AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.2.2.1

The human digestive system

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**7**
Available paper years	**2019–2024**

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.

4.2.2.1 The human digestive system

Answer 01 · Mark scheme June 2019 | 8464/B/1F | Original Q7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	amylase	allow phonetic spelling allow carbohydrase ignore references to source of enzyme e.g. salivary / pancreatic do **not** accept amylose	1	AO1 4.2.2.1
07.2	(partially permeable tubing) small intestine (water in test tube) blood	allow stomach ignore intestine unqualified do **not** accept large intestine allow plasma	1 1	AO3 4.2.2.1
07.3	(Starch): Iodine (solution) (Sugar): Benedict's (solution)	all allow phonetic spelling ignore iodide unqualified	1 1	AO1 4.2.2.1
07.4	enzyme had not started to work **or** none of the starch had been digested / broken down	allow idea of not enough time (for digestion)	1	AO2 4.2.2.1
07.5	(enzyme) digested / broke down starch to form sugar (however) not all the starch was digested / broken down		1 1	AO2 AO3 4.2.2.1
07.6	sugar molecules formed are small enough to pass through tubing (but) starch molecules too large (to pass through tubing)		1 1	AO3 4.2.2.1 AO2 4.2.2.1
Total			**10**	

4.2.2.1 The human digestive system

Answer 02 · Mark scheme

November 2020 | 8464/B/1F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	amylase	allow phonetic spelling allow carbohydrase do **not** accept amylose	1	AO1 4.2.2.1
06.2	small intestine		1	AO1 4.2.1 4.2.2.1
06.3	any **one** from: • greater magnification • higher resolving power	allow can see (smaller) sub-cellular structures / parts allow can see more detail (inside cells) allow reference to 3-D images	1	AO1 4.1.1.5
06.4	capillary		1	AO2 4.2.2.1 4.2.2.2
06.5	$20 = \frac{\text{image length}}{0.8}$ image length = 0.8 x 20 image length = 16 (mm)		1 1 1	AO2 4.1.1.5 RPA 1
06.6	diffusion		1	AO3 4.1.3.1
06.7	active transport	allow active uptake	1	AO3 4.1.3.3

4.2.2.1 The human digestive system

Answer 02 · Mark scheme

November 2020 | 8464/B/1F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.8	any **one** from: • respiration • to form glycogen • to make amino acids / proteins	allow as an energy source do **not** accept to make / use / create / produce energy allow to make lipid / fat	1	AO1 4.4.2.1 4.4.2.3

06.9	**Level 2:** Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	3–4	AO2 4.1.1.3 4.1.3.1 4.1.3.3 4.2.2.1
	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 • have (many) microvilli • (to) increase surface area • wall of villus only one cell thick **or** is thin • capillaries are close to surface • (so) short pathway • good blood supply • (to) transport food molecules away **or** to the body • (and) maintain a diffusion gradient • cells have many mitochondria • (where) respiration takes place • (where) energy is transferred • (as) active transport requires energy • energy is needed to absorb sugar / food / molecules For Level 2 must make links between structure and it's function		

Total		**14**

4.2.2.1 The human digestive system

Answer 03 · Mark scheme

November 2021 | 8464/B/1F | Original Q6

Question	Answers	Mark	AO / Spec. Ref.
06	**Level 3:** The method would lead to the production of a valid outcome. All key steps are identified and logically sequenced.	5–6	AO1 4.2.2.1 RPA3
	Level 2: The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.	3–4	
	Level 1: The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1–2	
	No relevant content	0	
	Indicative content **Protein** • grind up food • add Biuret (reagent / solution) **or** add copper sulfate (solution) **and** sodium hydroxide (solution) **or** add Biuret 1 and Biuret 2 • turns purple / lilac **Starch** • add iodine (solution) • turns black / blue-black / dark blue - ignore blue / purple **Sugar** • grind up food • mix with water • add Benedict's (reagent / solution) • heat mixture (≥ 65 °C) • in a water bath • turns (brick) red / orange / brown / green / yellow For Level 3 correct references to all three tests are needed.		
Total		**6**	

