

## Pearson BTEC Level 3 Nationals

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# Sport

## Unit 1: Anatomy and Physiology

Certificate/Extended Certificate/Foundation Diploma/Diploma/Extended Diploma

Sample Assessment Materials for first teaching September 2016

**Time: 1 hour 30 minutes**

**You do not need any other materials.**

Total marks
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### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and learner registration number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*

### Information

- The total mark for this paper is 90.
- The marks for **each** question are shown in grey boxes  
– *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

**Paper reference**

31524H

S51969A

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Turn over ►

**PEARSON**

**SECTION A : The Skeletal System for Sports Performance.**  
**Answer ALL questions. Write your answers in the spaces provided.**

Within the body there are different types of bone. One type is a sesamoid bone. The function of the sesamoid bone is to reduce friction across a joint.

**1** State the function of the following **three** types of bone:

3 marks

Long .....

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Short .....

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Flat .....

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Total for Question 1 = 3 marks

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Eve is a netballer and plays centre.



**Figure 1**

- 2 (a) Identify the movement occurring at Eve's ankle when she is jumping/taking off in **Figure 1**.

1 mark

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- (b) The ankle is an example of a synovial joint.

State **two** functions of ligaments within Eve's ankle.

2 marks

1 .....

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2 .....

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(c) Analyse the impact of participation in netball on Eve's skeletal system.

6 marks

Handwriting practice area with 18 horizontal dotted lines.

Total for Question 2 = 9 marks  
**TOTAL FOR SECTION A = 12 MARKS**

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**SECTION B: The Muscular System for Sports Performance.**  
**Answer ALL questions. Write your answers in the spaces provided.**

Tristan is a football player, he plays in midfield.



**Figure 2**

- 3 (a) Explain how type IIx muscle fibre types would be beneficial for Tristan when playing football.

3 marks

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The nervous system controls the force Tristan applies when kicking the ball.

(b) Describe the law associated with nervous control of muscle contraction.

3 marks

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As part of Tristan's pre-season training he has undertaken lactate threshold training.

- (c) Explain how increasing Tristan's tolerance to lactate would be beneficial to his football performance.

5 marks

Area for writing the answer, consisting of a large rectangular box with horizontal dotted lines.

Total for Question 3 = 11 marks



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A fundamental part of Tristan's training is using weights to develop his upper body strength.

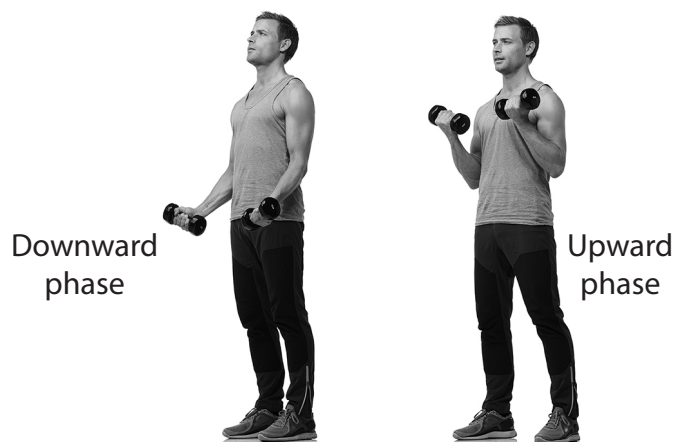


Figure 3

- 4 Analyse how the antagonistic muscle pairs, synergists and fixators at the elbow and shoulder, as shown in **Figure 3**, allow Tristan to complete the bicep curl.

