

GCSE Biology B (Twenty First Century Science)
J257/02 Depth in Biology (Foundation)

Question Set 1

1 (a) Diabetes and cardiovascular disease are common diseases in the UK.

There are two different types of diabetes.

Put **one** tick (✓) in each row of the table to show whether the statement applies to **both types of diabetes**, **only type 1 diabetes**, or **only type 2 diabetes**.

Statement	Both types of diabetes	Only type 1 diabetes	Only type 2 diabetes
The person cannot control their blood sugar level.	✓		
The body stops responding to the insulin it makes.			✓
The disease can be treated using injections of insulin.	✓		
In the future, the disease could be treated using stem cells to replace insulin-secreting cells in the pancreas.		✓	

[4]

(b) Ben is a middle-aged man with type 2 diabetes.

He is worried because he has heard that having type 2 diabetes will mean he also gets cardiovascular disease.

What advice would you give to Ben?

To seek medical advice from a doctor. Also stop smoking and exercise more to reduce risk of developing cardiovascular disease. [3]

(c) A class of students is learning about cardiovascular disease.

They do a practical activity to investigate the levels of fitness of people in the class.

The students work in pairs to measure each other's resting pulse rate.

(i) They start by sitting quietly for five minutes.

Explain why they do this.

This will allow heart rate to return to normal. This will therefore allow them to see the effect of exercise on pulse rate. [2]

(ii) Describe how a student could measure the resting pulse rate of their partner

Use two fingers to press gently against an artery on the wrist of partner.

While pressing start a timer to 30 seconds and record number of pulses per minute.

(iii) The method that the students are working from says they should repeat the resting pulse rate measurement until they have enough data to calculate an average.

[3]

There are three types of average: **mean**, **median** or **mode**.

Suggest which type of average the students should calculate.

Put a **ring** around the correct answer.

[1]

Mean **Median** **Mode**

(iv) Suggest why it is a good idea to calculate the average selected in (c) (iii). [1]

Reduces effects of random error.

Each student then exercises for 3 minutes by stepping up and down on a bench.

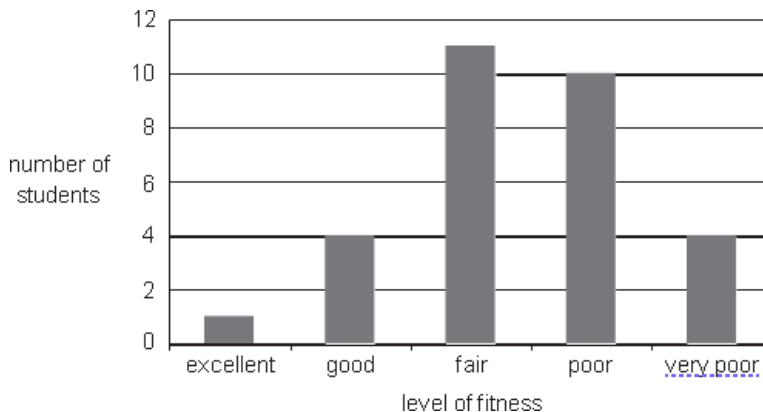
After 3 minutes, the student sits down and their partner immediately measures their pulse rate. Their partner measures the student's pulse again 1 minute and 2 minutes after exercise.

The resting and other pulse rates are used to calculate a 'fitness index score'.

A person's fitness index score gives an estimate of their level of fitness.

Fitness index score	Rating
90 and over	Excellent
80 - 89	Good
65 - 79	Fair
55 - 64	Poor
54 and below	Very poor

The class data is pooled and used to draw a bar chart.



(v) Use the table and the graph to help you answer these questions. [1]

How many of the students in the class have a fitness index score of 79 or lower?

Number of students = *25*

(vi) One of the students in the class has a fitness index score of 80.
How does their level of fitness compare to that of their classmates?

Their level of fitness is good as they are fitter than most people in the class. [2]

(vii) Some of the students in the class have suggested that the school should organise regular lunchtime exercise sessions.

Do you agree with their suggestion? [3]

Explain your answer and include supporting evidence from the class data.

YES because more exercise will improve the fitness of the students which is good for their health.
They need this as 4 of the students have good fitness and only 1 of the students has excellent fitness.

Total Marks for Question Set 1: 20

OCR

Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 2EA.

OCR is part of the Cambridge Assessment Group; Mbridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.