4.2.2.1 The human digestive system

Answer 04 · Mark scheme

June 2022 | 8464/B/1F | Original Q1

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	C		1	AO1 4.2.1 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.2 Mark with **01.3**	protease		1	AO1 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3 Mark with **01.2**	acidic reason: any **one** from: • produces (hydrochloric) acid • optimum / best condition for enzyme / protease to act	 allow contains (hydrochloric) acid allow optimum / best condition to digest food / protein allow ecf from question **01.2** allow to kill microorganisms / bacteria / pathogens	1 1	AO1 AO2 4.2.2.1 4.3.1.6

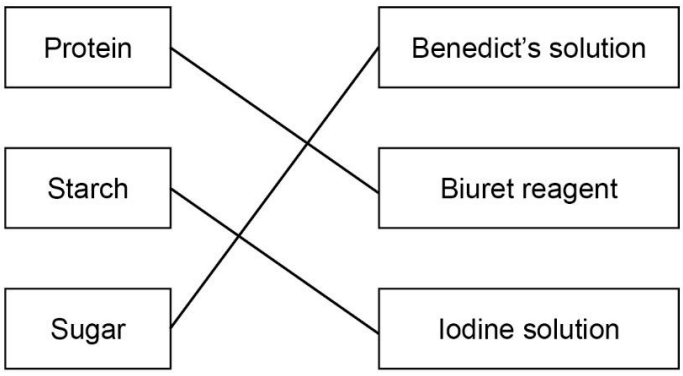
4.2.2.1 The human digestive system

Answer 04 · Mark scheme

June 2022 | 8464/B/1F | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	liver		1	AO1 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	it increases the surface area of fats		1	AO1 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.6	 all three correct for **2** marks one or two correct for **1** mark extra line from a box negates that box		2	AO1 4.2.2.1 RPA3

4.2.2.1 The human digestive system

Answer 04 · Mark scheme

June 2022 | 8464/B/1F | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.7	any **one** from: • wear goggles • use a water bath to heat the solution / mixture • wash spills from bench / skin	allow wash hands allow wear gloves ignore examples such as tie hair back or move bags under bench	1	AO1 4.2.2.1 RPA3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.8	Benedict's and iodine tests only		1	AO3 4.2.2.1 RPA3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.9	any **one** from: • starch (molecule) is (too) large • starch (molecule) is insoluble	allow idea that starch needs to be broken down into small / soluble molecules	1	AO1 4.2.2.1

Total Question 1		**11**

4.2.2.1 The human digestive system

Answer 05 · Mark scheme

June 2023 | 8464/B/1F | Original Q2

Question 2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	C		1	AO1 4.2.1 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.2	sugars		1	AO1 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.3	small intestine		1	AO1 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.4	pH of the amylase solution		1	AO1 4.2.2.1 RPA4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.5	● black ○ orange		1 1	AO2 4.2.2.1 RPA3 RPA4

4.2.2.1 The human digestive system

Answer 05 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.6	3(.0 minutes)	allow any value in the range 2.51 to 3.0 (minutes) do **not** accept 2.5 (minutes)	1	AO3 4.2.2.1 RPA3 RPA4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.7	pH 7		1	AO3 4.2.2.1 RPA3 RPA4

Total Question 2	**8**

4.2.2.1 The human digestive system

Answer 06 · Mark scheme

June 2023 | 8464/B/2F | Original Q7

Question 7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	humans have not found evidence of every species		1	AO3 4.6.3.2 4.6.3.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.2	fossils	allow fossil record allow remains of organisms allow DNA do **not** accept fossil fuels	1	AO1 4.6.3.1 4.6.3.2 4.6.3.3

