Candidate Name	Centre Number					Candidate Number				
						0				

GCSE

SCIENCE (Double Award)

UNIT 7: (Double Award) PRACTICAL ASSESSMENT

SAMPLE ASSESSMENT MATERIALS

INVESTIGATING THE SUGAR CONTENT OF BISCUITS

SECTION A

(1 hour)

For Examiner's use only		
	Maximum Mark	**Mark Awarded**
Section A	**6**	

ADDITIONAL MATERIALS
In addition to this paper you will require a calculator.

INSTRUCTIONS TO CANDIDATES
Use black ink or black ball-point pen.
Write your name, centre number and candidate number in the spaces at the top of this page.
Write your answers in the spaces provided in this booklet.

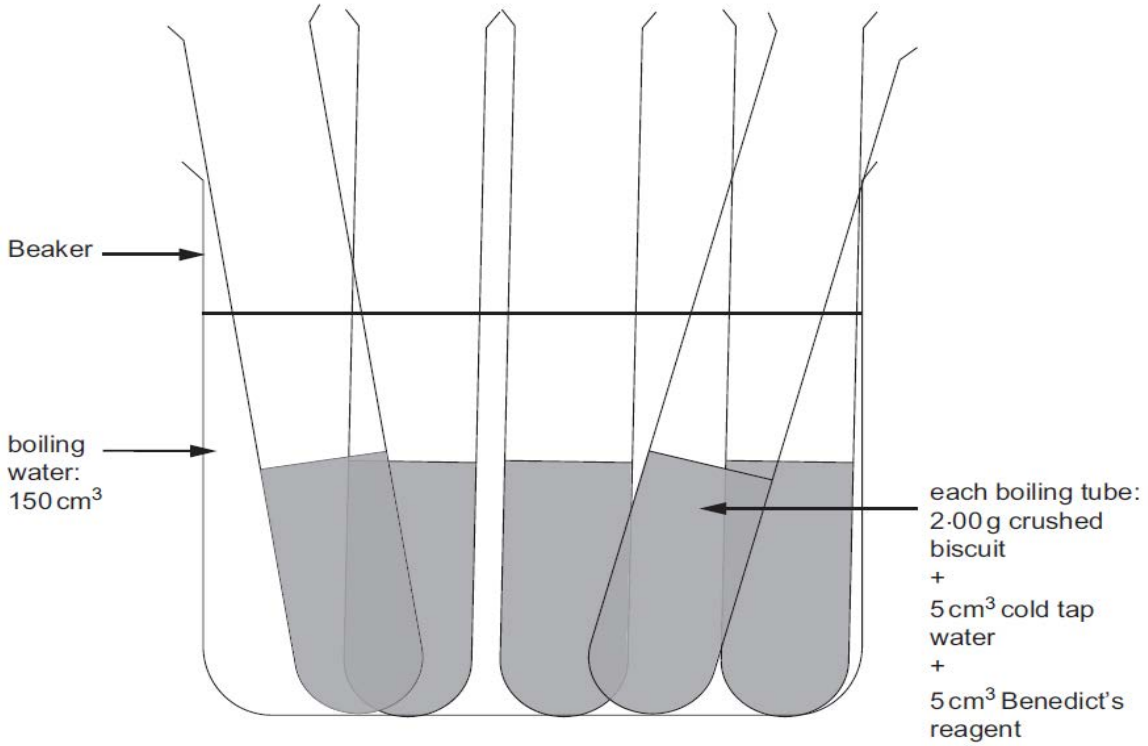
INFORMATION FOR CANDIDATES
The total number of marks available for this section of the task is 6.
The number of marks is given in brackets at the end of each question or part question.
This task is in 2 sections, **A** and **B**. You will complete section **A** in one session and section **B** in the next session.

SECTION A

Your task is to investigate the sugar content of different biscuits.

