AQA GCSE Biology | 8461

SPECIFICATION POINT 4.2.2.6

The effect of lifestyle on some non-communicable diseases

Mark schemes and examiner comments

Tier	**Higher**
Question groups	**39**
Available paper years	**2007–2025**

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

March 2007 | BLY1A | Original Q2 | Legacy

Two	**A**	arthritis	**2**
	B	diabetes	**1**
	C	heart disease	**3**
	D	high blood pressure	**4**

Answer 02 · Mark scheme

March 2007 | BLY1A | Original Q7 | Legacy

Seven	**3**	**1**	**3**	**4**

Answer 03 · Mark scheme

March 2007 | BLY1A | Original Q9 | Legacy

Nine	**2**	**4**	**1**	**2**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 03 · Mark scheme March 2007 | BLY1A | Original Q9 | Legacy

BLY1A (Human Biology) Higher Tier

Question	Key		
One	**A**	antibiotics	**1**
	B	natural selection	**3**
	C	pandemic	**4**
	D	resistance	**2**
Two	**A**	may cause damage to the liver and brain	**2**
	B	may cause less oxygen to be carried by the blood	**1**
	C	may cause withdrawal symptoms	**3**
	D	may lead to becoming addicted to a hard drug	**4**

	A	B	C	D
Three	**4**	**1**	**2**	**4**
Four	**2**	**4**	**1**	**2**
Five	**4**	**3**	**3**	**1**
Six	**2**	**3**	**3**	**3**
Seven	**3**	**3**	**4**	**2**
Eight	**2**	**4**	**2**	**1**
Nine	**2**	**2**	**2**	**2**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 04 · Mark scheme June 2007 | BLY1A | Original Q4 | Legacy

Four	**4**	**3**	**1**	**1**

Answer 05 · Mark scheme June 2007 | BLY1A | Original Q5 | Legacy

Five	**4**	**4**	**1**	**2**

Answer 06 · Mark scheme November 2007 | BLY1A | Original Q4 | Legacy

Four	**1**	**1**	**4**	**2**

Answer 07 · Mark scheme November 2007 | BLY1A | Original Q5 | Legacy

Five	**2**	**3**	**4**	**2**

Answer 08 · Mark scheme June 2008 | BLY1AP | Original Q3 | Legacy

Three	**2**	**2**	**2**	**2**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 09 · Mark scheme

June 2008 | BLY1H | Original Q7 | Legacy

question	answers	extra information	mark
7	any **five** from:	maximum **4** marks if no conclusion	5
	pros eg	maximum **three** pros	
	• used 'teenage rats' as equivalent to human teenagers		
	• THC dose typical of human cannabis smoking habits		
	• used control group		
	• rats allowed to choose amount of heroin		
	cons eg		
	• sample size small / only used 12 rats	ignore cruelty	
	• heroin administration very different from human situation		
	conclusions		
	• rats given THC / cannabis took more heroin		
	• (this) is evidence for a link between THC / cannabis and heroin		
	• (but) rat behaviour / physiology not necessarily same as human behaviour / physiology		
	• does not prove link in humans	allow results not reliable for humans	
Total			**5**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 10 · Mark scheme

January 2009 | BLY1H | Original Q3 | Legacy

question	answers	extra information	mark
3(a)(i)	does not contain drug / chemical	allow eg fake / sugar pill / dummy drug ignore control	1
3(a)(ii)	as control **or** to see if the effects are psychological **or** allows blind testing	allow 'to compare (with NRT)' ignore fair test	1
3(b)(i)	gum	allow gum placebo allow placebo	1
3(b)(ii)	high / highest number of participants / people **or** correct number given ie gum 16706, gum placebo 9319, placebo 16458		1
3(c)(i)	nasal spray		1
3(c)(ii)	highest <u>percentage</u> of people stopped / 24% stopped biggest difference between treatment and placebo	 allow 'highest by 4%' for **2** marks	1 1
Total			**7**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 10 · Mark scheme January 2009 | BLY1H | Original Q3 | Legacy

Biology BLY1H - AQA GCSE Mark Scheme 2009 January Series

COMPONENT NUMBER: BLY1H

COMPONENT NAME: Science B / Biology

STATUS: Final

DATE: January 2009

Answer 11 · Mark scheme March 2009 | BLY1AP | Original Q2 | Legacy

Two	**A** constant	**3**	
	B greater	**4**	
	C insufficient	**2**	
	D irregular	**1**	

	A	B	C	D

Answer 12 · Mark scheme March 2009 | BLY1AP | Original Q5 | Legacy

Five	**3**	**4**	**2**	**1**

Answer 13 · Mark scheme March 2009 | BLY1AP | Original Q6 | Legacy

Six	**1**	**3**	**1**	**1**

Answer 14 · Mark scheme June 2009 | BLY1AP | Original Q7 | Legacy

Seven	**4**	**1**	**1**	**4**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 15 · Mark scheme

June 2009 | BLY1AP | Original Q9 | Legacy

Nine	**2**	**4**	**4**	**4**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 16 · Mark scheme

June 2009 | BLY1H | Original Q3 | Legacy

Question 3

question	answers	extra information	mark
3(a)(i)	tobacco / nicotine / alcohol	accept solvent / glue / caffeine ignore cigarettes / coffee	1
3(a)(ii)	cannabis / heroin / cocaine	allow eg crack / weed / ecstasy / LSD / amphetamine / speed / steroids / GHB	1
3(b)(i)	heroin / cocaine / tobacco / nicotine	ignore alcohol / cigarettes / cannabis / caffeine / coffee	1
3(b)(ii)	alters body chemistry	ignore withdrawal symptoms / craving ignore non-chemical effects on nervous system	1
3(c)	any **two** from: • increase in cannabis smoking increases (%) depression • greater effect in women • depression linked with / not directly caused by cannabis • not all cannabis smokers get depression	 allow women become more depressed ignore cannabis causes depression	2
Total			**6**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 16 · Mark scheme June 2009 | BLY1H | Original Q3 | Legacy

BLY1H

Answer 17 · Mark scheme November 2009 | BLY1AP | Original Q1 | Legacy

No matching mark scheme was available in the supplied archive for this question.

Answer 18 · Mark scheme November 2009 | BLY1AP | Original Q3 | Legacy

No matching mark scheme was available in the supplied archive for this question.

