Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Practical skills

Time allowed: 1 hour 45 minutes

Subject code **0610**

Biology

Questions from Paper 3 and Paper 6

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.

Total marks

/ 71

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.

Information

- This paper has 9 questions worth 71 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

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Print at 100% (Actual size) so diagrams keep their real measurements.

1 Recycling rates in one country were monitored every ten years.

The percentages of different types of recycled materials were recorded.

Fig. 5.1 shows the results.

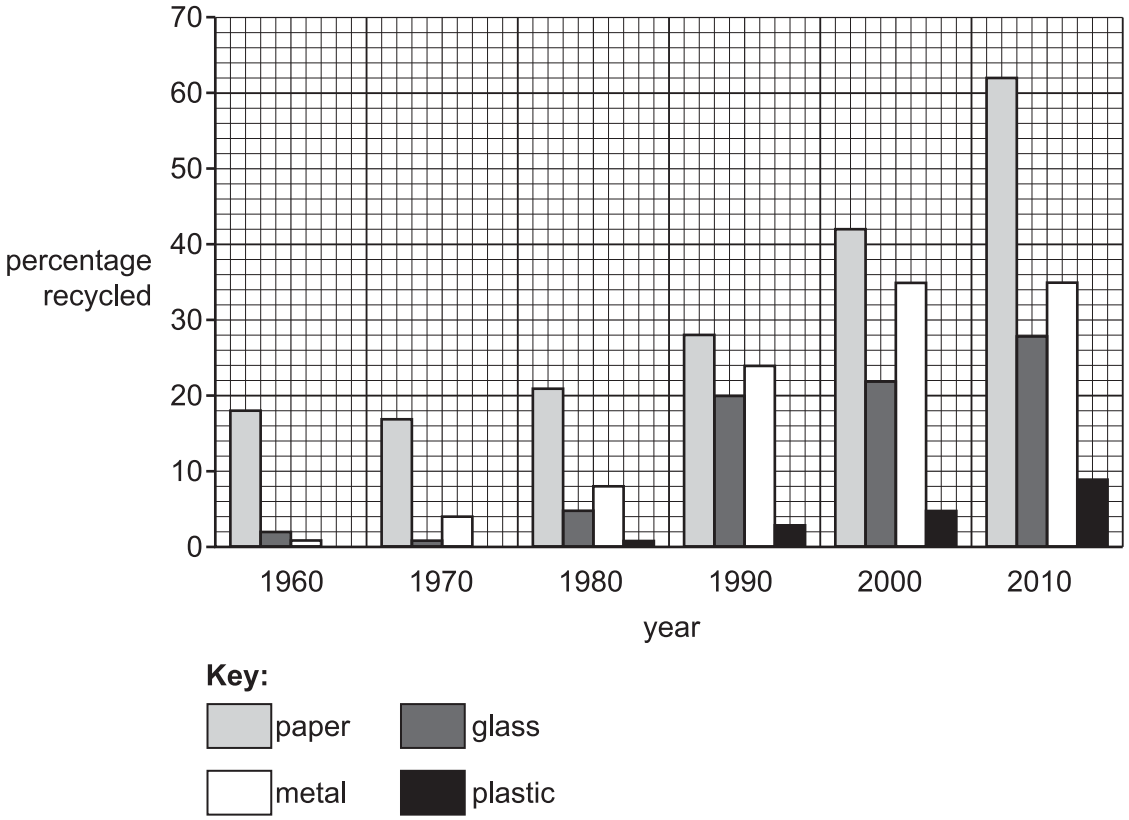


Fig. 5.1

(a) Complete the sentences using the data shown in Fig. 5.1.

The general trend shows that between 1970 and 2000 the percentage of materials recycled has ..... . The most commonly recycled material is ..... .

In 1970 ..... was **not** recycled.

The percentage of ..... recycled did not change between 2000 and 2010.

[4]

(b) Calculate the increase in the percentage of glass recycled between 1960 and 1990.

..... % [1]

[Total: 5]

Measurements, tables, graphs and conclusions Click for more variations

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2 Plan an investigation to find out how the volume of water added to germinating seeds affects the rate of germination.

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..... [6]

Seeds and germination Click for more variations

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3 In plants, water moves up the stem in xylem vessels as a column of water molecules as a result of transpiration.

A celery stalk that still has its leaves attached can be used to investigate the movement of water in a plant, as shown in Fig. 2.1.

Fig. 2.2 shows dye in the xylem vessels of a celery stalk.



Fig. 2.1



not to scale

Fig. 2.2

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Plan an investigation to determine the effect of temperature on the rate of movement of a coloured dye through celery stalks.

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..... [6]

Planning investigations: variables, controls and safety Click for more variations

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4 Amylase is an enzyme that catalyses the breakdown of starch to form reducing sugars.

Plan an investigation to determine the effect of pH on the activity of amylase.

Use iodine solution in your method.

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..... [6]

Planning investigations: variables, controls and safety Click for more variations

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5 Plan an investigation to determine the effect of exercise intensity on heart rate in humans.