The following apparatus available for each group:

- A range of five different crushed biscuit types (2 × 2.0 g of each)
- 1 × stopwatch (± 0.01 s)
- 1 × 250 cm^3 beaker
- 2 × 10 cm^3 measuring cylinders
- 5 × boiling tubes
- Filter paper
- Benedict's reagent
- Kettle
- Spatula
- Balance (± 0.1 g)
- CLEAPSS student safety sheet 4 – Food testing (1)



Read the method and answer question 1(a) before carrying out the experiment and recording your results.

Method:

1. Label the five boiling tubes for each type of biscuit.
2. Transfer 2.0 g of each biscuit type into the correct boiling tube.
3. Using a measuring cylinder/syringe, transfer 5 cm^3 of cold tap water into each boiling tube.
4. Using another measuring cylinder/syringe, transfer 5 cm^3 of Benedict's reagent into each boiling tube.
5. Shake each tube gently to ensure that the contents are thoroughly mixed.
6. Pour 150 cm^3 of boiling water into the 250 cm^3 beaker.
7. Place the boiling test tubes into the boiling water and immediately start the stopwatch.
8. Record, to the nearest second, the time it takes for the Benedict's reagent to change from blue to orange/brick red in colour.
9. Repeat steps 1 to 8 to gain two sets of results in total for each biscuit.

Answer **all** *questions*

1. (a) Carry out a risk assessment **for this experiment**.

Describe how each hazard may result in a risk of injury. Describe the control measures needed to minimise each risk. [2]

HAZARD	RISK	CONTROL MEASURE
Benedict's reagent: is an irritant		
Boiling water: can cause burns.		

You may record raw results in the space below.

(b) Present your results in a table; include all of your results and the mean time taken for the Benedict's solution to change from blue to orange/ brick red for each biscuit type. [4]

6

END OF PAPER

Candidate Name	Centre Number					Candidate Number				
						0				

GCSE

SCIENCE (Double Award)

UNIT 7: (Double Award) PRACTICAL ASSESSMENT

SAMPLE ASSESSMENT MATERIALS

INVESTIGATING THE SUGAR CONTENT OF BISCUITS

SECTION B

(1 hour)

For Examiner's use only		
	Maximum Mark	**Mark Awarded**
Section B	**24**	

ADDITIONAL MATERIALS
In addition to this paper you will require a calculator and your section **A** exam paper.

INSTRUCTIONS TO CANDIDATES
Use black ink or black ball-point pen.
Write your name, centre number and candidate number in the spaces at the top of this page.
Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES
The total number of marks available for this section of the task is 24.
The number of marks is given in brackets at the end of each question or part question.
This task is in 2 sections, **A** and **B**. You will have completed section **A** in a previous session.

SECTION B

Answer **all** *questions*

2. (a) (i) State the independent variable in this experiment. [1]

……

(ii) State the dependent variable in this experiment. [1]

……

(iii) State **two** variables that needed to be controlled **for this experiment**. Explain why you controlled each of these. [4]

Control variable 1: ……

Explanation: ……..

Control variable 1: ……

Explanation: ……..

