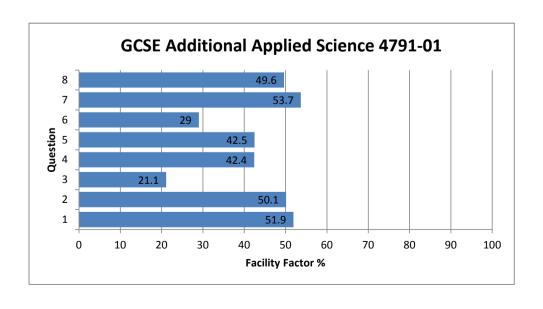


## WJEC 2014 Online Exam Review

## **GCSE Additional Applied Science 4791-01**

All Candidates' performance across questions

?	?	?	?	?	?	?	_
Question Title	N	Mean	S D	Max Mark	F F	Attempt %	
1	481	2.6	1.2	5	51.9	100	
2	480	3	1.3	6	50.1	99.8	
3	473	1.3	1.2	6	21.1	98.3	$\leftarrow$
4	480	3.4	2	8	42.4	99.8	$\leftarrow$
5	476	3.4	1.9	8	42.5	99	·
6	480	2.6	1.6	9	29	99.8	
7	480	5.4	2.1	10	53.7	99.8	$\leftarrow$
8	479	4	1.8	8	49.6	99.6	



The table shows the numbers of seeds that germinated at 10-day intervals after planting.

		Number of seeds germinating after:						
Group	Treatment	0 days	10 days	20 days	30 days	40 days	50 days	60 days
Α	Stored at 5°C for 120 days before planting	0	3	37	55	66	70	73
В	Stored at 5°C for 40 days before planting	0	0	0	0	2	9	10
С	Not stored at a low temperature before planting	0	0	0	0	0	0	0

State <b>three</b> conclusions the growers made from their results.	[3]
1	
2.	
3	

(ii) Plants make food by photosynthesis.

Once germinated, the seedlings were grown under cover as shown in the photograph below.



Explain how using fluorescent lighting and gas burners affects the rate of photosynthesis.	[3]
	· · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·

- 3. Plant growers use trials to enable them to improve output.
  - (i) In one trial, growers investigated whether the rate of germination (when seeds sprout and begin to grow) is affected by storing the seeds at a low temperature (5°C) before planting them.

The table shows the numbers of seeds that germinated at 10-day intervals after planting.

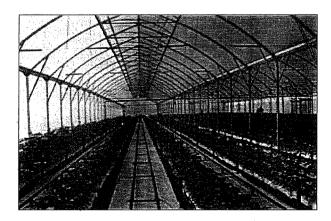
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[3]

- 1 Stored ax 5°C for 120 days before planting
- 2 Stored at 5°C for 40 days before plainting
- 3 Not stored at a low temperature before
- (ii) Plants make food by photosynthesis.

Once germinated, the seedlings were grown under cover as shown in the photograph below.



Explain how using fluorescent lighting and gas burners affects the rate of photosynthesis.

[3]

this affects the rate of photosynthesis because the fluorescent lighting and gas burners damages the growth of the seeds.

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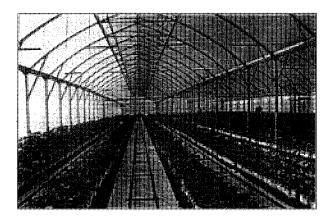
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© WJEC CBAC Ltd.

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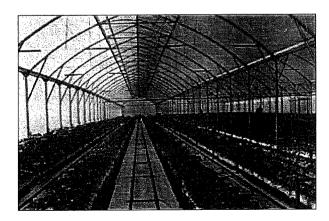
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State three conclusions the growers made from their results.

[3]

- 1 Ofter 170 days stored 5°C 146 Seed
- 2 HOT GOOD OVOLVOOR
- (ii) Plants make food by photosynthesis.

Once germinated, the seedlings were grown under cover as shown in the photograph below.



Explain how using fluorescent lighting and gas burners affects the rate of photosynthesis.

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Turn over.