Answer 19 · Mark scheme November 2009 | BLY1AP | Original Q6 | Legacy

No matching mark scheme was available in the supplied archive for this question.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 20 · Mark scheme January 2010 | BLY1H | Original Q5 | Legacy

Question 5

question	answers	extra information	mark
5(a)	rate of (chemical) reactions / rate of energy release / rate of respiration in cells / tissues / organs	ignore references to digestion	1 1
5(b)	any **three** from: • LDL 'bad' cholesterol **or** LDL causes heart / blood vessel disease • amplification eg reference to LDL depositing fat / lipid in blood vessels **or** LDL causes narrowness of arteries • HDL 'good' cholesterol / helps to prevent heart / blood vessel disease • amplification eg HDL lowers blood cholesterol • balance important (for good heart health) / high HDL and low LDL desirable	must have at least one LDL point and one HDL point for all **3** marks allow deposits of cholesterol in blood vessels	3
Total			**5**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 20 · Mark scheme January 2010 | BLY1H | Original Q5 | Legacy

BLY1H

Answer 21 · Mark scheme March 2010 | BLY1AP | Original Q5 | Legacy

Five	**4**	**4**	**3**	**2**

Answer 22 · Mark scheme March 2010 | BLY1AP | Original Q8 | Legacy

Eight	**4**	**2**	**3**	**4**

Answer 23 · Mark scheme June 2010 | BLY1AP | Original Q7 | Legacy

Seven	**1**	**2**	**1**	**1**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 24 · Mark scheme

June 2019 | BLY1H | Original Q4 | Legacy

Question 4

question	answers	extra information	mark
4(a)	any **two** from: • arthritis • diabetes • high blood pressure • strokes • allow breathing difficulties	 allow damaged joints accept high blood sugar allow blocked blood vessels / thrombosis ignore cancer ignore high cholesterol	2
4(b)(i)	any **two** from: • lower number of women deaths up to age of 75-80 • higher number of women deaths after 80 • men's peak higher • men's peak at an earlier age • men's death start earlier than women • more men than women die of heart disease	to gain marks there must be a comparison ignore comparison at single age ignore women die older **or** men die younger	2

Question 4 continues on the next page

BLY1H

Question 4 continued

question	answers	extra information	mark
4(b)(ii)	any **two** from: • men smoke more (cigarettes) • more men smoke • men under more stress • men less active • more men overweight / eat more / less diet conscious **or** different fat distribution • genetic factors • men might have lower metabolic rate • men less likely to visit doctor even though they have symptoms	ignore alcohol ignore reference to body size ignore references to hormones	2
4(c)	laboratory tests / tests on tissues **or** tests on animals **or** tests for toxicity tests for side effects on volunteers / healthy people / small numbers widespread testing **or** testing for optimum dose ***or*** test on patients / sick people ***or*** test to see if it is effective	points can be in any order ignore computer simulations accept use of placebo	1 1 1
Total			**9**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 24 · Mark scheme

June 2010 | BLY1H | Original Q4 | Legacy

BLY1H

Answer 25 · Mark scheme

November 2010 | BLY1AP | Original Q2 | Legacy

Two	**A**	carbon monoxide	**3**
	B	carcinogen	**2**
	C	nicotine	**1**
	D	oxygen	**4**

	A	**B**	**C**	**D**

Answer 26 · Mark scheme

November 2010 | BLY1AP | Original Q6 | Legacy

Six	**2**	**4**	**1**	**2**

Answer 27 · Mark scheme

November 2010 | BLY1AP | Original Q9 | Legacy

Nine	**3**	**3**	**3**	**1**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 28 · Mark scheme

January 2011 | BLY1H | Original Q5 | Legacy

Question 5

question	answers	extra information	mark
5(a)	any **two** from: • arthritis • diabetes • high blood pressure • heart / blood vessel disease	ignore descriptions ignore cholesterol	2
5(b)	(No) any **two** from: • patterns for cancer and obesity not identical • data only shows a link • some other factor(s) involved	allow descriptions of differences from graph	2
5(c)	any **two** from: • increases metabolic rate • exercise needs energy **or** exercise increases energy used by body • fat (stores) used / broken down **or** less food / energy converted into body mass / fat	accept increase BMR ignore increased respiration allow fat burned ignore burns energy / calories	2
Total			**6**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 28 · Mark scheme

January 2011 | BLY1H | Original Q5 | Legacy

BLY1H

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 29 · Mark scheme

January 2011 | BLY1H | Original Q6 | Legacy

Question 6

question	answers	extra information	mark
6(a)	drugs alter chemical processes in body person suffers withdrawal symptoms without drug		1 1
6(b)	(overall trend is) higher harm – greater dependence **or** greater dependency – higher harm **or** data show a correlation (but) wide spread of dependence at each harm 'level' **or** wide spread of harm at each dependence level	positive correlation gains **two** marks allow data do not give a straight line graph because wide spread	1 1
6(c)(i)	(no) heroin much more harmful / dependent	it or not mentioned = alcohol may use figures eg alcohol only has harm 1.5 heroin 2.75	 1
6(c)(ii)	many more people use alcohol less harmful effect multiplied	allow since alcohol legal drug / easier to obtain	1 1
Total			**7**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 29 · Mark scheme January 2011 | BLY1H | Original Q6 | Legacy

BLY1H

Answer 30 · Mark scheme March 2011 | BLY1AP | Original Q6 | Legacy

Six	**2**	**3**	**2**	**1**

Answer 31 · Mark scheme November 2011 | BLY1AP | Original Q2 | Legacy

Two	**A**	higher muscle to fat ratio		**2**
	B	obesity		**4**
	C	reduced cholesterol levels, decreases in weight		**1**
	D	very low metabolic rate, muscle loss		**3**

	A	**B**	**C**	**D**

Answer 32 · Mark scheme November 2011 | BLY1AP | Original Q9 | Legacy

Nine	**4**	**3**	**1**	**4**

The AQA UMS Conversion Calculator can be found at the following web address:

http://www.aqa.org.uk/umsconversion

4.2.2.6 The effect of lifestyle on some non-communicable diseases

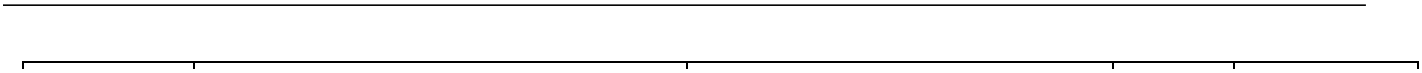
Answer 33 · Mark scheme June 2016 | BL1HP | Original Q1 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
1(a)(i)	legal, recreational drugs		1	AO1 1.3.1e
1(a)(ii)	any **one** from: • dependence / addiction • withdrawal (symptoms) or described	 allow reliance eg headache / sickness / nausea ignore side effects alone	1	AO1 1.3.1h
1(b)(i)	idea of not part of the drug company **or** it is another company	not biased can be accepted for either part bi or bii, but not both	1	AO2 1.3.1a
1(b)(ii)	idea of so they will not be biased	allow results will be trustworthy	1	AO3 1.3.1a
1(b)(iii)	no / reduced feeling of pleasure (from alcohol) (so) less likely to drink alcohol	allow brain less sensitive to alcohol allow so easier to stop (drinking alcohol)	1 1	AO3 1.3.1
1(c)(i)	higher % **or** more boys (than girls) drink beer / lager / cider higher % **or** more girls (than boys) drink spirits / alcopops / wine	allow boys drink more beer / lager / cider allow girls drink more spirits / alcopops / wine allow valid descriptions using % figures	1 1	AO2 1.3.1
1(c)(ii)	any **one** from: • only 100 boys were surveyed • only done on 15-year-olds • no data on the table about boys that don't drink alcohol • data only about UK • boys may have lied about alcohol consumption	 allow small sample may not be representative allow not done on all ages allow none of the bars are 100% or highest bar is 88%	1	AO3 1.3.1
Total			**9**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 33 · Mark scheme

June 2016 | BL1HP | Original Q1 | Legacy



Answer 34 · Mark scheme

November 2020 | 8461/1H | Original Q6

The full source mark scheme begins on page 35. Follow original question 6 in that document.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 35 · Mark scheme November 2021 | 8461/1H | Original Q3

03.1	normal		1	AO2 4.2.2.5 4.2.2.6
03.2	92 ÷ 1.71^2 31.46(…) 31.5	 allow correctly calculated value using 92 ÷ 1.71 	1 1 1	AO2 4.2.2.5 4.2.2.6
03.3	any **two** from: • the higher the BMI (category) the lower the number of years living in good health • the higher the BMI (category) the higher the number of years living in bad health • the higher the BMI (category), the lower total life expectancy	allow 'more overweight' or 'more obese' for higher BMI category throughout allow the lower the BMI (category) the higher the number of years living in good health allow the lower the BMI (category) the lower the number of years living in bad health allow the lower the BMI (category), the higher total life expectancy if no other marks awarded, allow for **1** mark idea that as BMI increases, quality of life decreases	2	AO2 4.2.2.5 4.2.2.6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 35 · Mark scheme

November 2021 | 8461/1H | Original Q3

03.4	costs the NHS / UK health service / Government / hospitals more money (because need to pay for) additional surgery / medication / hospital stay to treat stroke / diabetes **or** more time off work (if in hospital / unwell) (1) (so) employer / Government have to give financial support (1)	 allow other correct named conditions e.g. heart attack / immobility / disability / arthritis allow more people unable to work allow (so) decreased productivity (in workplace)	1 1	AO3 4.2.2.6
03.5	allow any **one** from: • movement issues • loss of job / income • disability • mental health impact of lack of movement **or** mental health impact of pain • need to visit the doctor / take medication regularly • may need surgery	 allow example of movement issue	1	AO3 4.2.2.6
03.6	<u>type 2</u> diabetes CVD / CHD **or** heart attack / disease **or** stroke	 allow atherosclerosis allow **two** named vascular conditions for **2** marks from heart attack **or** stroke **or** high blood pressure **or** high (blood) cholesterol allow cancer allow liver disease	1 1	AO1 4.2.2.4 4.2.2.6
Total			**11**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 35 · Mark scheme

November 2021 | 8461/1H | Original Q3

Question	Answers	Extra information	Mark	AO / Spec. Ref.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 36 · Mark scheme

June 2022 | 8461/2H | Original Q3

Question 3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	an answer in the range 1.1 to 2(.0) (hours)		1	AO2 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.2	*effect* : lowered *explanation*: glucose taken in **or** glucose converted to glycogen **or** glucose used in respiration by cells / liver / muscles		1 1 1	AO1 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.3	underweight		1	AO3 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.4	(from) 67.5 (kg to) 90 (kg)	allow in the range 67 to 68 (kg) for 67.5 (kg) allow in the range 90 to 90.5(kg) for 90 (kg) allow from 90 (kg to) 67.5 (kg)	1	AO2 4.5.3.2

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 36 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.5		answers must be comparative		AO3 4.5.3.2
	(person **C** has) higher glucose (than mean)	allow comparison of higher glucose using numbers allow (person **C**'s) glucose is too high	1	
	(person **C** has) higher insulin (than mean)	allow comparison of higher insulin using numbers allow (person **C**'s) insulin is too high	1	
		do **not** accept (person **C** has) higher cholesterol		
		ignore unprocessed data		

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.6	(more) exercise	allow example of (more) exercise	1	AO1 4.5.3.2
	eat less carbohydrate / sugar **or** eat a low carbohydrate diet	allow eat less fat allow eat a carbohydrate controlled diet	1	
		if no other marks awarded allow **1** mark for lose weight **or** maintain healthy weight **or** eat less **or** eat fewer calories ignore references to healthy / balanced diet **or** diet unqualified		

Total Question 3		10

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 37 · Mark scheme

June 2024 | 8461/1H | Original Q1

Question 1

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.1	arteries		1	AO1 4.2.2.2 4.2.2.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.2	pushes / moves blood to get oxygen around the body	 allow description of getting oxygen around the body, such as through blood vessels **or** to get oxygen to a named organ do **not** accept to get oxygen to the lungs ignore reference to restarting the heart ignore reference to the pacemaker	1 1	AO2 4.2.2.2 4.4.2.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.3	provides oxygen (for respiration)	allow idea of carbon dioxide triggering breathing to restart	1	AO2 4.2.2.2 4.4.2.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.4	statin(s)	allow named statin	1	AO1 4.2.2.4

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 37 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.5	(stent) opens / widens (blocked blood) vessel	allow (stent) keeps (blocked blood) vessel open allow a description of the blood vessel being opened ignore type of blood vessel ignore unblocks (blood) vessel	1	AO1 4.2.2.4
	to allow (more) blood to flow **or** to allow (more) glucose / oxygen to the heart (cells / tissue / muscle)		1	

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.6	any **two** from: • smoking increases the (%) risk of **all** types of (cardiovascular) disease • smoking increases the (%) risk of having (disease) **H** more than any other type of (cardiovascular) disease • smoking increases the (%) risk of having (disease) **E** less than any other type of (cardiovascular) disease	ignore smoking causes (cardiovascular) disease allow not smoking decreases the risk of **all** types of (cardiovascular) disease allow if you smoke, you are **most** likely to get (disease) **H** allow if you smoke, you are **least** likely to get (disease) **E** allow a comparison of the effect of smoking on the risk of two (cardiovascular) diseases allow two comparisons of the effect of smoking on the risk of two (cardiovascular) diseases for **2** marks	2	AO3 4.2.2.6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 37 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.7	*y*-axis labelled 'Percentage / % increase in risk (compared to people who have never smoked)'		1	AO2 4.2.2.6
	correct scale of 1 cm = 5% on *y*-axis		1	
	all bars plotted correctly	allow a tolerance of ±½ small square ignore bars touching ignore width of bars	1	
	all bars correctly labelled		1	