6 marks

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Total for Question 4 = 6 marks  
**TOTAL FOR SECTION B = 17 MARKS**

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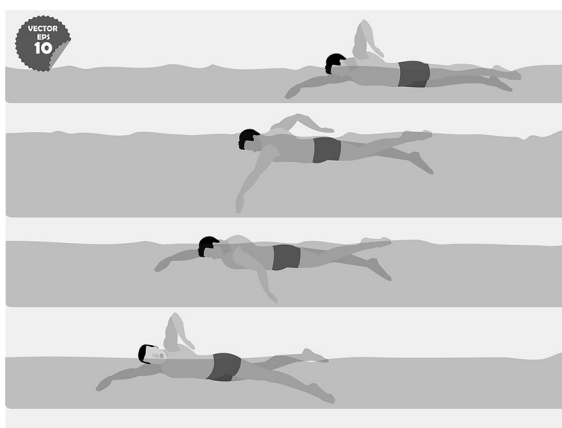
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**SECTION C: The Respiratory System for Sports Performance.**  
**Answer ALL questions. Write your answers in the spaces provided.**

Evan is a competitive triathlete and needs to prepare his body to meet the needs of the swimming, cycling and running sections of his event.



**Figure 4**

- 5 (a) Describe the mechanisms of breathing for inspiration during the swimming section of Evan's race compared with at rest.

5 marks

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The next section of the race is cycling.

- (b) Explain how neural factors regulate Evan's respiratory system during the cycling section of his race.

4 marks

Area for writing the answer, consisting of a large rectangle with horizontal dotted lines for writing.

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The weakest part of Evan's triathlon is his running section. To improve this, Evan considers training at altitude to boost his performance for this section of the race.

(c) Analyse the **immediate** effects of altitude training on Evan's respiratory system.

6 marks

Handwriting practice area with 18 horizontal dotted lines.

Total for Question 5 = 15 marks  
**TOTAL FOR SECTION C = 15 MARKS**



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**SECTION D: The Cardiovascular System for Sports Performance.**  
**Answer ALL questions. Write your answers in the spaces provided.**

A capillary is a blood vessel that enables gaseous exchange to occur.

**6** Describe how the capillary aids the process of gaseous exchange.

3 marks

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Total for Question 6 = 3 marks

**7** Describe the functions of the right atria.

2 marks

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Total for Question 7 = 2 marks

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8 Explain the role of the Atrio-ventricular node (AVN) in the nervous control of the heart when exercising.

3 marks

Handwriting practice area with seven horizontal dotted lines for writing the answer.

Total for Question 8 = 3 marks

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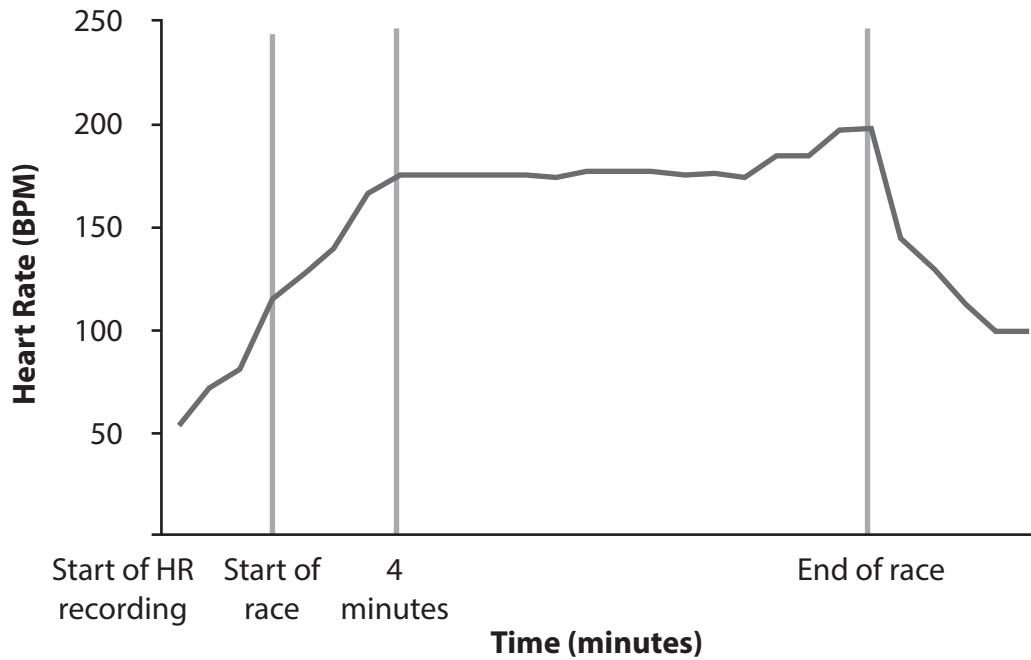
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Joe has been taking part in a 6 week endurance training programme to try to improve his 5000m time. He used a heart rate monitor to record his heart rate during his first 5000m race.



