



General Certificate of Secondary Education  
2011

---

## Physical Education

[G9741]

TUESDAY 24 MAY, AFTERNOON

---

**MARK  
SCHEME**

1 The person could:

- **exercise regularly**
- **eat a balanced, healthy diet**
- **get sufficient sleep**
- **avoid taking harmful substances such as smoking tobacco or taking illegal drugs.**

Award [1] mark for naming a factor that could promote physical health eg exercise.

Award [2] marks if the factor is qualified to show how it can help promote physical health eg the person could exercise regularly.

2 x [2]

[4]

2 Award [1] mark for each correct match.

Foods	Components					
	Carbohydrate	Fats	Proteins	Vitamins & minerals	Dietary fibre	Water
Nuts			✓			
Butter		✓				
Chicken meat			✓			

3 x [1]

[3]

3 (b) 25% fats; 15% proteins and 60% carbohydrates

[1]

4 Carbon monoxide takes the place of oxygen in the red blood cells [1] therefore there is less oxygen available for the working muscles [1] and so the task of climbing stairs is more difficult. [2]

5 Drinking too much alcohol over a prolonged period of time can lead to:

- Liver damage and disease
- Cirrhosis of the liver
- Increased risk of fertility problems
- Obesity
- Depression

Any **two** acceptable health problems.

2 x [1]

[2]

6 Examples of foods or drinks which, when taken before going to bed, could affect a person's quality of sleep are:

- Taking food or drinks that contain caffeine, for example, coffee, cola or chocolate. Caffeine is a stimulant and can prevent the person from getting to sleep.
- Eating spicy or acidic foods or eating a big meal before a person goes to bed can cause heartburn or indigestion and prevent quality of sleep.
- Some bedtime drinks can assist relaxation and therefore help with the quality of sleep.

Award [0] for an answer not worthy of credit.

Award [1] mark for an acceptable food or drink that could affect a person's quality of sleep e.g. drinking coffee before going to bed.

Award [2] marks for an acceptable food or drink with a sound explanation as to how it could affect a person's quality of sleep e.g. drinking coffee before going to bed. The caffeine in the coffee is a stimulant and will hinder a person from getting to sleep. [2]

7 Award [0] for an answer not worthy of credit.

Award [1] mark for an acceptable reason e.g. many people work in offices **or** many people use their cars to travel even for short distances.

Award [2] marks for an acceptable reason with a sound explanation e.g. many people work in offices and are therefore sitting all day and getting no exercise through their work, **or** many people use their cars to travel even for short distances and this means they miss out on opportunities for getting exercise. They therefore have to plan exercise into their lifestyles. [2]

8 *The physical changes help improve aerobic performance because they make the circulatory system more efficient.* [1] The circulatory system will be able to deliver more blood to the working muscles with less effort (fewer beats of the heart) [1], or any other acceptable answer e.g. capillarization. The effects of capillarization allow more blood to be delivered to the working muscles. [2]

9 Aerobic energy is produced with the use of oxygen. Aerobic energy production is determined by the ability of the **respiratory** and **circulatory** systems to deliver **nutrients** and **oxygen** to the working muscles and the ability of the working muscles to use the supply.  
2 x [1] [2]

10 (a) The physical demands in the run-up in the long jump require the athlete to build up their running speed to near maximum. This is **high intensity work** as it is at near maximum effort and it is **for a short period of time**. [1] This means that **most** of the energy will be produced **anaerobically**. **Very little** of the energy will be produced **aerobically**. [1] [2]

(b) The physical demands of the take-off require maximum effort with speed in an explosive effort. Muscular power is about being able to produce maximum force, or a considerable force, with speed in an explosive effort. [1] This means that **muscular power** will be **most important** type of muscular fitness required. Muscular strength underpins muscular power and **muscular endurance** would be of **little importance** in this action. [1] [2]

- 11 (a) For example, a CSP swim to develop aerobic fitness would be to swim at a steady pace (eg 100 m / 2 minutes) or at a steady heart rate (eg 70% MHR) for a set time (eg 30 minutes) or set distance (eg 1500 m).

Award [0] for an answer not worthy of credit.