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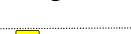
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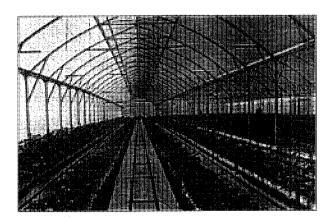
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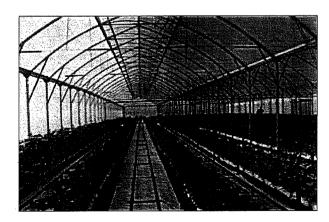
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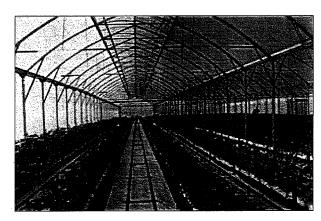
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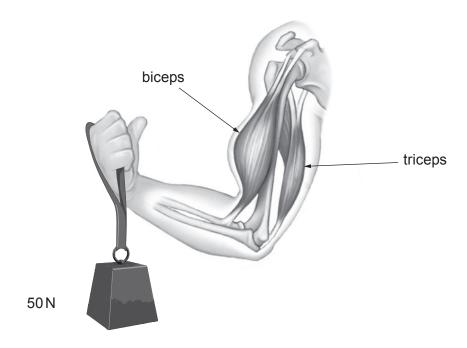
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Turn over.

2

**4.** The diagram shows an arm lifting a weight.



(a)	(i)	Describe what happens to the biceps and triceps when the arm lifts the weight. [2]					
			•••••••••••••••••••••••••••••••••••••••				
	(ii)	Describe the changes to these muscles when the arm straightens.	[2]				
(h)	\//ba	on the arm lifts a weight it is gating as a lover					

(b) When the arm lifts a weight it is acting as a lever.

The perpendicular distance from the weight to the elbow joint is 40 cm. The perpendicular distance from the biceps muscle to the elbow is 5 cm.

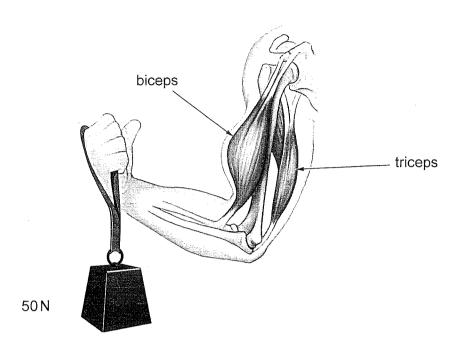
(i) Calculate the moment of the 50 N weight using the equation: [2]
 Moment = force × perpendicular distance between force and point of turning

Moment = ..... Ncm

Exa	ım	iin	er
С	n	lν	

(11)		qual to the moment	•	, the moment create	a by the biceps	must
	I.	Give <b>one</b> reason weight.	why the biceps	must produce a fo	orce bigger thar	the [1]
	II.	Circle the force cre	eated by the bice	ps when lifting the w	eight.	[1]
		40 N	400 N	4 000 N		

4. The diagram shows an arm lifting a weight.



(a) (i) Describe what happens to the biceps and triceps when the arm lifts the weight. [2]

The bicep contracts and the tricep relaxes when lifting the weight

(ii) Describe the changes to these muscles when the arm straightens.

The bicep relaxes and the tricep contrats when putting the arm Straight

(b) When the arm lifts a weight it is acting as a lever.

The perpendicular distance from the weight to the elbow joint is 40 cm. The perpendicular distance from the biceps muscle to the elbow is 5 cm.

(i) Calculate the moment of the 50 N weight using the equation: [2]

Moment = force × perpendicular distance between force and point of turning

40 × 5 = 200 50 \$ 40 \$ 5 =

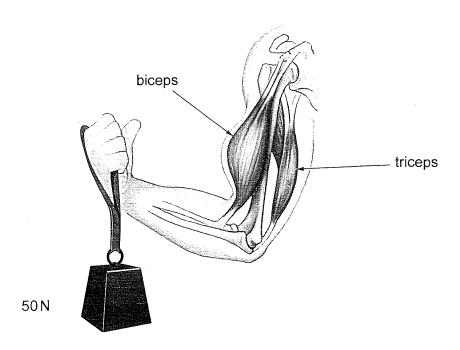
Moment = ...... N cm

(ii)		old the weight in the position shown, the moment created by the biceps musqual to the moment of the weight.	t
	1.	Give <b>one</b> reason why the biceps must produce a force bigger than the weight.	e 
		Because the bicep is using all the	
		force to lift up the weight	
	11.	Circle the force created by the biceps when lifting the weight. [1]	
		40 N 400 N	

[2]

0

The diagram shows an arm lifting a weight.



