

(Respiration (aerobic and anaerobic, energy release))

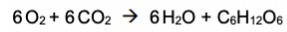
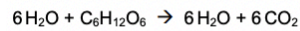
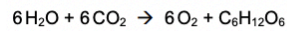
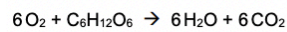
Q1.(2021)

All living organisms respire.

What is the chemical equation for aerobic respiration?

[1 mark]

Tick (✓) **one** box.


☐

☐

☐

☐

Q2.(2021)

Name the sub-cellular structures where aerobic respiration takes place.

[1 mark]

Q3.(2021)

Energy is released in respiration.

Give **two** uses of the energy released in respiration.

[2 marks]

1 _____

2 _____

Q4.(2021)

Describe **two** differences between aerobic and anaerobic respiration in humans.

Do **not** refer to oxygen in your answer.

[2 marks]

1 _____

2 _____

Q5.(2021)

What are the **two** products of anaerobic respiration in plant cells?

[2 marks]

Tick (✓) **two** boxes.

Carbon dioxide

☐

Ethanol

☐

Glucose

☐

Lactic acid

☐

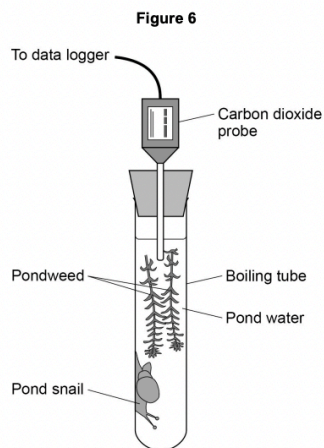
Water

☐

Q6.a)(2021)

A scientist investigated respiration and photosynthesis using some pondweed and a pond snail.

Figure 6 shows the apparatus used.



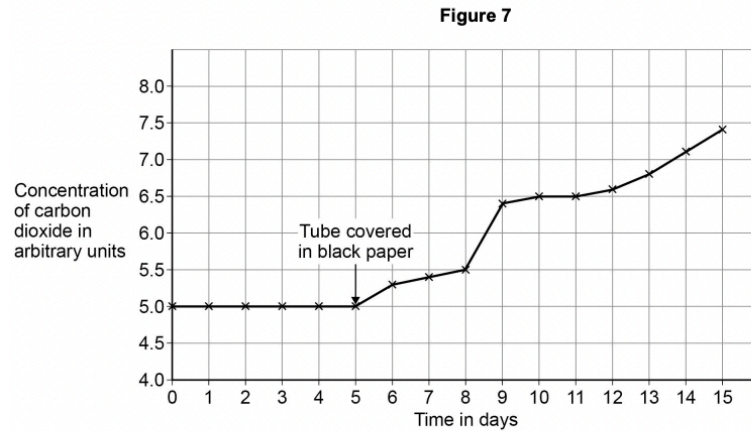
The apparatus was left in a well-lit room for 5 days.

The data logger recorded the concentration of carbon dioxide continuously.

After 5 days, the scientist completely covered the boiling tube with black paper.

The data logger continued to record the concentration of carbon dioxide.

Figure 7 shows the concentration of carbon dioxide inside the boiling tube over 15 days.



Explain why the concentration of carbon dioxide in the tube stayed the same between day 0 and day 5.

[2 marks]

Q6.b)(2021)

Suggest why the concentration of carbon dioxide increased between day 5 and day 10.

[1 mark]

Q6.c)(2021)

On day 10, the pond snail died.

Explain why the death of the pond snail caused the concentration of carbon dioxide to increase after day 10.

[3 marks]

Q7.a)(2023)

This question is about exercise.

During vigorous exercise, anaerobic respiration occurs in a person's body.

Explain **two** effects of anaerobic respiration on the person's body.

[4 marks]

1 _____

2 _____

Q7.b)(2023)

Design an investigation to show the effect of different types of exercise on the heart rate of athletes.

[6 marks]

Q7.c)(2023)

Bioenergetics

<http://www.pcfgstudy.com>

Anabolic steroids are drugs.

Anabolic steroids:

- increase muscle mass in humans
- are banned in most competitive sports.

Some athletes take anabolic steroids to improve their performance in sport.

Explain how taking anabolic steroids could improve an athlete's performance.

[2 marks]

Q7.d)(2023)

Scientists use monoclonal antibodies to test for the presence of anabolic steroids in an athlete's urine.

To produce monoclonal antibodies, a mouse lymphocyte is combined with a tumour cell.

What type of cell is created when a mouse lymphocyte and a tumour cell combine?

[1 mark]

Tick (✓) **one** box.

Embryo

☐

Hybridoma

☐

Phagocyte

☐

Stem cell

☐

Q7.e)(2023)

Describe how scientists make monoclonal antibodies using the cell created when a mouse lymphocyte and a tumour cell combine.

[3 marks]

Q7.f)(2023)

Bioenergetics

<http://www.pcfgstudy.com>

What property makes a monoclonal antibody useful in detecting the presence of an anabolic steroid in urine?

[1 mark]

Tick (✓) **one** box.

A monoclonal antibody is quick and easy to produce.

☐

A monoclonal antibody is specific to only one person's urine.

☐

A monoclonal antibody only binds to the anabolic steroid.

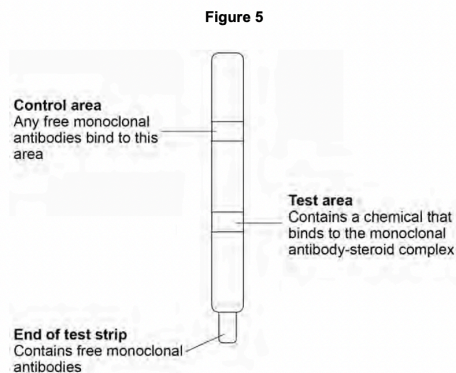
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A monoclonal antibody can identify many different drugs at the same time.

☐

Q7.g)(2023)

Figure 5 shows a test strip that can detect the presence of an anabolic steroid in an athlete's urine.



The end of the test strip is dipped in urine.

The urine moves up through the test strip.

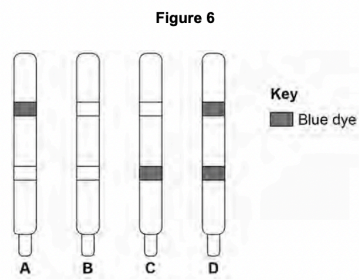
The test area and the control area contain a dye.
The dye turns blue when monoclonal antibodies bind to it.

Suggest the purpose of the control area in the test strip.

[1 mark]

Q7.h)(2023)

Figure 6 shows the urine test results of four athletes.



Describe the evidence in **Figure 6** that shows the test for athlete **B** has **not** worked.

Suggest **one** reason why the test did **not** work.

[2 marks]

Evidence _____

Reason _____

Q7.i)(2023)

Which athlete has tested positive for anabolic steroids in their urine?

[1 mark]

Tick (✓) **one** box.

A

☐

B

☐

C

☐

D

☐