Award [1] mark for giving an example of an **appropriate steady pace** eg 100 m every 2 minutes **or** for a **steady heart rate** eg 70% MHR **and**

Award [1] mark for giving an example of an **appropriate set time** eg 30 minutes **or** for an **appropriate set distance** 1500 m. [2]

- (b) For each weight training exercise you must decide:

- the appropriate weight to be lifted [1]
- the appropriate number of repetitions for which you will lift that weight [1]
- the appropriate number of sets that you are going to do for that exercise [1]
- the appropriate recovery time between each set [1]

4 x [1]

[4]

## 12 Resource 1

Factors to consider	To effectively use <u>Interval training</u> to develop <u>aerobic fitness</u>	To effectively use <u>Interval training</u> to develop <u>anaerobic fitness</u>
<b>Intensity</b>	80 – 85% MHR	> 95% MHR
<b>Work time</b>	One from 60 – 90 seconds <u>or</u> 3 – 5 minutes	10 – 30 seconds
<b>Number of Repetitions</b>	with 13 – 20 repetitions <u>or</u> 8 – 10 repetitions	3 – 5 repetitions
<b>Work/Recovery ratio</b>	Ratio of 1:1	Ratio of 1: 4
<b>Number of sets</b>	with 1 or 2 sets <u>or</u> 1 set	with 1 or 2 sets

10 x [1]

[10]

## 13 Resource 2

<b>Weeks</b>	<b>Weight</b>	<b>Repetitions</b>
Weeks 1 – 3	40 kg	5
Weeks 4 – 6	50 kg	5
Weeks 7 – 9	60 kg	4

Award **[0]** for an answer not worthy of credit.

Award **[1]** mark if the weight for Weeks 4 – 6 is appropriately higher than Weeks 1 – 3.

Award **[1]** mark if the weight for Weeks 7 – 9 is appropriately higher than Weeks 4 – 6.

Award **[1]** mark if the number of repetitions for Weeks 4 – 6 is within the range of 1 – 5 repetitions and appropriate for the weight increase between Weeks 1 – 3 and Weeks 4 – 6.

Award **[1]** mark if the number of repetitions for Weeks 7 – 9 is within the range of 1 – 5 repetitions and appropriate for the weight increase between Weeks 4 - 6 and Weeks 7 – 9.

[4]

***Explanation for decisions on how to improve muscular power***

Muscular power is about being able to produce maximum force, or a considerable force, with speed in an explosive effort.

To develop muscular power you lift a very heavy weight (1 – 5RM or 85% – 100% of 1RM) for a small number of repetitions (1 – 5 repetitions) as the weight is very heavy.

To apply the principle of progressive overload the weight is increased as a priority rather than increasing the number of repetitions. The number of repetitions should be between 1 and 5 depending on how heavy the weight is.

**Applying the principle appropriately to the weight**

Award **[0]** for an answer not worthy of credit.

Award **[1]** mark if the answer states that the weight must be increased over the period of time.

Award **[2]** marks if the answer shows a clear understanding for increasing the weight over the period of time (see answer above).

**Applying the principle appropriately to the repetitions**

Award **[0]** for an answer not worthy of credit.

Award **[1]** mark if the answer states that the repetitions are not increased over the period of time.

Award **[2]** marks if the answer shows a clear understanding for not increasing the number of repetitions (see answer above).

[4]

- 14 (a)** The tests selected (or designed by you) should be suitable for the purpose.

If you want to test aerobic fitness then the test you select or design must be able to do that. For example, Cooper's 12 minute run or the 20 metre progressive shuttle run are recognised as aerobic tests and therefore would be suitable. Finding what your 1RM is for a weight training exercise would not be a test for aerobic fitness and therefore would not be suitable for the purpose.

Award **[0]** for an answer not worthy of credit.

Award **[1]** mark if the answer to some degree explains the principle.

Award **[2]** marks if the answer to a fair degree explains the principle.

Award **[3]** marks if the answer clearly explains the principle. [3]

- (b)** The protocol (procedures and rules) for the tests must be followed strictly.

