

STANBOROUGH

A Level Biology Induction Activity

Preparing for A Level Biology

Feedback

Total marks from section A (/20) _____

Total marks from section B (/13) _____

Total marks from section C (20) _____

This booklet needs to be completed and handed in to your Biology teacher at the start of your first lesson in September.

Section A .

Investigating the Fat Content of Milk

A student carried out a Quantitative Task investigating the fat content of milk. The procedure used is summarised on the Specimen Experiment Sheet provided.

1 The student calculated the **standard deviation** of the data around the mean for each milk sample.

The student did not complete the calculation of standard deviation for the skimmed cow's milk.

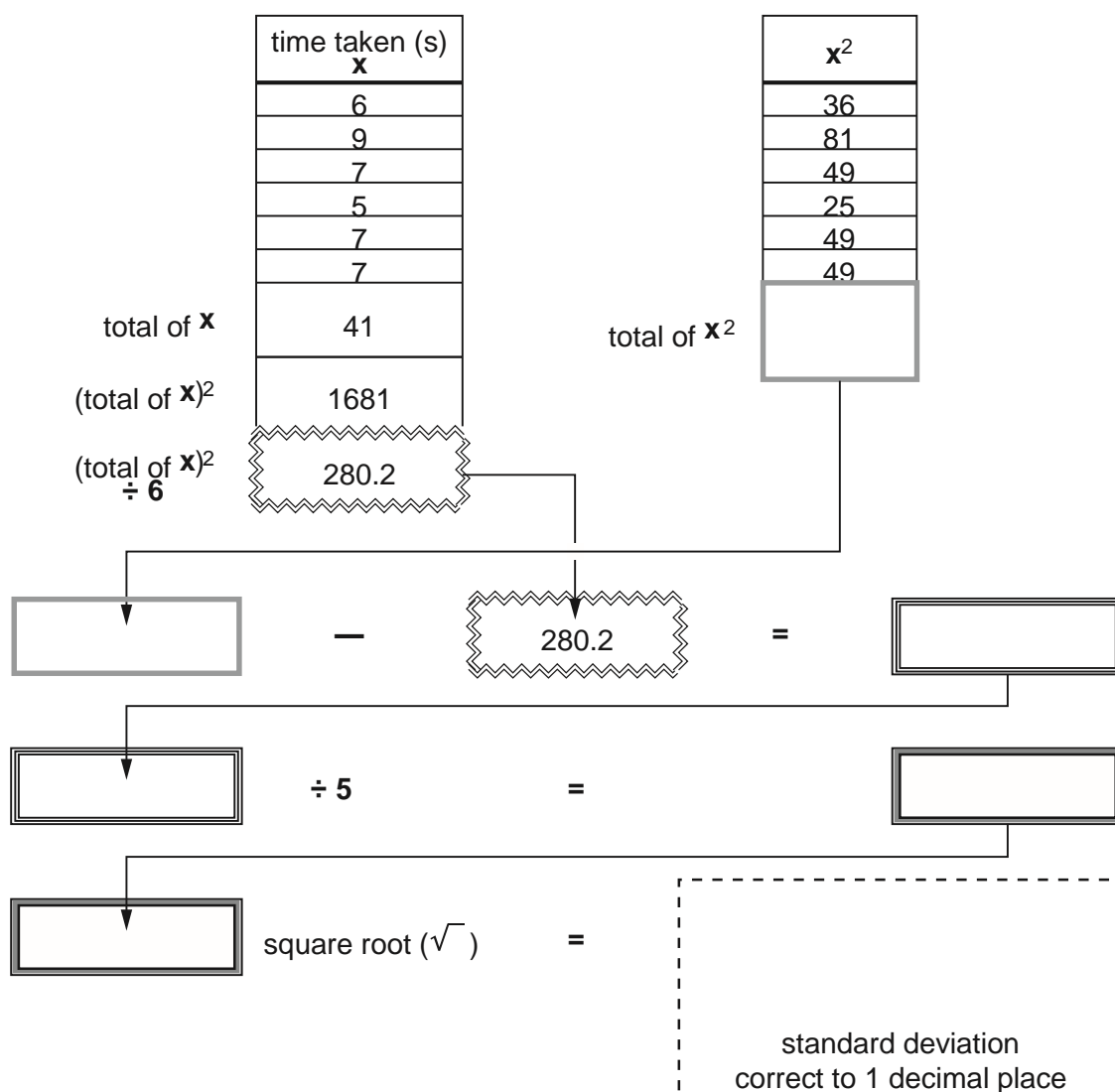


Fig. 1

[2]

Fill in the boxes in Fig. 1 below by performing the required mathematical processes to complete the calculation of standard deviation for the skimmed cow's milk sample.