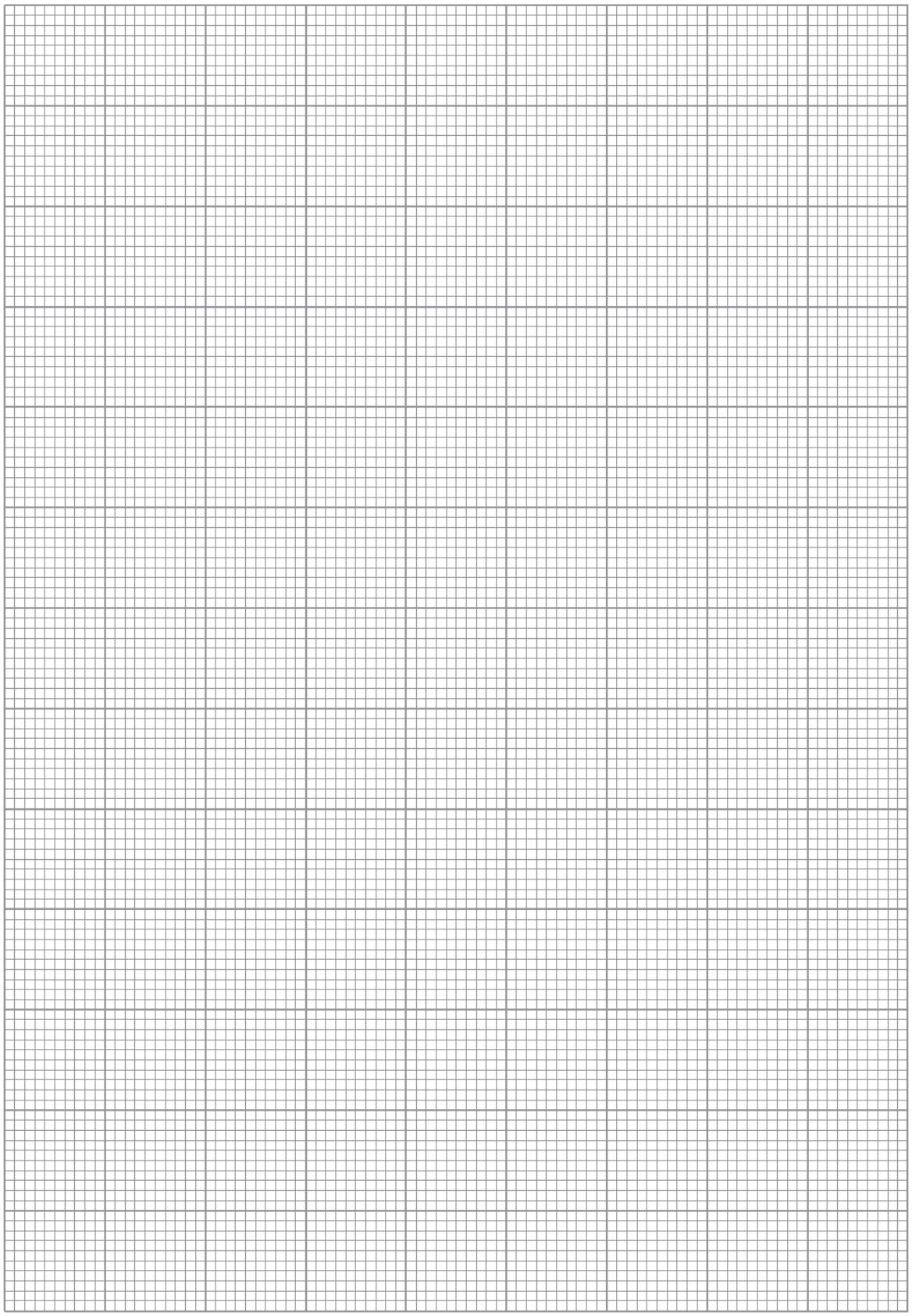
(b) Describe how you could set up a control tube for this experiment. [3]

……

……

……

(c) Use your results from section A to draw a graph of your results on the grid below. [4]



(d) What can you conclude about the sugar content of the biscuits tested? Explain your answer. [3]

……

……

(e) State the **main** source of uncertainty during this experiment. Describe how this uncertainty could be reduced. [2]

……

……

(f) Why does it make sense to record the time to the nearest second rather than tenths or hundredths of a second? [1]

……

……

(g) Angharad tests the sugar content of three types of biscuit (A, B and C). She times how long it takes for the Benedict's reagent to change colour. She repeats each biscuit three times.

Biscuit	Trial 1	Trial 2	Trial 3	Mean
A	361.8	355.3	347.2	354.8
B	315.4	329.3	333.5	326.1
C	303.9	312.0	398.6	338.2

(i) Circle the anomalous result in the table. State why this result is anomalous. [2]

……

……

(ii) Angharad concluded that Biscuit **B** contained the most sugar. Another student disagreed with her. Suggest why the other student disagreed with her. [1]

……

……

(iii) State what **further** data would be needed to produce a more valid conclusion. [2]

……

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……

……

24

END OF PAPER

Candidate Name	Centre Number					Candidate Number				
						0				

GCSE

SCIENCE (Double Award)

UNIT 7: (Double Award) PRACTICAL ASSESSMENT

SAMPLE ASSESSMENT MATERIALS

INVESTIGATING THE REACTION BETWEEN ZINC AND COPPER SULFATE SOLUTION

SECTION A

(1 hour)

For Examiner's use only		
	Maximum Mark	**Mark Awarded**
Section A	**6**	

ADDITIONAL MATERIALS
In addition to this paper you will require a calculator.