If everyone did not follow the same procedures and rules in doing a test then it would be unfair to compare the results. The results would be unreliable. For example, in doing a sit-up test if some were allowed to use their hands and arms to help pull themselves up while others had to keep their hands touching their ears throughout it would not be fair to compare these results.

Award **[0]** for an answer not worthy of credit.

Award **[1]** mark if the answer to some degree explains the principle.

Award **[2]** marks if the answer to a fair degree explains the principle.

Award **[3]** marks if the answer clearly explains the principle. [3]

- 15** Cardiac output increases. The stroke volume increases (the amount of blood pumped from the heart in each beat) and the heart rate increases (the number of beats in a minute). This means more blood carrying oxygen can be delivered to the working muscles.

Blood flow is largely diverted to the working muscles. This means the muscles receive 80 – 85% compared to 15 – 20% during rest. During exercise, organs such as the stomach, intestines and kidneys, with less urgent needs, receive only a small amount.

Award **[0]** for an answer not worthy of credit.

Award **[1]** mark for accurately providing a response eg cardiac output increases.

Award **[2]** marks for accurately providing a response and explaining how it helps.

2 x [2] [4]

- 16 (a)** A hazard is something that can cause illness, injury or even death.

Award **[0]** for an answer not worthy of credit.

Award **[1]** mark if the answer to some degree explains what a hazard is.

Award **[2]** marks if the answer clearly explains what a hazard is. [2]

- (b)** Award **[0]** for an answer not worthy of credit.

Award **[1]** mark if the answer is an appropriate example of a hazard. [1]

**17 Good reasons for John continuing his participation in golf:**

- John's job at the petrol station will allow him to be flexible about when he works so he could play golf during the day and work late shifts or plan his working hours around the golf.
- John will have easy access to the golf club as it is next door. This means there will be little travel time to go to or come from the golf club.
- John has twenty miles to travel to the volleyball club. It is not known how he would get there for the training sessions and the matches and how he will pay.
- His parents play golf as does his older brother so there is a family tradition and they will want him to continue to play golf.
- His parents have paid his fees while he was at school and if he could not afford to pay the fees himself they are likely to continue to support him.
- John has friends who play golf and he will be well known at the club so he will know the situation and feel comfortable with it.

**Good reasons for John continuing his participation in volleyball:**

- John's job at the petrol station will allow him to be flexible about when he works so he could arrange to be free for the practice sessions and the matches.
- A round of golf can take three to four hours to complete so he needs quite a bit of time if he is to play golf on a regular basis. It may take time to travel to the volleyball club, however, the practice sessions and the matches will not take as long as a round of golf.
- Playing volleyball will make him more independent as he will be away from his parents and brother in a different situation. He will have to cope on his own.
- He will have some friends that he knows at the club but he will also be able to meet new friends.
- The fees for the volleyball club are likely to be cheaper than the fees for the golf club.

Award [0] for an answer not worthy of credit.

**Level 1 ([1] – [2])**

The case made for John continuing to play **either** golf **or** volleyball is limited. The quality of written communication is basic. There is limited use of specialist terms and spelling, punctuation and grammar are weak.

**Level 2 ([3] – [5])**

The case made for John continuing to play **either** golf **or** volleyball is sound. The quality of written communication is moderate to good. A range of specialist terms is used with facility and spelling, punctuation and grammar are reasonably good.

**Level 3 ([6] – [8])**

The case made for John continuing to play **either** golf **or** volleyball is sound and comprehensive. The quality of written communication is very good. A wide range of specialist terms is used adeptly and spelling, punctuation and grammar are almost faultless.

[8]

## 18 (a) Organisation of the circuit

**Possible good points**

The work-outs take place in a purpose-built fitness gym which has been booked for the group. It is good that the fitness gym has been booked for the group as it will allow them to use the gym without interference from other people.

This is also good because it allows a good range of fixed stations and free weights to be used for the exercises. There will be a wider choice of exercises available and with the use of weights you can more easily target the development of muscular endurance.

The group works in pairs. This is good in that as one works the other gets a rest and it is their job to count the number of repetitions and record the number.

This is also good in that you can work with a friend or it can be made that you work with someone different each week.

Each person does as many repetitions as they can in 30 seconds. This is good because everyone changes over at a station at the same time and each pair moves on to next station at the same time. This means things flow smoothly and there is no bunching at a station.

