



Additional Assessment Materials
Summer 2021

Pearson Edexcel GCE (Biology A)

Resource Set Topic 1: Lifestyle, Health and
Risk

Question Paper

(Public release version)

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General guidance to Additional Assessment Materials for use in 2021

Context

- Additional Assessment Materials are being produced for GCSE, AS and A levels (with the exception of Art and Design).
- The Additional Assessment Materials presented in this booklet are an **optional** part of the range of evidence teachers may use when deciding on a candidate's grade.
- 2021 Additional Assessment Materials have been drawn from previous examination materials, namely past papers.
- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.

Purpose

- The purpose of this resource to provide qualification-specific sets/groups of questions covering the knowledge, skills and understanding relevant to this Pearson qualification.
- This document should be used in conjunction with the mapping guidance which will map content and/or skills covered within each set of questions.
- These materials are only intended to support the summer 2021 series.

(ii) Explain how atherosclerosis in one part of an artery could increase the likelihood of it developing in another part of the same artery.

(2)

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(iii) A haemorrhagic stroke occurs when a blood vessel in the brain bursts.

Which of the following would be the least helpful in reducing damage from this type of stroke?

(1)

- A** anticoagulant
- B** antihypertensive
- C** statins
- D** thrombin

(Total for Question 6 = 9 marks)

5 The food we eat contains carbohydrates, lipids and proteins.

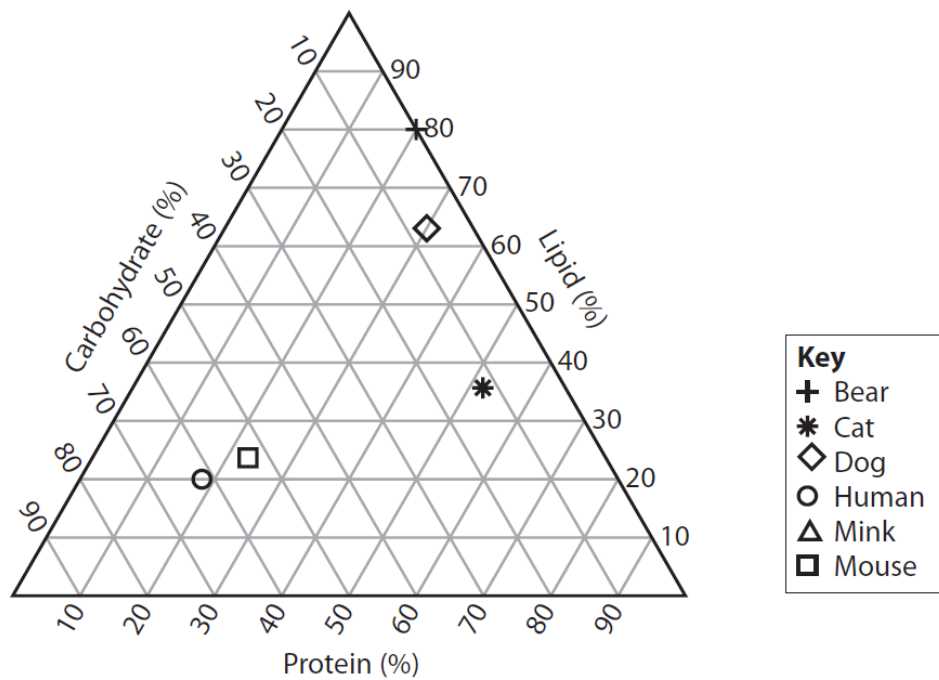
(a) Which of the following contains nitrogen atoms?

(1)

- A carbohydrate
- B glycogen
- C lipid
- D protein

(b) Mammals have diets containing different proportions of carbohydrates, lipids and proteins.

The diagram shows the composition of the average diet of some mammals.



(i) The diet of a dog contains 6% carbohydrate, 64% lipid and 30% protein. This is shown on the diagram as a diamond.

The diet of a mink contains 15% carbohydrate, 50% lipid and 35% protein.

Plot this on the diagram.

(1)

(ii) Which mammal will have a diet containing food with the highest proportion of ester bonds?