INSTRUCTIONS TO CANDIDATES
Use black ink or black ball-point pen.
Write your name, centre number and candidate number in the spaces at the top of this page.
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INFORMATION FOR CANDIDATES
The total number of marks available for this section of the task is 6.
The number of marks is given in brackets at the end of each question or part question.
This task is in 2 sections, **A** and **B**. You will complete section **A** in one session and section **B** in the next session.

SECTION A

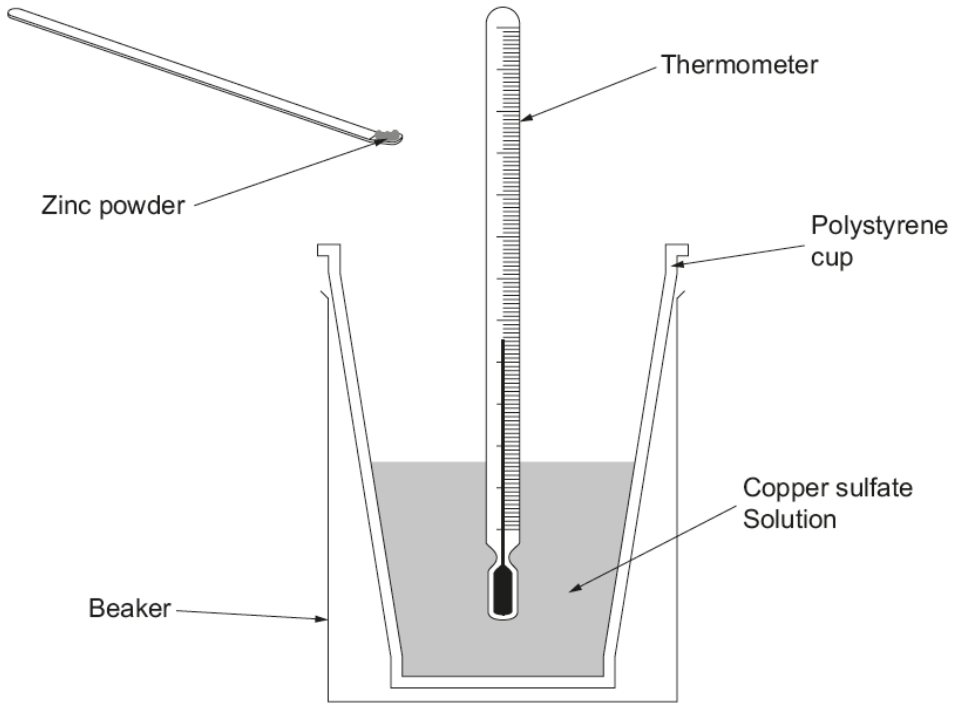
Introduction

Your task is to investigate the reaction between zinc and copper sulfate solution.

Apparatus

The following apparatus is required for each group:
(each group should consist of no more than three candidates)

- Polystyrene cup
- 100 cm^3 measuring cylinder
- 250 cm^3 beaker
- Safety goggles
- 50 cm^3 0.5M copper sulfate
- Zinc powder
- Microspatula



Read the method and answer question 1(a) before carrying out the experiment and recording your results.

Method:

1. Measure 50 cm^3 of copper sulfate into the polystyrene cup.
2. Stand the cup in a beaker to keep it stable.
3. Measure the initial temperature of the copper sulfate solution.
4. Add 1 microspatula of zinc powder to the copper sulfate solution and stir.
5. Measure and record the highest temperature reached by the mixture.
6. Calculate the temperature rise compared to the original temperature.
7. Repeat steps 4 - 6 until a total of 8 microspatulas of zinc powder have been added to the copper sulfate solution.
8. Repeat steps 1 to 7 to gain two sets of results in total.