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.8	any **one** from: • poor diet	ignore obesity allow descriptions of poor diet eg diet high in (saturated) fat / cholesterol ignore diet unqualified	1	AO1 4.2.2.6
	• lack of exercise	allow descriptions of lack of exercise allow high alcohol intake allow other correct lifestyle factors such as having a stressful job		

Total Question 1	14

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 38 · Mark scheme

June 2025 | 8461/1H | Original Q2

Question 2

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.1	type 2 diabetes	ignore diabetes unqualified do **not** accept type 1 diabetes allow high blood pressure allow (coronary) heart disease **or** CHD allow cardiovascular disease **or** CVD allow stroke allow heart attack allow (osteo)arthritis allow cancer allow sleep apnoea allow liver disease allow other correct diseases ignore high cholesterol ignore heart failure	1	AO1 4.2.2.6 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.2	correct scale **and** *y*-axis labelled 'mean obesity rate in arbitrary units'		1	AO2 4.2.2.6
	all points plotted correctly	allow a tolerance of ± ½ small square allow 3 or 4 correct plots for **1** mark ignore letters	2	
	line of best fit drawn	ignore line extended beyond plotted points ignore line joined point to point with straight lines	1	

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.3	scatter (diagram / graph)	allow scattergram	1	AO2 4.2.2.6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 38 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.4	positive correlation		1	AO2 4.2.2.6

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.5	(30 °C) (iodine solution remains yellow-brown because) starch is not present	allow (iodine solution remains yellow-brown because) all / the starch had been broken down	1	AO3
	(because) amylase / enzyme broke starch down	allow (because) the amylase / enzyme is active / working allow (because this is close to) the optimum / best temperature for amylase / enzyme	1	AO2
	(90 °C) (iodine solution blue-black because) starch was (still) present	allow (iodine solution blue-black because) starch was not broken down allow (because) the amylase / enzyme had no effect on starch	1	AO3
	(because) the amylase / enzyme has denatured	allow description of denaturation allow amylase / enzyme is destroyed / damaged do **not** accept amylase / enzyme has been killed	1	AO2 4.2.2.1 RPA5

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.6	test more temperatures between 10 °C and 60 °C		1	AO3 4.2.2.1 RPA5

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 38 · Mark scheme

June 2025 | 8461/1H | Original Q2

Question	Answers	Mark	AO / Spec Ref.
02.7	<table><tr><th>Protease enzyme</th><th>Optimum pH</th><th>Organ where enzyme is active</th></tr><tr><td></td><td></td><td>stomach</td></tr><tr><td></td><td></td><td><u>small</u> intestine allow ileum / duodenum</td></tr></table>	1 1	AO2 4.2.2.1

Total Question 2	14

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 39 · Mark scheme

June 2025 | 8461/2H | Original Q9

Question 9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.1		allow converse allow answers in terms of likelihood of having / getting (Type 2) diabetes		AO3 4.5.3.2
	(percentage of people with Type 2) diabetes increases with age	allow more old people have (Type 2) diabetes	1	
	(percentage of people with Type 2) diabetes increases with increased (body) mass / weight	allow more obese people have (Type 2) diabetes allow (percentage of people with type 2) diabetes increases with obesity	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.2	7.65%		1	AO3 4.3.1.9 4.5.3.2

Question	Answers	Mark	AO / Spec. Ref.
09.3	**Level 3:** A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given.	5–6	AO3 4.3.1.9 4.5.3.2
	Level 2: Some logically linked reasons are given. There may also be a simple judgement.	3–4	
	Level 1: Relevant points are made. They are not logically linked.	1–2	
	No relevant content	0	

	Indicative content allow 'investigation 1' for drug **A** and 'investigation 2' for drug **B** throughout **Methods** *Methods are not comparable because:* • different methods are used to administer the drugs - injection (drug **A**) and pill (drug **B**) **or** drug **A** acts more quickly (than drug **B**) • dosage for drug **A** and drug **B** might differ (as dosage is not stated) • drug **A** and drug **B** are tested for different time periods **or B** is given for a longer period (24 weeks) (than **A** - 12 weeks) • placebo / control only included when testing drug **B** • only drug **B** has intermediate readings **or** fewer readings were taken when testing drug **A** • different sample sizes were used **or** greater sample size used when testing drug **B** (**A** = 175, **B** = 631 / 1261) • different scientists carried out each investigation • no double-blind trial for drug **A** *Methods may be similar because:* • neither drug trial was double-blind • quantitative tests in both trials • (relatively) large sample size used for both drugs **Usefulness of drug A and drug B** allow 'blood glucose' for Hb-G throughout o both lower Hb-G (levels) o both lower Hb-G to similar levels o drug **A** reduced Hb-G more than drug **B** o neither drug reduced Hb-G to an acceptable value (<7%) o Hb-G increases after 18 weeks with drug **B** o no information on side effects for either drug o no information on the trend for drug **A** For **Level 1**, details about the method **or** usefulness of the drugs must be given. For **Level 3**, details about the method **and** usefulness of the drugs must be given.		

Total Question 9	**9**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

AQA

GCSE
BIOLOGY
8461/1H

Paper 1 Higher Tier

Mark scheme

June 2020

Version: 1.0 Final

206G8461 1H/MS

4.2.2.6 The effect of lifestyle on some non-communicable diseases

MARK SCHEME – GCSE BIOLOGY – 8461/1H – JUNE 2020

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 Examiner.

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.