2 Use the value for the standard deviation that you calculated in question 1 to complete Table 2.

Table 2

milk sample	standard deviation (s)
full-fat cow's milk	1.9
skimmed cow's milk	
full-fat soya milk	0.6

The student plotted the mean times for the three types of milk as a bar chart, as shown in Fig. 2.

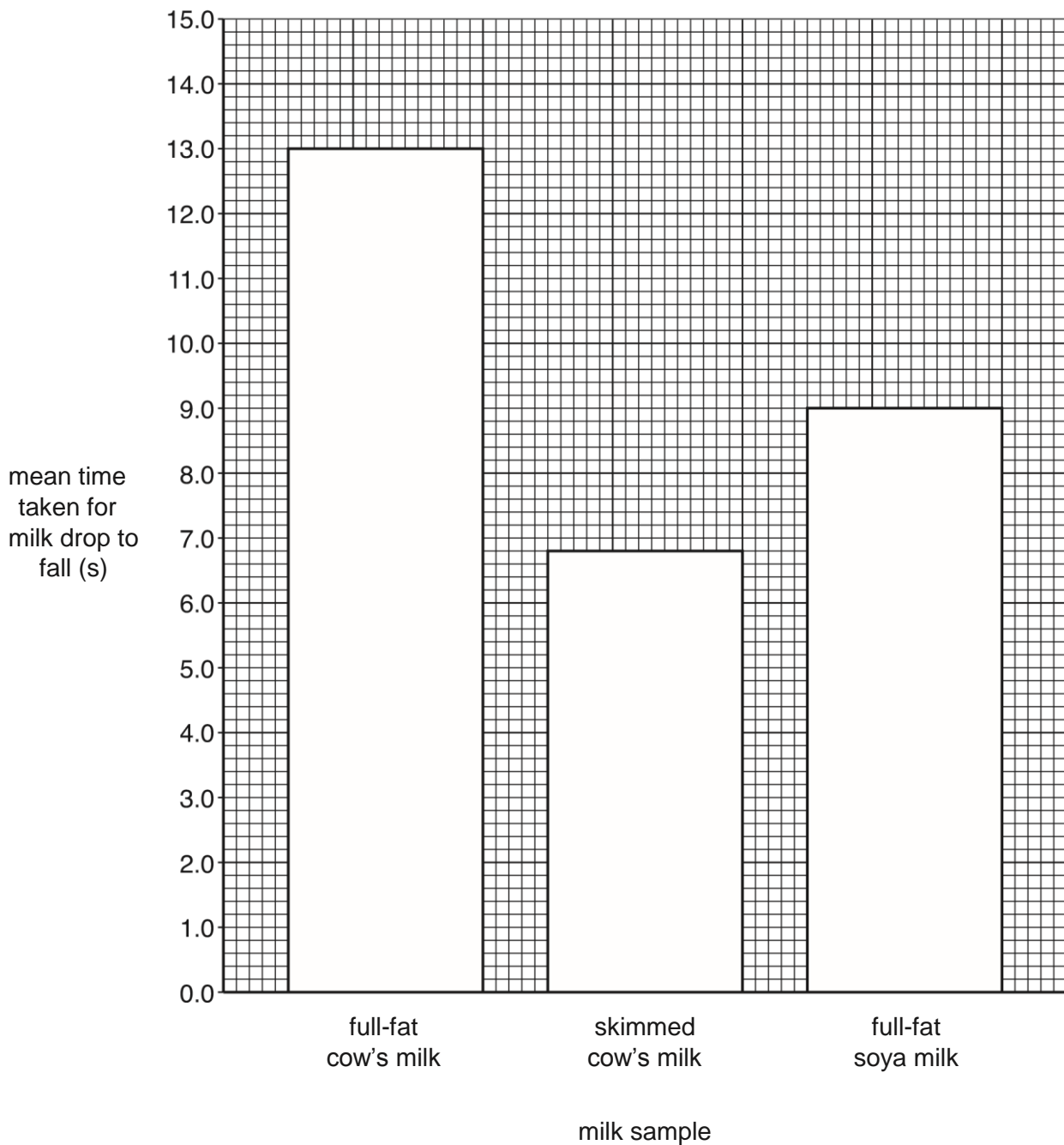


Fig. 2

- (b) The student concluded that there must be another factor, other than fat content, that contributes to the difference in the results obtained for skimmed cow's milk and skimmed soya milk. He suggested that the difference could be due to the proteins in the milk.

Suggest how the protein composition of cow's milk may differ from that of soya milk.

.....

[2]

- (c) All the milk used in the experiment was fresh.

UHT milk, which has been heated to a very high temperature, is also available.

Suggest why it was important that the milk used in the experiment was **not** UHT.

.....
[1]

- 4 (a) Consider the method that the student used to collect the data.

Identify **two** variables that were controlled.

Variable 1
 Variable 2[2]

- (b) State **why** it was necessary to control the two variables you have identified in 4(a).

Variable 1

 Variable 2
[2]

- (c) State **how** each of the two variables you have identified in 4(a) was controlled.

Variable 1

 Variable 2
[2]

Section B

Enzymes are often referred to as biological catalysts. A set of experiments were carried out on the enzyme *catalase* which helps to breakdown hydrogen peroxide into water and oxygen. The results of these experiments are in **Table 1**.

Table 1

Time (seconds)	Volume of oxygen produced (cm ³)			
	Replicate 1	Replicate 2	Replicate 3	Mean
0	0	0	0	
30	1.1	1.1	0.9	
60	1.8	1.9	1.9	
90	2.6	2.8	3.0	
120	3.3	3.3	3.5	
150	4.3	3.7	4.0	
180	4.6	4.6	4.3	
210	5.7	4.7	4.9	
240	5.0	5.2	4.8	
270	5.3	5.1	4.9	
300	5.5	5.0	5.0	
330	5.3	5.0	5.2	
360	5.4	5.0	5.2	
390	5.3	5.3	5.0	

- Calculate the mean volume of oxygen produced at each time to **3 significant figures** (1)