Answer 06 · Mark scheme

June 2023 | 8464/B/2F | Original Q7

Question	Answers	Mark	AO / Spec. Ref.
07.3	**Level 3:** Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO2
	Level 2: Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.	3–4	AO2
	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
	Methods of reducing rate of evolution and linked explanation
	• doctors should not prescribe antibiotics inappropriately
	  ○ so fewer *C. difficile* are exposed to antibiotic(s)
	• do not use antibiotics to treat mild (bacterial) infection
	  ○ because the immune system can respond (to mild bacterial infection)
	• do not use antibiotics to treat (any) viral infections
	  ○ because antibiotics do not kill viruses
	• patients should complete their course of antibiotics
	  ○ so (more likely that) all *C. difficile* are killed
	  ○ so none survive to mutate (and form resistant strains)
	• the agricultural use of antibiotics should be restricted
	  ○ so fewer *C. difficile* are exposed to antibiotic(s)
	• hand washing after going to toilet
	  ○ will reduce spread of *C. difficile*
	• people with diarrhoea / *C. difficile* should stay away from school / work
	  ○ to reduce spread of *C. difficile*
	• develop new antibiotic against *C. difficile*
	  ○ so all *C. difficile* are killed
	  ○ so none survive to mutate and form (another) resistant strain
	• develop vaccine against *C. difficile*
	  ○ would decrease the use of antibiotics
	For **Level 3**, answers must refer to method(s) and linked explanation(s).
			4.6.3.4
			4.6.3.1
			4.6.2.2

Total Question 7	8

4.2.2.1 The human digestive system

Answer 07 · Mark scheme

June 2024 | 8464/B/1F | Original Q6

Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	any **two** from: • less (fructose / sugar) needed • cheaper to produce / buy the drink • less energy in the drink (so people are more likely to buy it)	ignore fructose is sweeter than glucose allow less (sugar) tax allow more profit ignore cheaper unqualified allow less calories / J / KJ in the drink allow less (fructose / sugar) needed so would be cheaper for **2** marks	2	AO3 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.2	add Benedict's (reagent / solution) heat reagent / solution green / yellow / orange / brown / (brick) red	 allow appropriate method of heating if a temperature is given, must be at least 60 °C ignore warm ignore starting colour	1 1 1	AO1 4.2.2.1 RPA3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.3	add Biuret (reagent / solution) mauve / purple / lilac / pink-purple	allow add Biuret A **and** Biuret B allow add potassium / sodium hydroxide solution **and** copper sulfate solution ignore starting colour	1 1	AO1 4.2.2.1 RPA3

4.2.2.1 The human digestive system

Answer 07 · Mark scheme

June 2024 | 8464/B/1F | Original Q6

Question	Answers	Mark	AO / Spec. Ref
06.4	**Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	4–6	AO1 4.2.2.1
	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 ***Protein*** • protease ○ (protein) broken down into amino acids ○ (protease) produced in the stomach ○ (protease) produced in the pancreas ○ (protease) produced in the small intestine ○ (hydrochloric) acid provides the correct pH for protease (in the stomach) ***Fat*** • lipase ○ (fat) broken down into fatty acids ○ (fat) broken down into glycerol ○ (lipase) produced by the pancreas ○ (lipase) produced by the small intestine ○ bile ○ (bile) produced by the liver ○ (bile) released from the gall bladder ○ emulsification of fats ○ larger surface area for lipase ○ neutralises acid to provide the correct pH for enzymes For **Level 2**, answers must describe digestion of fat **and** protein linked to correct type of enzyme for both		

Total Question 6	13

4.2.2.1 The human digestive system

Answer 03 · Examiner comments

November 2021 | 8464/B/1F | Original Q6

Question 6 (standard demand)

This was an extended response question which assessed knowledge of Required Practical Activity 3: using qualitative reagents to test a sample of food for protein, starch and sugar. A fifth of students did not attempt the question and half scored zero. It was evident that only a few students were familiar with the practical. Very little knowledge of food tests was demonstrated.

Concluding remarks

It was clear that in the unusual teaching circumstances leading up to this exam, it had not been possible for more some topics and practical work to be covered in the typical way. It was a small and seemingly atypical cohort of students who have chosen to take the autumn series of examinations. Gaps in both knowledge and skills were evident.