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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, level of demand 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

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1		allow correct chemical symbols ignore any attempt at balancing equation ignore light / chlorophyll		AO1 4.4.1.1
	before arrow carbon dioxide **and** water	either order	1	
	after arrow glucose	ignore sugar / carbohydrate do **not** accept starch	1	
01.2		ignore description of subsequent parts of the photosynthesis reaction		AO1 4.1.1.2 4.4.1.1
	<u>light</u>	allow sun<u>light</u> ignore sun	1	
	(light) is captured / trapped / absorbed by chlorophyll / chloroplasts	allow (light) is used by chlorophyll / chloroplasts	1	
01.3	$\frac{18.5 + 19.3 + 19.5}{3}$ **or** $\frac{57.3}{3}$		1	AO2 4.4.1.2 RPA 6
	19.1 (cm^3/hour)	allow an answer correctly calculated using only two correct values	1	
01.4	a ring around 14.2	allow clear indication of correct result	1	AO3 4.4.1.2 RPA 6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

01.5	any **one** from: • scale / value was misread • there was air / oxygen in the syringe / measuring cylinder / apparatus • the lamp / light was moved • temperature changed • had different mass / length of pondweed • pondweed had not acclimatised	ignore human error ignore references to counting bubbles or time allow measurement error allow light intensity changed ignore different bulb / lamp unqualified	1	AO3 4.4.1.2 RPA 6
01.6	did not use it in calculation (of mean)		1	AO3 4.4.1.2 RPA 6
01.7	any **one** from: • light (intensity) • carbon dioxide (concentration) • pondweed size / amount • pondweed species	do **not** accept temperature ignore time allow distance / power / colour of lamp / light allow same (piece of) pondweed	1	AO3 4.4.1.2 RPA 6
01.8	enzyme(s) lose the shape of the active site	allow enzyme(s) (start to) denature allow enzyme(s) destroyed / damaged do **not** accept enzyme(s) killed	1	AO2 4.2.2.1

4.2.2.6 The effect of lifestyle on some non-communicable diseases

01.9	y-axis labelled '(rate of) photosynthesis in cm^3/hour'		1	AO2 4.4.1.2 RPA 6
	suitable scale on y-axis	must take up half or more of grid provided	1	
	all points plotted to within ± ½ small square	allow 3 or 4 correct plots for **1** mark ignore any attempt to plot a point at 20 °C	2	
	correct curved line of best fit	ignore line joined point to point with straight lines ignore extrapolation	1	
Total			**16**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	movement / spreading out of molecules / particles	allow movement / spreading out of (named) substances / chemicals / gases / liquids ignore reference to membranes / cells	1	AO1 4.1.3.1
	from (an area of) high(er) concentration to (an area of) low(er) concentration	allow down / with the concentration gradient ignore along / across the concentration gradient do **not** accept movement from / to a concentration gradient	1	
02.2	increased carbon dioxide concentration in the air		1	AO2 4.1.3.1 4.2.3.2
	increased number of stomata that are open		1	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

02.3	**Level 3:** Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO1 4.1.3.1 4.2.2.2 4.2.2.3
	Level 2: Relevant points (reasons/causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.	3–4	
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	
	No relevant content	0	

	Indicative content
	• (many) alveoli
	  • provide a large(r) surface area (**:** volume)
	
	• capillaries are thin
	  or alveoli / capillary walls are thin **or** one cell thick
	  or capillaries are close to the alveoli
	  • which provides short diffusion path (for oxygen / carbon dioxide)
	
	• breathing (mechanism) moves air in and out
	or lungs are ventilated
	  • to bring in (fresh) oxygen
	  • to remove carbon dioxide
	  • to maintain a concentration / diffusion gradient
	
	• large capillary network (around alveoli)
	or good blood supply
	  • to remove oxygen(ated blood) quickly
	  • to bring carbon dioxide to the lungs quickly
	  • to maintain a concentration / diffusion gradient		

4.2.2.6 The effect of lifestyle on some non-communicable diseases

02.4	osmosis	allow diffusion	1	AO1 4.1.3.1 4.2.3.2 4.1.3.2
02.5	active transport (because) energy is needed (to move nitrate ions) from a low(er) concentration (in the soil) to a high(er) concentration (in the root / cell)	 allow (to move nitrate ions) against / up the concentration gradient allow (because) there is a lower concentration (of nitrate ions) in the soil **or** (because) there is a higher concentration (of nitrate ions) in the root / cell ignore reference to amount / number of nitrate ions ignore along / across the concentration gradient do **not** accept if reference to molecules / atoms moving	1 1 1	AO3 AO2 AO2 4.1.1.3 4.2.3.2 4.1.3.3
Total			**14**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	any **two** from: (both have) • cytoplasm • (cell) membrane • DNA / genetic material • ribosomes	ignore reference to shape allow RNA ignore genetic information if no other mark awarded allow sub-cellular structures for **1** mark if no other mark awarded allow correct cellular process, e.g. respiration for **1** mark	2	AO2 4.1.1.1 4.1.1.2 4.1.2.1
03.2	any **three** from: • prokaryotic cell is smaller • prokaryotic cell has no mitochondria • prokaryotic cell has no nucleus **or** DNA is free in the cytoplasm **or** genetic material is free in the cytoplasm • prokaryotic cell has a single loop of DNA **or** prokaryotic cell has a single loop of genetic material • prokaryotic cell has plasmids	allow converse for eukaryotic cells allow reference to bacterium instead of prokaryotic cell ignore reference to features not shown in Figure **5** if neither mark awarded, allow prokaryotic cell has no membrane-bound organelles ignore genetic information ignore genetic information ignore circular / rings of DNA allow prokaryotic cells have smaller ribosomes	3	AO2 4.1.1.1 4.1.1.2 4.1.2.1

03.3	1 µm = 0.001 mm **or** 1 mm = 1000 µm **or** 0.05 mm = 50 µm **or** 0.05 × 1000 (1:) 50	 do **not** accept if a unit is given	1 1	AO2 4.1.1.1 4.1.1.2
03.4	mitosis	correct spelling only	1	AO1 4.1.2.2
03.5	35%		1	AO2 4.1.2.2
03.6	 (stage 1) DNA / chromosomes replicate / duplicate mitochondria / ribosomes / sub-cellular structures increase in number **or** mitochondria / ribosomes / sub-cellular structures replicate (stage 2) one set of chromosomes is pulled / moved to each end of the cell (stage 3) the cytoplasm **and** cell membrane divides (to form two cells)	ignore names of the stages of the cell cycle ignore genetic material ignore DNA / chromosomes double / reproduce allow cytoplasm increases ignore cell grows unqualified allow one of each chromosome is pulled / moved to each end of the cell ignore nucleus divides allow cytoplasm divides **and** (new) cell membranes form ignore nucleus divides	 1 1 1 1	AO1 4.1.2.2
Total			**13**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	fatty acids		1	AO1 4.2.2.1
	glycerol		1	4.4.2.3
04.2	enzyme binds to the substrate because they are complementary (shapes)	allow enzyme joins to the substrate because they fit together exactly allow enzyme joins to the substrate because the substrate fits the active site ignore reference to specificity do **not** accept same shape	1	AO2 4.2.2.1
	(so) substrate is broken down (into products)	allow (so) substrate splits (into products) ignore products are formed, unqualified	1	
	(so) products are released **or** enzyme is not changed	allow enzyme is not used up allow reference to activation energy for either marking point 2 **or** marking point 3	1	
04.3	each <u>active site</u> has a specific shape (so only fits one type of lipid molecule)	allow each <u>active site</u> is a different shape do **not** accept reference to the substrate having an active site	1	AO2 4.2.2.1
04.4	add Benedict's (solution / reagent to the liquid)		1	AO1 4.2.2.1 RPA 4
	boil / heat	allow any temperature of 65 °C or above	1	
	(if glucose is present the blue) colour changes to yellow / green / orange / brown / (brick)red		1	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

