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REVISE BTEC NATIONAL







REVISE BTEC NATIONAL Sport UNIT 1



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A note from the publisher

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Introduction

This book has been designed to help you to practise the skills you may need for the external assessment of BTEC National Sport Unit 1. You may be studying this unit as part of the BTEC National Certificate, Extended Certificate, Foundation Diploma, Diploma or Extended Diploma.

About the practice assessments

The book contains four practice assessments for the unit, but unlike your actual assessment, each question has targeted hints, guidance and support in the margin to help you understand how to tackle them.

Sport REVISION GUIDE COULDE CO	gives you relevant pages in the Pearson Revise BTEC National Sport Revision Guide so you can revise the essential content. This will also help you to understand how the essential content is applied to different contexts when assessed
Hint	gets you started and reminds you of the skills or knowledge you need to apply
Prepare	helps you on how to approach a question, such as making a brief plan
FERNIT!	provides content that you need to learn such as a definition rule or formula
LEARN TE	
Explore	reminds you of content related to the question to aid your revision on that topic
Watch out!	helps you avoid common pitfalls
Time it!	appears in the final practice assessment and helps you become familiar with answering
	in a given time and start to think about allocating appropriate time for different kinds of questions.

There is space for you to write your answers to questions within this book. However, if you are planning or writing notes, or simply require more space to complete your answers, you may want to use separate paper.

There is also an answer section at the back of the book, so you can check your answers for each practice assessment.

Check the Pearson website

For overarching guidance on the official assessment outcomes and key terms used in your assessment, please refer to the specification on the Pearson website.

The practice questions, support and answers in this book are provided to help you to revise the essential content in the specification, along with ways of applying your skills. The details of your actual assessment may change, so always make sure you are up to date on its format and requirements by asking your tutor or checking the Pearson website for the most up-to-date Sample Assessment Material, Mark Schemes and any past papers.



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A small bit of small print

Pearson publishes Sample Assessment Material and the Specification on its website. This is the official content and this book should be used in conjunction with it. The questions have been written to help you test your knowledge and skills. Remember: the real assessment may not look like this.

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Practice assessment 1

SECTION A: The Skeletal System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

1 State **one** function of short bones.

Total for Question 1 = 1 mark

2 marks

2 There are three classifications of joints. A synovial joint is one of these classifications.

(a) Identify the **two** other classifications of joints.

•••••	••••••	•••••	

Practice assessment

Hint

This is a **state** question and requires a short answer. You are asked for only one function – don't give more than one!

Hint

Joint **classifications** are the categories that joints are put into according to how much movement is permitted at the joint. You have been given the synovial joint classification (which has the greatest range of movement permitted) and you need to name the other two which allow other types of movement.



Hint

To describe the main **function** of synovial fluid, you need to identify what synovial fluid does, and then describe its purpose or why is it important in the joint.

Watch out!

Remember, ligaments join bone to bone. Don't confuse them with tendons, which join muscles to bones.

Hint

In order to describe the main **function** of ligaments, you need to identify what the ligaments do as well as describing why they are important in the synovial joint.

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(b) (i) Describe the main function of synovial fluid in a synovial joint.

2 marks

2 marks

(ii) Describe the main function of ligaments in a synovial joint.

.....

.....

Total for Question 2 = 6 marks

Practice assessment

Arthritis is a condition that can affect the skeletal system. This condition is usually linked with older age.

3

Explain how participation in sport and physical activity can help to offset arthritis.

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Total for Question 3 = 3 marks

TOTAL FOR SECTION A = 10 MARKS

Hint

In this question, the command word **explain** is asking you to identify an adaptation to exercise that will help to reduce the effects of arthritis, and then explain how this adaptation can reduce the effects of arthritis.

LEARN IT!

Offset means 'to help to reduce the effects of something'.

Explore

Medical names with 'itis' as a suffix (at the end of the word) are generally related to inflammation. For example, arthritis is an inflammation of the joints and gastritis is inflammation of the stomach.



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SECTION B: The Muscular System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

4 Figure 1 shows Sarah performing a handstand in two phases.



LEARN IT!

The **deltoids** are the muscles located at the shoulder.

Hint

There are three types of muscle contraction. For this question you will need to think about the muscle contraction that does not produce any movement, as the person is stationary in Phase 2 of the handstand.

Hint

The agonist is the muscle that is contracting.

Watch out!

