AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.2.2.6

The effect of lifestyle on some non-communicable diseases

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**6**
Available paper years	**2018–2023**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 01 · Mark scheme

June 2018 | 8464/B/1F | Original Q7

The full source mark scheme begins on page 22. Follow original question 7 in that document.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 02 · Mark scheme November 2020 | 8464/B/1F | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	eat less fatty food		1	AO2 4.2.2.5 4.2.2.6
01.2	any **two** from: • strengthens muscles • strengthens heart (muscle) • reduces risk of Can younCan(coronary) heart disease / CHD / cardiovascular disease • reduces blood pressure • reduces risk of (Type 2) diabetes • improves mental health / mood • improves mobility	ignore references to losing weight / mass ignore references to immediate effects of exercise on body eg increases heart rate ignore makes you healthier allow makes you stronger allow improves stamina allow keeps your heart healthy allow reduces (blood) cholesterol allow improves circulation allow strengthens bones allow boosts immunity allow reduces risk of (some) cancers allow makes you fitter ignore improves a person's appearance	2	AO2 4.2.2.4 4.2.2.6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 02 · Mark scheme

01.3	glucose + oxygen → carbon dioxide + water		1	AO1 4.4.2.1
01.4	C		1	AO2 4.2.1 4.2.2.2
01.5	any **two** from: • lowest / lower resting breathing rate • lowest / lower breathing rate after exercise • lowest / lower increase in breathing rate • least amount of time for breathing rate to return to resting rate	statements must be comparative allow less time for breathing rate to return to resting rate allow shortest recovery time	2	AO3 4.2.2.2 4.4.2.2
01.6	any **two** from: • only based on one measurement • person B may have done less intense exercise • other factors (besides breathing rate) indicate fitness	allow person B may have done a different type of exercise eg stamina / strength / speed allow age / sex / body mass may not have been controlled ignore references to medical conditions	2	AO3 4.4.2.2

4.2.2.6 The effect of lifestyle on some non-communicable diseases

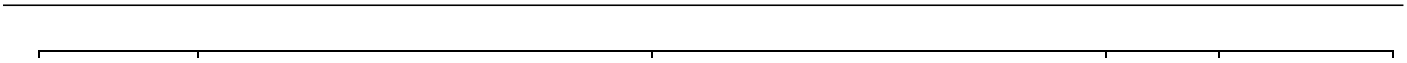
Answer 02 · Mark scheme

01.7	deeper breathing	allow heavier breathing ignore breathing rate increases	1	AO1 4.4.2.2
	increased heart rate	allow blood flows faster ignore more blood flows around body	1	
		allow increased (body) temperature		
		allow (increased) sweating		
		allow increased blood flow to skin		
		do **not** accept lactic acid is produced		
01.8		word takes precedence		AO1 4.4.2.1
	oxygen	allow O_2 ignore O / O^2	1	4.4.2.2
	lactic acid		1	
Total			**13**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 02 · Mark scheme

November 2020 | 8464/B/1F | Original Q1



4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 03 · Mark scheme

June 2022 | 8464/B/1F | Original Q4

Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	nucleus		1	AO2 4.1.1.1 4.1.1.2 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.2	cells never stop dividing		1	AO1 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.3	any **one** from: • chemicals enter the lungs (first) • chemicals are inhaled • chemicals are more concentrated in the lungs	allow smoke / tar / carcinogens for chemicals ignore nicotine unqualified	1	AO2 4.2.2.6 4.2.2.7

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 03 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.4	(cancer cells transported) in the blood		1	AO2 4.2.2.2 4.2.2.3 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.5	any **one** from: • (smoking) will damage the new lung • (NHS has) limited financial resources • the lung could be used for someone else (who does not smoke) • illness is self-inflicted **or** person is not attempting to help themselves	allow poor chance of success allow (smoking) will increase the risk of cancer developing in the new lung allow wastes a healthy lung allow there is a shortage of lungs	1	AO3 4.2.2.6 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.6	300	answer line takes precedence	1	AO2 4.2.2.6 4.2.2.7

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 03 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.7	any **one** from: • little exposure to ionising radiation • little exposure to the sunlight / UV (light) • more use of sunscreen • little exposure to carcinogens • little cell / DNA / gene damage	ignore references to smoking allow do not use sunbeds allow better sunscreen allow named carcinogen allow skin cancer takes a long time to develop	1	AO2 4.2.2.6 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.8	any **one** from: • most new cases each year are in males / people aged 65−69 (years) • new cases per year increases (from age 15) up to 69 (years) • new cases per year decreases from age 69 to 90 (+ years)	allow any upper age of 65-69	1	AO3 4.2.2.6 4.2.2.7

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 03 · Mark scheme

June 2022 | 8464/B/1F | Original Q4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.9	any **two** from: • improved treatment / drugs • earlier diagnosis • improved cancer screening • improved patient / doctor knowledge (of dangers / treatments)	allow improved technology / machinery allow improved patient diet / lifestyle	2	AO3 4.2.2.6 4.2.2.7

Total Question 4		**10**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 04 · Mark scheme

June 2022 | 8464/B/2F | Original Q4

Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	D		1	AO1 4.5.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.2	B		1	AO1 4.5.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.3	(in / through / via) blood(stream)	allow (in / through / via) plasma allow (in / through / via) blood vessels allow (in / through / via) arteries / veins / capillaries	1	AO1 4.5.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.4	insulin		1	AO1 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.5	glucose is converted to glycogen glucose moves from the blood into the cells		1 1	AO1 4.5.3.2