Describe what happens to the biceps and triceps when the arm lifts the weight. [2] (a)

The bicep contracts and the tricep relaxes when lifting the weight

Describe the changes to these muscles when the arm straightens. The bicep relaxes and the tricep

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When the arm lifts a weight it is acting as a lever. (b)

The perpendicular distance from the weight to the elbow joint is 40 cm. The perpendicular distance from the biceps muscle to the elbow is 5 cm.

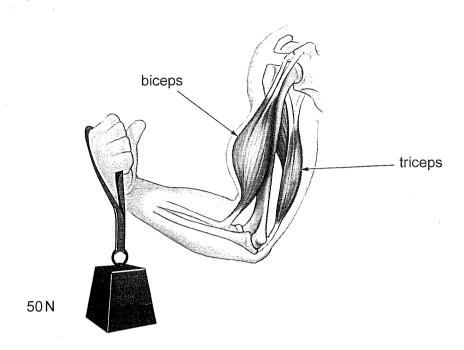
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Moment = force × perpendicular distance between force and point of turning

40 X5 = \$ 200

Moment = ...\* ... N cm (ii)

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the becep will be come now and the triceps becomes Soft.

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When own strong Wens the tricep becomes

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[2]

Moment = force × perpendicular distance between force and point of turning

12 5 8 4 5 10 4 5 10 4 5

(ii)	To he	old the weight in the position shown, the moment created by the biceps must qual to the moment of the weight.
	· I.	Give one reason why the biceps must produce a force bigger than the weight.  [1]  Hen its easyer to liftly the the Meiont
		With Milling I'm

II. Circle the force created by the biceps when lifting the weight.

[1]

40 N

400N

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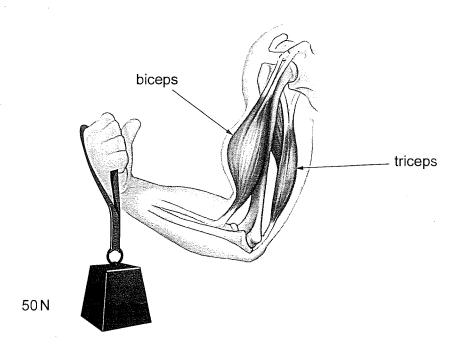
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[2]

2

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[2]

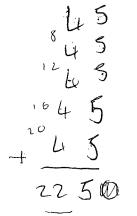
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7 000 MOM Moment = ....V Ncm



(ii) To hold the weight in the position shown, the moment created by the biceps must be equal to the moment of the weight.

I. Give **one** reason why the biceps must produce a force bigger than the weight. [1]

easyer to lifting

II. Circle the force created by the biceps when lifting the weight.

[1]

1

40 N

#00N

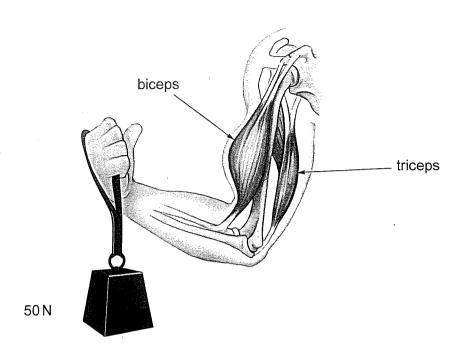
4000 N



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(i)	Describe what happens to the biceps and triceps when the arm lifts the weig	ght. [2]
	When the arm life the weight the	
	bi-cep contact whilst the pricep relaxis	
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(i) Calculate the moment of the 50N weight using the equation:

[2]

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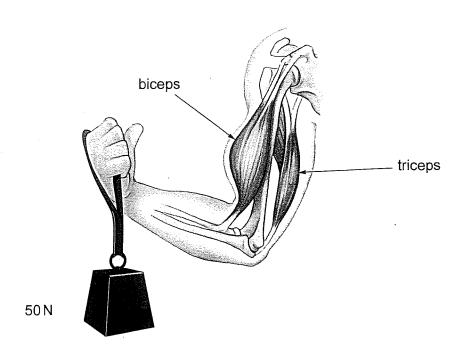
Moment = 250 Ncm