**Figure 5**

- 9 (a) Explain, using **Figure 5**, how Joe's heart rate increases from the start of the Heart Rate (HR) recording to 4 minutes into the race.

4 marks

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**Figure 6** shows Joe's stroke volume at rest and during his race following completion of his six week training programme.

	SV at rest (ml)	SV during the race (ml)
Before training programme	70	120
After training programme	85	140

**Figure 6**

(b) Explain how an increased stroke volume would impact on Joe's performance.

4 marks

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**Figure 7** shows Joe's cardiac output at rest and during his race following completion of his 6 week training programme.

	Cardiac output (L/min) at rest	Cardiac output (L/min) during race
Before training programme	5	15
After training programme	5	19

**Figure 7**

- (c) Analyse, using **Figure 7**, cardiac output values over the rest and race period and how this would affect performance following completion of the 6 week training programme.

6 marks

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Total for Question 9 = 14 marks  
**TOTAL FOR SECTION D = 22 MARKS**

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**SECTION E: Energy Systems for Sports Performance.**  
**Answer ALL questions. Write your answers in the spaces provided.**

Alyssa is a marathon runner and one of the adaptations to endurance training is that she has the ability to store more glycogen.

- 10** Explain **one** reason why increased glycogen storage would be beneficial to Alyssa's marathon performance.

2 marks

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Total for Question 10 = 2 marks



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11 Explain how Alyssa's body uses oxygen to recover after intense exercise.

5 marks

Handwriting practice area with 12 horizontal dotted lines for writing the answer to Question 11.

Total for Question 11 = 5 marks

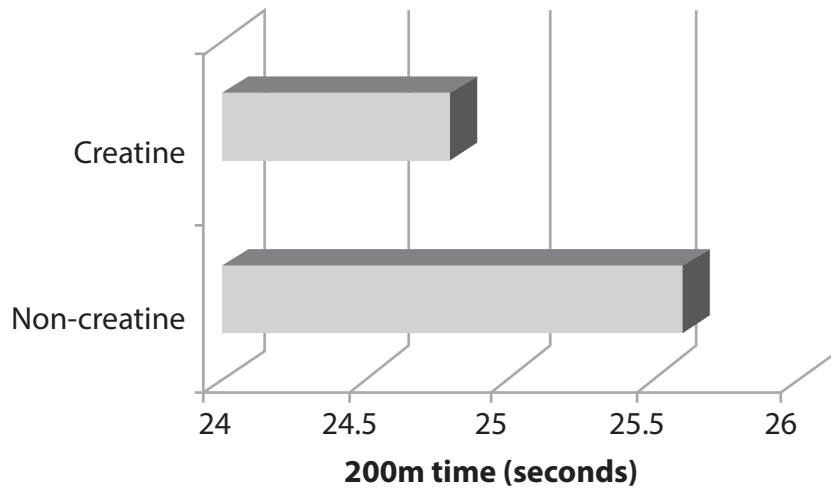
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Abi is a competitive sprinter who regularly competes in 100m and 200m races. Some of her rivals are using a creatine supplement to enhance their performance. Abi also decides to use a creatine supplement.

**Figure 8** shows Abi's 200m personal best sprint times before and after creatine supplementation.



**Figure 8**

**12** Explain why increasing creatine stores may have an impact on Abi's sprint time.

3 marks

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Total for Question 12 = 3 marks



Jasmine is a county rugby player and she trains regularly to improve her performance. As well as her rugby sessions, she will do two 30-minute runs per week to develop her aerobic system.