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 04 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.6	8:30 (am)	allow 8:15 – 8:35 (am) allow time written in words	1	AO3 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.7	any value in the range ≥ 6.5 to ≤ 20 ($mmol/dm^3$)		1	AO3 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.8	any **two** from: • low carbohydrate diet • exercise (regime) • lose body mass	 allow low calorie / fat / sugar diet allow eat fewer (sugary) snacks allow description of exercise allow lose weight allow (metformin) tablets to reduce blood glucose	2	AO2 4.5.3.2

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Answer 04 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.9	(less) respiration		1	AO1 4.5.3.2
	(so) less energy released / transferred **or** less muscle contraction	do **not** accept energy produced / made / created	1	AO2 4.4.2.1

Total Question 4		**12**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 05 · Mark scheme

June 2023 | 8464/B/1F | Original Q6

Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	cancer		1	AO1 4.2.2.7 4.2.2.6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.2	any **one** from: • (coronary) heart disease / CHD / cardiovascular disease • diabetes	ignore cancer allow atherosclerosis ignore heart attack allow high blood pressure allow stroke / asthma / depression / gallstones / (osteo)arthritis allow sleep apnoea	1	AO1 4.2.2.4 4.2.2.5 4.2.2.6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 05 · Mark scheme

June 2023 | 8464/B/1F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.3	any **one** from: • taxes on high energy / fat / sugar foods • education (about diet and health) • (government) advertising • restrict media advertising of high energy / fat / sugar foods • information on food labels • help / advice / groups for obese people via the NHS • calorie information on restaurant / takeaway menus • regulation of supermarket offers on high sugar / fat / energy foods • regulation of type of foods for sale near checkouts • exercise campaigns	allow increase the price on high energy / fat / sugar foods	1	AO3 4.2.2.5 4.2.2.6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.4	BMI = $\frac{69}{1.64^2}$	allow BMI = $\frac{69}{1.64 \times 1.64}$ allow BMI = $\frac{69}{2.6896}$	1	AO2
	BMI = 25.6(5437….)	allow 26 or 25.7	1	AO2
	(the person's BMI category is) overweight	must be consistent with their calculated BMI value	1	AO3 4.2.2.5 4.2.2.6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 05 · Mark scheme

June 2023 | 8464/B/1F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.5	any **one** from: • women will gain mass / weight (during pregnancy) • (developing) baby will increase mass / weight of woman	allow BMI (of woman) will increase (during pregnancy)	1	AO3 4.2.2.5 4.2.2.6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.6	any **two** from: • smokers had babies with lower birth mass • women / smokers / non-smokers with higher BMI had heavier babies • smoking had the greatest effect on birth mass in underweight women • smoking had the least effect on birth mass in overweight women • smoking had less effect on birth mass in overweight and obese women (than in underweight and healthy weight women)	statements must be comparative allow converse statements allow weight for mass allow obese women have the heaviest / heavier babies allow underweight women have the lightest / lighter babies allow there is only a 365 g difference between the smallest and largest babies	2	AO3 4.2.2.5 4.2.2.6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 05 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.7	coughs / sneezes (spread virus in droplets)	assume 'it' refers to the virus allow breathing out (spreads virus in droplets)	1	AO1 4.3.1.1 4.3.1.2
	droplets / virus are inhaled	allow droplets / virus are breathed in ignore contact with infected person unqualified allow touch a contaminated surface **and** then touch your mouth / nose / eyes for **1** mark if no other marks awarded allow kissing for **1** mark only	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.8	$\frac{17}{100}$ × 67 961 900	allow 0.17 x 67 961 900	1	AO2 4.3.1.4
	= 11 553 523	allow 11 553 500	1	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 05 · Mark scheme

June 2023 | 8464/B/1F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.9	any **one** from: • dry feet thoroughly (after washing) • do not share socks / tights / shoes / towels • use a fungicide • do not walk around barefoot in public / contaminated areas	allow use foot powder ignore keep feet dry ignore wash feet regularly allow named fungicide allow wear silver(-impregnated) socks allow wear flip flops in public / contaminated areas ignore avoid moist conditions	1	AO2 4.3.1.1 4.3.1.4

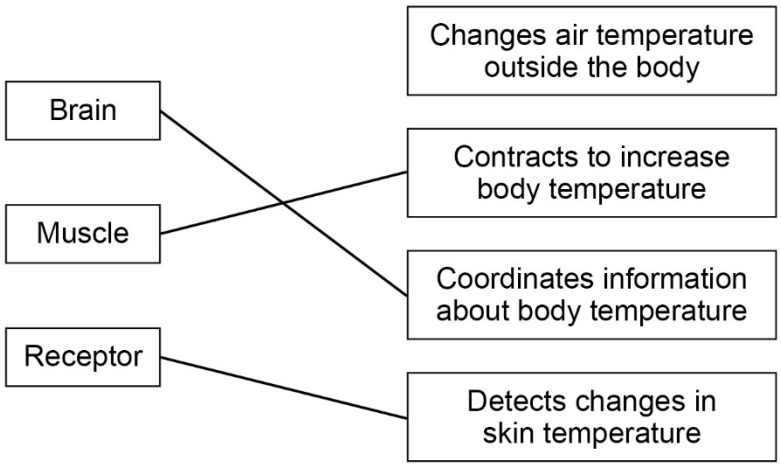
Total Question 6	14

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 06 · Mark scheme

June 2023 | 8464/B/2F | Original Q5

Question 5

Question	Answers	Mark	AO / Spec. Ref.
05.1	 do **not** accept more than one line from a box on the left	1 1 1	AO1 4.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.2	to allow cells to function properly to maintain the optimum conditions for enzymes		1 1	AO1 4.5.1