(ii)			weight the mo			n show reight.	n, the	momer	it crea	ted by t	he bic	eps m	iust	
	I.	Give weigh		ason v	vhy th	e bicep	s mus	t produ	ice a	force b	oigger	than	the [1]	
		[H	othe	1W13	٤	1 he	b	cep	W	ont	'nе	ab	le	
		Lt.	ver.	K.	the	MeJ	ht.	i	not	enov	yh	force	٤	5
						the bic							[1]	
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(a)	(i)	Describe what happ	pens to the biceps a	and triceps when	the arm lifts	the weight. [2]
		When the	arm life	the w	eight.	the
		breep conto			\ /	
	(ii)	Describe the chang	es to these muscle	s when the arm	straightens.	[2]
		I han th	0 0 0 0	Showald Long	- Mag	

When the arm Straightens the bicep relaxs and the trizep contract D

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Moment = force × perpendicular distance between force and point of turning

5 x So = 250



Moment = 250 Ncm

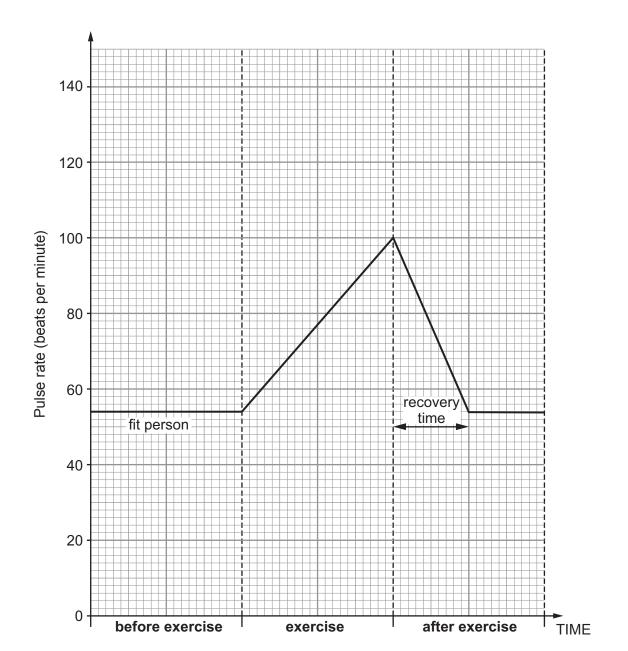
ii)			iminer only
	1.	Give <b>one</b> reason why the biceps must produce a force bigger than the weight.	0
		We otherwise the bicep won't be able [	<u> </u>
		to life the weight if not enough force is	
		Circle the force created by the biceps when lifting the weight. [1]	l
		40 N 4000 N	5 8

- 7. When members join a gym, their personal trainer will record basic information about them. One of these is pulse rate.
  - (a) Name **two** other body measurements that will be collected during the initial health check. [2]

1. .....

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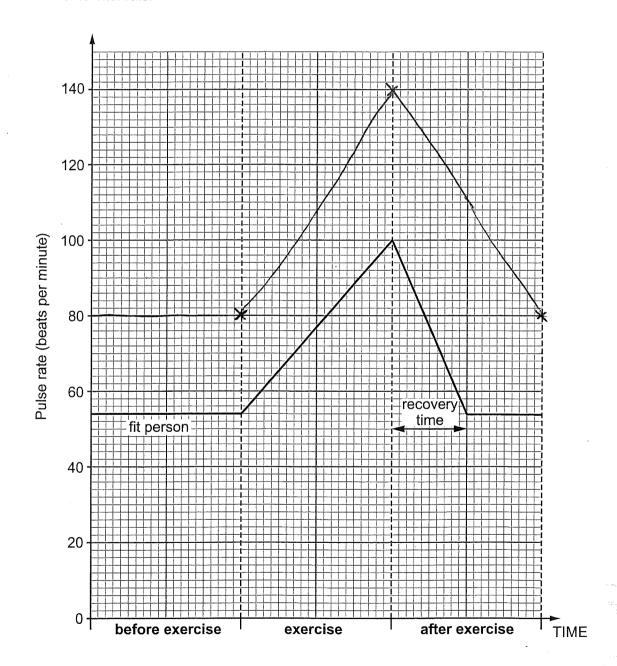
(b) The graph below shows how the pulse rate for a fit person changes during the labelled time intervals.