13 Evaluate the importance of the aerobic system for Jasmine's rugby performance.

6 marks

Area for writing the answer to Question 13, consisting of a large rectangular box with horizontal dotted lines for writing.

Total for Question 13 = 6 marks  
**TOTAL FOR SECTION E = 16 MARKS**

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**SECTION F: Interrelationships between Body Systems for Sports Performance.**  
**Answer ALL questions. Write your answer in the space provided.**

Freya is a national level badminton player and regularly competes in high-level competitive events . Her weekly training schedule involves high intensity interval training and intense long distance running.

- 14** Analyse how the physiological adaptations to the muscular and energy systems, as a result of these intense training methods, can improve Freya's badminton performance.

8 marks

A large rectangular area with horizontal dotted lines for writing the answer to question 14.

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Large rectangular area with horizontal dotted lines for writing.

Total for Question 14 = 8 marks

**END OF EXAM**

**TOTAL FOR SECTION F = 8 MARKS  
TOTAL FOR PAPER = 90 MARKS**



## Pearson BTEC Level 3 Nationals

Write your name here

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Level

3

Learner Registration Number

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Centre Number

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# Sport

## Unit 2: Fitness Training and Programming for Health, Sport and Well-being

Part

B

Marks

Supervised hours

2.5

Extended Certificate/Foundation Diploma/Diploma/Extended Diploma

Sample assessment material for first teaching September 2016

### Instructions

- Use **black** ink or ball-point pen.
- Fill in the boxes** at the top of this page with your name.
- Answer **all** activities.
- Answer the activities in the spaces provided  
– *there may be more space than you need.*
- Do **not** return research notes or **Part A** to Pearson.

### Information

- The total mark for this paper is 60.
- The marks for each activity are shown in brackets  
– *use this as a guide as to how much time to spend on each activity.*
- Centres may choose **ONE** 2.5 hour slot on either of the two dates specified by Pearson. Centres must not schedule multiple sessions as this will be considered malpractice.

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every activity.
- Check your answers if you have time at the end.

### Paper reference

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PEARSON

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## Important Information

Refer to your research notes from Part A to complete Part B. You cannot access the internet or any other resource during the supervised assessment period.

You must plan your time and work independently throughout the 2.5 hour supervised assessment period.

You will complete Part B under supervision and your work will be kept securely during any breaks taken.

You must not share your work with other learners.

## Part A

### Case study

John is a 32-year-old male who works approximately 7-8 hours a day as a full-time builder.

He takes part in regular exercise and has a passion for weightlifting. John has recently participated in numerous competitions to challenge himself further within his sport. John trains twice every day, once before and once after work, and tries to follow a diet plan that will maximise his potential and performance.

John has recently hired a strength and conditioning coach, as he wants to improve his weightlifting technique, as well as different components of fitness that can take him to a higher level within the sport.

John's coach has decided to put him through a health screening procedure to see what his general health is like, as well as design a new diet plan and a fitness training programme. The aim of this is to improve his components of fitness, with the main objective being to win the next competition in 3 months' time.