Mark Ranges and Award of Grades

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

4.2.2.1 The human digestive system

Answer 04 · Examiner comments — June 2022 | 8464/B/1F | Original Q1

Question 1 (low demand)

01.1 Three-quarters of the students correctly identified the stomach in the drawing of the human digestive system.

01.2 30% of students knew that a protease enzyme is produced in the stomach.

01.3 Most students scored at least one mark, for knowing the pH in the stomach is acidic. A quarter of students also scored the second mark for saying the stomach produces an acid, or that acidic conditions provide the optimum conditions for enzymes in the stomach to work. Most students said 'to digest food', which was insufficient.

01.4 Half of students knew that bile is produced by the liver. Most of the other students were evenly split between selecting the large intestine and the pancreas.

01.5 20% of the students said that bile increases the surface area of fats. More than half of the students thought that bile is an enzyme that digests protein.

01.6 More than half of the students scored both marks for identifying the reagents used to test for protein, starch and sugar. Where a single mark was scored, this was usually for knowing that iodine solution is used to test for starch.

01.7 76% of students scored the mark, usually for saying to wear safety goggles when using Benedict's solution. Quite a lot of students said wear gloves or wash hands, both of which were allowed.

01.8 42% of students knew the colours for positive test results when using Benedict's solution and iodine solution. More than half thought the colour blue represented a positive Biuret test.

01.9 Fewer than a fifth of students said that starch molecules cannot be absorbed into the blood because they are too big, or because they are insoluble. Many students said that starch is digested into sugar, but without reference to the size, or solubility, of the molecules. Quite a common answer was that starch would cause blood clots.

Answer 05 · Examiner comments — June 2023 | 8464/B/1F | Original Q2

Question 2

02.1 A third of students identified part C, the small intestine, as part of the digestive system that produces amylase. Almost half thought the stomach produced amylase.

02.2 Only just over a quarter of students knew that sugars are produced when starch is digested. Almost half thought starch is digested to form amino acids.

02.3 Over half the students knew that digested food is absorbed into the blood from the small intestine. Just over a quarter thought food was absorbed from the pancreas.

02.4 Half of the students correctly identified the pH of the amylase solution as the independent variable in the investigation.

02.5 A fifth of students scored both marks for interpreting the key correctly. They gave the colour of iodine solution as black when starch is present, and orange when starch is not present. A further

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4.2.2.1 The human digestive system

Answer 05 · Examiner comments

June 2023 | 8464/B/1F | Original Q2

two fifths of students scored 1 mark, usually for saying iodine solution is black when starch is present. Some students got the two colours the wrong way round. Green and white were common incorrect responses.

02.6 Only a quarter of students realised that the results showed that all the starch had been digested by 3 minutes. The majority gave the answer 2.5 minutes, which was the time of the last test when starch was still present.

02.7 Two fifths of students identified pH 7 as being the optimum pH for amylase to work. The majority thought pH 5 was the optimum.

4.2.2.1 The human digestive system

Answer 06 · Examiner comments

June 2023 | 8464/B/2F | Original Q7

Question 7 (Standard demand)

07.1 In this question students were asked to identify why the percentage of species that are extinct is only an estimate. Over 85% of students gave the correct answer.

07.2 Most students could state that fossils or DNA are used as evidence to study species that have become extinct. References to fossil fuels were seen and did not gain credit. A few students misread the question and gave details of the reasons why species become extinct instead.

07.3 This was an 'extended response' style of question. Such questions are marked holistically. There are overall generic descriptions for the three levels of response at the top of the scheme, giving a hierarchy of response. Within each level there are 2 marks.

In this question, students were asked to explain how the evolution of an antibiotic-resistant bacterium could be slowed down. As students were asked to explain how this could be done, it was necessary to link suggested actions with reasons in order to achieve higher level marks.

The question was not asking how antibiotic-resistant bacteria evolve in the first place and neither was it about genetic engineering.