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	(i)	An unfit person has a normal resting pulse rate of 80 beats per minute before exercise. During exercise, the pulse rate rises to 140 beats per minute. The pulse rate returns to normal by the end of the 'after exercise' time interval.	
		Plot the information for the unfit person on to the graph on the previous page. [3]	
	(ii)	Compare the pulse rate for the fit person with the unfit person for the time shown on the graph. [3]	
(c)	(i)	State the name of the <b>group</b> of exercises (including cycling and running) that the unfit person needs to do, to eventually reduce their resting pulse rate. [1]	
		exercise	
	(ii)	Give <b>one</b> reason for your answer. [1]	

- 7. When members join a gym, their personal trainer will record basic information about them. One of these is pulse rate.
  - (a) Name **two** other body measurements that will be collected during the initial health check. [2]
    - 1 BMI
    - 2 how fit they are
  - (b) The graph below shows how the pulse rate for a fit person changes during the labelled time intervals.



	(i)	An unfit person has a normal resting pulse rate of 80 beats per minute before exercise. During exercise, the pulse rate rises to 140 beats per minute. The pulse rate returns to normal by the end of the 'after exercise' time interval.	c
		Plot the information for the unfit person on to the graph on the previous page. [3]	
	(ii)	Compare the pulse rate for the fit person with the unfit person for the time shown on the graph. [3]	
		The unfit Person's heart rate opes	
		The unfit person's heart rate goes up by a big amount. This means he Ishe	
		need too much recovery time to get	
		their heart rate back to normal	
(c)	(i)	State the name of the <b>group</b> of exercises (including cycling and running) that the unfit person needs to do, to eventually reduce their resting pulse rate. [1]	
		exercise	
	(ii)	Stratches Give one reason for your answer. [1]	
		This gives them time to cool down	
		and get their heart rate back to its	
		oringinal beat.	
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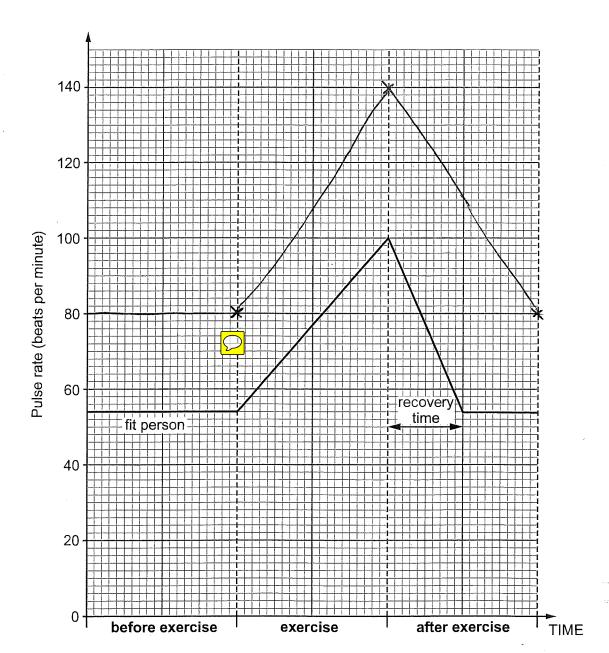
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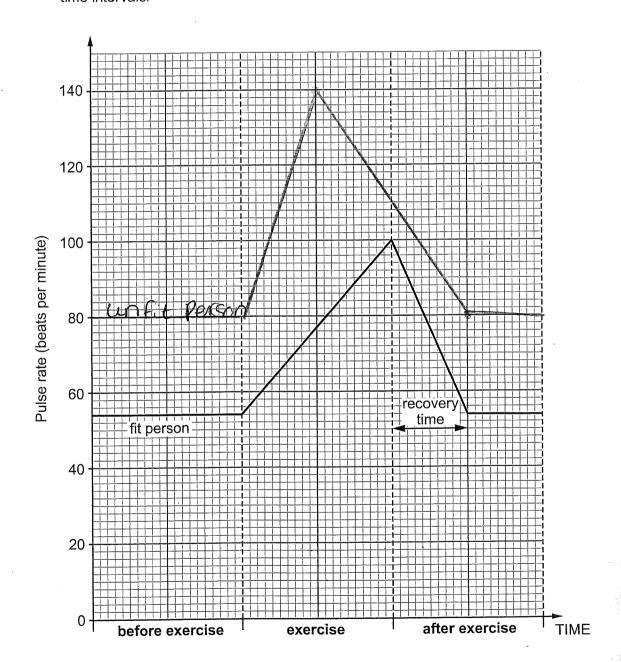
		Examiner only
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	Plot the information for the unfit person on to the graph on the previous page. [3]	3
(ii)	Compare the pulse rate for the fit person with the unfit person for the time shown on the graph. [3]	1
	The unfit person's heart rate opes	
	The unfit person's heart rate opes up by a hig amount. This means he she	
	need too much recovery time to get	
	their heart rate back to normal	
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$\bigcirc$	exercise Stretches	
(ii)	Give <b>one</b> reason for your answer. [1]	0
	This gives them time to cook down	
	and get their heart rate back to its	
	oringinal beat.	5
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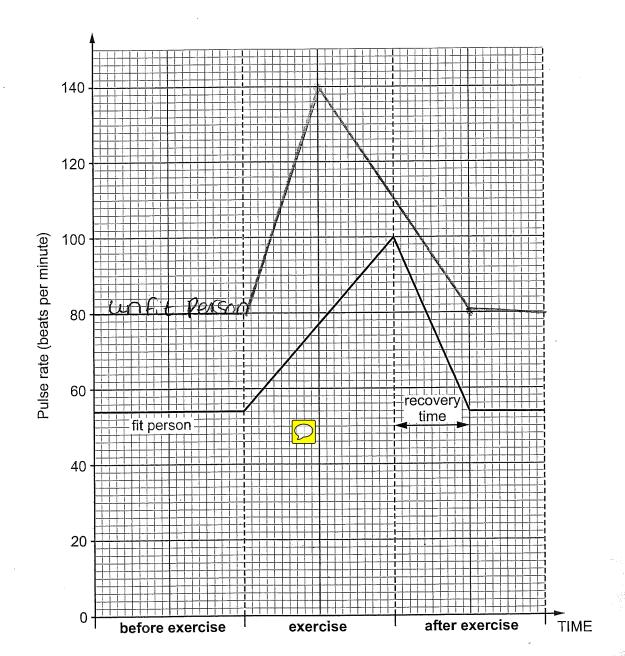


