

Respiration – GCSE Combine Science Biology1. **No.1**

0	1
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Being overweight can affect the health and life expectancy of a person.

0	1	.	1
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What is **one** lifestyle change a person could make to help them lose body mass?**[1 mark]**Tick (✓) **one** box.

Drink more alcohol

☐

Eat less fatty food

☐

Stop smoking

☐

0	1	.	2
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Exercise has many health benefits.

Give **two** health benefits of regular exercise.Do **not** refer to losing body mass in your answer.**[2 marks]**

1 _____

2 _____

During exercise, breathing rate increases to provide more oxygen for aerobic respiration.

0 1 . 3 What is the equation for aerobic respiration?

[1 mark]

Tick (✓) **one** box.

carbon dioxide + water → glucose + oxygen

☐

glucose + oxygen → carbon dioxide + water

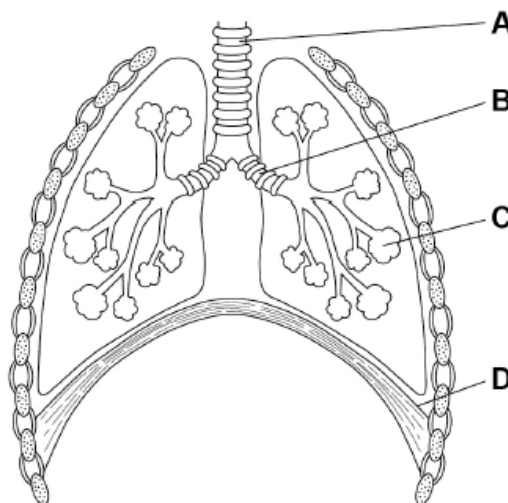
☐

oxygen + water → glucose + carbon dioxide

☐

0 1 . 4 Figure 1 shows the human breathing system.

Figure 1



Where does gas exchange take place?

[1 mark]

Tick (✓) **one** box.

A ☐

 B ☐

 C ☐

 D ☐

A scientist investigated the effect of exercise on the breathing rate of four people.

This is the method used.

1. Measure the resting breathing rate.
2. Exercise for 10 minutes.
3. Measure the breathing rate as soon as exercise stops.
4. Record the time taken for the breathing rate to return to the resting rate.

Table 1 shows the results.

Table 1

Person	Resting breathing rate in breaths per minute	Breathing rate after exercise in breaths per minute	Increase in breathing rate in breaths per minute	Time for breathing rate to return to resting rate in minutes
A	12	45	33	5.5
B	10	28	18	4.0
C	11	35	24	6.5
D	13	52	39	10.0

0 1 . 5 The scientist concluded that person **B** was the fittest.

Give **two** reasons that support the scientist's conclusion.

Use **Table 1**.

[2 marks]

1 _____

2 _____

0 1 . 6 Suggest **two** reasons why the scientist's conclusion may **not** be valid.

[2 marks]

1 _____

2 _____

0 1 . 7 Give **two** changes that happen in the body during aerobic exercise.

Do **not** refer to increased breathing rate in your answer.

[2 marks]

1 _____

2 _____

01.8

Muscles respire anaerobically during vigorous exercise.

Complete the sentences.

Choose answers from the box.

[2 marks]

amino acids	carbon dioxide	glucose
lactic acid	oxygen	

Muscles respire anaerobically if they do not have
enough _____.

Anaerobic respiration of glucose produces _____.

2. No.3

0 3

Being overweight can affect the health and life expectancy of a person.

0 3

. 1

Give one disease related to being overweight.

[1 mark]

0 3

. 2

Body mass index (BMI) helps to show if a person has a healthy body mass for their height.

BMI is calculated using the equation:

$$\text{BMI} = \frac{\text{body mass in kg}}{(\text{height in m})^2}$$

A woman has a BMI of 27 and a body mass of 68.1 kg

Calculate the woman's height in metres.

