

Guided Discussion of Results of the Investigation into the Effect of Exercise on Internal Body Temperature.

Name: _____

Date: _____

We did not have enough time to conduct as many trials as we know that we should to get reliable results..

1. To increase reliability in an investigation we should conduct more than one trial.

Explain why we should conduct more than one trial.

(3 marks)

2. Explain two methods to increase accuracy of measurement in this investigation. (2 marks)

Table 1 shows the average body temperature of Mrs Morritt taken over ten sessions on the stationary bike. Temperature measurements were taken over eighty minutes of exercise and the average over ten sessions calculated.

3. What do you observe about the time intervals in **Table 1**?

(1 mark)

Table 1. The effect of length of time spent exercising on average internal body temperature.

(Note: some of the data have been removed so that the table may fit on this page.)

Time spent exercising (min)	0	5	10	15	17	20	27	30	35	44	50	52	57	60	65	70	78	80
Body Temperature (oC)	37.0	37.5	37.0	36.5	36.7	37.0	36.7	37.0	36.5	37.4	37.0	36.8	36.7	37.0	37.5	37.0	37.0	37.2

4. Compare your results to the second-hand data shown in **Table 1** above.

(3 marks)

Figure 1. below shows the average body temperature of Mrs Morritt plotted over ten 80 minute sessions on the stationary bike

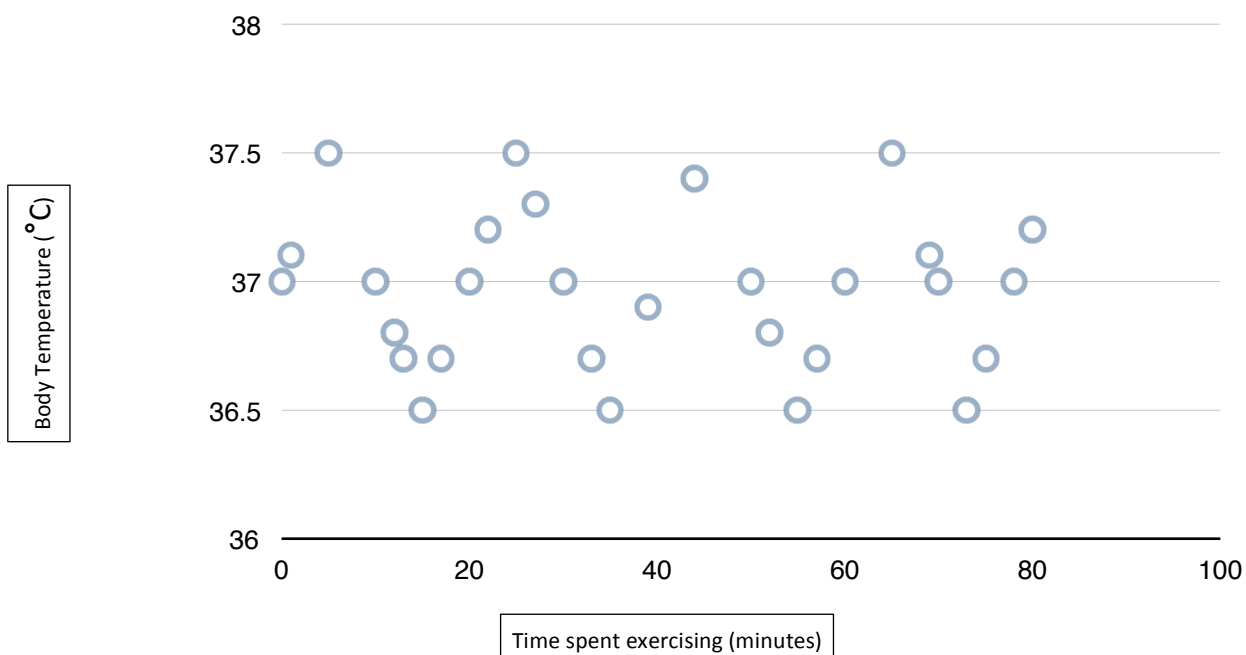


Figure 1. The effect of length of time spent exercising on internal body temperature.

5. Even though the data was not collected at even intervals of time the intervals on the axes of the graph must be even. Why must intervals on the axes be even?

(3 marks)

6. Use a pencil to join the points on the graph to make one continuous line. How would you describe the shape of the graph?

(2 marks)

7. What is the highest temperature reached? _____

(1 mark)

8. What is the lowest temperature reached? _____

(1 mark)

This type of graph is complex so is made of different parts.

9. Label the crest and the trough of the graph.

(2 marks)

10. Identify the temperature around which the graph line to oscillates (or goes up and down).

Draw a horizontal line in pencil at this point and starting at the Y axis. This line will be horizontal to the X axis. It represents the normal body temperature.

(1 mark)

11. The amplitude is the displacement (or distance) above the line you have drawn and the crest. Rule a vertical line in pencil to show the amplitude on the graph. (1 mark)
12. The amplitude is also the displacement (or distance) below the line you have drawn and the trough. Show the amplitude on the graph. (1 mark)
13. What is the value of the amplitude in degrees? _____ (1 mark)
14. Comment on the data that you collected over the time that you had in class in regard to seeing a trend like the graph in **Figure 1**. . (2 marks)

15. When this experiment is repeated many times with many different subjects we see the same type of graph. What does this graph show about body temperature in humans, even though they may feel hot as they exercise?

16. Which body tissues are responsible for **working** by contracting? (1 mark)

17. Contraction of this tissue requires energy. The cells of this body tissue contain a high density of mitochondria. Explain the function of mitochondria. (4 marks)

18. Write the word equation for this process. (1 mark)

19. Some of this energy is lost as heat energy. What would you expect body temperature to do as muscles contract repeatedly? (1 mark)

20. This increase in body temperature is called a stimulus. How would you expect the body of a mammal to respond? (2 marks)

21. Other observations were recorded during exercise; sweating and redness of the skin.
a. What effect does sweating have on body temperature? (2 marks)

b. Why does the skin appear redder? (1 mark)

c. Predict the effect on internal body temperature of bringing a greater volume of blood to the surface of the body. (2 marks)

22. A Flow Chart is a drawing that represents your thinking about a topic. It includes:

- Concept Terms (in boxes).
- One-way arrows that relate two Concept Terms.
- Linking phrases or words that label the arrows and describe the relationship between a pair of Concept Terms

On a left-side page draw a flow chart to summarise the science of this investigation. That is; explain what happens to body temperature as we exercise. Use the concepts; **stimulus, response, temperature increase, temperature decrease, negative feedback, homeostasis, mitochondria, cellular respiration, muscles, contract, work, energy, heat, sweating, redness of skin**

Wonder question. I wonder why the internal body temperature remains constant around a set point?

Evaluation of the Investigation

Address each of the dot points in the Evaluation Section of the Report Writing Template and hand in your work.