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 06 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.3	(body) temperature decreases (with increasing time)	ignore decreases unqualified	1	AO2 4.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.4	37 – 35.5 1.5 (°C)	 ignore minus sign ignore decrease	1 1	AO2 4.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.5	suitable extrapolation line on **Figure 6** answer consistent with student's line	 if no extrapolation allow value in range 4.3 to 4.8 allow answer in minutes **or** hours and minutes if units are given	1 1	AO2 AO3 4.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.6	pancreas		1	AO1 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.7	endocrine (system)		1	AO1 4.5.3.1

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 06 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.8	decrease		1	AO1 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.9	obesity / overweight	allow any **one** from: • lack of exercise • inactivity • family history (of diabetes) • age • high blood pressure • high cholesterol • race • smoking • high BMI • diet high in carbohydrate / sugar / fat / salt	1	AO1 4.5.3.2

Total Question 5	**14**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

AQA

GCSE
COMBINED SCIENCE: TRILOGY

8464/B/1F – BIOLOGY PAPER 1 FOUNDATION TIER

Mark scheme

8464

June 2018

Version/Stage: 1.0 Final

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

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4.2.2.6 The effect of lifestyle on some non-communicable diseases

MARK SCHEME – GCSE COMBINED SCIENCE: TRILOGY – 8464/B/1F – JUNE 2018

Information to Examiners

1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the Examiner make his or her judgement
- the Assessment Objectives and specification content that each question is intended to cover.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example: where consequential marking needs to be considered in a calculation; or the answer may be on the diagram or at a different place on the script.

In general the right-hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

2. Emboldening and underlining

2.1 In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following bullet points is a potential mark.

2.2 A bold **and** is used to indicate that both parts of the answer are required to award the mark.

2.3 Alternative answers acceptable for a mark are indicated by the use of **or**. Different terms in the mark scheme are shown by a / ; eg allow smooth / free movement.

2.4 Any wording that is underlined is essential for the marking point to be awarded.

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which students have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error / contradiction negates each correct response. So, if the number of error / contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as * in example 1) are not penalised.

Example 1: What is the pH of an acidic solution?

[1 mark]

Student	Response	Marks awarded
1	green, 5	0
2	red*, 5	1
3	red*, 8	0

Example 2: Name two planets in the solar system.

[2 marks]

Student	Response	Marks awarded
1	Neptune, Mars, Moon	1
2	Neptune, Sun, Mars, Moon	0

3.2 Use of chemical symbols / formulae

If a student writes a chemical symbol / formula instead of a required chemical name, full credit can be given if the symbol / formula is correct and if, in the context of the question, such action is appropriate.

3.3 Marking procedure for calculations

Marks should be awarded for each stage of the calculation completed correctly, as students are instructed to show their working. Full marks can, however, be given for a correct numerical answer, without any working shown.

3.4 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

3.5 Errors carried forward

Any error in the answers to a structured question should be penalised once only.

Papers should be constructed in such a way that the number of times errors can be carried forward is kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation ecf in the marking scheme.

3.6 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

3.7 Brackets

(…..) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

3.8 Allow

In the mark scheme additional information, 'allow' is used to indicate creditworthy alternative answers.

3.9 Ignore

Ignore is used when the information given is irrelevant to the question or not enough to gain the marking point. Any further correct amplification could gain the marking point.

3.10 Do <u>not</u> accept

Do **not** accept means that this is a wrong answer which, even if the correct answer is given as well, will still mean that the mark is not awarded.

4. Level of response marking instructions

Extended response questions are marked on level of response mark schemes.

- Level of response mark schemes are broken down into levels, each of which has a descriptor.
- The descriptor for the level shows the average performance for the level.
- There are two marks in each level.

Before you apply the mark scheme to a student's answer, read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Step 1: Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer.

When assigning a level you should look at the overall quality of the answer. Do **not** look to penalise small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level.

Use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 2 with a small amount of level 3 material it would be placed in level 2 but be awarded a mark near the top of the level because of the level 3 content.

Step 2: Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this.

The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do **not** have to cover all of the points mentioned in the indicative content to reach the highest level of the mark scheme.

You should ignore any irrelevant points made. However, full marks can be awarded only if there are no incorrect statements that contradict a correct response.