04.5	add iodine solution / reagent (to the liquid) (if starch is present) it changes colour to blue / black (from yellow / orange / brown)	allow add a drop of iodine ignore iodine unqualified	1 1	AO1 4.2.2.1 RPA 4
04.6	glucose from photosynthesis (excess) glucose converted to starch	do **not** accept starch made in photosynthesis allow (excess) glucose is stored as starch	1 1	AO2 4.2.2.1 4.4.1.1 4.4.1.3 4.4.2.3
04.7	starch (stores) have been converted to glucose (so the glucose can be) used for respiration / (named) metabolic reactions **or** (so the glucose can be) used to release energy (because) there is no light to make (new / more) glucose by photosynthesis	ignore reference to residual glucose from previous photosynthesis do **not** accept idea of energy being produced / created / made	1 1 1	AO3 4.4.1.1 4.4.2.1 4.4.1.3
04.8	any **one** from: • test roots / stems of plants (in the light and dark) • test other species of plant • measure the concentrations of glucose **and** starch • vary the time in the dark / light • test variegated leaves	do **not** accept reference to changing the independent variable allow test other parts of the plants allow test other types of plant ignore mass / amount allow any other valid extension ignore repeats	1	AO3 4.4.1.2 4.4.1.3
Total			**17**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	mechanical	allow physical allow structural	1	AO3 4.3.3.2
05.2	any **one** from: • to deter herbivores • to prevent animals damaging it	ignore to injure animals, unqualified allow to deter animals eating it do **not** accept to deter predators	1	AO2 4.3.3.2
05.3	chemical		1	AO3 4.3.3.2

4.2.2.6 The effect of lifestyle on some non-communicable diseases

05.4	any **two** from : • lack of magnesium (ions) (1) (so) not enough chlorophyll for (efficient) photosynthesis (1) (so) not enough glucose to make proteins for growth **or** not enough glucose to release energy for growth (1) • infection by pathogen / bacteria / virus / fungus (1) (so) leaves become discoloured / yellow so less photosynthesis (1) (so) not enough glucose to make proteins for growth **or** not enough glucose to release energy for growth (1) • infected by aphids (1) (which) remove sugars from phloem (1) (so) not enough glucose to make proteins for growth **or** not enough glucose to release energy for growth (1) • lack of (available) light (1) (so) chlorophyll breaks down (1) (so) not enough glucose to make proteins for growth **or** not enough glucose to release energy for growth (1)	allow (so) lack of chlorophyll produced causes yellow leaves (1), (so) not enough photosynthesis to produce glucose which is used to make proteins for growth (1) allow correctly named pathogen allow has rose black spot / TMV allow other symptoms of named pathogens / disease award once only award once only award once only	5	AO2 4.3.3.1 4.3.1.1 4.3.1.2 4.3.1.4 4.4.1.1 4.4.1.2 AO1 4.4.2.3 4.4.1.3

4.2.2.6 The effect of lifestyle on some non-communicable diseases

05.5	(bacteria) obtain glucose / sugar (from the plant) (glucose used) for respiration **or** (glucose used) for making other named substances	 allow (glucose used) to release energy	1 1	AO3 AO2 4.2.3.2 4.4.1.3
05.6	(gorse plant) obtains nitrate (ions) needed for amino acids / proteins	 allow needed to make chlorophyll / DNA	1 1	AO2 4.1.3.3 4.4.2.3 AO1 4.3.3.1
05.7	willow bark		1	AO2 4.3.1.9
Total			**13**	

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	any **two** from: • BMI / morphology / obesity level • smoking habits • diet • medication • family history of liver disease • fitness levels • ethnicity • area of UK they live in	ignore genetic factors allow mass / weight **and** height allow previous drinking habits allow medical conditions allow drug use allow level of exercise allow race	2	AO3 4.2.2.6
06.2	2.55 – 1.60 (= 0.95) $\left(\frac{0.95}{2.55} \times 100 = \right)$ 37 (.2549019608…) (%)	allow 1.60 – 2.55 (= –0.95) allow value for with meals in range 1.60 to 1.65 (for 1.60) allow answer correctly calculated from values in ranges 1.60 to 1.65 and 2.50 to 2.60 allow – 37(.2549019608...)(%)	1 1	AO2 4.2.2.6
06.3	12 × 2 × 7 = 168 (g/week) 1.8	 allow in range 1.8-1.9 allow correct reading from a calculation that omits the 2 **or** the 7 do **not** accept if a unit is given	1 1	AO2 4.2.2.6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

06.4	any **two** from: • consuming alcohol increases the RR (with / without meals) **and** supporting data • consuming less than 50 g/week of alcohol with meals does not increase the RR • even (small amounts of alcohol at) 25 g/week increases the RR if not with meals	allow risk for RR throughout allow data in terms of number of glasses of wine allow increasing alcohol consumption increases the RR at an increasing rate allow any value between 35 and 60 g/week	2	AO3 4.2.2.6
06.5	any **two** from: • large number in survey • long term / 15 year survey • well controlled	allow 800 000 in survey if neither mark awarded allow large study allow many controls	2	AO3 4.2.2.6
06.6	any **one** from: • people underestimate / overestimate alcohol consumption • people may change (lifestyle / drinking) habits over time • some people may drink all their weekly alcohol at once	allow people lie about alcohol consumption **or** people lie about other named control variables ignore survey only tested women	1	AO3 4.2.2.6

