



GCSE

**MONDAY, 8 JANUARY – FRIDAY, 9 FEBRUARY 2024**

**APPLIED SCIENCE (Double Award) –  
Unit 5 (3445U50)**

**PRACTICAL ASSESSMENT**

**INVESTIGATING THE VITAMIN C CONTENT  
OF FRUIT JUICES**

**SECTION B**

**1 hour, plus your additional time allowance**

**Surname** \_\_\_\_\_

**First name(s)** \_\_\_\_\_

**Centre Number** \_\_\_\_\_

**Candidate Number**   0   \_\_\_\_\_



## **ADDITIONAL MATERIALS**

**A calculator and your Section A exam paper.**

## **INSTRUCTIONS TO CANDIDATES**

**Use black ink, black ball-point pen or your usual method.**

**Write your name, centre number and candidate number in the spaces provided on the front cover.**

**Answer ALL questions.**

**Write your answers in the spaces provided in this booklet. If you run out of space, use the additional pages at the back of the booklet, taking care to number the question(s) correctly.**

## **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 lesson.**

**(Turn over)**

<b>For Examiner's use only</b>		
	<b>Maximum Mark</b>	<b>Mark Awarded</b>
<b>Section B</b>	<b>24</b>	

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<b>Control variable</b>	<b>How it was controlled</b>

## SECTION B

Answer ALL questions.

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

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

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(iii) In the table on the opposite page, state TWO control variables in this experiment AND how they were controlled. [4 marks]

(iv) State the resolution of the syringe used in this experiment. [1 mark]

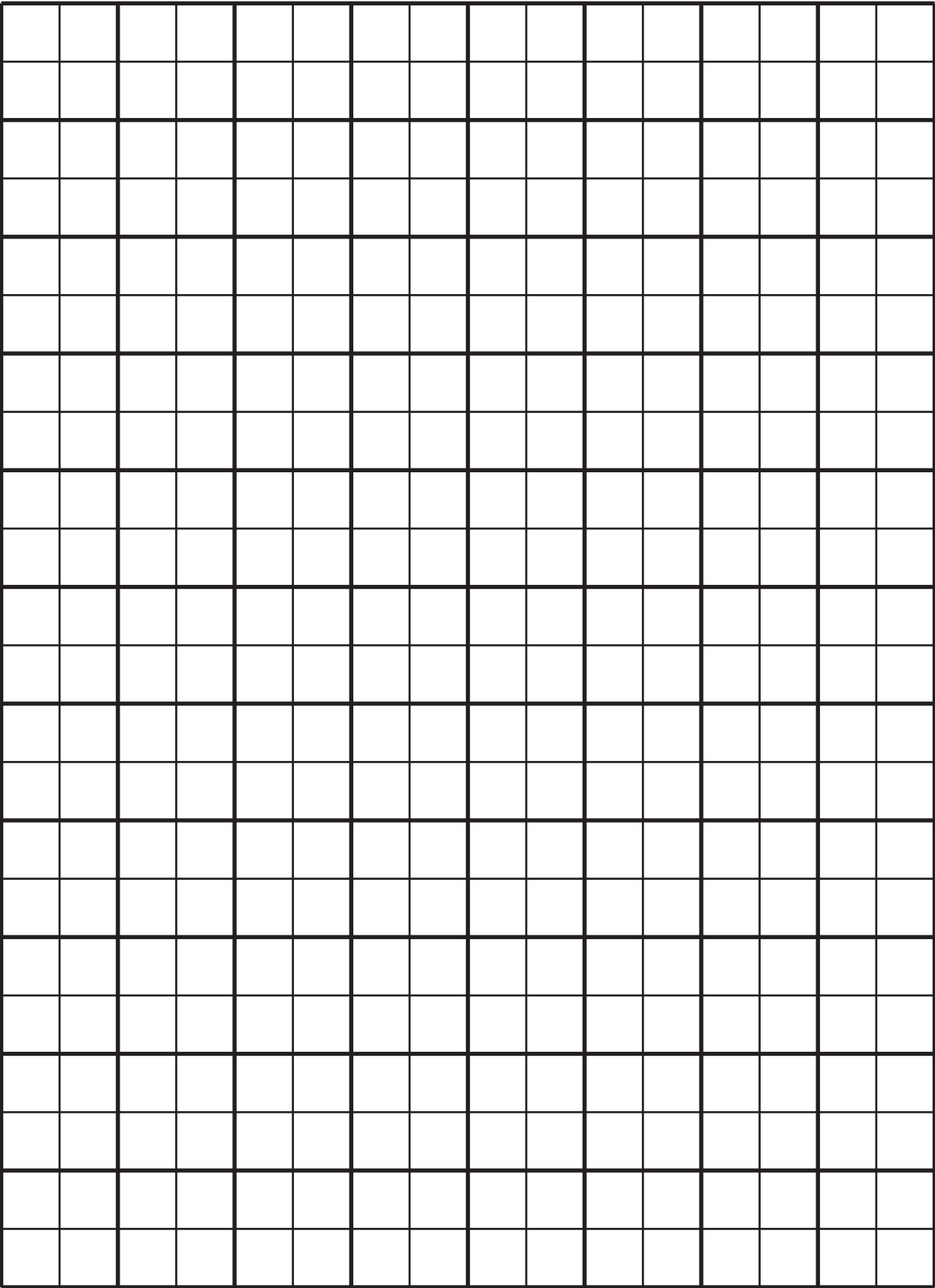
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- 2 (b) A student carried out an experiment to determine how many drops of known concentrations of vitamin C solution were needed to decolourise 1 cm<sup>3</sup> of a 0.01% solution of DCPIP.