- Plot these results on suitable graph (4)
- Add range bars for each time (1)
- Using the information in **Table 1** and in your graph describe and explain the relationship between time and volume of oxygen produced (5)
- Which of the results could be classified as an anomalous result? What is an anomalous result? (2)

Section C

Research task

Assessed on

- Scientific knowledge
- Scientific communication

Create a 'model' that shows the structures and functions of the organelles found in **eukaryotic cells** (cell with a membrane bound nucleus and membrane bound organelles). Models in science are methods used to help us understand difficult or abstract concepts. This means you do not have to make a physical model of a cell (though you may want to) but you can be more creative. Some ideas include a poster, a cartoon strip, a story, a video or podcast. It is up to you.

In order to include all organelles it will need to be a plant cell.

Success criteria:

	The model includes;
Pass (5-10)	Organelles found in an eukaryotic cell (plasma membrane, cell wall, nucleus, lysosomes (there is a debate whether plant cells contain lysosomes add them for this task) , ribosomes, rough endoplasmic reticulum, smooth endoplasmic reticulum, vesicles, Golgi apparatus, mitochondrion, chloroplast) and a description of their function within the cell.
Good (11-15)	The main differences between an eukaryotic cell and a prokaryotic cell
Excellent (16-20)	An explanation of how organelles work together to make a protein

Where to find information to help you;

<http://www.s-cool.co.uk/a-level/biology/cells-and-organelles/revise-it/organelles> (Note: There is more detail about the structure of some organelles than you need to know at this point you are only expected to identify them and describe their function)

<http://www.mrothery.co.uk/cells/cellnotes.htm>

<http://alevelnotes.com/Cell-Structure/6#/?id=6>

<http://www.biologyguide.net/cells/ultrastructure.htm>

