Zig Zag Education

**Sport** BTEC Tech Award (L1/2) | 603/7068/3


# Topic Tests for BTEC Tech Award (L1/2): Sport

## Component 3: Developing Fitness to Improve Other Participants' Performance in Sport and Physical Activity

**zigzageducation.co.uk**

**POD 12237**

# Contents

# Teacher's Introduction

This resource has been created for the BTEC Level 1/2 Tech Award in Sport (first teaching from September 2022). It covers all the theoretical content for ***Component 3: Developing Fitness to Improve Other Participants' Performance in Sport and Physical Activity***. There is a total of 14 topic tests, each of which focuses on a different area of the unit specification.
Tests range from 28 to 44 marks in total and should take approximately 30–45 minutes each to complete, depending on the specific number of marks available in each test.

**Remember!**
Always check the exam board website for new information, including changes to the specification and sample assessment material.

Each topic test is designed to progress in difficulty, generally starting with memory recall questions, to get students thinking about the core specification points of each topic, before becoming harder and requiring students to use more of their initiative in their answers. The topic tests often contain multiple parts, containing a mix of short-answer questions and longer, inferential questions. Many questions include sport and physical activity examples to give students an idea of the broad practical application of theoretical content. A variety of question styles is included, e.g. multi-choice, gap-fill, match-up exercises, tables, diagrams and images, all of which are used to engage the student. For the purpose of testing questions using normative data, we have created data sets that are reasonable estimations of normative data. As such, they are realistic and work in testing the student's ability to interpret data. **Please note for coursework and alike, students should compare to real normative data obtained from reliable sources.**

Answers and guidance for mark allocation are provided at the end of the resource, and can be used for peer- or self-assessment. They also provide you, the teacher, with an opportunity to identify students' strengths and weaknesses in order to individualise and direct your teaching practices accordingly.

**Specification reference table**
The following table can be used to identify which specification points you are teaching and select the appropriate topic test to suit your needs.

| Topic test | Title | Spec reference | Total marks |
|---|---|---|---|
| **A – Importance of fitness for sports performance** | | | |
| 1 | Components of fitness | A1 | 39 |
| 2 | Fitness training principles and exercise intensity | A2–A3 | 43 |
| **B – Investigate fitness testing to determine fitness levels** | | | |
| 3 | Importance of fitness testing and requirements for administration | B1 | 41 |
| 4 | Physical fitness test methods (aerobic endurance and muscular endurance) | B1–B2, B4 | 39 |
| 5 | Physical fitness test methods (muscular strength and speed) | B1–B2, B4 | 35 |
| 6 | Physical fitness test methods (flexibility and body composition) | B1–B2, B4 | 37 |
| 7 | Skill-related fitness test methods (agility, balance, coordination) | B1, B3–B4 | 37 |
| 8 | Skill-related fitness test methods (power and reaction time) | B1, B3–B4 | 32 |
| **C – Investigate different fitness training methods** | | | |
| 9 | Fitness training methods: aerobic endurance (requirements, provision and long-term training effects) | C1–C2, C4–C6 | 44 |
| 10 | Fitness training methods: muscular endurance and strength (requirements, provision and long-term training effects) | C1–C2, C4–C6 | 28 |
| 11 | Fitness training methods: speed and flexibility (requirements, provision and long-term training effects) | C1–C2, C4–C6 | 38 |
| 12 | Fitness training methods: skill-related fitness components (requirements, provision and long-term training effects) | C1, C3–C6 | 40 |
| **D – Investigate fitness programming to improve fitness and sports performance** | | | |
| 13 | Personal information and fitness training programme design | D1–D2 | 30 |
| 14 | Motivational techniques for fitness programming | D3 | 32 |

# 1. Components of Fitness

1. a) Complete the following definition of muscular strength.