Students achieving Level 1 gave simple unconnected but appropriate suggestions such as 'isolation of infected people' or 'don't use antibiotics when not necessary'. To enter Level 2 there had to be evidence of at least an attempt at linking an idea with the underlying reason(s) behind it together with some limited but additional relevant information. To enter Level 3 students had to make several appropriate points as well as show at least one clear, logical link.

The most frequently seen suggestion was that patients should complete courses of antibiotics. This was often correctly linked with the need to kill all *C. difficile* but fewer answers then went on to say that none would therefore (survive and) mutate to form resistant strains.

Simple rewording of the question did not gain credit. Answers that simply said 'so the bacteria would not be able to evolve and become antibiotic resistant' added nothing else to be credited.

Other points that were commonly made included references to isolation of patients and to hand washing. The question context here was of infection of the digestive system by *C. difficile* and, therefore, suitable qualification of hand washing, such as 'after going to the toilet' or 'before preparing food' was required in order for a strong, reasoned link to be credited. Vague answers relating to 'good hygiene' only were insufficient. Some students thought that diet and exercise would kill the bacteria.

Several students made references to doctors not prescribing antibiotics inappropriately but few students went on to explain why. Similarly, the reason for not using antibiotics for mild infections – 'the body's own immune system can respond effectively' – was rarely seen. Students do seem to appreciate, though, that antibiotics cannot kill viruses and so a mention of this linked to no antibiotics being used in such cases often gained credit.

Answer 06 · Examiner comments June 2023 | 8464/B/2F | Original Q7

Some answers suggested that new antibiotics might be developed but the idea that antibiotics can be made 'stronger' is incorrect. As with the point about completing courses of antibiotics, the advantage of a new antibiotic would need to be linked to 'all *C. difficile* being killed' or 'none could survive to mutate' in order to gain credit for a linked statement.

Some students commented on developing a vaccine against *C. difficile* but very few then managed to link this to an explanation.

The indicative content in the mark scheme can never cover all ideas that are worthy of credit, but are there to guide examiners. Other ideas such as 'Treatment with several antibiotics at the same time to kill all of them' was another appropriate method with linked explanation.

Many students referred to 'it' it their answer. Sometimes this meant antibiotics and other times this meant bacteria. We always read for context to make sense of the term 'it'.

'Immune bacteria' was not an acceptable alternative to resistant bacteria. It was assumed that bacteria referred to in a response meant *C. difficile*.

0 7 . 3 A bacterium called *Clostridioides difficile* (*C. difficile*) can infect the human digestive system.

C. difficile can multiply and produce toxins. The toxins cause diarrhoea.

Doctors are concerned that new strains of *C. difficile* may evolve.
Antibiotics may **not** be able to kill these new strains.

Explain how the evolution of antibiotic resistant *C. difficile* can be slowed down.

[6 marks]

the evolution of the antibiotic resistant C. difficile can be slowed down by getting people who have it on the antibiotics instantly and make sure they take the full course correctly. Another way to stop the evolution from happening so quick is by quarantining people who have it or have been near someone who had it to stop it spreading and developing fast. also staying out/away from lots of heat as that lets bacteria multiply faster.

The student (from a Foundation tier paper) has given bullet point 7 and then linked bullet points 14 and 15 from the indicative content. This exceeds the minimum requirement to meet the Level 2 descriptor, but does not meet the Level 3 descriptor, therefore 4 marks were awarded.

4.2.2.1 The human digestive system

Answer 06 · Examiner comments June 2023 | 8464/B/2F | Original Q7

0 2 . 3 A bacterium called *Clostridioides difficile* (*C. difficile*) can infect the human digestive system.

C. difficile can multiply and produce toxins. The toxins cause diarrhoea.

Doctors are concerned that new strains of *C. difficile* may evolve. Antibiotics may **not** be able to kill these new strains.

Explain how the evolution of antibiotic resistant *C. difficile* can be slowed down.