An answer which contains nothing of relevance to the question must be awarded no marks.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

MARK SCHEME – GCSE COMBINED SCIENCE: TRILOGY – 8464/B/1F – JUNE 2018

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	cell membrane	extra ticks negates marks	1	AO1 4.1.1.2
01.2	engulf pathogens produce antibodies produce antitoxins	extra ticks negates marks	1 1 1	AO1 4.2.2.3 4.3.1.6
01.3	2050 − 100 = 1950	an answer of 1950 scores **2** marks allow **1** mark for a correct subtraction of incorrect values	1 1	AO2 4.3.1.2
01.4	any **one** from: • (more) people vaccinated • (more) people immune • no new measles strain	ignore injections / treatments / medicines unqualified allow vaccine produced allow (more people given) MMR (vaccine) do **not** allow antibiotics ignore less people infected	1	AO2 4.3.1.1 4.3.1.2 4.3.1.7
01.5	any **one** from: • measles is (caused by) a virus • viruses cannot be killed / destroyed by antibiotics	allow measles is not caused by a bacterium allow antibiotics **only** kill / destroy bacteria ignore harmed / treated	1	AO1 4.3.1.1 4.3.1.8 4.3.1.2
01.6	any **one** from: • use of a barrier method of contraception • use of a condom • vaccination / immunisation • avoid sexual intercourse / contact	ignore use of diaphragm ignore use protection / safe sex do **not** accept less sexual intercourse / contact	1	AO1 4.3.1.3

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.7	any **one** from: • size / shape/ type of paper disc • concentration of antibiotic • volume / amount of antibiotic • (incubation) time • (incubation) temperature	ignore paper disc unqualified allow strength / dosage of antibiotic allow 3 days ignore size of petri dish	1	AO2 4.3.1.8
01.8	to check that the disc / water did not have an effect **or** to make sure it was the antibiotic that had an effect	allow for comparison with the antibiotics allow as a (experimental) control do **not** accept as a control variable	1	AO3 4.3.1.8
01.9	(antibiotic) **A** any **one** from: • (antibiotic **A**) had the larg**est** clear area around it • (antibiotic **A**) killed the **most** bacteria	no marks if wrong antibiotic given	1 1	AO3 4.3.1.8
Total			**13**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

MARK SCHEME – GCSE COMBINED SCIENCE: TRILOGY – 8464/B/1F – JUNE 2018

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	glucose oxygen	extra ticks negates marks	1 1	AO1 4.4.1.1
02.2	count the number of bubbles produced in 1 minute measure the volume of gas produced in 30 seconds	extra ticks negates marks	1 1	AO3 4.4.1.2
02.3	any **one** from: • to control the temperature • temperature affects the rate of photosynthesis	ignore reference to 'it' allow so pondweed / solution did not warm up allow correct description of effect of temperature on rate allow high temperatures denature enzymes ignore references to limiting factors	1	AO3 4.4.1.2
02.4	52		1	AO2 4.4.1.2
02.5	all points plotted correctly smooth curve drawn through all points	(where a bar chart has been plotted) allow **1** mark for all bars plotted correctly if points are plotted as well as bars, ignore bars allow ± ½ a square allow **1** mark for three points correctly plotted ignore extensions of line / curve unless inconsistent with line / curve drawn	2 1	AO2 4.4.1.2

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.6	any **one** from: • the nearer the light source to the pondweed the faster the rate of photosynthesis • the greater the light intensity the faster the rate of photosynthesis	allow converse statements for all marking points allow the nearer the light source to the pondweed the faster the bubbles produced allow the greater the light intensity the faster the bubbles produced allow the closer the light source the more the plant photosynthesises ignore more bubbles are produced with no reference to rate allow oxygen for bubbles do **not** accept carbon dioxide	1	AO3 4.4.1.2
Total			**10**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

MARK SCHEME – GCSE COMBINED SCIENCE: TRILOGY – 8464/B/1F – JUNE 2018

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	any **one** from: • water on potato would increase mass • to control amount of water on potato	allow so only the mass of the potato is measured allow to remove water from outside of potato allow liquid / solution / sugar solution for water allow so you get the correct (starting) mass of the potato do **not** accept so that all the pieces of potato weighed the same	1	AO3 4.1.3.2
03.2	increase in mass increase in length	extra ticks negate marks	1 1	AO2 4.1.3.2
03.3	osmosis into lower	in this order only allow diffusion allow inside do **not** accept through allow low / more dilute / dilute	1 1 1	AO1 4.1.3.2 AO2 4.1.3.2 AO2 4.1.3.2
03.4	any **one** from: • the concentration (of sugar solution) in the cells is 0.4 (mol/dm^3) • the concentration (of sugar solution) in the cells is the same as the solution (in the tube)	allow reference to potato instead of cells	1	AO3 4.1.3.2

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.5	any **two** from: • has (root) hairs • large surface / area • (root) hairs extend into soil • (root) hairs have thin walls	ignore references to active transport and mineral uptake allow root hair cells allow wide surface area allow (root) hairs are long / widespread	2	AO1 4.1.1.3 4.1.3.1 4.1.3.2
Total			**9**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

MARK SCHEME – GCSE COMBINED SCIENCE: TRILOGY – 8464/B/1F – JUNE 2018

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1		**max 2** marks if written in terms of heart rate		AO2 4.4.2.2
	breathing rate when walking is twice that at rest	allow breathing rate when walking is 12 (breaths / minute) more than at rest	1	
	breathing rate when jogging is 5 times that at rest	allow breathing rate when jogging is 48 (breaths / minute) more than at rest	1	
	breathing rate when jogging is 2.5 times that when walking	allow breathing rate when jogging is 36 (breaths / minute) more than when walking	1	
		allow for **1** mark if no other marks gained: breathing rate at rest is 12 (breaths per minute), breathing rate when walking is 24 (breaths per minute) and breathing rate when jogging is 60 (breaths per minute) **or** breathing rate increases with increasing activity		