Each person chooses the weight or resistance that is suitable for them. This is good in that each person is different. A weight that improves muscular endurance for one person may not be a suitable weight for developing muscular endurance in another. This keeps the focus of the workout on developing muscular endurance.

The exercises included in the circuit cover the major muscle groups in the upper body, trunk and lower body. This is good as the objective of the programme was to develop muscular endurance in the major muscles of the body.

Award [0] for an answer not worthy of credit.

**Level 1 ([1] – [2])**

The answer includes few good points about the organisation of the circuit and the explanation is limited. The quality of written communication is basic. There is limited use of specialist terms and spelling, punctuation and grammar are weak.

**Level 2 ([3] – [4])**

The answer includes a range of good points about the organisation of the circuit and the explanations are sound. The quality of written communication is moderate to good. A range of specialist terms is used with facility and spelling, punctuation and grammar are reasonably good.

**Level 3 ([5] – [6])**

The answer includes a wide range of good points about the organisation of the circuit and the explanations are sound and comprehensive. The quality of written communication is very good. A wide range of specialist terms is used adeptly and spelling, punctuation and grammar are almost faultless.

[6]

**(b)** Two from the following exercises: 1, 3, 5, 11, 13.

The average number of repetitions for exercises 1, 3, 5, 11, 13 is above 25 in all three sets. For muscular endurance the resistance should be sufficient that the number of repetitions done should be between 13 and 25. This means the resistance in these exercises is too low to effectively develop muscular endurance.

The people doing the circuit had to do as many repetitions as possible in 30 seconds. Being able to do over 25 in each set would mean nearly a repetition a second. This would suggest that the resistance is too low to effectively develop muscular endurance.

In the second and third sets the average number of repetitions is as high as or higher than the first set. You would expect the people not to do as many repetitions in the second and third sets as their muscles would be tired. This is evidence that the resistance may be too low to effectively develop muscular endurance.

Award **[0]** for an answer not worthy of credit.

Award **[1]** mark if the candidate can identify two exercises from 1, 3, 5, 11, 13.

Award **[2]** marks if the candidate can identify two exercises from 1, 3, 5, 11, 13 and gives a sound explanation as to why the resistance for these exercises is too low to effectively develop muscular endurance. [2]

**(c)** The exercises are numbers 4 and 15.

The average number of repetitions for exercises 4 and 15 is below 9 in all three sets. For muscular endurance the resistance should allow between 13 and 25 repetitions to be done. This means the resistance in these exercises is too high to develop muscular endurance.

The people doing the circuit had to do as many repetitions as possible in 30 seconds. Being able to do only 3 – 8 repetitions in each set would mean the exercises are very demanding. This would suggest that the resistance is too high to develop muscular endurance.

In the second and third sets the average number of repetitions is much lower than the first set. When the number of repetitions is 8, you would expect the people to do as many or maybe one or two less in the second and third sets as their muscles would be tired. In the third set the average is 3 or 4 which is half of 8. This is evidence that the resistance may be too high to develop muscular endurance.

Award **[0]** for an answer not worthy of credit.

Award **[1]** mark if the candidate can identify the two exercises 4 and 15.

Award **[2]** marks if the candidate can identify the two exercises 4 and 15 and gives a sound explanation as to why the resistance for these exercises is too high to develop muscular endurance. [2]

**19** For example;

A person could do exercise at home before he/she leaves to go to work. He/she could get up, do 20 – 30 minutes of moderate aerobic exercise on an exercise bike or do aerobic exercise using Wii-fit or by using an exercise DVD. He/she could do this in his/her pyjamas before having a shower and breakfast.

A person could take the bus to work and get off early. He/she could walk at a brisk pace for 15 – 30 minutes to complete the rest of his/her journey.

As an alternative, a person could cycle to work at a moderate intensity and it would be reasonable for him/her to cycle for a time of 20 – 60 minutes.

A person on arriving at the office block could take the stairs instead of the elevator/lift. He/she could use the stairs during his/her working day, when he/she goes for his/her breaks or for lunch. The time will be short (a few minutes) but the effort will be intense.