(1)

- A bear
- B cat
- C human
- D mouse

(c) Carbohydrates, lipids and proteins can be used as sources of energy.

The table shows the average daily energy requirements for boys and girls aged 13 to 18.

Age / years	Daily energy requirement / kJ	
	Boys	Girls
13	10 090	9 292
14	10 989	9 789
15	11 787	9 990
16	12 389	10 090
17	12 886	10 291
18	13 187	10 291

(i) Calculate the percentage increase in the average daily energy requirements for boys aged 17 compared with their energy requirements aged 13.

(2)

Answer %

(ii) Many foods are labelled in kilocalories (kcal). One calorie is equal to 4.18 joules.

Which of the following is the average energy requirements for girls aged 13 in kilocalories (kcal)?

(1)

- A 2.223 kcal
- B 222.3 kcal
- C 2223 kcal
- D 2 223 000 kcal

(iii) State what will happen to the additional energy if an individual takes in more energy than is required.

(1)

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(Total for Question 5 = 7 marks)

1 Starch is an important component of the human diet.

The main sources of starch are plants such as maize and potatoes.

(a) (i) Starch is composed of amylose and amylopectin.

Which of the following terms is the correct description of amylose?

(1)

- A disaccharide
- B monosaccharide
- C polysaccharide
- D trisaccharide

(ii) Starch can be broken down by a

(1)

- A condensation reaction involving ester bonds
- B condensation reaction involving glycosidic bonds
- C hydrolysis reaction involving ester bonds
- D hydrolysis reaction involving glycosidic bonds

(iii) Give **one** structural difference between amylose and amylopectin.

(1)

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(b) Explain how the structures of amylopectin and glycogen make them suitable for storing energy.

(3)

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(Total for Question 1 = 6 marks)

- 1 The photograph shows a young zebrafish that can be used to investigate the circulatory system. Zebrafish are vertebrates.



- (a) The effect of caffeine on the heart rate of zebrafish was investigated.

A zebrafish was placed in water and observed using a microscope. The number of heartbeats in one minute was counted and the heart rate was recorded. This was repeated to give three measurements of heart rate.

The water was replaced with a caffeine solution and the heart rate was recorded. This was repeated to give three measurements of heart rate.

The results of the investigation are shown in the table.

Treatment	Heart rate / beats min ⁻¹		
	Repeat 1	Repeat 2	Repeat 3
Water	124	120	112
Caffeine solution	184	172	156

- (i) State **one** variable that should have been controlled in this investigation.

(1)

(ii) Analyse the data to justify a conclusion for this investigation.

(2)

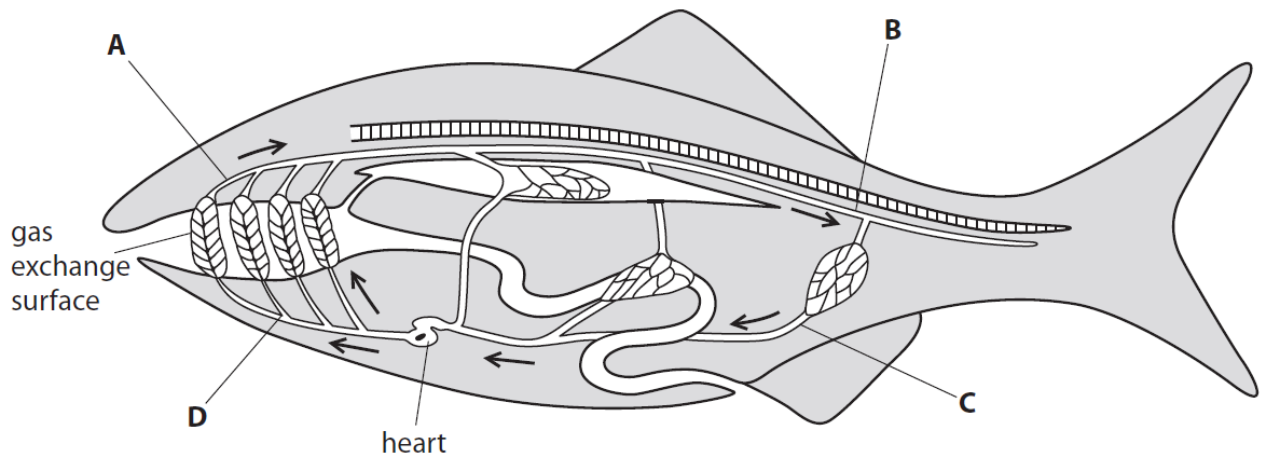
(iii) Explain the advantages of using young zebrafish for this investigation.

