



## Notes for guidance

- 1 Your Plan should have a clear and helpful structure and should be illustrated by diagrams, tables, charts, graphs etc. as appropriate. Remember that these can often be used to replace words in the text. Diagrams should be relevant to the content of your Plan and positioned appropriately. Labels on diagrams, flow charts or tables should be clear and concise. Large blocks of text should be included in the word count.
- 2 You should take care to use technical and scientific terms correctly and to write in clear and correct English.
- 3 Your Plan should be handwritten or word-processed on A4 paper, which should have a hole punched at the top left-hand corner. Pages should be numbered and should have a clear margin on the right-hand side. **You must write (or print) on one side of the paper only** and each sheet should be marked with your Centre Number and Candidate Number.
- 4 You should show that you have consulted an appropriate range and variety of sources. At the end of your Plan you should list clearly the sources you have used. You should refer to these references in your Plan where appropriate. Where you have incorporated material which has been copied directly from a source such as a book or the Internet, this must be acknowledged in your Plan and details included in the references at the end. However, it should be noted that the inclusion of copied material will not in itself gain credit. The list of references should not be included in the word count.
- 5 Your Plan should be based on the use of standard equipment, apparatus, chemicals and other materials available in a school or college science laboratory.
- 6 Your Plan should be between 500 and 1000 words. A Plan that is in excess of 1000 words is likely to have poor structure and unselective choice of material, so that full credit may not be available. You should indicate the number of words in the margin of the Plan at approximately 200 word intervals.
- 7 When you have finished, tie the pages **loosely** together (or use a treasury tag), with this sheet on the top, so that the pages turn over freely. Your Centre will give you the date by which your Plan must be handed in.

### NOTICE TO CANDIDATE

The work you submit for assessment must be your own.

If you copy from someone else or allow another candidate to copy from you, or if you cheat in any other way, you may be disqualified from at least the subject concerned.

- 1 Any help or information you have received from people other than your subject teacher(s) must be clearly identified in the work itself.
- 2 Any books, information leaflets or other material (e.g. videos, software packages or information from the Internet) which you have used to help you complete this work must be clearly acknowledged in the work itself. To present material copied from books or other sources without acknowledgement will be regarded as deliberate deception.

### Declaration by candidate

I have read and understood the **Notice to Candidate** (above). I have produced the work without any help from other people apart from that which I have declared in the work itself. I have acknowledged all source materials in the work itself.

Candidate's signature: ..... Date: .....

## Planning Exercise

In this Planning Exercise, two marks are available for the quality of your written communication.

**This Planning Exercise is about the effect of calcium ions on the coagulation of milk.**

Milk is often considered to be a 'whole food' because it contains carbohydrates, proteins, fats, ions such as calcium, and some vitamins.

During the production of cottage cheese, the enzyme rennin is often added to milk to cause it to coagulate.

Calcium ions influence the activity of rennin in bringing about the coagulation of milk.

**You are required to plan an investigation to find out what effect changing the concentration of calcium ions has on the rate of coagulation of milk.**

The coagulation time is the time taken for flecks of curd to first appear on a microscope slide dipped into a sample of milk.

Calcium ions may be removed from milk by adding sodium citrate solution. This may be done by adding  $1\text{ cm}^3$  sodium citrate solution to every  $10\text{ cm}^3$  milk.

Calcium chloride may be used as a source of calcium ions.

Your planning must be based on the assumption that you are provided with the following:

- rennin solution
- milk
- a solution of sodium citrate
- $1.0\text{ mol dm}^{-3}$  calcium chloride solution
- school or college laboratory resources.

Give full details in your Plan of:

- the apparatus and materials to be used
- a detailed method to include procedures that you would adopt to ensure that the results obtained would be as precise and reliable as possible
- a risk assessment and safety precautions.

Indicate briefly how you would present and analyse your data to draw your conclusions.

You are strongly recommended to consult the descriptors for Skill P as given in Appendix C of the Biology Specification.

[14]

Quality of Written Communication [2]

[Total: 16]

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