*'Muscular strength is the maximum _____ that c*
*muscle or muscle group.'*

Muscular strength is impo nt f sports such as rugby.

b) W ne the following examples in rugby requires the most muscul
Ti ox next to your answer.

i) Driving back the opposition in a ruck, maul or scrum ☐

ii) Changing direction quickly to evade an opponent ☐

iii) Performing a chip kick over an opponent ☐

iv) Throwing a spin pass out wide to the winger in space ☐

c) N **o other** sports or activities where strength is a key component
ex e how.

| **Sport/activity 1:** *(1 mark)* | **Sp** |
|---|---|
| **Example:** *(1 mark)* | **Example:** |

2. a) Give **one** example of where reaction time is required in the following sp

*Bat and ball sports, e.g. Cricket:* .....

.....

*Sprint events, e.g. 100 m sprint:* .....

.....

b) Give **one** exam[illegible] where coordination is required in the following spo

*R[illegible] sports, e.g. Tennis:* .....

.....

*Jump events, e.g. Triple jump:* .....

.....

3. Flexibility is an important component of fitness in gymnastics.

a) Explain how having good flexibility could impact performance in gymnas

.....

.....

.....

.....

b) In [illegible] other sport would flexibility be most important to performance
Tick the box next to your answer.

i) Skiing ☐

ii) Martial arts ☐

iii) Snooker ☐

iv) 100 m sprint ☐

c) Balance is also a key component of fitness in gymnastics. There are two
and dynamic.

Give one example of where static b[illegible] might be used in gymnastics a
dynamic balance might be [illegible] gymnastics.

*Static balan[illegible]* .....

.....

*Dynamic balance:* .....

.....

4. a) State the definition of muscular endurance.

.....

.....

Josh is a decathlete who requires muscular endu[illegible] for the 400 and 1,500 also competes in the events displayed in the table below.

| | | |
|---|---|---|
| 100 m sprint | Long jump | Shot-put |
| 110 m hurdles | Discus throw | Pole vault |

b) Explain, using examples from the decathlon, why the type of event shou determining the fitness components important for successful participati

.....

.....

.....

.....

5. a) Fill in the gaps below to identify how speed and power are determined.

*'Speed is measured by the _____ it tak*

*cover a [illegible] determined _____*

*Power is calculated from _____ × spee*

*exertion is performed as _____*

Tanja is a 100 m sprinter who has been advised by her coach that in order to must develop her power and her speed.

b) Explain **one** reason why power and **one** reason why speed are importan
successful performance in the 100 m sprint.

**Power:**

.....

.....

.....

.....

**Speed:**

.....

.....

.....

.....

c) Using **one** team sport, give an example of where speed and power are re

| **Speed** | |
|---|---|
| *(1 mark)* | |

6. a) Describe **two** examples of where agility is required in different playing p

1. .....

.....

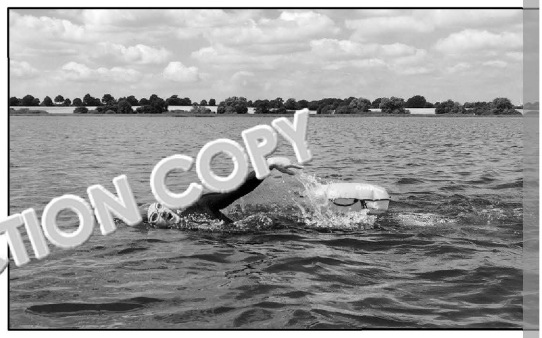
2. .....

.....

b) Name **one other** sport where agility is a key c ponent of fitness, and g

| | **Sport/activity 1:** |
|---|---|
| | |

7. Samantha's coach suggested that aerobic endurance is a key component of fi
water swimming.



a) Explain **one** reason why aerobic endurance is a key component of fitnes

.....

.....

.....

.....

b) Give **two other** sports or physical activities where aerobic endurance is

1. .....

2. .....

8. a) Identify the co[illegible] of fitness described below.

*Th[illegible] of fat-free mass to fat mass.*

.....

b) Using different sporting examples, explain why low body fat and high m
to sports performance.

| Low body fat | Hi |
|---|---|
| *(2 marks)* | |

T

# 1. Components of Fitness

1. a) Complete the following definition of muscular strength.