4.2.2.6 The effect of lifestyle on some non-communicable diseases

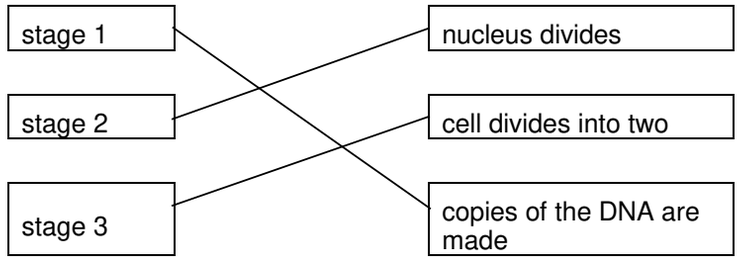
Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.2	(breathing rate increases)	reference to more / faster required at least once for full marks		AO1 4.4.2.2
	to supply more oxygen / O_2 **or** to supply oxygen / O_2 faster	allow to remove more carbon dioxide / CO_2 **or** to remove carbon dioxide / CO_2 faster do **not** accept incorrectly written formulae	1	
	for (aerobic) respiration **or** to reduce anaerobic respiration **or** to reduce lactic acid build up		1	
	(so) that more energy is transferred / released **or** (because) more energy is required	do **not** accept used / produced / created or energy made	1	
04.3	right ventricle / side of the heart pumps (blood) to the lungs		1	AO1 4.2.2.2
	left ventricle / side of the heart pumps (blood) to the body		1	
		if no other marks scored allow **1** mark for one side pumps blood to the lungs and the other side pumps blood to the body		

4.2.2.6 The effect of lifestyle on some non-communicable diseases

MARK SCHEME – GCSE COMBINED SCIENCE: TRILOGY – 8464/B/1F – JUNE 2018

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.4	any **one** from: • (the left ventricle) has to pump blood further (than the right ventricle) • (the left ventricle) has to pump blood with a greater force (than the right ventricle) • (the left ventricle) has to pump blood at a higher pressure (than the right ventricle)	there must be a comparative statement allow (the left ventricle) has to pump blood all around the body allow (left ventricle) has to pump blood harder	1	AO2 4.2.2.2
04.5	any **one** from: • strengthens heart (muscle) • reduces chance of another heart attack • reduces / controls weight • improves circulation	ignore prevents / no heart attacks allow decreases chance of fatty deposits **or** fat building up (in arteries / blood vessels) allow reduces resting heart rate	1	AO2 4.2.2.2 4.2.2.6
Total			**10**	

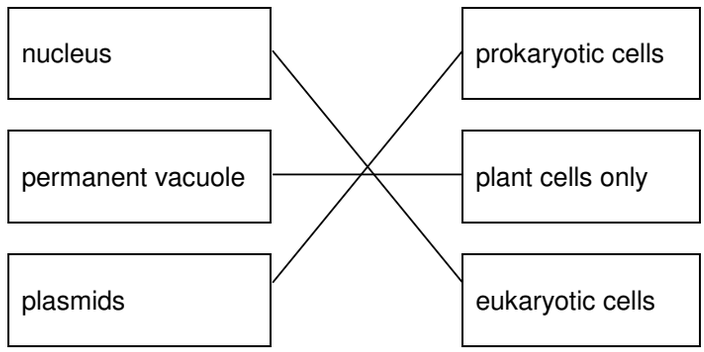
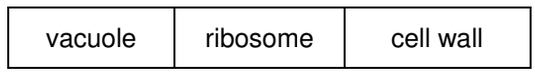
4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	 allow **1** mark for 1 or 2 correct credit can be given where students have matched the boxes correctly, for example numbering the boxes		2	AO1 4.1.2.2
05.2	6 picograms		1	AO2 4.1.2.2
05.3	meristem cells in plants can differentiate throughout the life of the plant		1	AO1 4.1.2.3

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.4	any **two** from: • may cure / treat diseases **or** cure medical conditions **or** produce replacement cells / tissues / organs • cells unlikely to be **rejected** by patient • cells / tissues of any type can be produced • many cells produced • cells produced could be used for research • would reduce waiting time for transplants	ignore references to cost ignore all reference to producing babies / IVF allow example eg diabetes / paralysis allow cells can be stored for future use ignore used in medical treatments ignore patient makes / grows cells / tissues / organs ignore same genetic information ignore differentiated into most types of cells	2	AO3 4.1.2.3 4.1.1.4 4.6.2.4
05.5	any **two** from: • (potential) life is killed / destroyed • shortage of donors / eggs • egg donation / collection has risks • do not yet know risks / side effects of the procedure on the patient • may transfer (viral) infection • poor success rate	ignore references to cost ignore unethical unqualified Ignore reference to religion / beliefs allow embryo is killed ignore embryo is destroyed ignore embryo is a life / becomes a baby ignore long term effects are not well understood allow may cause tumours / cancer allow in terms of viable egg / embryo / cell / tissue / organ production	2	AO3 4.1.2.3 4.1.1.4 4.6.2.4
Total			**8**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	 allow **1** mark for one or two correct links		2	AO1 4.1.1.1 4.1.1.2
06.2	 tick box takes precedence if no tick is given, look at both the figure and the circling of words in the table if writing is seen on the figure and in the table both must be correct		1	AO1 4.1.1.2
06.3	turn the (fine focusing) knob until the cells are in focus	allow focus it do **not** accept increase magnification ignore decrease magnification ignore clear ignore references to resolution / illumination ignore zoom in / out	1	AO2 4.1.1.2