[6 marks]

Evolution of antibiotic resistant C. difficile can be slowed down if the overuse of the antibiotics used to treat this bacterial disease, is reduced by taking precautions. These might be ~~that it~~ making ~~the~~ the rules for its prescription more strict and actually having the regulations properly in place.
Another way is to encourage people to use full course of their antibiotic treatment even if the symptoms are relieved, because ~~the~~ when it is not used fully, ~~antibiotics~~ bacteria that's left alive can reproduce and develop resistance to the drug which is what ~~or~~ might cause it to evolve.
Also for lighter symptoms, if it is not serious, it might be better for the body to overcome the bacteria by itself to not ~~endure~~ introduce the drug to the bacteria.

The student (from a Higher tier paper) has given bullet point 1 from the indicative content. They link bullet points 7 and 8. In the final paragraph they link bullet points 3 and 4. This exceeds the minimum required for the Level 3 descriptor, therefore 6 marks were awarded.

Answer 07 · Examiner comments

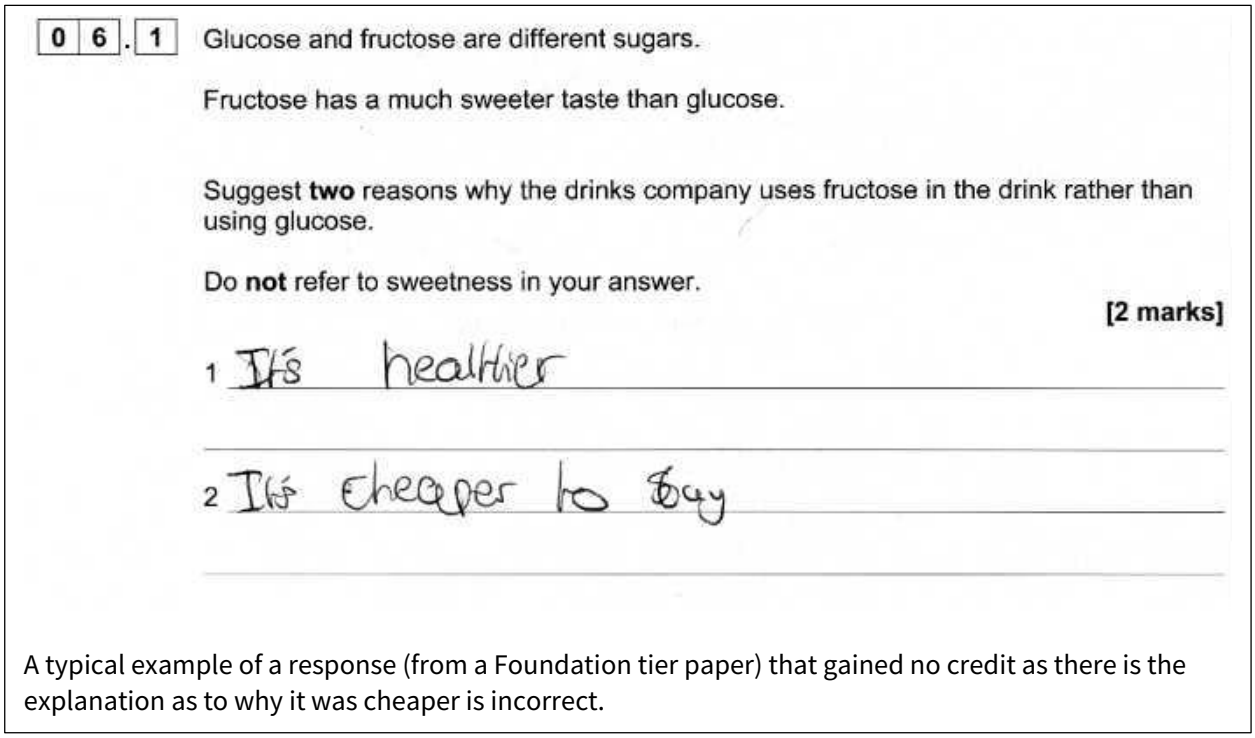
June 2024 | 8464/B/1F | Original Q6

Question 6 (standard demand)

06.1 Nearly all students attempted this question with 82% unable to gain any marks. Many made the link to fructose being cheaper but simply stated that 'it' or 'the fructose' would be cheaper or easier to get without stating why fructose would have been cheaper. Despite being told not to refer to sweetness some students still said the drink would taste better.

