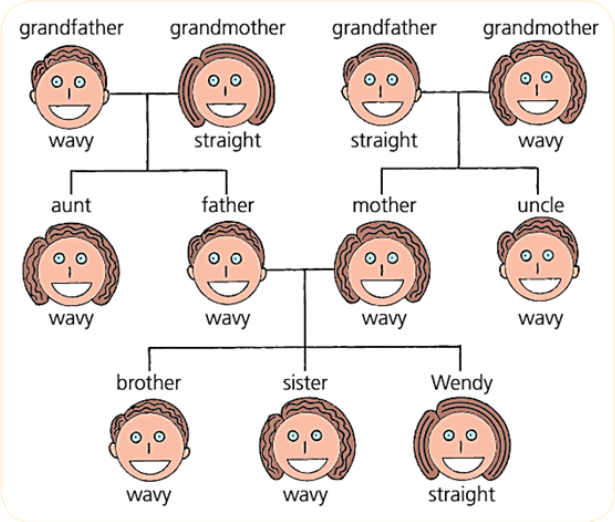

Figure 13.4

a) From which parent did Wendy inherit her tongue-rolling ability? (1)

b) From which of her grandparents did Wendy receive the genetic information that gave her straight hair? (2)

c) Using a square to represent a male and a circle to represent a female, copy each family tree and write in the genotypes. (8)