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..... [6]

Heart and circulation Click for more variations

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6 **(a)** Milk contains fats. The enzyme lipase catalyses the breakdown of fats to form fatty acids and glycerol. The fatty acids cause the pH of the milk to decrease.

Plan an investigation to determine the effect of lipase concentration on the breakdown of fats in milk.

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..... [6]

(b) The emulsion test is used to test a sample of food for fat.

Describe the method you would use to do the emulsion test.

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..... [2]

[Total: 8]

Planning investigations: variables, controls and safety Click for more variations

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7 Fig. 3.1 shows a male and a female fly of the same species.

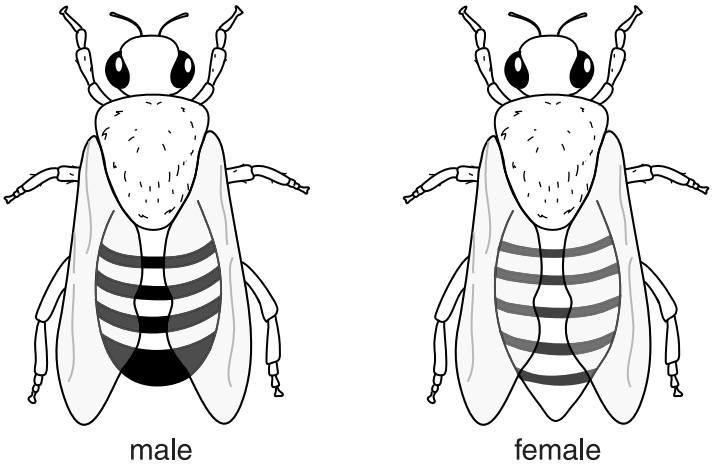


Fig. 3.1

(a) Describe **two** differences, **visible** in Fig. 3.1, between the male and female fly.

Complete Table 3.1 to record these differences.

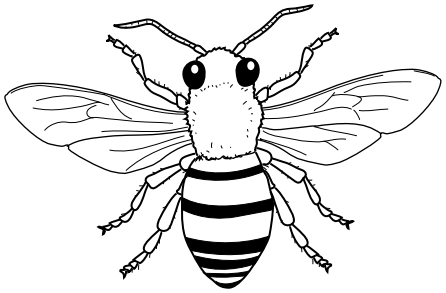
Table 3.1

feature	male	female

[3]

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(b) Fig. 3.2 shows a different type of insect, a bee.



not drawn to scale

Fig. 3.2

Insects can be recognised by having three parts to the body and three pairs of legs, amongst other features.

Describe **two other** features, visible in Fig. 3.1 **and** Fig. 3.2 that show that the fly and the bee are both identified as insects.

1 .....

2 .....[2]

(c) Both flies and bees are attracted to coloured flowers.

Suggest how you could find out which colours attract more bees than flies.

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.....[5]

[Total: 10]

Planning investigations: variables, controls and safety Click for more variations

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8 A protease enzyme digests the white protein in milk to form a clear soluble product.

Some students carried out an investigation to find the effect of temperature on this process.

5 cm^3 of milk and a few drops of enzyme were warmed separately to 40 °C and then mixed together. The time taken for the white mixture to clear was recorded. This procedure was repeated two more times at this temperature.

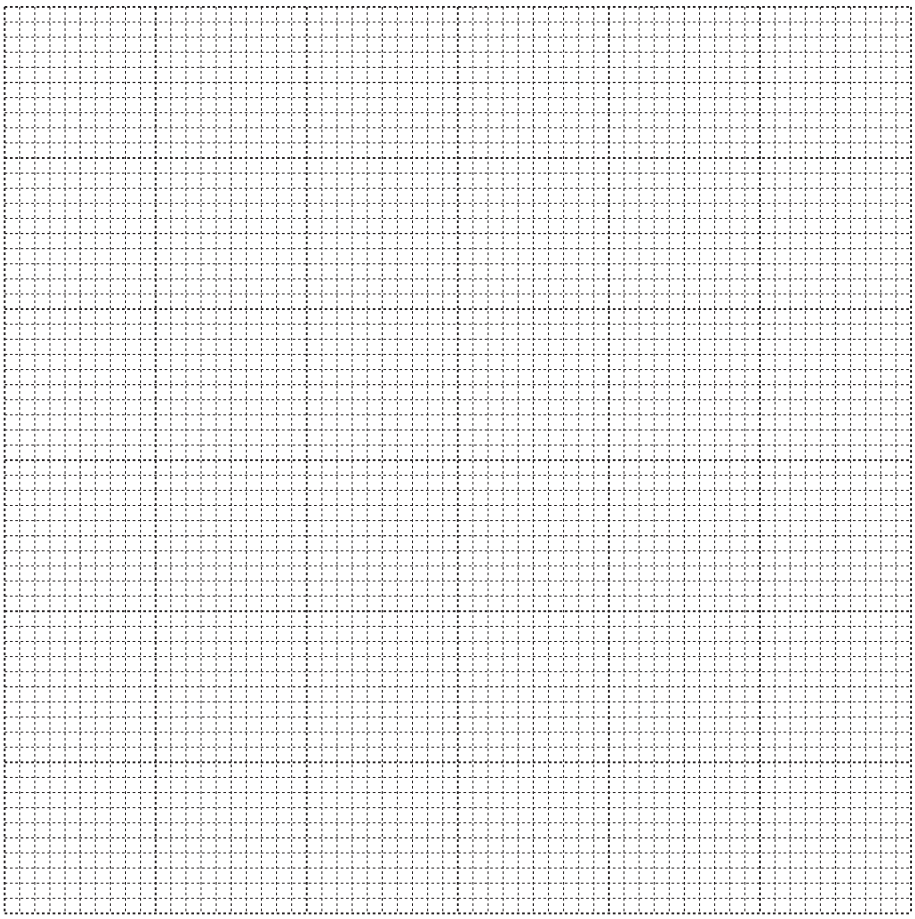
The whole procedure was repeated for a range of temperatures and all the results were recorded in Table 3.1.

