Centre Number						Candidate Number				
Surname						Other Names				

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.

Candidate Declaration. I have read and understood the Notice to Candidate and can confirm that I have produced the attached work without assistance other than that which is acceptable under the scheme of assessment.

Candidate Signature		Date	

Teacher's Initials	
Section	Mark
$1_{/18}$	
$2_{/16}$	
$PSA_{/6}$	
TOTAL (max 40)	

General Certificate of Secondary Education
June 2013

Human Health and Physiology 44152

Unit 2 Investigations in Human Health and Physiology
ISA 2 – Vitamin C

Valid for submission in May 2013

For this paper you must have:
- results tables and charts or graphs from your own investigation
- a calculator
- a ruler.

Time allowed 45 minutes

Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.
- Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 34.
- You are expected to use a calculator where appropriate.
- In some questions you will be marked on your ability to use good English, organise information clearly and use correct scientific words where appropriate.

Details of additional assistance (if any). Did the candidate receive any help or information from anyone other than the subject teacher(s) in the production of this work? If the answer is yes give the details below or on a separate page.

Yes ☐ No ☐

Did this candidate take part in the practical activity?	**YES / NO**

Teacher Declaration:

I confirm that the candidate's work was conducted under the conditions laid out by the specification. I have authenticated the candidate's work and am satisfied that to the best of my knowledge the work produced is solely that of the candidate.

Signature of teacher ..... Date .....

Section 1

These questions are about the investigation that you carried out about Vitamin C.

Answer **all** questions in the spaces provided.

1 This question is about the **independent** variable in your investigation.

1 (a) What was the **independent** variable (the variable that you deliberately changed)?

.....

(1 mark)

1 (b) Which term describes your **independent** variable?
Draw a ring around the correct answer.

Categoric **Continuous** **Controlled**

(1 mark)

2 (a) Name the reagent you used to compare the amount of vitamin C in your samples of juice.

.....

(1 mark)

2 (b) Describe the colour change that you **saw** when you added your samples of juice to the reagent.

.....

.....

(1 mark)

2 (c) How does the reagent help you to compare the amount of vitamin C in different samples of juice?

.....

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.....

(1 mark)

3 The method you used does **not** produce very accurate results.
Give **one** reason why.

.....

.....

(1 mark)

4 To make the investigation a **fair test** certain control variables need to be kept the same.

4 (a) State **one** variable you needed to control.

.....

(1 mark)

4 (b) Explain why it was necessary to keep this variable the same.

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(1 mark)

5 (a) Look at **your** results table and chart or graph.
What conclusion can you make about a link between the independent variable and the amount of vitamin C?

.....

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(2 marks)

5 (b) Use your results table and chart or graph to explain why you made this conclusion.

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(2 marks)

6 Make sure that **your** results table and chart or graph are handed in with this paper.
You will be awarded up to 6 marks for your table and chart or graph.

(6 marks)

18

Section 2

These questions are based on a vocational application of your own investigation.
In some questions you will be required to relate your own method/results to this new context.

Answer **all** questions in the spaces provided.

Some investigations suggest that high levels of vitamin C can improve behaviour in autistic children.
A group of scientists conducted an investigation:

- 18 autistic children were given a placebo (a pill with no vitamin C) every day for the first 15 weeks
- for the next 15 weeks the children were given a pill containing large doses of vitamin C every day.

The results of the investigation were:

- there was no change in the behaviour of the children during the first 15 weeks
- there was a significant improvement in the behaviour of the children during the second 15 weeks.

7 (a) Why were the children given a placebo (a pill with no vitamin C)?

.....

.....

(1 mark)

7 (b) The scientists should have repeated the investigation.
Explain why.

.....

.....

(1 mark)

7 (c) A second group of scientists decided to repeat the investigation.
Give **two** additional pieces of information that the first group of scientists would need to provide so that the investigation could be repeated.

1 .....

.....

2 .....

.....

(2 marks)

The recommended daily amount of vitamin C for a 15-year-old girl is 64 mg.

The table shows the amount of vitamin C found in some foods.

Food type	**Amount of vitamin C in mg per 100 g**
Orange	32
Lime	65
Cabbage	128

8 (a) Approximately how many grams of orange would give a 15-year-old girl the daily recommended amount of vitamin C?

Tick (✓) **one** box.