4.2.2.6 The effect of lifestyle on some non-communicable diseases

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Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.4	(rotate the) nosepiece / objective lens	allow change the (objective / eyepiece) lens	1	AO2 4.1.1.2
	to a higher power (lens)	allow (to) increase the magnification a comparator is required ignore change / adjust the magnification allow stronger or more powerful lens ignore references to resolution / illumination unqualified ignore zoom in / out ignore references to an electron microscope	1	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.5		an answer of 400 (×) scores **3** marks		AO2 4.1.1.2
	conversion of units: (112 mm →) 112 000 (µm) **or** (280 µm →) 0.28 (mm)		1	
	(magnification =) $\frac{112}{0.28}$ **or** (magnification =) $\frac{112\,000}{280}$	allow **1** mark for no conversion of units 112 / 280 **or** incorrect value from step 1 correctly substituted	1	
	400 (×)	do **not** accept if units are given	1	
		if no other mark scored allow **1** mark for: magnification = $\frac{\text{size of image}}{\text{size of real object}}$ a triangle with words or letters in is insufficient, as the correct rearrangement is needed		
Total			**9**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

MARK SCHEME – GCSE COMBINED SCIENCE: TRILOGY – 8464/B/1F – JUNE 2018

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	is not caused by a pathogen / infective organism	allow not caused by a microorganism / microbe ignore not caused by infection ignore named pathogen unless bacteria, virus and fungus all mentioned	1	AO1 4.2.2.4 4.2.2.5 4.3.1.1 4.3
	(so) is not passed / spread (from person to person)	allow cannot be spread / caught allow is not infectious / contagious	1	AO2 4.2.2.4 4.2.2.5 4.3.1.1 4.3
07.2		allow 'it' for heart		AO1 4.2.2.4
	reduced / restricted / stopped blood flow	it does not matter where blood flow is restricted to – heart / body	1	
	(so) less oxygen reaches heart (muscle / cells)	must reference heart / it allow no oxygen reaches the heart (muscle / cells)	1	
	(so heart muscle / cells) cannot respire (enough) **or** (so heart muscle / cells) do not release (enough) energy	do **not** accept do not make / produce / create energy ignore references to breathing / suffocation ignore blood clots / blockages	1	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Mark	AO / Spec. Ref.
02.3	**Level 3:** Relevant points (factors / effects) are identified, given in detail and logically linked to form a clear account.	5–6	AO2
	Level 2: Relevant points (factors / effects) are identified and there are attempts at logical linking. The resulting account is not fully clear.	3–4	AO2 AO1
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	AO1
	No relevant content	0	
	Indicative content **medical risk factors:** • high blood pressure • high cholesterol • diabetes • genetic factors • medications **lifestyle risk factors:** • smoking • obesity • lack of exercise • high fat / energy diet • eating insufficient fruit / vegetables • alcohol • high salt intake • exposure to air pollution • certain drugs / correct named drug **examples of links:** • smoking – high bp / cholesterol / fatty deposition • obesity – lack of exercise / high bp / cholesterol / fatty deposition / diabetes • exercise – obesity / bp /diabetes • diet – obesity / cholesterol / diabetes • alcohol – bp / cholesterol • high salt intake - high blood pressure • genetic factors – bp / cholesterol / diabetes / obesity • medication – can affect blood / blood vessels / metabolism the main discriminator is the quality of linking both lifestyle and medical factors are required for **level 3**		4.2.2.2 4.2.2.4 4.2.2.5 4.2.2.6
Total		**11**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 03 · Examiner comments

June 2022 | 8464/B/1F | Original Q4

Question 4 (low & standard demand)

04.1 41% of students said that mutations occur in the nucleus. The remainder of students were evenly split between thinking they occur in the cell membrane or the cytoplasm.

04.2 71% of students knew that some cancers develop into large tumours because the cells never stop dividing.

04.3 In this question the idea that smoke or chemicals from cigarettes enter the lungs directly was needed. Only describing the effect of chemicals on the body was insufficient. Just over half the students scored the mark.

04.4 16% of students said that cancer cells can be transported in the blood to other parts of the body. Most students said that cancers can spread, but they did not describe how.

04.5 Just over half of the students scored the mark for saying that smoking would damage the new lung, or that the lung cancer is self-inflicted by smoking. Some gave confused responses about cancer still being in the body, which would spread to the new lung.

Answer 03 · Examiner comments

June 2022 | 8464/B/1F | Original Q4

04.6 79% of students made two correct graph readings and subtracted one from the other to give an answer of 300 more new cases in males aged 40 to 44 than in males aged 15 to 19.

04.7 A tenth of students could suggest why there are no new cases of skin cancer in males younger than 15. Those who did score usually said that younger males used sunscreen. Many students thought the reason was that younger people were healthier, had healthier skin or were still developing.