The results are shown below.

Concentration of vitamin C solution (mg/cm <sup>3</sup> )	Number of drops needed to decolourise DCPIP
0.10	14
0.20	7
0.30	5
0.40	3
0.50	2

- (i) Use the results obtained by the student above to draw a graph of number of drops needed to decolourise DCPIP (vertical axis) against concentration of vitamin C solution (horizontal axis) on the grid on the opposite page. [5 marks]

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Type of juice	Number of drops needed to decolourise DCPIP				Concentration of vitamin C mg/cm <sup>3</sup>
	Trial 1	Trial 2	Trial 3	Mean	
orange	7	6	6	6	
pineapple	55	54	53	54	0.03
grapefruit	7	3	6	5	0.30

**2 (b)(ii)**

**The student carried out a similar experiment to the one you carried out in Section A to investigate the vitamin C content of the same fruit juices.**

**Their results are shown in the table on the opposite page.**

**Use the graph drawn in part (b)(i) and the table on the opposite page to calculate the concentration of vitamin C in the orange juice tested by the student.**

**WRITE YOUR ANSWER IN THE TABLE.**

**[1 mark]**



**2 (c) Before carrying out the experiment, the student put forward the following hypothesis, 'Orange juice contains more vitamin C per cm<sup>3</sup> than pineapple and grapefruit juice.'**

**(i) State whether the results in part (b)(ii) support this hypothesis. Use data from the table to explain your answer. [2 marks]**

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**2 (c)(ii)**

**Evaluate the repeatability of the data the student obtained in part (b)(ii). [2 marks]**

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**(iii) State why it is not possible to comment on the reproducibility of this experiment. [1 mark]**

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<b>Inaccuracy</b>	<b>Improvement</b>

2 (d) In the table on the opposite page, suggest **TWO** inaccuracies that may have affected the validity of the results you obtained **AND** suggest how each could be overcome.  
[4 marks]

(e) The recommended daily allowance (RDA) of vitamin C is 40 mg.  
In another experiment a student calculated that 1 cm<sup>3</sup> of apple juice contained 0.84 mg of vitamin C.  
Calculate the volume of apple juice the student would need to drink to reach their RDA of vitamin C. [2 marks]  
Space for calculation.

volume = \_\_\_\_\_ cm<sup>3</sup>

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**END OF PAPER**



<b>Question number</b>	<b>Additional page, if required. Write the question numbers in the left-hand margin.</b>



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