(2)

(iv) Give **one** reason why a different ethical issue has to be considered when using zebrafish instead of *Daphnia* in this investigation.

(1)

(b) The diagram shows the direction of blood flow in a fish.



(i) Which labelled part of this circulatory system has the lowest concentration of carbon dioxide?

(1)

- A
- B
- C
- D

(ii) Which labelled part of this circulatory system has the highest blood pressure?

(1)

- A
- B
- C
- D

(Total for Question 1 = 8 marks)

(ii) Explain why a snake needs a heart.

(2)

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(b) The image shows a cross section of a vein viewed with a light microscope. An eyepiece lens of $\times 10$ magnification and an objective lens of $\times 4$ magnification were used.



(Source from: <https://dissectionconnection.com.au/product/artery-and-vein-40x/>)

(i) Calculate the actual thickness of the wall of the vein between points X and Y. Give your answer in μm .

(3)

Answer..... μm

(ii) Explain how the structure of a vein relates to its function.

(4)

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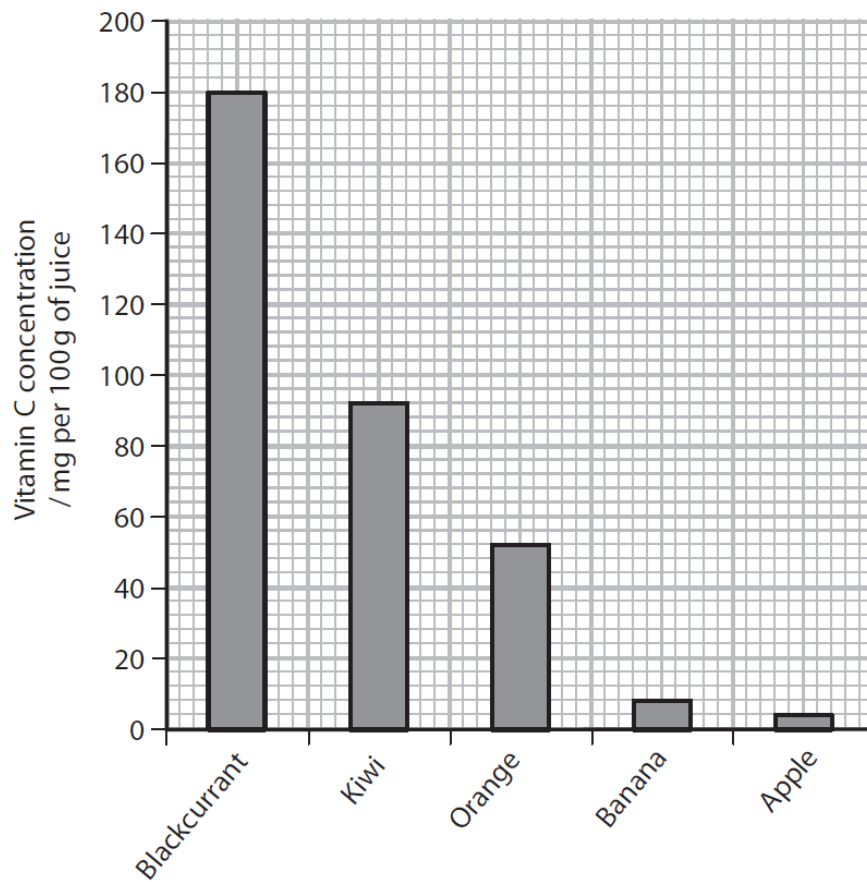
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(Total for Question 6 = 13 marks)

3 Fruit juices contain various concentrations of vitamin C.

The graph shows the vitamin C concentration of five fruit juices.



(a) Calculate the mass of orange juice required to provide the same mass of vitamin C that is in 100 g of blackcurrant juice.

(2)

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