

Dalkeith High School
N5 Biology
Variation and Inheritance (Task 2)

1. Polydactyly is a condition which can result in additional fingers, as shown in the picture below.



Polydactyly (D) is dominant to normal number of fingers (d).

(a) Complete the table below to show the phenotype which results from the three possible genotypes shown in the table.

<i>Genotype</i>	DD	Dd	dd
<i>Phenotype</i>			

1

b) A man homozygous for the polydactyly allele and a woman homozygous for the normal allele had a son.

i) State the genotype and phenotype of their son.

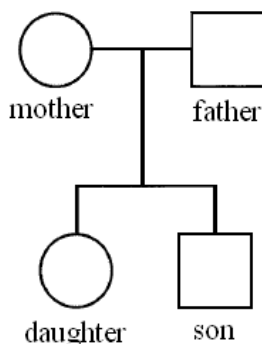
Genotype _____

1

Phenotype _____

1

ii) The couple also had a daughter. Complete the pedigree chart below to show the inheritance of polydactyly in this family.



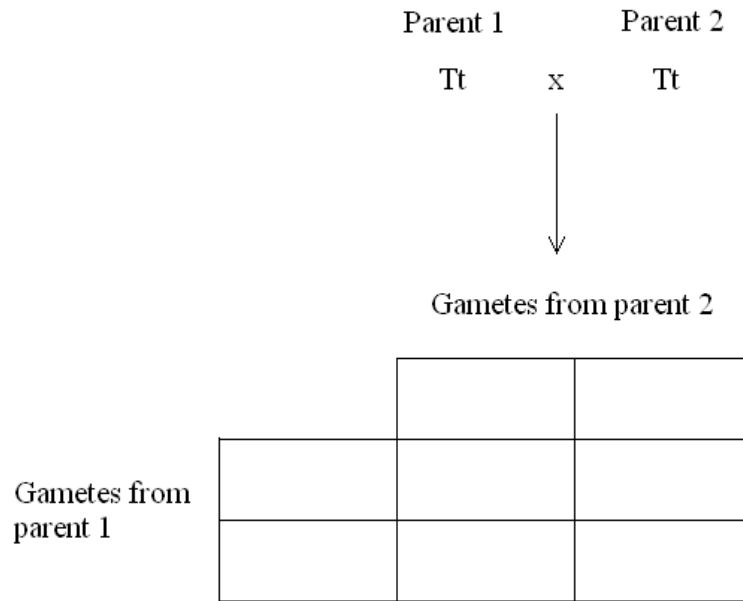
Key

Female	Male	
●	■	polydactyly
○	□	normal

1

2. In pea plants, tall height (T) is dominant to dwarf height (t). Two pea plants each with the genotype Tt were crossed.

a) Complete the punnet square below.



2

b) What is the expected ratio of tall to dwarf pea plants in the offspring?

_____ tall : _____ dwarf

1

c) The cross actually produced 56 tall plants and 14 dwarf plants. Express this result as a simple whole number ratio.

_____ tall : _____ dwarf

1

3. Sickle cell anaemia is a disease which results in the production of abnormal haemoglobin. The allele for normal haemoglobin (H) is dominant to the allele for abnormal haemoglobin (h). A couple wanting to have a baby have discovered they are both carriers of the abnormal haemoglobin allele.

a) What is meant by the term carrier?

1

b) What service could be provided to the couple to explain their situation?

1