

0 8

Our understanding of genetics and inheritance has improved due to the work of many scientists.

0 8 . **1**

Draw **one** line from each scientist to the description of their significant work.

[3 marks]

Scientist	Description of significant work
Charles Darwin	Carried out breeding experiments on pea plants.
Alfred Russel Wallace	Wrote 'On the origin of species'.
Gregor Mendel	Worked on plant defence systems.
	Worked on warning colouration in animals.

0 8 . **2**

In the mid-20th century the structure of DNA was discovered.

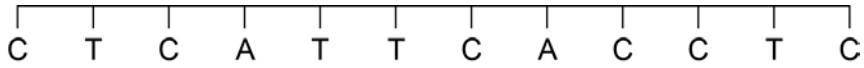
What is a section of DNA which codes for one specific protein called?

[1 mark]

Figure 11 shows one strand of DNA.

The strand has a sequence of bases (A, C, G and T).

Figure 11



0 8 . **3** How many amino acids does the strand of DNA in **Figure 11** code for?

[1 mark]

Tick **one** box.

2

3

4

6

Question 8 continues on the next page

Mutations of DNA cause some inherited disorders.

One inherited disorder is cystic fibrosis (CF).

A recessive allele causes CF.

0 8 . **4** Complete the genetic diagram in **Figure 12**.

- Identify any children with CF.
- Give the probability of any children having CF.

[3 marks]

Each parent does not have CF.

The following symbols have been used:

D = dominant allele for **not** having CF

d = recessive allele for having CF

Figure 12

		Mother	
		D	d
Father	D	DD	
	d		

Probability of a child with CF = _____

0 8 . **5** What is the genotype of the mother shown in **Figure 12**?

[1 mark]

Tick **one** box.

Heterozygous

Homozygous dominant

Homozygous recessive

Question 8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.1			1	AO1/1 4.6.3.1
			1	AO1/1 4.6.3.2
			1	AO1/1 4.6.3.3
08.2	a gene	allow allele	1	AO1/1 4.6.1.4
08.3	4		1	AO3/1a 4.6.1.5
08.4	correct derivation of children's genotypes identification of children with cystic fibrosis (dd) 0.25	allow ecf allow $\frac{1}{4}$ / 25% / 1 in 4 / 1:3 do not accept 1:4	1	AO2/1 4.6.1.6
			1	AO3/1b 4.6.1.6
			1	AO2/1 4.6.1.6
08.5	heterozygous		1	AO2/1 4.6.1.6
Total			9	