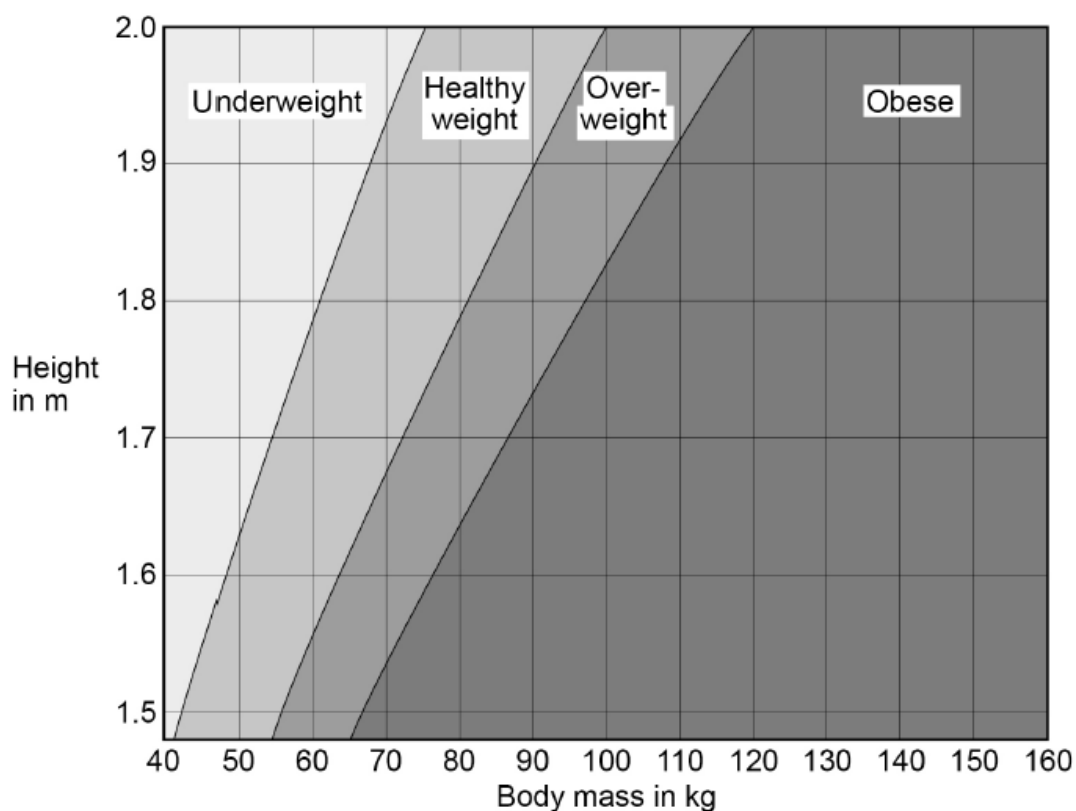
[3 marks]

Height = _____ m

03.3

Figure 4 shows a height-body mass chart for adults.

Figure 4



Which weight category describes the woman in Question 03.2?

[1 mark]

Tick (✓) one box.

Underweight

☐

Healthy weight

☐

Overweight

☐

Obese

☐

03.4

People are encouraged to control their body mass with diet and exercise.

Describe how the balance between the mass of food eaten and the amount of exercise a person does controls body mass.

[3 marks]

During long periods of vigorous exercise the body respire anaerobically.

[6 marks]

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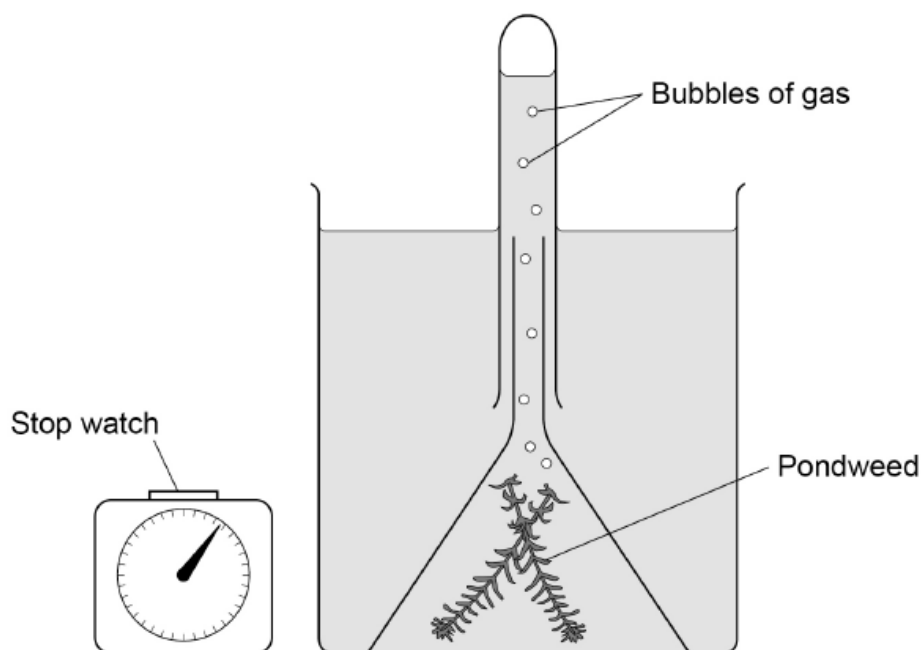
3. No.1

0 1

A student investigated the effect of light intensity on the rate of photosynthesis.