Plantar flexion and dorsi flexion are both movements that occur at the ankle. Plantar flexion is the movement that points a person's toes. Dorsi flexion is the movement that brings the toes closer to the shin. (c) Explain the muscle contractions at the elbow and the hip to move from Phase 1 to Phase 2.

 •

4 marks

Total for Question 4 = 6 marks



Hint

First, identify the muscle giving the movement at the elbow and then explain the type of movement. Consider whether the movement is shortening or lengthening the muscle. This will help you to work out what type of muscle contraction is taking place. Then repeat this process for the hip.

LEARN IT!

If a muscle shortens when contracting, this is a **concentric** contraction. If a muscle lengthens when contracting, this is an **eccentric** contraction. When a muscle contracts but there is no movement, this is an **isometric** contraction.



Hint

The term **synergist** comes from the word synergy. Synergy is when two or more things work together to produce a combined effect.

Hint

The name **fixator** provides a clue to the role the muscle performs.

LEARN IT!

An **antagonistic muscle** pair consists of an agonist and an antagonist: when one muscle is contracting, the other is relaxing. The muscle that contracts is the agonist and the muscle that relaxes is the antagonist. Other muscles can be involved in muscle contractions to support the agonist muscle. These muscles are called synergists and fixators. **5** (a) Explain the role of a synergist in antagonistic muscle contractions.

.....

2 marks

(b) Explain the role of a fixator in antagonistic muscle contractions.

.....

2 marks

Total for Question 5 = 4 marks

TOTAL FOR SECTION B = 10 MARKS

SECTION C: The Respiratory System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

6 Figure 2 shows an image of the respiratory system.

Identify the structures labelled A and B.



Total for Question 6 = 2 marks



Hint

Label A is pointing to the structure commonly known as the windpipe. You will need to write the technical term for this to get the mark.

Hint

Label B is pointing to the layer of muscle that runs along the floor of the thoracic cavity. This muscle is the main respiratory muscle involved in breathing at rest.



LEARN IT!

Expiration is the process of breathing air out of the body.

Hint

Make sure you read the question carefully. You are asked only about expiration (not inspiration). Don't waste time writing about anything else.

8

Hint

Be precise in your description of the expiration process. Your answer should include relevant technical vocabulary such as diaphragm, intercostal muscles, pressure and thoracic cavity.

Hint

Chemoreceptors detect chemical changes in the blood. Think about what chemical changes take place in the blood and how this would affect breathing rate. You should also include in your response the area in the brain that is responsible for increasing breathing rate.

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7 Describe the process of expiration at rest.

.....

Total for Question 7 = 4 marks

Torin is a basketball player. When he takes part in basketball he notices that his breathing rate increases

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.....

(a) Explain how chemoreceptors increase breathing rate.

3 marks

Torin's tidal volume is measured at rest and after five minutes of playing basketball. Table 1 shows the results.

Activity	Tidal volume (litres)
Rest	0.5
After five minutes of playing basketball	0.95

Table 1

(b) Evaluate the importance to performance of varying tidal volume during a basketball game.

6 marks

Total for Question 8 = 9 marks

TOTAL FOR SECTION C = 15 MARKS



LEARN IT!

Tidal volume is the amount of air breathed in and out during one breath.

Hint

The table shows that tidal volume increased when Torin changed from rest to playing basketball. Think about what the body needs more of from the air when playing basketball as well as what waste product the body is producing that is being breathed out.

Watch out!

Make sure you do not confuse tidal volume with stroke volume. Stroke volume relates to blood flow out of the heart.



LEARN IT!

The **cardiovascular system** has five main functions:

- 1. It delivers oxygen and nutrients.
- 2. It removes waste products.
- 3. It provides thermoregulation.
- 4. It fights infection.
- 5. It clots blood.

Hint

In this question, the command word **describe** is asking you to identify the functions of platelets and red blood cells, define how they carry out these functions and note any benefits.

LEARN IT!

There are four **components of blood** that you need to know about: red blood cells, white blood cells, platelets and plasma.

SECTION D: The Cardiovascular System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

9 The cardiovascular system has many different functions.

Describe the function of platelets and red blood cells.

.....

Total for Question 9 = 4 marks

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- **10** Ann is taking part in a long-distance rowing race. Just before the race she notices that her heart rate increases even though she has not started to exercise.
 - (a) Explain why Ann's heart rate increases just before she takes part in exercise.

4 marks

On the race day, the sun is out and it is hot.

(b) Explain **one** thermoregulatory method that will help to maintain Ann's core body temperature whilst she is taking part in the longdistance rowing race.