Answer **all** *questions*

1. (a) Copper sulfate and zinc powder are irritants. Complete the risk assessment for copper sulfate using the template set out below. [1]

HAZARD	RISK	CONTROL MEASURE
Copper sulfate is an irritant/ harmful		

You may record raw results in the space below.

(b) Present your results in a table, including all of your results and the mean temperature rise for each spatula added. [5]

6

END OF PAPER

Candidate Name	Centre Number					Candidate Number				
						0				

GCSE

SCIENCE (Double Award)

UNIT 7: (Double Award) PRACTICAL ASSESSMENT

SAMPLE ASSESSMENT MATERIALS

INVESTIGATING THE REACTION BETWEEN ZINC AND COPPER SULFATE

SECTION B

(1 hour)

For Examiner's use only		
	Maximum Mark	**Mark Awarded**
Section B	**24**	

ADDITIONAL MATERIALS
In addition to this paper you will require a calculator and your section **A** exam paper.

INSTRUCTIONS TO CANDIDATES
Use black ink or black ball-point pen.
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INFORMATION FOR CANDIDATES
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This task is in 2 sections, **A** and **B**. You will have completed section **A** in a previous session.

SECTION B

Answer **all** *questions*

2. (a) (i) Identify the independent and dependent variables in the experiment completed in section A. [2]

independent variable: ……

dependent variable: ……

(ii) State **two** controlled variables from the method used in section A and give the value for each. [2]

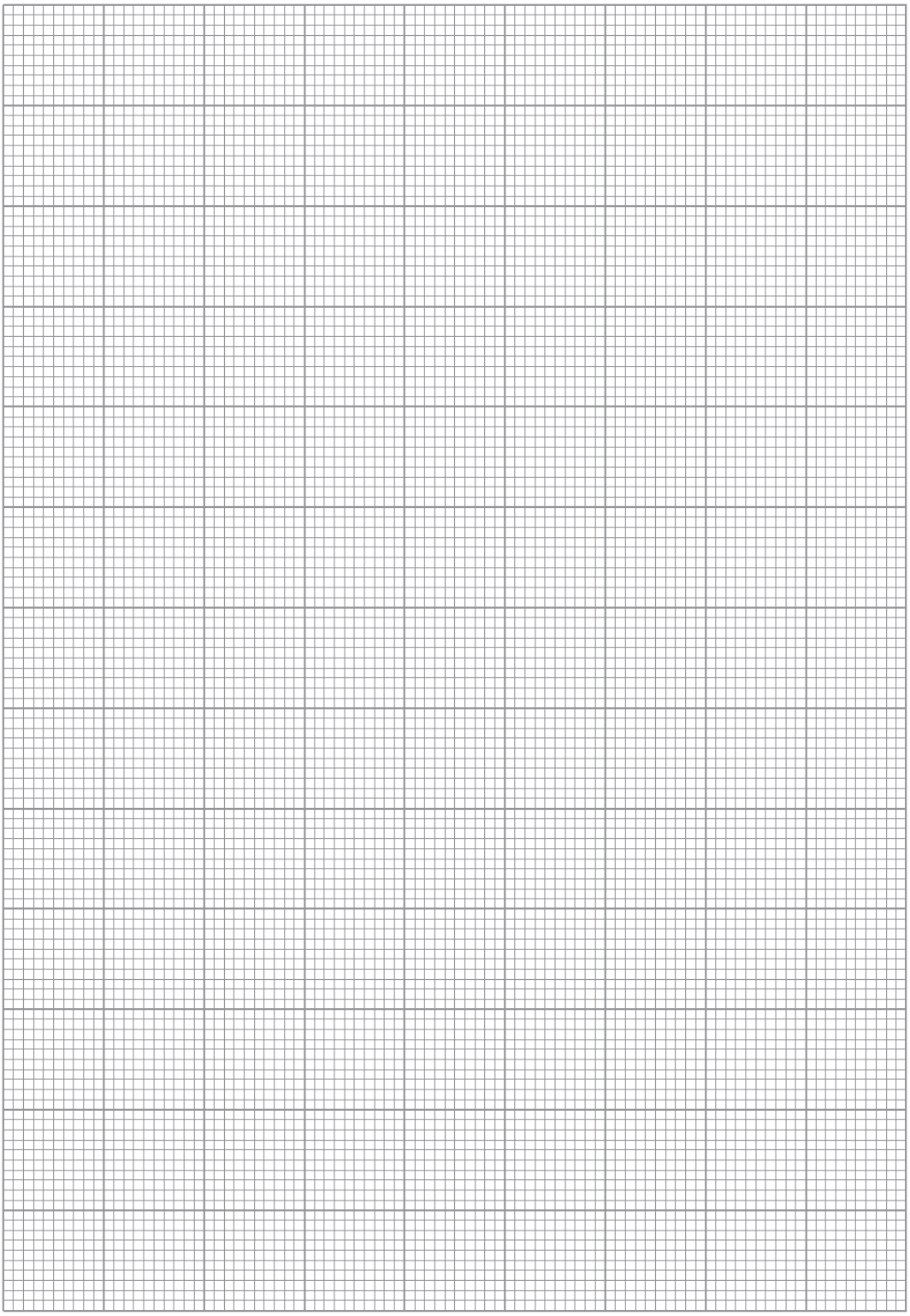
Controlled variable 1 ……..