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	(ii)	Compare the pulse rate for the fit person with the unfit person for the time shown on the graph. [3]
		on this graph this snow us
		on this graph this snow us the fit person don't vise as the
		as the high as the
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(c)	(i)	State the name of the <b>group</b> of exercises (including cycling and running) that the unfit person needs to do, to eventually reduce their resting pulse rate. [1]
		Anton bic exercise
	(ii)	Give <b>one</b> reason for your answer. [1]
		because they can just walk
		or job, wedows

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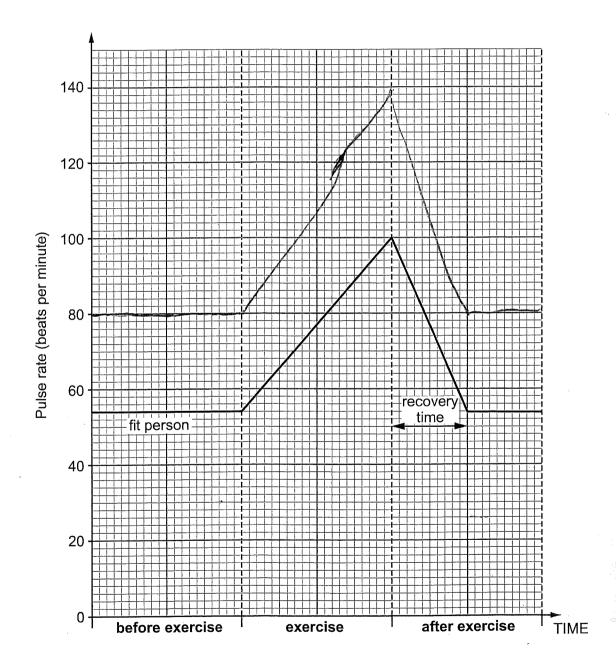
			Examiner only
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	(ii)	Compare the pulse rate for the fit person with the unfit person for the time shown on the graph. [3]	1
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		on the graph the snow us the fit person don't vise	
		as the high as the	
		It unfit person	
(c)	(i)	State the name of the <b>group</b> of exercises (including cycling and running) that the unfit person needs to do, to eventually reduce their resting pulse rate. [1]	0
	$\bigcirc$	Anton bic exercise	
	(ii)	Give <b>one</b> reason for your answer. [1]	0
		because they can Just walk	
		Or job, below	
			3
			10

