

Centre Number						Candidate Number					
Surname						Other Names					
<b>Notice to Candidate.</b> 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.											
<b>Candidate Declaration.</b> 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 <sub>1/6</sub>	
<b>TOTAL</b> (max 40)	



General Certificate of Secondary Education  
June 2013

# Human Health and Physiology 44152

## Unit 2 Investigations in Human Health and Physiology ISA 1 – Pulse Rate

Valid for submission in May 2013

**For this paper you must have:**

- results tables and charts or graphs from your own investigation.
- a calculator.

**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 .....

As part of AQA's commitment to assist students, AQA may make your work available on a strictly anonymous basis to teachers, examining staff and students in paper form or electronically, through the Internet or other means, for the purpose of indicating a typical mark or for other educational purposes. In the unlikely event that your work is made available for the purposes stated above, you may object to this at any time and we will remove the work on reasonable notice. If you have any concerns please contact AQA.

To see how AQA complies with the Data Protection Act 1988 please see our Privacy Statement at [aqa.org.uk](http://aqa.org.uk)



J U N 1 3 4 4 1 5 2 0 1

M/Jun13/44152

**44152**

**Section 1**

These questions are about the investigation that you carried out on Pulse Rate.

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)** How many different values of this variable did you use?

.....  
(1 mark)

**1 (c)** If you were able to test another value of this variable:

**1 (c) (i)** What value would you choose to test?

.....  
(1 mark)

**1 (c) (ii)** Why would you choose this value?

.....  
.....  
(1 mark)

**2** This question is about the **dependent** variable in your investigation.

**2 (a)** What was the **dependent** variable?

.....  
(1 mark)

**2 (b)** Name the instrument you used to measure the **dependent** variable.

.....  
(1 mark)



**2 (c)** Look at your results table and graph or chart.  
What range of values did you obtain for the **dependent** variable?  
You should state the unit for these values.

The range was from .....  
to .....  
*(2 marks)*

**3** Another group of students did a similar investigation to your investigation. Their results were **not** exactly the same as your results.

Suggest **two** reasons why the other group's results were **not** exactly the same as your results.

1 .....  
.....  
.....  
2 .....  
.....  
.....  
*(2 marks)*

**4** Look at your results table and graph or chart.  
What conclusion can you make about the effect of exercise on pulse rate?

.....  
.....  
.....  
.....  
.....  
*(2 marks)*

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

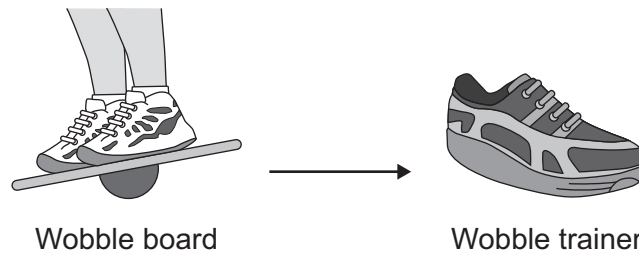


## Section 2

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.

A company has designed a new type of trainer called the 'Wobble trainer'.  
These trainers imitate the effect of using a wobble board.  
The company claims that wearing Wobble trainers will increase fitness levels.



The Wobble trainers were tested by the company that designed them.  
Five postmen wore Wobble trainers and five different postmen wore normal trainers for 8 hours a day.  
The fitness levels of the postmen were checked every week for 6 weeks by measuring their resting pulse rates.  
The lower the resting pulse rate the fitter the postman.

**Table 1** shows the results.

**Table 1**

Type of trainer	Mean pulse rate per minute						
	At start	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Wobble	76	74	73	70	69	68	66
Normal	71	70	70	68	72	65	63

- 6** **One** of the mean results for the group wearing **normal** trainers did **not** follow the trend.  
Draw a ring around this mean result. (1 mark)



7 (a) The type of independent variable in the company's investigation is different from that in your investigation.  
What type of independent variable did the company use?  
Draw a ring around the correct answer.

**Categoric**

**Continuous**

**Controlled**

(1 mark)

7 (b) Some variables must be kept the same in an investigation to make it a fair test.  
What name is given to these variables?

.....  
(1 mark)

7 (c) Give **one** variable that the Wobble trainer company kept the same in their investigation.

.....  
(1 mark)

8 Use information from **Table 1** to help you answer this question.

8 (a) Give **one** way in which the results for the Wobble trainers are **similar** to the results for the normal trainers.

Similarity .....

.....  
(1 mark)

8 (b) Give **two** ways in which the results for the Wobble trainers are **different** from the results for the normal trainers.

Difference 1 .....

.....

Difference 2 .....

.....  
(2 marks)

Turn over ▶



The Wobble trainer company also checked fitness levels by recording improvement in performance in four different exercises:

- Walking - the distance the postmen could walk in 6 minutes
- Standing - the time the postmen could stand on one leg
- Squatting - the number of squats the postmen could do in 1 minute
- Stretching - the distance the postmen could stretch down their legs.

Results from the four different exercises are shown in **Table 2**.

**Table 2**

Type of trainer	Mean percentage increase in performance after 6 weeks			
	Walking	Standing	Squatting	Stretching
Wobble	38	52		15
Normal	32	48	21	10

- 9 (a)** The percentage increases in the number of squats completed by the five postmen wearing the Wobble trainers are shown below.

**22%**

**23%**

**23%**

**25%**

**27%**

Calculate the mean percentage increase in the number of squats for the postmen wearing Wobble trainers.

Write your answer in **Table 2**.

(1 mark)

- 9 (b)** The Wobble trainer company would like to display the results from **Table 2** in an advert.

How should they display these results?

Tick (✓) **one** box.

Bar chart

Line graph

Pie chart

Scattergram

(1 mark)



- 9 (c)** The Wobble trainer company claims that Wobble trainers increase fitness levels. Is the company's claim justified?

Draw a ring around the correct answer.

YES/NO

Use data from **Table 2** to explain your answer.

.....

.....

.....

.....

.....

(2 marks)

**Table 1** has been repeated to help you answer the next question.

**Table 1**

Type of trainer	Mean pulse rate per minute						
	At start	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Wobble	76	74	73	70	69	68	66
Normal	71	70	70	68	72	65	63

- 10** The Wobble trainer company did **not** use the results from **Table 1** in their advert. Suggest why they did **not** use these results.

.....

.....

(1 mark)

**Turn over for the next question**

**Turn over ▶**



**11** Another sports shoe manufacturer disputes the claim made by the Wobble trainer company. This manufacturer thinks that the results may be biased.

Design an investigation to check the claim made by the Wobble trainer company. Use ideas from your own investigation and your knowledge of experimental design to answer this question.

You should include fair test ideas and ways in which the reliability of the data could be improved.

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

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)

16
----

**END OF QUESTIONS**