value ……..

Controlled variable 2 ……..

value ……..

(b) Use your results from section A to draw a graph on the grid below. [5]



(c) Use your graph to describe the relationship between the quantity of zinc added and the temperature change. [2]

……

……

……

……

(d) Why is a polystyrene cup used to carry out the experiment? [1]

……

(e) (i) How could you change the apparatus/method used to ensure that the maximum temperature change was achieved? [2]

……

……

……

……

……

(ii) Identify **two** inaccuracies in the method and suggest an improvement for each. [4]

……

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……

……

(f) What is the name given to a reaction in which heat energy is given out? [1]

……

(g) What happens in terms of energy changes during the reaction that causes the temperature to rise? [2]

……

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……

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……

(h) Using the formula given below, calculate the maximum energy released during your experiment. [3]

$E = mc\Delta T$

where:

E = Energy released (J)

m = mass of solution used (1 cm^3 = 1 g)

c = specific heat capacity = 4.18 J/g °C

ΔT = temperature change ($T_{maximum}$ - $T_{initial}$)

energy released = ...J

24

END OF PAPER

Candidate Name	Centre Number					Candidate Number				
						0				

GCSE

SCIENCE (Double Award)

UNIT 7: (Double Award) PRACTICAL ASSESSMENT

SAMPLE ASSESSMENT MATERIALS

INVESTIGATING THE EXTENSION OF A SPRING

SECTION A

(1 hour)

For Examiner's use only		
	Maximum Mark	**Mark Awarded**
Section A	**6**	

ADDITIONAL MATERIALS
In addition to this paper you will require a calculator.

INSTRUCTIONS TO CANDIDATES
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INFORMATION FOR CANDIDATES
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This task is in 2 sections, **A** and **B**. You will complete section **A** in one session and section **B** in the next session.

SECTION A

Introduction

Your task is to investigate the extension of a spring.