04.8 Just over half of the students gave a correct conclusion from the bar chart. The most common one was that most new cases each year are in males aged 65 to 69 years old. Errors were seen in reading the age ranges.

04.9 64% of students scored at least one mark. The question asked why survival rates for cancers has improved. Answers relating to reducing the risk of getting cancer, such as not smoking, were ignored. Marks were often awarded for the ideas of better medicines and treatments, improved technology and earlier diagnosis. References to better medical staff were ignored.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 04 · Examiner comments — June 2022 | 8464/B/2F | Original Q4

Question 4 (low & standard demand)

04.1 Two-thirds of students could identify the pancreas on Figure 5.

04.2 72% of students could identify the thyroid gland on Figure 5.

04.3 62% of students gained this mark. Blood, bloodstream and blood vessels were the most commonly seen correct answers. Named blood vessels were acceptable, as was plasma, but this was rarely seen.

Common misconceptions were seen, such as hormones travelling in blood cells, electrical impulses transporting hormones or the brain sending hormones out to the rest of the body.

04.4 45% of students gave the correct answer 'insulin'. Phonetic spelling was allowed. Incorrect answers included a range of other hormones, diabetes and pancreas.

Answer 04 · Examiner comments — June 2022 | 8464/B/2F | Original Q4

04.5 A fifth of students could identify two ways that hormone X causes a decrease in blood glucose concentration.

04.6 Students found this challenging, with fewer than 43% gaining the mark. Some students incorrectly gave the time that the graph peaked, others the trough or the start of the *x*-axis.

04.7 This was another challenging question, with a third of students gaining the mark.

04.8 Most students could give at least one lifestyle change. Exercise or descriptions of exercise were the most common correct response.

04.9 Students found this a very challenging question. Few students made correct reference to respiration. Energy was often referred to in incorrect terms, such as glucose making energy or glucose being needed to feel energised. Some students stated that you need lots of glucose for energy which was insufficient. Other students confused the idea that low blood glucose was because of insulin in this case.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 05 · Examiner comments

June 2023 | 8464/B/1F | Original Q6

Question 6

Question 6 was common to both tiers and was set at standard demand.

06.1 The vast majority of students selected cancer as a non-communicable disease. Only a tenth of students selected an incorrect disease, and these were evenly split across AIDS, gonorrhoea and malaria.

06.2 Three quarters of students scored the mark for naming a non-communicable disease that obesity is a risk factor for. Diabetes or heart disease, which are both listed in the specification were the most common responses. References to heart attack or heart failure were ignored as a named disease was required.

06.3 A quarter of students suggested a national policy that could help people to lose weight. The most common suggestions related to increasing taxes on unhealthy foods. This was usually phrased as increase the cost of unhealthy foods. A few suggested decreasing the cost of healthy foods.

Quite a lot of students suggested providing free gym memberships, or more public sports facilities. Some referred to mandatory PE lessons in school. References to labelling the energy content of foods and meals on packaging and menus were also made.
A common mistake was to give lifestyle changes that an individual could make, rather than a policy that a national organisation or the Government could make. Exercise regularly and eat a balanced diet were often stated, but these did not gain credit. Saying increase the recommended amount of daily exercise a person should do would gain credit, as this suggests a national policy.

06.4 In this BMI calculation 1 mark was for the correct substitution into the equation. The second mark was for a correct calculation, which was usually given as 25.65. Most students did show their working, which was good to see. The final mark was for selecting the correct BMI category that matched their final answer. Therefore, if a student did an incorrect calculation, they could still score the third mark. This was sometimes seen if they didn't square 1.64, and gave an answer of 42.07 with the BMI category obese. On the Foundation tier well over half the students scored full marks. A tenth of students scored 2 marks. These were usually for a correct calculation, but then they did not give the BMI category. Just over a tenth scored 1 mark for identifying the correct BMI category for an incorrectly calculated BMI.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 05 · Examiner comments June 2023 | 8464/B/1F | Original Q6

06.5 Over a third of students scored the mark for saying that women gain weight when pregnant, or that their mass will increase due to the baby. A clear reference to the weight, mass or BMI of the woman increasing was needed, so saying the woman's weight would change was insufficient. Incorrect responses included saying the BMI category was calculated before the woman became pregnant to see if she was healthy enough to have a baby, or to check the baby's health. Some described the harmful effects of smoking on a developing baby, which did not answer the question.

06.6 Two conclusions were needed, so smoking or BMI of the mother had to be linked to the birth mass, or weight, of the babies. Comparative statements were needed. Half of the students scored at least 1 mark, and well over a tenth of students gave two correct conclusions.
The most common correct response was that non-smokers had heavier babies. Some students repeated this conclusion by also stating the converse, saying smokers had lower birth mass babies. These two statements could only score 1 mark. A reference to a healthier weight was often seen, which was insufficient. The main misunderstanding was that smoking affected the woman's mass, and not the birth mass of the baby. Some students gave general recommendations to stop smoking and to eat a healthy diet, which did not answer the question.

06.7 The first marking point was for how the virus is transferred out of an infected person. Two fifths of students scored this mark for saying by coughing or sneezing. The second mark was for how the virus is taken in by a second person. Few students scored the second mark. Many thought the virus was transferred by direct contact or sexual intercourse. Some said the virus travels in the air, but they did not describe how it left one person and entered another.