## Part B

### Lifestyle questionnaire

#### Section 1: Personal details

Name: **John Smith**

Address: **49 The Walk  
Anytown  
The County**

Home telephone: **01234 567891**

Mobile telephone: **07123 456790**

Email: **john7@email.com**

Date of birth: **25/07/1984**

**Please answer the following questions to the best of your knowledge.**

#### Occupation

1. What is your occupation?

**Builder**

2. How many hours do you work daily?

**7–8 hours per day with a 30-minute lunch break**

3. How far do you live from your workplace?

**I work in lots of different places**

4. How do you travel to work?

**Drive**

5. How active would you say your job was?

**Very active**

#### Section 2: Current activity levels

1. How many times a week do you currently take part in physical activity?

**Six days a week, twice a day**

2. What type of activity/exercise do you mainly take part in?

**Weight training**

### Section 3: Nutritional status

1. Complete the food diary for the previous two days.

Day 1	Breakfast	Lunch	Dinner	Snacks
Yes/No	No	Yes	Yes	Yes
Time of day		12.45pm	8.30–9pm	Variable times throughout the day
Food intake		Jacket potato with cheese and beans	Steak and potatoes	Chocolate bar Packet of crisps Peanuts
Fluid intake	3 x cups of tea, 3 pints of beer, 1 small bottle of water			
Day 2	Breakfast	Lunch	Dinner	
Yes/No	No	Yes	Yes	Yes
Time of day		12.45pm	8.30–9pm	Variable times throughout the day
Food intake		Ham and cheese sandwich 1 apple	Spaghetti Bolognese	1 apple Chocolate bar Peanuts
Fluid intake	3 x cups of tea, 3 pints of beer, 1 small bottle of water			
2. Do you take any supplements? If yes, which ones?				No

### Section 4: Your lifestyle

Please answer the following questions to the best of your knowledge.

1. How many units of alcohol do you drink in a typical week? **24**
2. Do you smoke? **Yes** If yes, how many cigarettes a day? **3 a day**
3. Do you experience stress on a daily basis? **Yes**

If yes, what causes you stress (if you know)? **I worry that my work may interrupt my training programme in the future.**

4. On average, how many hours sleep do you get per night? **7**

### Section 5: Health monitoring tests

Test results

Test	Result
Blood Pressure	123/81 mmHg
Resting Heart Rate	65 bpm
Body Mass Index	35
Waist-to-Hip Ratio	0.80

### Section 6: Physical activity/sporting goals

What are your physical activity/sporting goals?

**To win my next weightlifting competition in 3 months' time.**

**To increase my strength and the amount of weight I can lift.**

### CLIENT DECLARATION

I have understood and answered all of the above questions honestly.

Signed client: J. Smith

Print name: John Smith

Date: 11/09/16

# Taskbook

Please do not write answers outside the spaces provided.

You must complete all activities in this taskbook.

- 1 Interpret the lifestyle factors and screening information for John Smith.

12 marks

Large rectangular area with horizontal dotted lines for writing the answer to question 1.



A large rectangular area with a double-line border. The inner border is solid, while the outer border has slightly rounded corners. Inside this area, there are 25 horizontal dotted lines spaced evenly down the page, providing a guide for handwriting practice.

Lined writing area for activity 1.

Total for Activity 1 = 12 marks



2 Provide lifestyle modification techniques for John Smith.

12 marks

A large rectangular area containing 25 horizontal dotted lines for writing.

A large rectangular frame with a double-line border and a dotted line inside, intended for writing. The frame is centered on the page and occupies most of the vertical space.



Lined writing area for activity 2.

Total for Activity 2 = 12 marks

**3** Provide and justify your nutritional guidance for John Smith to meet his specific requirements.

8 marks

A large rectangular box containing 25 horizontal dotted lines for writing the answer.

Lined writing area with 25 horizontal dotted lines.

Total for Activity 3 = 8 marks

4 Propose and justify different training methods that meet John Smith's training needs.

8 marks

A large rectangular box containing 25 horizontal dotted lines for writing the answer.

Handwriting practice area with 25 horizontal dotted lines.

Total for Activity 4 = 8 marks

5 Design weeks 1, 3 and 6 of a six-week fitness training programme for John Smith.

6 marks

<b>Week 1</b>							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Physical activity							

**Week 3**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Physical activity							

**Week 6**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Physical activity							

**Total for Activity 5 = 6 marks**



**6** Justify the fitness training programme that you have designed for John Smith.

14 marks

A large rectangular box containing 25 horizontal dotted lines for writing the answer.

A large rectangular frame with a double-line border and a dotted line inside, intended for writing. The frame is centered on the page and occupies most of the vertical space.

A large rectangular area with a solid border and a dotted line for writing.

Lined writing area for student response.

Total for Activity 6 = 14 marks

**END OF TASK** **TOTAL FOR TASK = 60 MARKS**