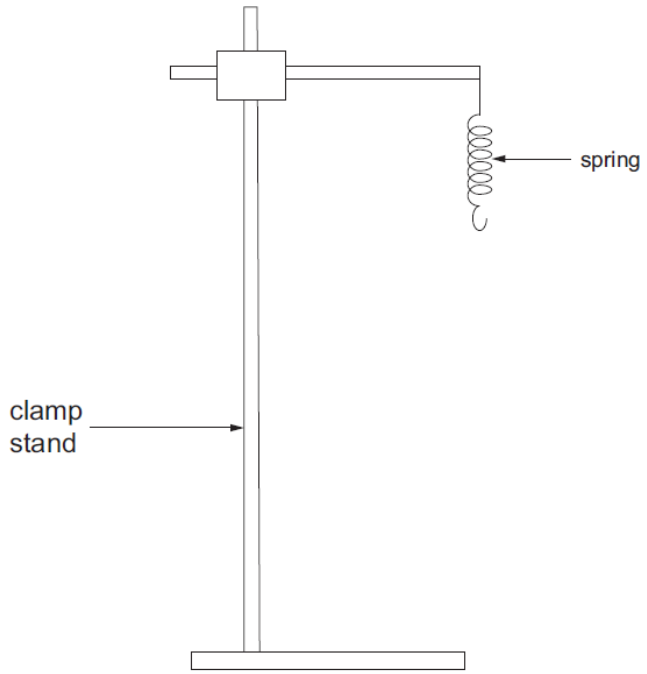
When a load is added to a spring it extends. The extension of a spring is the difference between the unstretched and the stretched length. The apparatus shown below can be used to investigate how the extension of a spring varies with the force stretching it. The force on the spring can be calculated from:

force (N) = mass (kg) × 10

Apparatus

The following apparatus is required for each group:
(each group should consist of no more than three candidates)

- 1 × expendable spring (spring constant 25 N m^{-1}) prestretched prior to use
- 1 × clamp stand and boss
- 1 × 30 cm ruler (resolution ± 1 mm)
- 1 × 100 g mass hanger and 5 × slotted masses



Read the method and answer question 1(a) before carrying out the experiment and recording your results.

Method

1. Set up the apparatus as shown in the diagram.
2. Use the ruler to measure the length of the spring.
3. Add a 100 g mass hanger to the spring.
4. Measure the new length of the spring.
5. Calculate the extension.
6. Repeat steps 3 - 5 until all masses have been added.
7. Repeat steps 1 - 6 to gain three sets of results in total.

Answer **all** *questions*

1. (a) Make a hypothesis for this experiment. [1]

……

……

You may record raw results in the space below.

(b) Present your results in a table, including all of your results and the mean extension for each value of the independent variable. [5]

END OF PAPER

Candidate Name	Centre Number					Candidate Number				
						0				

GCSE

SCIENCE (Double Award)

UNIT 7: (Double Award) PRACTICAL ASSESSMENT

SAMPLE ASSESSMENT MATERIALS

INVESTIGATING THE EXTENSION OF A SPRING

SECTION B

(1 hour)

For Examiner's use only		
	Maximum Mark	**Mark Awarded**
Section B	**24**	

ADDITIONAL MATERIALS
In addition to this paper you will require a calculator and your section **A** exam paper.

INSTRUCTIONS TO CANDIDATES
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INFORMATION FOR CANDIDATES
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This task is in 2 sections, **A** and **B**. You will have completed section **A** in a previous session.

SECTION B

Answer **all** *questions*

2. (a) (i) Identify the independent and dependent variables in this experiment. [2]

independent variable: ……

dependent variable: ……

(ii) Name **one** variable that must be controlled in this experiment. Give a reason for your answer. [2]