4.2.2.6 The effect of lifestyle on some non-communicable diseases

06.7	**Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	3-4	AO2 4.4.2.3 4.2.2.1
	Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.	1-2	AO1 4.4.2.2 4.2.2.6 4.2.2.5 4.5.3.3
	No relevant content	0	
	Indicative content Responses may refer to either total or partial liver failure • no bile made (in the liver) ○ fats / lipids are not emulsified ○ surface area of fats / lipids not increased ○ pH of small intestine will not be alkaline / neutralised ○ enzymes (in small intestine) will not work effectively **or** (named) food not digested / absorbed ○ so may lose weight • lactic acid not broken down / oxidised ○ accumulation of lactic acid in blood / body ○ lactic acid is toxic **or** body will be poisoned ○ oxygen debt higher / prolonged ○ so muscle pain / fatigue • proteins / amino acids will not be broken down (in liver) ○ (amino acids) not deaminated ○ amino acids not made into urea **or** will not form ammonia ○ (however) any ammonia formed is toxic ○ so accumulation of amino acids in blood / body • liver does not break down / remove other toxins (like alcohol) ○ toxins accumulate in blood / body ○ body will be poisoned ○ so pain **or** jaundice **or** swollen liver **or** portal hypertension occurs • glycogen stores will not be formed ○ cannot control blood glucose ○ so hyperglycaemia / hypoglycaemia / diabetes / coma may occur		

Total			**15**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Question	Answers	Extra information	Mark	AO / Spec.Ref.
07.1		ignore add mAbs and dye to slide (unbound)		AO2 4.3.2.2
	bind fluorescent dye to mAbs		1	
	put (bound) fluorescent mAbs on the slide (and rinse off)		1	
	mAbs will bind to Candida albicans / pathogens and show up under the microscope	allow mAbs will bind to Candida albicans / pathogens and show up under UV (lamp)	1	
07.2	more Candida albicans / pathogens will be engulfed / killed by phagocytes / white blood cells	allow Candida albicans / pathogens will be engulfed / killed by phagocytes / white blood cells more quickly do **not** accept white blood cells produce antibodies do **not** accept lymphocytes engulf Candida albicans	1	AO2 4.2.2.3 4.3.1.6 4.3.1.7
	therefore less damage to cells / tissues / organs	ignore less toxin released (by Candida albicans)	1	

07.3	**Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	4-6	AO1 4.3.1.9
	Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.	1-3	
	No relevant content	0	
	Indicative content • given first to healthy volunteers o at (very) low dose o to test it is safe **or** to test for toxicity **or** to check for any side effects • then to some patients (with the disease) **or** people with the disease o to test for the correct / optimum dose o to check for any side effects o to test for efficacy **or** to test if it works o in a double blind trial o where neither patients nor doctors know who has the mAbs and who has a placebo (or alternative treatment) • reference to large trial **or** long duration **or** control variables		

07.4	any **one** from: • (the body will) not reject the mAbs **or** (the body is) less likely to reject the mAbs • mouse mAbs are (more likely to be) rejected • the human lymphocytes have already responded to that infection / cancer cell so they are known to work against the disease	do **not** accept idea of rejection of cells	1	AO3 4.3.2.2 4.3.2.1 4.3.1.6

Total			**12**

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 34 · Examiner comments November 2020 | 8461/1H | Original Q6

Question 6 (standard/high & high demand)

Throughout this question many students missed out on marks because they had not read the stem of the question, and its supporting information, carefully enough. In addition, when the use of data is specifically asked for in a question, students need to provide the appropriate data to achieve full marks.

In **06.7**, many students could not comprehensively name one function of the liver, with many confusing its role with that of the kidney. Some students thought that digestive enzymes were produced in the liver and that bile neutralises the acid within the stomach, rather than in the small intestine.

Answer 35 · Examiner comments November 2021 | 8461/1H | Original Q3

Question 3 (standard demand)

Many students struggled to articulate themselves in describing the pattern shown in the table for **03.3**. Students provided many different, incorrect descriptions of increasing BMI category, including 'going down the BMI category' (implying the BMI is getting lower, but meaning going down the table), 'going down the table', 'getting fatter', 'having more weight', 'the worse the BMI' and 'being less healthy'. It is important that students plan their answers carefully before putting pen to paper and that they use the information given in the table when structuring their responses.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 36 · Examiner comments — June 2022 | 8461/2H | Original Q3

Question 3

This was the final common question on the topic of insulin and blood glucose, and the relationship between obesity and Type 2 diabetes.

03.1 Around three-quarters of students were able to state a time on the graph in **Figure 2** at which the concentration of insulin in the blood would be high – i.e. corresponding to a high blood glucose concentration. The most common error was to select a time when blood glucose was low, at 2.5 hours.

03.2 While the vast majority knew that insulin would lower the concentration of glucose in the blood, explanations of how this was achieved varied in detail. Some referred to the glucose being taken out of the blood without stating that it went into the body cells, or into organs such as the liver or muscles. Some correctly included the conversion of glucose to glycogen. Full marks were awarded to around half of the students.

03.3 and **03.4** These questions involved interpretation of the height – body mass graph in **Figure 3**. Over 90 percent of students correctly deduced that person **A** was underweight, but fewer than three-quarters could give sufficiently precise values for the range of healthy weights for person **B**, given a height of 1.9m, even though this fell on a major gridline.

03.5 This question involved the selection of appropriate data from a simple table that compared blood concentratons of cholesterol, glucose and insulin in an obese person with mean values for people who did not have Type 2 diabetes. Around half the students were able to point out that person **C** had *higher* concentrations of both glucose and insulin. Simply quoting figures from the table, without a comparison, was inadequate, as was the use of a non-comparative term such as 'high' concentration. Any mention of cholesterol was deemed inappropriate – the question tested the selection of *relevant* data.

Answer 36 · Examiner comments — June 2022 | 8461/2H | Original Q3

03.6 Nearly all students knew that exercise was a means of reducing the chance of developing Type 2 diabetes. Most also knew that 'diet' was relevant but many answers, such as 'a heathy diet' or 'a balanced diet' were inadequate; it was necessary to state that the diet contained less sugar / carbohydrate / fat or involved weight loss.

Answer 37 · Examiner comments

Question 1 (standard demand)

01.1 93% of students selected the correct answer in this question.

01.2 50% of students achieved one mark in this question, with 38% gaining full marks. Many students believed that the principle reason for putting pressure on the heart was to restart the heart first and then to get the blood flowing generally to the lungs to get rid of carbon dioxide and to collect oxygen.

01.3 Three quarters of students answered this question correctly. Of those that did not, the idea of forcing air into the lungs helping to restart breathing was often given, but with no link to carbon dioxide triggering breathing to restart.

01.4 75% of students were able to recall the term 'statins' from the specification, with a small number giving incorrect answers such as 'blood thinners', 'insulin' or 'anti-cholesterol drugs'.

01.5 Nearly three quarters of students achieved full marks in this question. Of the 20% that scored one mark, most did not elaborate on the idea of the vessel being wider and therefore, that more blood could flow.