Figure 1 shows some of the apparatus used.

Figure 1



0 1 . 1

Name the gas produced by the pondweed in the light.

[1 mark]

0 1 . 2

Describe **one** way the student could change the intensity of light reaching the pondweed.

[2 marks]

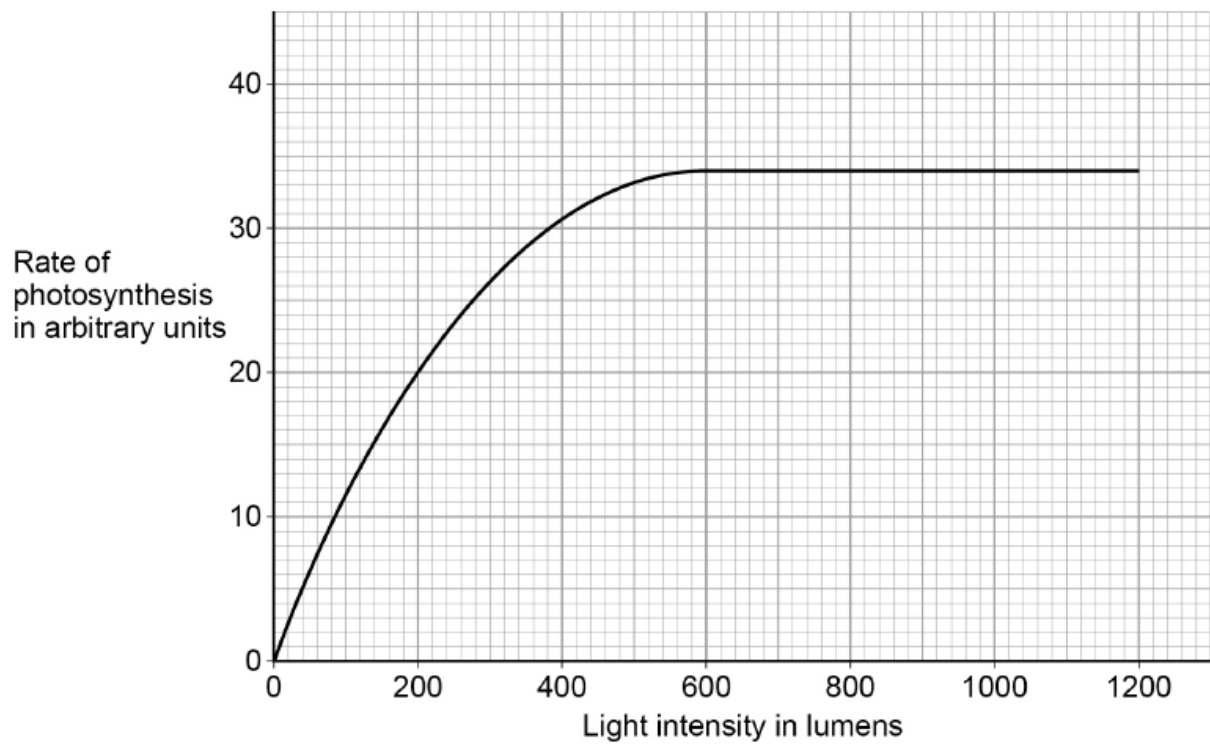
0 1 . 3

Describe how the student could use the apparatus in **Figure 1** to measure the rate of photosynthesis.

[2 marks]

Figure 2 shows the student's results.

Figure 2



0 1 . 4 What was the maximum rate of photosynthesis?

[1 mark]

Maximum rate = _____ arbitrary units

0 1 . 5

At which light intensity was light a limiting factor?

[1 mark]

Tick (✓) **one** box.

200 lumens

☐

600 lumens

☐

1200 lumens

☐

0 1 . 6

Light intensity can affect the rate of photosynthesis.

Give **one** other factor that can affect the rate of photosynthesis.

[1 mark]

4. No.4

0 4

Pathogens are microorganisms that cause infectious diseases.

0 4 . 1

What type of pathogen causes malaria?