50 g ☐ 100 g ☐

150 g ☐ 200 g ☐

(1 mark)

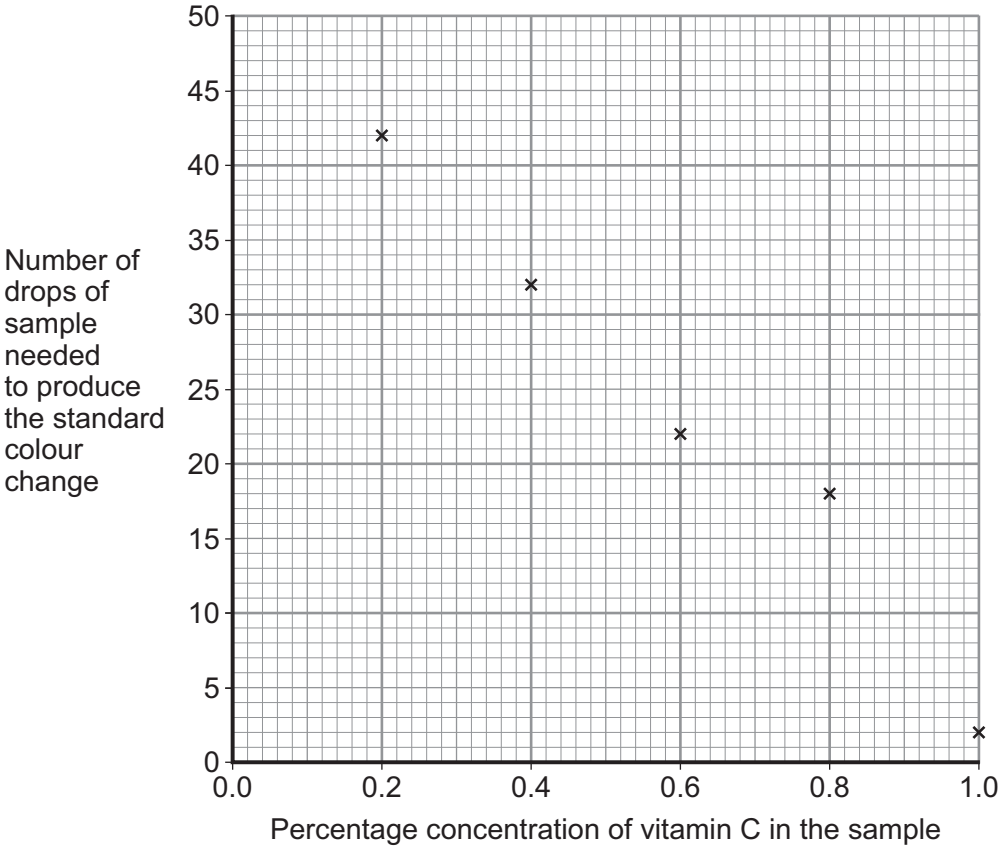
8 (b) Scientists found that increasing the vitamin C levels to ten times the recommended daily amount improved the behaviour of autistic children.

Approximately how many grams of cabbage would a 15-year-old girl need to eat to give her the **640 mg** of vitamin C?

She would need to eat ……. g of cabbage.

(1 mark)

9 A technician used the same reagent that you used in your investigation.
She already knew how much vitamin C was in each of her samples.
For each sample, she counted the number of drops needed to produce the same standard colour change that you saw when you added your samples of fruit juice to the reagent.
The graph shows her results.



9 (a) Draw a line of best fit on the graph above. *(1 mark)*

9 (b) Why is the data displayed as a line graph rather than a bar chart?

.....

(1 mark)

9 (c) What was the range for the **dependent** variable?

The range was from …… to …… *(1 mark)*

9 (d) Use the graph to find the number of drops of the sample that would be needed to produce the standard colour change when using a sample containing 0.5% vitamin C.

……. drops of the sample. *(1 mark)*

The technician wanted to find out the percentage concentration of vitamin C in kiwi fruit juice. A sample of kiwi fruit juice was added one drop at a time to the reagent. 47 drops of the kiwi fruit juice were needed to produce the same standard colour change as before.

9 (e) Use the graph to find out the percentage concentration of vitamin C in the kiwi fruit juice.

The percentage concentration of vitamin C in the kiwi fruit juice was .....……..... %

(1 mark)

9 (f) Use your answer from **9 (e)** to calculate how much vitamin C there would be in 250 g of the kiwi fruit juice.

There would be .....…….....g of vitamin C in 250 g of kiwi fruit juice.

(1 mark)

Turn over for the next question

10 Use ideas from your own investigation and your knowledge of experimental design to answer this question.

Describe, in as much detail as you can, a method that could be used to obtain the data used to produce the graph on page 6.

In this question you will be assessed on your ability to use good English, organise information clearly and use correct scientific words.

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(4 marks)

16

END OF QUESTIONS