……

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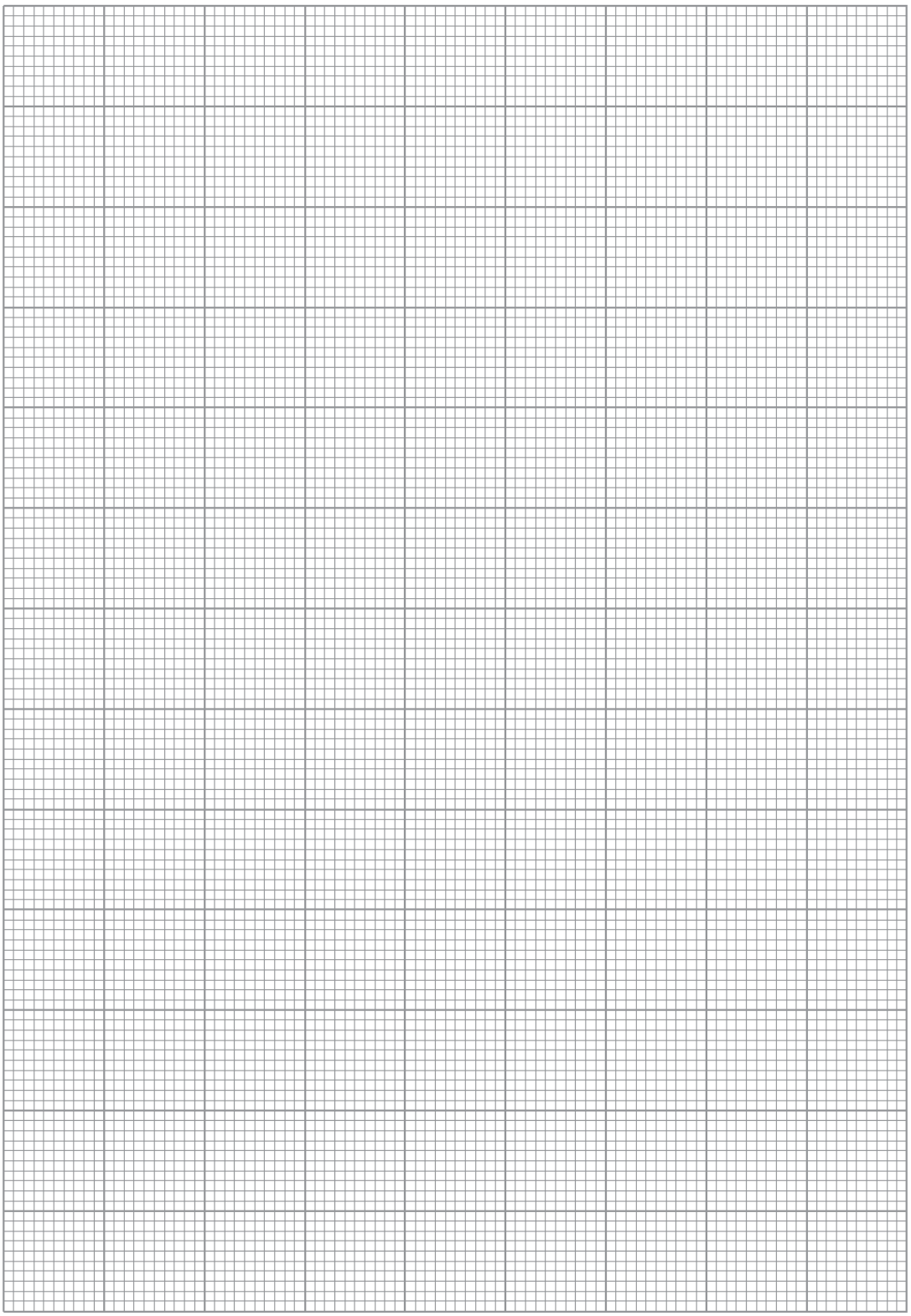
(b) A mass of 100 g provides a force of 1 N to the spring. Use this information and your results from section A to plot a graph of force (vertical axis) against extension (horizontal axis). [5]



(c) It is suggested that the extension is directly proportional to the force. Do your results support this theory? [2]

……

……

(d) The spring constant, k, is given by:

$$k = \frac{\text{force}}{\text{extension}}$$

Use data from your graph to calculate a value for the spring constant. Include a unit with your answer.

[3]

spring constant = ……..

unit = ……..

(e) The experiment is repeated with a spring which is twice as stiff. This means its spring constant is twice as big. Use the equation:

force = $k \times$ extension

to calculate the force required to give an extension of 0.5 m. [3]

force = …….. N

(f) Evaluate the quality of the data you have collected. You should consider accuracy and repeatability in your answer. [3]

……

……

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……

(g) Identify **one** source of inaccuracy in this experiment and state an improvement. [2]

……

……

(h) The experiment was repeated with an elastic band. The results are shown in the table below. Describe how the elastic band behaves differently to an ideal spring for which extension is directly proportional to force. [2]

Force (N)	Extension (mm)
1.0	102
2.0	303
3.0	470
4.0	579
5.0	653
6.0	732
7.0	800
8.0	860

……

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24

END OF PAPER