01.6 50% of students gained no credit in this question and found making conclusions based on the results in Table 5 difficult. The data showed to what extent the percentage risk of getting four different cardiovascular diseases increased as a result of smoking when compared with people who had never smoked. As a result, all conclusions had to reflect both the increased risk and its association with smoking. They also needed to be comparative, either on the basis of one disease over all others, by using words such as 'most' or 'least', or on the basis of one disease over one other by using words such as 'more' or 'less'. Answers invariably failed to match all of these requirements. Some students also mistakenly believed that the results reflected the 'risk' or 'danger' of the diseases rather than the risk of 'developing' them. Other answers revealed the misconception by some that the letters E to H referred to individual people rather than to the different diseases.

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4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 37 · Examiner comments June 2024 | 8461/1H | Original Q1

01.7 Students' graph drawing skills were generally good, with 84% of students achieving full marks in this question. In the 12% of responses that scored three marks, the most commonly omitted feature was the *y*-axis label, and some students truncated their label so much as to omit the reference to 'risk', which was not creditworthy. Students should be reminded to ensure that they use a ruler for graph drawing, as a number attempted to draw their bars freehand, resulting in missing out on credit due to inaccuracy.

01.8 68% of students answered this question correctly. The most common incorrect answers were those that lacked qualification, such as references to 'drinking alcohol' or to 'eating fatty foods', which needed the added idea of consumption of these being 'high'. Obesity was a common incorrect answer; it is not a lifestyle factor.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 38 · Examiner comments

June 2025 | 8461/1H | Original Q2

Question 2 (standard demand)

02.1 Nearly 80% of students gave a creditworthy answer to this question, very often by referring to heart disease or to Type 2 diabetes. Heart failure was considered too vague and did not gain credit. The most frequently seen error was one of omission when students simply suggested 'diabetes' without the qualification of 'Type 2'.

02.2 Nearly 60% of students achieved full marks in this question, with a further 32% achieving 2 marks. MP1 was occasionally missed due to labelling the axis with 'y' only, omitting to include 'arbitrary units' or the use of an incorrect scale. It was sometimes difficult to determine the plotted points in responses, because they were either far too small or far too large or were concealed by a very thick line of best fit. Students should ideally be advised to give clear crosses for plotted points and to draw graphs in pencil so that alterations can be made without any ambiguity. MP4 was usually awarded for a straight line which went through or between the majority of the plotted points, regardless of whether some of these had been incorrect. The most common error was to draw the line of best fit through the origin. It was rare to see students drawing straight lines between individual points but, where this alone was given, they did not match MP4.

02.3 77% of students answered this question correctly, with the most common incorrect responses including 'dot', 'line' or 'spot' graph, or references to conclusions in respect of correlations shown, such as 'directly proportional'.

02.4 99% of students gained credit in this question.

02.5 Over half of all students scored full marks in this question, correctly interpreting the results and using their knowledge of the starch test to explain the results shown in the table. A lack of acknowledgement of the command word (explain) and confusion over the colour changes at each temperature (thinking that at 30 °C, the enzyme was not working) were the most common errors seen. A small proportion of students incorrectly stated that iodine solution showed the presence (or absence) of both starch *and* sugar, or that the amylase itself was being broken down. Unspecific references to 'carbohydrates' in place of starch and / or glucose were not creditworthy.

02.6 53% of students gained credit in this question.

02.7 60% of students scored full marks in this question, with a further 28% scoring 1 mark, most commonly MP1. A substantial number of students gave their answers the wrong way around and the 'pancreas' was often chosen mistakenly in the context of being a site of production, rather than activity of, protease. Unqualified references to 'intestine' were frequently seen but were not credited and a number of students think that the liver is an organ that manufactures, and is a site of, digestive enzyme activity.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Answer 39 · Examiner comments

June 2025 | 8461/2H | Original Q9

Question 9 (Standard, Standard/high and High demand)

09.1

This question required students to provide two conclusions about the percentage of people with Type 2 diabetes, from data provided in the form of a bar chart. Two thirds of students scored 2 marks on this question.

Referring to 'diabetes' was sufficient for credit to be awarded, although 'it' was insufficiently clear without some qualification. Any student referring to Type 1 diabetes could not gain credit, but this was extremely rare.

Most students gained at least one mark, with nearly all describing the effect of age on the prevalence of Type 2 diabetes. This could be phrased in terms of an overall trend or a

description of one or other end of the age range. Some students referred to both ends of the age range as their two conclusions but could only be awarded one mark.

Descriptions of the effect of body weight on the prevalence of diabetes proved to be a little more problematic, with some suggesting that 'overweight people' have the highest percentage of diabetes; unfortunately, these students had not used the key sufficiently well, as 'overweight' was the middle category of body weight. Hence, students who described one or other end of the body weight scale were most successful, with answers such as 'diabetes is more common in obese people'.

Some students were confused by the information and wrote about the effect of age on body weight, 'people get more obese as they get older', which was not supported by the information and gained no credit. Other students attempted to describe both trends in one statement, often not clearly describing either trend.

09.2

Two thirds of students correctly identified the mean percentage of Hb-G after 12 weeks as being 7.65%

09.3

Around a third of students did not gain any marks in this extended response question. For credit, students were required to analyse information about two clinical studies on diabetes treatments. Students were expected to evaluate both the methods used and the effectiveness of the treatments in detail to be awarded a mark in Level 3 – achieved by just 20% of students.

The high demand of this question meant that a single statement for each of the usefulness of the drugs and the methods used was insufficient to access the lower mark in Level 1.

Many students did attempt to compare the usefulness of the drugs, with answers such as 'both drugs lower Hb-G levels', which even if seen in reference to the two drugs in statements well apart in the response, were still credited. Furthermore, a correct comparison of the relative impact of the two drugs in lowering Hb-G levels could gain credit for both drugs lowering Hb-G levels and for drug A having a greater effectiveness in this respect. However, many students referred only to the drugs 'changing Hb-G levels' or even for 'drug A changing Hb-G levels more than drug B' and could not gain credit for either of these statements.

In terms of comparing the methods used in the investigations, many students simply restated the methods or suggested alternative methods, such as 'investigation 1 should have used a placebo' which was not a clear comparison of the methods and gained no credit.

Some students were confused by the numbers of patients involved in Investigation 2, believing that only 1 patient had taken the drug, and 630 patients had been given the placebo.

Students should practise questions of this type in their studies and revision, as the command word 'evaluate' was not well understood in many cases. This requires students to make comparisons; in this case of the two investigations.

4.2.2.6 The effect of lifestyle on some non-communicable diseases

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.