[1 mark]

Tick (✓) **one** box.

Bacterium

☐

Fungus

☐

Protist

☐

Virus

☐

0 4 . 2

Give **two** methods used to prevent people catching malaria.Give a reason why **each** method works.

[4 marks]

Method 1 _____

Reason _____

Method 2 _____

Reason _____

0 4 . 3

Describe **two** differences between a bacterial cell and a eukaryotic cell.**[2 marks]**

1 _____

2 _____

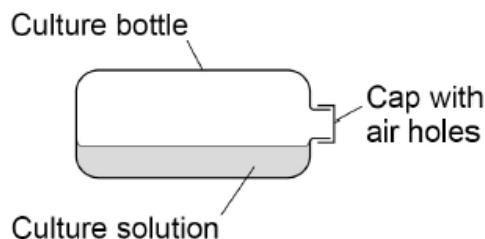
A scientist investigated the population growth of bacteria in a culture solution.

At the start of the investigation the culture solution contained all the nutrients the bacteria needed.

The scientist determined the number of living bacterial cells in the solution every hour over two days.

Figure 5 shows the apparatus used.

Figure 5



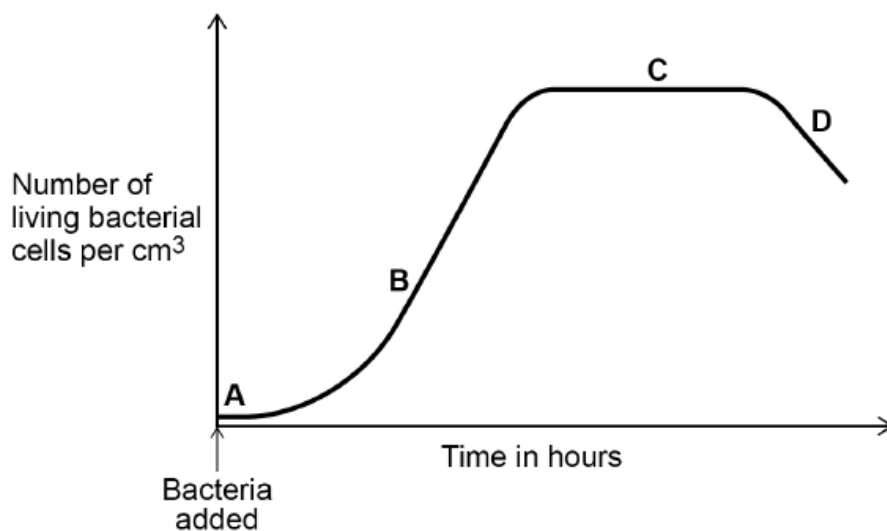
0 4 . 4

Describe why there are air holes in the cap of the culture bottle.

[1 mark]

Figure 6 shows the scientist's results.

Figure 6



0 4 . 5

Give **one** reason for what is happening to the number of bacteria at each of the stages.

[4 marks]

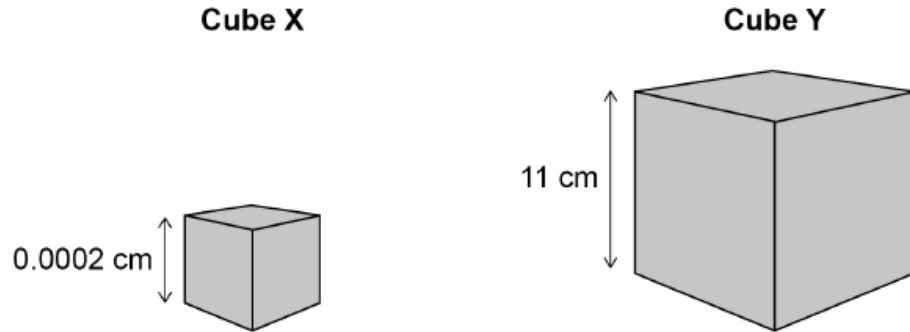
Stage A _____

Stage B _____

Stage C _____

Stage D _____

0 4 . 6

Figure 7 shows two cubes.Cube **X** represents a bacterial cell.Cube **Y** represents a small multicellular organism.**Figure 7**

A bacterial cell can absorb all the nutrients it needs by diffusion through its outer surface.

Explain why a multicellular organism **cannot** absorb all the nutrients it needs by diffusion through its outer surface.

You **must** include calculations in your answer.

Use **Figure 7**.

[5 marks]