	••••
	•••
	•••
	•••
4 marks	



LEARN IT!

Anticipatory increase is the term for an increase in heart rate when a person starts to think about taking part in exercise but is not yet increasing their physical activity.

Hint

You should use the term anticipatory increase in your answer and then provide an explanation for why it is beneficial for heart rate to increase prior to exercise.

LEARN IT!

Thermoregulation is the process of keeping the body's core temperature at a constant 37 degrees centigrade. The core of the body is the head and torso.

Hint

Exercising in the heat is going to be a concern for Ann, so you need to think about how the body cools itself down. To get ideas about a method of heat loss, think about what happens to you when you get too hot when you exercise. As the question is asking about a thermoregulatory method, responses such as taking off a layer of clothing or spraying herself with cold water would not gain any marks as these are behavioural, not thermoregulatory, responses.



Hint

To answer this **analyse** question you should identify the cardiovascular adaptations, describe how they are related and explain how they contribute to improving rowing performance.

Hint

This is called **hypertrophy** and affects the wall of the heart. You need to explain how this increases the stroke volume and the resting heart rate.

Hint

You could start your answer by saying:

'Cardiac hypertrophy is an adaptation of the cardiovascular system to aerobic training. An increase in the strength of the heart means that the resting heart rate will ...'

Hint

To conclude your answer, you could begin your sentence like this:

'These adaptations will improve Ann's rowing performance because more blood carrying oxygen is ...'

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To prepare for the rowing race, Ann took part in six months of aerobic training.

(c) Analyse how cardiovascular adaptations to aerobic training would increase Ann's rowing performance.

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6 marks

Total for Question 10 = 14 marks

TOTAL FOR SECTION D = 18 MARKS

SECTION E: Energy Systems and Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

- **11** Joshua is a long-distance runner. He competes in a 10 km race at his local athletics stadium. This event requires the aerobic energy system to provide most of the energy required for Joshua to complete the race.
 - (a) Aerobic glycolysis is one of the processes that takes place in the aerobic energy system.

Identify the **two** other processes that take place in the aerobic energy system.

Process 1	•••••	 •••••	•••••	•••••	•••••	 	•••••
Process 2	•••••	 				 	•••••

2 marks

(b) Explain why the aerobic energy system provides most of the energy for a 10 km race.

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	5 marks
	5 marks



LEARN IT!

There are three main processes that take place in the aerobic energy system, producing **adenosine triphosphate** (ATP). ATP provides the energy required for muscle contraction.

Hint

In a question that asks you to **identify** something, you are being asked for a short piece of factual information. This will probably be just a few words, you do not need to write a long response.

Hint

You should always consider the intensity and duration of an activity when thinking about the contribution of an energy system to the energy demands of the activity. This question is about a long-duration, lowintensity activity. Intensity is how hard a sport or exercise is, and duration is how long it lasts. Think about the energy yield from each energy system to explain which is used for the 10km race.



- What is the ATP-PC system?
- What type of exercise is the ATP-PC energy system used for?
- Therefore, when during a 10km race could this be relevant?

LEARN IT!

The ATP-PC system

uses phosphocreatine to resynthesise ATP. This system provides ATP very quickly for fast, explosive movements. It can only supply energy for short periods of time though – up to 10 seconds of highintensity exercise.

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(c) Explain when in the 10 km race Joshua may use the ATP-PC energy system.

.....

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6 marks

Total for Question 11 = 13 marks

12 Joshua spent many months carrying out aerobic training for his 10 km race.

Analyse how the aerobic energy system adapts to aerobic training to improve 10 km running performance.

Total for Question 12 = 6 marks

TOTAL FOR SECTION E = 19 MARKS

Prepare

Take a minute or two to plan your response as this will improve your answer. You will need to cover:

- adaptations to the aerobic energy system from the training
- how each adaptation will improve energy production and therefore performance in the 10km race.

Hint

For this question, think about where in the body the aerobic energy system creates ATP. You should know the specific organelles in the muscles in which this process takes place.

You should also consider what energy sources are used for the aerobic energy system and how increases in these fuel stores help to increase the amount of ATP that can be produced by the aerobic energy system. There are two main fuel sources for the aerobic energy system and one supplies energy at a faster rate than the other.

Lastly, include examples of how the increase in ATP production from adaptations to the aerobic energy system will lead to improvements in 10km running performance.



Prepare

Take a few minutes to plan your response by thinking about key adaptations to the cardiovascular system and muscular system in response to aerobic training. You can jot down bullet points to make sure you don't forget anything. Your answer should cover the interrelationships between the muscular and cardiovascular systems, how they work together to enable performance and how the adaptations to them result in an improved performance.