Table 3.1

temperature / °C	time for milk to clear / seconds			
	1st test	2nd test	3rd test	mean
20	120	110	115	115
30	60	55	59	58
40	30	35	28	31
50	19	25	22	22
60	80	75	76	77

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(a) (i) Plot the data to show the effect of temperature on the mean time for the milk to clear.



[4]

(ii) Describe **and** explain the effect of temperature on the time taken for the milk to clear.

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..... [4]

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(b) (i) Suggest **and** explain why each test was carried out three times.

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..... [2]

(ii) In this investigation, temperature was varied.

Suggest **and** explain **one** variable that needs to be controlled.

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..... [2]

[Total: 12]

Measurements, tables, graphs and conclusions Click for more variations

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9 Fig. 2.1 is a photomicrograph of some blood cells.

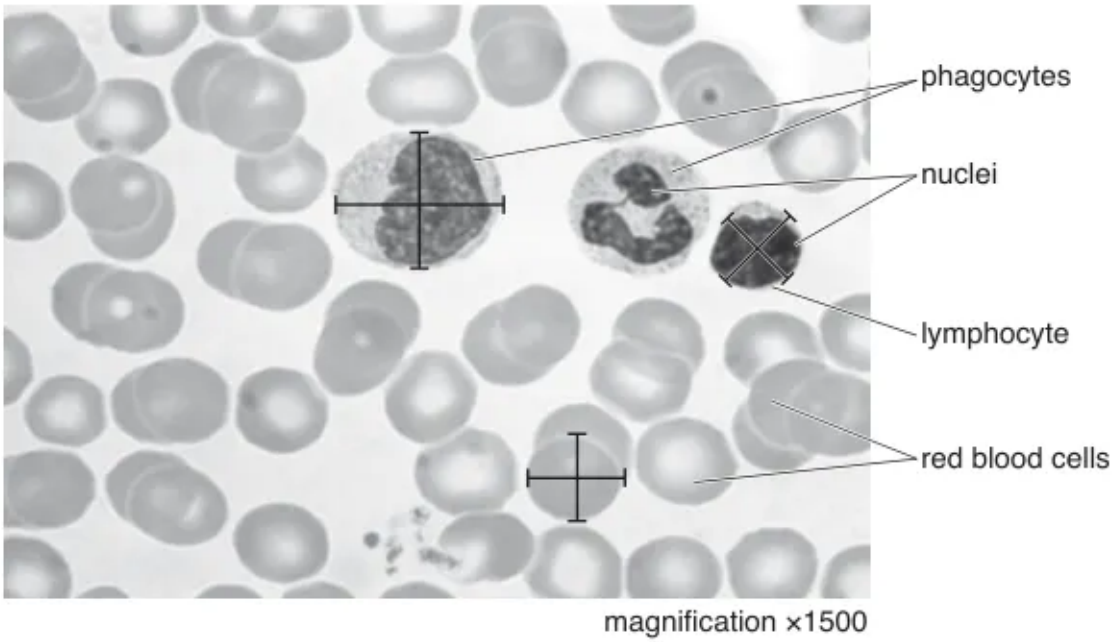


Fig. 2.1

(a) **(i)** State **two** visible differences between the red blood cells and the white blood cells (phagocytes and lymphocytes) in Fig. 2.1.

1 .....

.....

2 .....

.....

[2]

(ii) Make a large drawing of the two cells labelled **phagocytes** in Fig. 2.1.

[4]

(b) (i) Measure the diameters of the three marked blood cells, along both the lines drawn on each of the cells, in Fig. 2.1. Record these measurements in Table 2.1.

Add the missing units to Table 2.1.

Calculate the average diameter for each type of blood cell and write your results in Table 2.1.

Table 2.1

type of blood cell	diameter 1 /	diameter 2 /	average diameter / .....
red blood cell			
lymphocyte			
phagocyte			

[3]

(ii) Calculate the actual average diameter of the red blood cell using your answer in **2(b)(i)** and the following equation.

$$\text{magnification} = \frac{\text{average diameter of the red blood cell in Fig. 2.1}}{\text{actual average diameter of the red blood cell}}$$

Give your answer in micrometres (μm) to the nearest whole number. 1 mm = 1000 μm

Show your working.

.....μm
[3]

[Total: 12]

Biological drawings Click for more variations

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