At lunch time a person could go out for a walk. He/she could go to the park or go for a walk to the shops or walk around the streets. He/she could easily achieve a 20 – 30 minute walk at a moderate to brisk pace.

A person could take the bus home and get off early and walk at a moderate to brisk pace the rest of the way home. This walk could be anything from 20 minutes to 30 minutes. He/she could choose depending on weather conditions, at what time he/she had left work and what aerobic activities he/she had done throughout the day at work.

On the days he/she cycles to work he/she could cycle home again. This could take anything from 20 – 60 minutes and be at a moderate pace. Or he/she could leave the bike at work and take the bus home then cycle home the next day.

In the evening, a person could do aerobic exercise using an exercise bike as he/she watched television or he/she could dance while listening to music or he/she could do step-ups. What he/she does and how much he/she does and how hard he/she works depends on what he/she had already done throughout the day.

If he/she decides to go outdoors he/she could go for a walk or he/she could walk to wherever he/she was going or he/she could walk for part of the way. This could be at a moderate to brisk pace and be for 10 minutes to 60 minutes.

Award **[0]** for an answer not worthy of credit.

**Level 1 ([1] – [4])**

The answer identifies a few opportunities and the explanation of what would be done, at what intensity and for how long is limited. The quality of written communication is basic. There is limited use of specialist terms and spelling, punctuation and grammar are weak.

**Level 2 ([5] – [7])**

The answer identifies a range of opportunities and the explanation of what would be done, at what intensity and for how long is sound. The quality of written communication is moderate to good. A range of specialist terms is used with facility and spelling, punctuation and grammar are reasonably good.

**Level 3 ([8] – [10])**

The answer identifies a wide range of opportunities and the explanation of what would be done, at what intensity and for how long is sound and comprehensive. The quality of written communication is very good. A wide range of specialist terms is used adeptly and spelling, punctuation and grammar are almost faultless. [10]

**20 (a) The principle of specificity**

You judge whether the components of training included in the training programme [1] match with the physical fitness demands of the event or sport [1]. [2]

**(b) The principle of progressive overload**

You judge whether the frequency, intensity or time of the training [1] or a combination of them have been increased over the training programme [1]. You also need to judge if it was done progressively in that each time an overload is introduced, it is a sufficient overload to allow improvement but not too much that it could cause fatigue or injury. [1]

[3]

**(c) The principle of rest/recovery**

You judge whether there is sufficient rest/recovery after each training session/period [1] to allow recovery before training hard again. [1] The harder the training the longer the rest. [1]

[3]

**(d) The principle of peaking**

You judge whether there was in the lead up to the event or competition high intensity quality work with lots of recovery time. [1] This should be followed by the training tapering off [1] in the days immediately before the event or competition. [1]

Award [0] for an answer not worthy of credit.

Award [1] mark if the answer to some degree explains how to judge if the principle has been applied safely and appropriately.

Award [2] marks if the answer to a fair degree explains how to judge if the principle has been applied safely and appropriately.

Award [3] marks if the answer clearly explains how to judge if the principle has been applied safely and appropriately.

[3]

## GCSE PHYSICAL EDUCATION ASSESSMENT GRIDS

2011

The table sets out the assessment objective weightings for each examination component and the overall weighting for the GCSE qualification:

COMPONENT WEIGHTING	ASSESSMENT OBJECTIVES			TOTAL WEIGHTING
	AO 1	AO 2	AO 3	
External Assessment Knowledge, Understanding and Skills	20 – 30%		10 – 20%	<b>40%</b>
Developing and Maintaining a Balanced, Healthy Lifestyle		15%	5%	<b>20%</b>
Individual Performance in Physical Activities		35%	5%	<b>40%</b>
<b>OVERALL WEIGHTING</b>	20 – 30%	50%	20 – 30%	<b>100%</b>

The table sets out the assessment objective weightings for each area of study for the 2011 External Assessment Paper