06.8 Just over half the students scored full marks for the percentage calculation to estimate the number of people with athlete's foot. Some students incorrectly converted 17% to 0.017, rather than to 0.17 Other students attempted to calculate 1% of 67 961 900, then multiply this value by 17 to obtain their answer. Errors were often made when calculating 1%.

06.9 Only just over a tenth of students scored a mark for suggesting one way a person could reduce their chance of catching athlete's foot. References to washing feet regularly were very common which were ignored. Saying keep your feet dry was too vague, a reference to drying feet thoroughly, properly or between the toes after washing was required, which was rarely seen. Vague statements about wearing clean socks, or not wearing shoes and socks were common. The idea of covering the feet when walking around at a public swimming pool was suggested by some students, but saying don't walk around barefoot, without qualification, was ignored.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 06 · Examiner comments June 2023 | 8464/B/2F | Original Q5

Question 5 (Low and Standard demand)

05.1 Most students gained 2 or 3 marks. The most frequent error was to link 'Receptor' with 'Changes air temperature outside the body'.

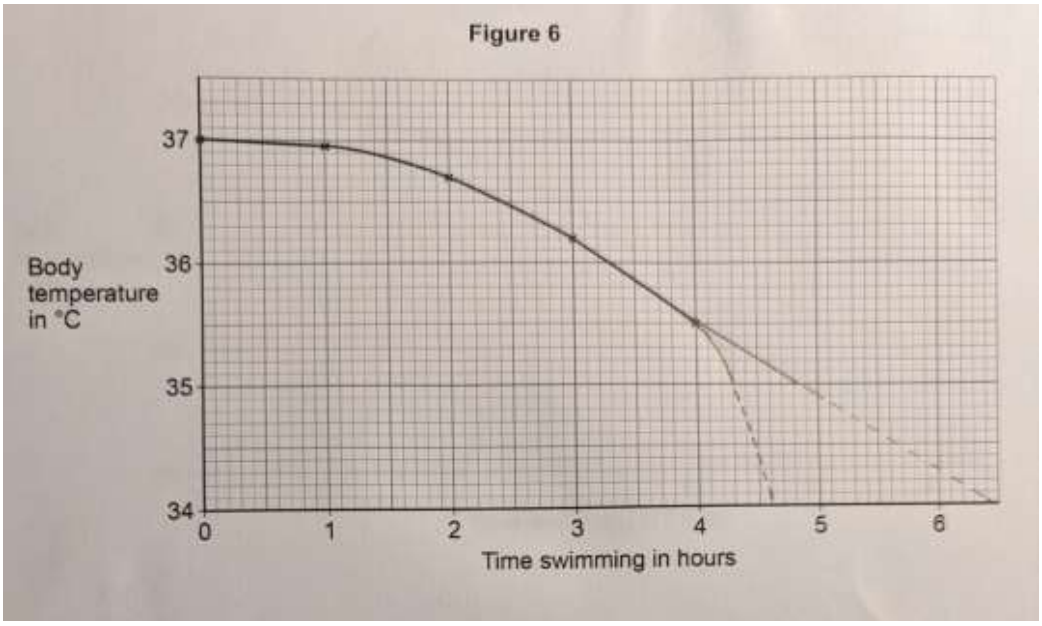
05.2 40% of students could identify why homeostasis is important.

05.3 Most students could describe the trend as a decrease in temperature. Some students misinterpreted the graph as lower temperature causing longer time.

05.4 Most students could read the relevant values from the graph and subtract the values.

Answer 06 · Examiner comments

05.5 There was a generous tolerance on extrapolation lines, from appropriately curved to straight.



The illustration above shows the acceptable limits for the extrapolation line, which needed to reach 35 °C. Small imperfections were acceptable, but lines could not be too thick, wobbly or sketchy to allow a reading to be taken. Extrapolation of the line below 35 °C was ignored (as shown by the dashed lines above).

Where extrapolation lines were drawn most were acceptable and gained credit.

The mark scheme for marking point 2 details how this was marked if no extrapolation line was drawn, but in that instance **only** marking point 2 was awarded. Of the large number of students who did not draw a line many still scored a mark for predicting a suitable result, usually 4.5 hours.

Of those who did draw a line about half correctly read their result at 35 °C, and about half gave a different answer of 5 or 6 hours, which did not match to their graph line.

05.6 Most students knew that insulin is produced by the pancreas.

05.7 Very few students knew that the endocrine system is the name of the system involving hormones. Many incorrect answers were seen, such as glands, nervous, reproductive, stomach, capillaries, intestines and brain.

05.8 There was considerable confusion over the function of an increased insulin concentration, with only 55% of students choosing the correct option.

05.9 The most common correct answer was obesity, although the full range of other acceptable responses, as shown in the extra information on the mark scheme, was seen.

Many students misinterpreted the question and believed it was asking for a future risk if a person has Type 2 diabetes. Thus, common responses such as ‘coma’, ‘CHD’ and ‘high blood glucose level’ were frequently seen and did not gain credit.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 06 · Examiner comments June 2023 | 8464/B/2F | Original Q5

Those that did read the question correctly generally gave ‘obesity’ to gain the mark. Specific types of eating or diets such as those high in fats or sugar were acceptable, but vague terms such as bad / poor / unhealthy diets or ‘eating junk food’ were not accepted.