- 7. When members join a gym, their personal trainer will record basic information about them. One of these is pulse rate.
  - (a) Name **two** other body measurements that will be collected during the initial health check. [2]

1. flearl (ate

2 Medical 2.9 heat problems

(b) The graph below shows how the pulse rate for a fit person changes during the labelled time intervals.



Examiner
only

	(i)	An unfit person has a normal resting pulse rate of 80 beats per minute befor exercise. During exercise, the pulse rate rises to 140 beats per minute. The pulse rate returns to normal by the end of the 'after exercise' time interval.	e only
		Plot the information for the unfit person on to the graph on the previous page. [3	5]
	(ii)	Compare the pulse rate for the fit person with the unfit person for the time show on the graph.	
		whe unfil person's heat rate goes up whilst	
		exercising, further than the fil perions. The Unfit perion also start and ends on a	
		Unfit person also start and ends on a	
		higher head eate than the fit person.	
(c)	(i)	State the name of the <b>group</b> of exercises (including cycling and running) that th unfit person needs to do, to eventually reduce their resting pulse rate.	
		Aerobit exercise	
	(ii)	Give <b>one</b> reason for your answer.	]
		get their heart hearthier and beating	
		at a Lover rate during exercise.	
			10

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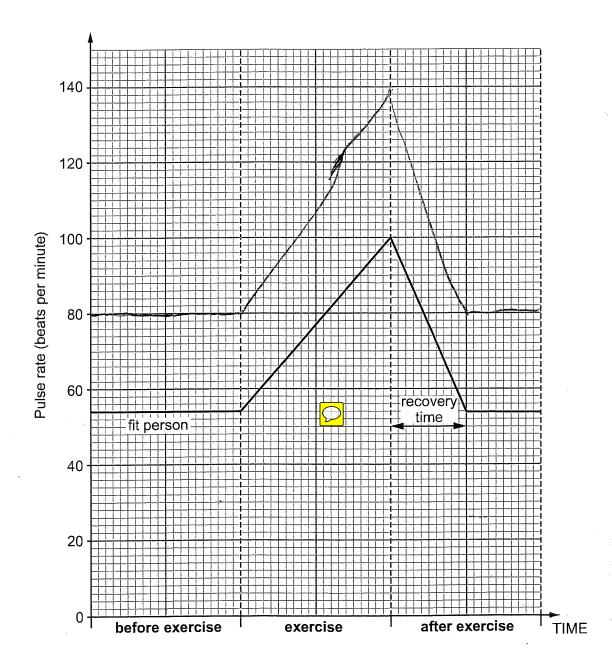
- 7. When members join a gym, their personal trainer will record basic information about them. One of these is pulse rate.
  - (a) Name **two** other body measurements that will be collected during the initial health check. [2]

1. Fleat (ate



2. Medical e.g head problems

(b) The graph below shows how the pulse rate for a fit person changes during the labelled time intervals.



	(i)	An unfit person has a normal resting pulse rate of 80 beats per minute before exercise. During exercise, the pulse rate rises to 140 beats per minute. The pulse rate returns to normal by the end of the 'after exercise' time interval.	Examiner only
		Plot the information for the unfit person on to the graph on the previous page. [3]	1
	(ii)	Compare the pulse rate for the fit person with the unfit person for the time shown on the graph. [3]	2
		va The unfil parson's heat rate goes up whilst	
		exercising, further than the fil powers. The	
		exercising, further than the fil poerons. The	
		higher head eate than the fit person	
(c)	(i)	State the name of the <b>group</b> of exercises (including cycling and running) that the unfit person needs to do, to eventually reduce their resting pulse rate. [1]	1
		Aerobit exercise	
$\bigcirc$	(ii)	Give <b>one</b> reason for your answer. [1]	1
		get their heart hearthier and beating at a lower rate during exercise.	
		at a lower rate during exercise.	
			5
			10