AREAS OF STUDY	ASSESSMENT OBJECTIVE			TOTAL WEIGHTING
	AO 1	AO 2	AO 3	
<b>3.1.1</b>	0 – 5%		0 – 5%	2 – 5%
<b>3.1.2</b>	0 – 20%		0 – 20%	15 – 20%
<b>3.1.3</b>	0 – 15%		0 – 15%	10 – 15%
<b>3.1.4</b>	0 – 15%		0 – 15%	10 – 15%
<b>3.1.5</b>	0 – 10%		0 – 10%	4 – 10%
<b>3.1.6</b>	0 – 10%		0 – 10%	4 – 10%
<b>3.1.7</b>	0 – 10%		0 – 10%	4 – 10%
<b>3.1.8</b>	0 – 10%		0 – 10%	4 – 10%
<b>3.1.9</b>	0 – 15%		0 – 15%	10 – 15%
<b>3.1.10</b>	0 – 20%		0 – 20%	15 – 20%
<b>OVERALL WEIGHTINGS</b>	50 – 75% (20 – 30%)		25 – 50% (10 – 20%)	100% (40%)

The table sets out the assessment objective weighting for each question and area of study for the 2011 External Assessment Paper

QUESTION NUMBER	AO1	AO3	AREAS OF STUDY	MARKS FOR EACH QUESTION	MARKS FOR EACH SECTION
			3.1.1 – 3.1.10		
1	4		3.1.1 Physical well being	4	
Range	0 – 5%	0 – 5%	3.1.1 Total Weighting Range 2 – 5%		4
2	3		3.1.2 Components of food	3	
3		1	3.1.2 Balance between nutrients	1	
4	2		3.1.2 Tobacco – carbon monoxide	2	
5	2		3.1.2 Alcohol – long term effect	2	
6	2		3.1.2 Sleep – diet	2	
17		8	3.1.2 Reasons for participation	8	
Range	0 – 20%	0 – 20%	3.1.2 Total Weighting Range 15–20%		18
7	2		3.1.3 Physical demands of work	2	
8	2		3.1.3 Benefits of exercise – circulatory	2	
9	2		3.1.3 Components – aerobic energy	2	
10(a)	2		3.1.3 Components – long jump	2	
10(b)	2		3.1.3 Components – long jump	2	
Range	0 – 15%	0 – 15%	3.1.3 Total Weighting Range 10–15%		10
11(a)	2		3.1.4 Training methods – CSP	2	
11(b)	4		3.1.4 Training methods – weight training	4	
12		10	3.1.4 Training methods – interval	10	
Range	0 – 15%	0 – 15%	3.1.4 Total Weighting Range 10–15%		16
13	8		3.1.5 Principles – progressive overload/power	8	
Range	0 – 10%	0 – 10%	3.1.5 Total Weighting Range 4 – 10%		8
14(a)	3		3.1.6 Valid test – suitable for purpose	3	
14(b)	3		3.1.6 Reliable results – protocol	3	
Range	0 – 10%	0 – 10%	3.1.6 Total Weighting Range 4 – 10%		6
15	4		3.1.7 Immediate effects – circulatory	4	
Range	0 – 10%	0 – 10%	3.1.7 Total Weighting Range 4 – 10%		4
16(a)	2		3.1.8 Safety – definition of hazard	2	
16(b)	1		3.1.8 Safety – example of hazard	1	

Range	0 – 10%	0 – 10%	3.1.8 Total Weighting Range 4 – 10%		3
18(a)		2	3.1.9 Training session – circuit for endurance	2	
18(b)		2	3.1.9 Training session – circuit for endurance	2	
18(c)		6	3.1.9 Training session – circuit for endurance	6	
Range	0 – 15%	0 – 15%	3.1.9 Total Weighting Range 10–15%		10
19	10		3.1.10 Exercise programme – improve	10	
20(a)		2	3.1.10 Training programme – steps to evaluate	2	
20(b)		3	3.1.10 Training programme – steps to evaluate	3	
20(c)		3	3.1.10 Training programme – steps to evaluate	3	
20(d)		3	3.1.10 Training programme – steps to evaluate	3	
Range	0 – 20%	0 – 20%	3.1.10 Total Weighting Range 15 – 20%		21
1 - 20	60	40	<b>TOTALS</b>	100	100
	50 – 75%	25 – 50%			
	(25–30%)	(10–20%)		(40%)	(40%)