

DNA

Q1.a(2018)

Figure 2 shows part of a DNA molecule.

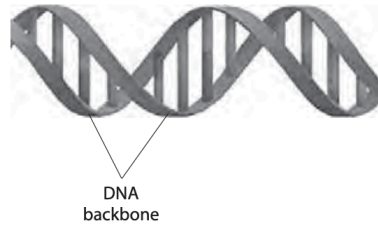


Figure 2

(a) (i) What is the shape of a DNA molecule?

(1)

- ☐ A single helix
- ☐ B double helix
- ☐ C complementary helix
- ☐ D triple helix

Q1.b(2018)

(ii) Which molecules are present in the DNA backbone?

(1)

- ☐ A sugars and phosphates
- ☐ B amino acids and bases
- ☐ C sugars and bases
- ☐ D amino acids and phosphates

Q1.c(2018)

State the type of bond that joins the bases together in the DNA molecule.

(1)

.....

Q2.(2018)

DNA can be extracted from fruit.

Describe how cells are broken down to release DNA.

(2)

.....

.....

.....

.....

Q3.a(2019)

James Watson and Francis Crick built a model that showed that DNA has a double helix structure.

(i) Which statement about DNA is correct?

(1)

- ☐ **A** each pair of bases is joined by hydrogen bonds
- ☐ **B** phosphate groups are joined by hydrogen bonds
- ☐ **C** nucleotides consist of a sugar and a phosphate group only
- ☐ **D** bases are joined to phosphate molecules

Q3.b(2019)

(ii) Figure 6 shows the percentage of each base in human DNA.

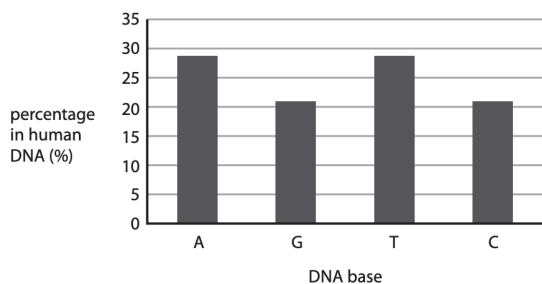


Figure 6

Describe how this data provides evidence for base pairing in DNA.

(2)

Q3.c(2019)

A scientist obtained a mass of 0.0062 nanograms of DNA from a diploid human cell.

Calculate the mass of DNA the scientist should obtain from a haploid human cell.

Give your answer in picograms.

(1 nanogram = 1000 picograms)

(2)

..... picograms

Q3.d(2019)

A student used the method shown in Figure 7 to compare the mass of DNA extracted from strawberry fruit cells and from kiwi fruit cells.

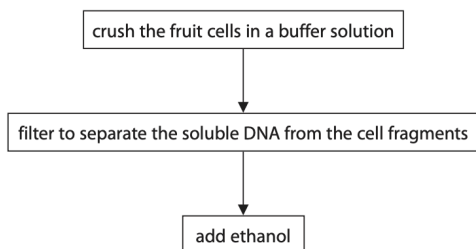


Figure 7

(i) State why ethanol is used.

(1)

.....

.....

Q3.e(2019)

State **two** variables the student needs to control when using this method to compare the mass of DNA from these two fruits.

(2)

.....

.....

.....

Q3.f(2019)

The student repeated the experiment.

Give **one** reason why.

(1)

.....

.....

.....

Q4.(2020)

Describe the structure of DNA and how it can be extracted from plant cells.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Describe how the base pairs are bonded together in a DNA molecule.

.....

.....

.....

.....

.....

T	T	G	A	T	T	G	C	G	T	A	A
---	---	---	---	---	---	---	---	---	---	---	---

[illegible]

(i) Write the code for the complementary DNA strand in Figure 9.

Q6.b(2022)

Three bases code for each amino acid.

Which is the maximum number of amino acids coded for by this strand of DNA?

(1)

- ☐ A 3
- ☐ B 4
- ☐ C 6
- ☐ D 12

Q6.c(2022)

What is the shape of a DNA molecule?

(1)

- ☐ A triple stranded
- ☐ B single stranded
- ☐ C single helix
- ☐ D double helix

Q7.a(2022)

A student wanted to extract the DNA from fresh peas.

The student crushed the peas and added washing up liquid and water.

The enzyme protease was then added to this mixture.

(i) Explain why the enzyme protease was added to the mixture.

(2)

Q7.b(2022)

The mixture was then heated and filtered.

Finally, the student poured the filtrate into a test tube and ice-cold ethanol was poured down the side of the test tube into the filtrate.

State why ice-cold ethanol was poured into the filtrate.

(1)

Q7.c(2022)

The student wanted to compare the mass of DNA found in fresh peas with the mass of DNA found in fresh beans.

Give **two** variables the student would need to control to make this a valid comparison.

(2)

Q8.a(2024)

Figure 2 shows a method used to extract DNA from strawberries.

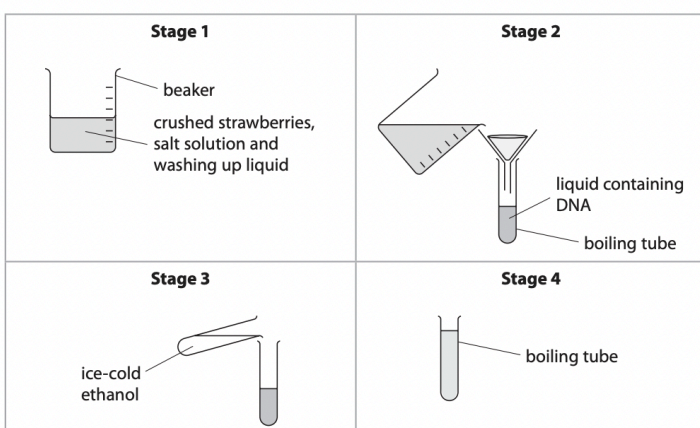


Figure 2

(a) (i) Complete the sentences using words from the box.

(2)

indicator	membranes	salt
substrates	sugar	vacuoles

Crushed strawberries are mixed with washing up liquid and
..... solution.

Washing up liquid helps to release DNA by breaking open cell
.....

Q8.b(2024)

Describe the method shown in stage 2.

(2)

Q8.c(2024)

What is the colour of the DNA precipitate?

(1)

- ☐ A blue
- ☐ B orange
- ☐ C white
- ☐ D red

Q8.d(2024)

A scientist used this method to find the mass of DNA in four strawberries.

Figure 3 shows the results.

strawberry	mass of DNA in ng
1	11.8
2	6.5
3	5.9
4	1.4

Figure 3

- (i) The range is the difference between the largest value and smallest value in a set of numbers.

Which is the range of these results?

(1)

- ☐ A 13.2
- ☐ B 10.4
- ☐ C 5.9
- ☐ D 5.3

Q8.e(2024)

Calculate the mean mass of DNA.

(1)

mean mass of DNA = ... ng