Several students suggested that more people with diabetes would buy the drink but had not linked this to why (less sugar used). Many students said that the company would sell more as people would like the sugary taste of it or that people would become addicted to the drink.

It was very rare to see the suggestion that the consumer would pay less sugar tax.



0 6 . 1 Glucose and fructose are different sugars.

Fructose has a much sweeter taste than glucose.

Suggest **two** reasons why the drinks company uses fructose in the drink rather than using glucose.

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

[2 marks]

1 It's healthier

2 It's cheaper to buy

A typical example of a response (from a Foundation tier paper) that gained no credit as there is the explanation as to why it was cheaper is incorrect.

06.2 Many students gained 2 out of 3 marks for this question.

Common mistakes were mixing up the chemicals and solutions. The incorrect solution most suggested was 'Biuret's solution', although many suggested iodine and a few Sudan III.

Simply stating 'use a water bath' was insufficient, as heating is needed for the test to work. 'Use a hot water bath' or 'heat in a water bath' would gain the marks.

Some students could not name a solution at all and simply stated 'heat it'. In the context of this question 'it' is the drink and such responses were insufficient as just heating the drink would not work.

Most students were able to gain the mark for the colour of the positive result, even though they could not name the correct solution.

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4.2.2.1 The human digestive system

Answer 07 · Examiner comments June 2024 | 8464/B/1F | Original Q6

06.3 A very limited number of students suggested adding potassium hydroxide without also adding copper sulphate and so were not awarded the mark. Even fewer students suggested using Biuret A and Biuret B.

Many students gave an answer of 'blue–purple' for the result, which was insufficient as it was not clear which colour the result was (blue or purple). However, blue to purple was accepted.

06.4 This question was not well answered on the Foundation tier paper and 55% gained no credit. Many students did not identify the two enzymes and therefore were unable to access Level 2. Many students made generic comments about enzymes and digestion sites but were unclear if they were talking about fats or proteins. Generic statements such as 'enzymes that digest proteins and fats are produced in the stomach' were ignored.

Many described the whole digestive system instead of specifically focusing on enzymes. The most common statements that were not creditworthy were that 'digestion begins in the mouth using amylase' and 'the stomach digests food using hydrochloric acid'.

Very many students did not give the site of production of each enzyme separately but said that protease and lipase are produced/found in the small intestine, pancreas, and stomach: stomach being incorrect for lipase. Some students, who clearly had some knowledge, found it difficult to get the facts into the correct order and had the products of digestion breaking down the enzyme (for example 'amino acids break down protease') or named amylase as the enzyme that breaks down proteins.

Students who were very knowledgeable of the role of enzymes in digestion were able to give enough linked information for 6 marks in just a few sentences.

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4.2.2.1 The human digestive system

Answer 07 · Examiner comments June 2024 | 8464/B/1F | Original Q6

0 6 . 4 The human digestive system breaks down protein and fat in the drink.

Describe how **protein** and **fat** are digested.

You should include:

- the enzymes involved
- where the enzymes are produced.

[6 marks]

- Enzymes are biological catalysts that speed up chemical reactions.
- Protease ~~are~~ are made in the stomach, pancrease, and small intestine, and it breaks down proteins into amino acids.
- lipease are made in the pancrease and small intestine, it breaks down fats into fatty acids.
- Enzymes are produced in the stomach
- ~~Bile helps neutralise the acids~~
- They are then digested in the stomach where the acids ~~break~~ down the liquids.

This concise response gained 6 marks. The spelling of pancreas was taken as phonetically correct here and they are clear referring to an organ and not a different enzyme.

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