Hint

You need to describe how the muscular system and cardiovascular system work together to increase hockey performance. The cardiovascular system consists of the heart, blood vessels and blood, while the muscular system consists of the muscles.

SECTION F: Interrelationships Between Body Systems for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

13 Nima is a hockey player. A hockey game lasts 70 minutes plus a halftime break. Nima takes part in aerobic training to help to improve her performance.

Analyse how adaptations to Nima's muscular and cardiovascular system could improve her hockey-playing performance.

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Hint

Identify what muscles require from the blood to help them to contract for long periods of time. Then explain how adaptations to the cardiovascular system allow increased supply of these key requirements to the muscles, so that Nima can play long games of hockey. The cardiovascular system is also responsible for removing waste products from the muscles, so you should explain which waste products are produced by the muscles and how adaptations to the cardiovascular system can increase the removal of these waste products.

Watch out!

Remember to write coherently and make sure you link the points together. Look back through your answer to check that you have covered the key points related to the muscular and cardiovascular systems.

..... Total for Question 13 = 8 marks **TOTAL FOR SECTION F = 8 MARKS TOTAL FOR PAPER = 80 MARKS**

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Practice assessment 2

SECTION A: The Skeletal System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.



Practice assessment

Three functions of the skeleton when performing sporting techniques are muscle attachment, leverage and weight bearing.	Revision Guide pages 3 and 12
(c) Explain two other functions of the skeleton.	
Function 1	Hint
	In this question, the command word explain is asking you to identify a function of the skeleton and describe how or why the skeleton helps to perform this function.
Function 2	I.F.ARN IT!
(d) Explain why taking part in resistance training can have a negative impact on bone growth in young children.	The eight functions of the skeleton are: providing a supporting framework, protection, providing an attachment for skeletal muscle, a source of blood cell production, storage of minerals, leverage, weight bearing and reducing friction across joints. Learn these functions and make sure you can apply them to how the body functions during sporting activities.
	Hint
4 marks	Focus on how the ends of the bone are related to bone growth. You should demonstrate your knowledge of how an increase in muscle size can result in stronger muscles that may pull with too much force on the ends of the bone. Your answer should include the consequences of this increased force on bone growth on young people
Total for Ourstien 1 11 montes	growing.

Total for Question 1 = 11 marks

TOTAL FOR SECTION A = 11 MARKS



LEARN IT!

There are three different **muscle fibre types**: type I, type IIa, and type IIx. You should know their names, their characteristics, and when and in which sports they are recruited.

Hint

The word **characteristic** in this question refers to a distinguishing feature. You need to describe a key feature which is specific to the skeletal muscle and describe the importance of that feature.

Hint

You have only been asked to describe one characteristic. Do not waste time writing about more than one.

SECTION B: The Muscular System for Sports Performance

Answer ALL questions. Write your answers in the spaces provided.

2 Identify the muscle fibre types mainly used in:

100 m sprinting

long-distance running

Total for Question 2 = 2 marks

3 (a) Describe **one** characteristic of skeletal muscle.

2 marks

.....

Hypertrophy is one adaptation of skeletal muscle to resistance training.

.....

.....

(b) Explain how hypertrophy occurs.



Hint

The scenario describes an adaptation of the skeletal muscle to resistance training. This means how the muscles change as a result of regular long-term resistance (anaerobic) training, not how the muscular system responds to a single resistancetraining session.

Hint

3 marks

You have been asked to **explain** how hypertrophy occurs, not just to define it. You need expand your answer to include what happens in the muscles and why it happens.



LEARN IT!

Make sure you know the correct terminology for the different types of muscle contraction: **isometric**, **concentric** and **eccentric** muscle contraction.

Hint

The question asks you to explain the muscle contraction at the elbow only, so don't worry about the action at any other joint shown on the diagram. Make sure you also explain the action that allows the movement from the starting position (Phase 1) to the finish position (Phase 2).

Hint

You should identify which muscle is contracting, the type of contraction that is happening and what type of movement is resulting at the elbow. Carrie takes part in resistance training to improve her performance in the shot put.

Figure 2 shows Carrie throwing the shot put.



(c) Explain the type of muscle contraction at the elbow as Carrie moves from Phase 1 to Phase 2.

.....

3 marks

Total for Question 3 = 8 marks

TOTAL FOR SECTION B = 10 MARKS