*'Muscular strength is the maximum _____ that can be generated by*

Muscular strength is important for sports such as rugby.

b) Which one of the following examples in rugby requires the most muscul
   i) Driving back the opposition in a ruck, maul or scrum
   ii) Changing direction quickly to evade an opponent
   iii) Performing a chip kick over an opponent
   iv) Throwing a spin pass out wide to the winger in space

c) Name **two other** sports or activities where strength is a key component
example how.

2. a) Give **one** example of where reaction time is required in the following sp
   - *Bat and ball sports, e.g. Cricket*
   - *Sprint events, e.g. 100 m sprint*

b) Give one example of where coordination is required in the following sp
   - *Racquet sports, e.g. Tennis*
   - *Jump events, e.g. Triple jump*

3. Flexibility is an important component of fitness in gymnastics.

a) Explain how having good flexibility could impact performance in gymnas

b) In which other sport would flexibility be most important to performance
   i) Skiing
   ii) Martial arts
   iii) Snooker
   iv) 100 m sprint

c) Balance is also a key component of fitness in gymnastics. There are two
and
Give one example of where static balance might be used in gymnastics a
of where dynamic balance might be used in gymnastics.

4. a) State the definition of muscular endurance.

Josh is a decathlete who requires muscular endurance for the 400 and 1,500 decathlon, he also competes in the events displayed in the table below.

| | | |
|---|---|---|
| 100 m sprint | Long jump | Shot-put |
| 110 m hurdles | Discus throw | Pole vault |

b) Explain, using exa[illegible] from the decathlon, why the type of event shou[ld] when deter[mining] the fitness components important for successful part[icipation]

5. a) Complete the sentences below to identify how speed and power are det[ermined]

*'Speed is measured by the (i)_____ it takes an individual to cover a short, pre[determined]*

*'Power is calculated from (iii)_____ × speed, where maximal exertion is perfo[rmed]*

Tanja is a 100 m sprinter who has been advised by her coach that in order to improve her personal best she must develop her power and her speed.

b) Explain **one** reason why power and **one** reason why speed are important components of fitness for successful performance in the 100 m sprint.

*(4 marks)*

c) Using **one** team sport, give an example of where speed and power are re[quired]

6. a) D[escribe] **two** examples of where agility is required in different playing p[ositions]

b) Name **one other** sport where agility is a key component of fitness, and g[ive]

7. Samantha's coach suggested that aerobic endurance is a key component of fitness for her event of open water swimming.

a) Explain **one** reason why aerobic endurance is a key component of fitness for open water swimming.

*(2 marks)*

b) Give **two other** sports or physical activities where aerobic endurance is [important]

8. a) Identify the component of fitness described below.

*The ratio of fat free mass to fat mass.*

b) Using different sporting examples, explain why low body fat and high mu[scle mass] important to sports performance.

## Preview of Questions Ends Here

| Q. | | Answer |
|---|---|---|
| 1 | | b) To increase the time available for planning future training sessions. |
| 2 | | To calculate the intensity for training muscular strength and muscular endurance it involves determining one-rep max (the maximum weight an individual can lift for a given exercise) (1). Muscular strength training can be performed at 80–100% of one-rep max (1), whereas muscular endurance can be trained with a load below 80% of one-rep max but for approx. 15 repetitions (1). |
| 3 | | **Principle of training** / **Definition** / **c) Practical examples**<br>*Adaptation* / **a)** The response of the body over time to progressive increases in training loads (1) / By gradually increasing the distance run each session, the performer will improve the efficiency of their cardiovascular system (1)<br>**b)** Variation (1) / *Keeping the training regime dynamic in order to avoid boredom and maintain motivation and enjoyment* / A performer might choose to change the type of training between continuous, interval, circuit and fartlek if they are hoping to stay motivated for their aerobic endurance training (1) |
| 4 | a | How hard a participant works |
| | b | 60–85 % HR max |
| | c | He would work at an intensity of 85–100% HR max (1), in order to be in the anaerobic training zone for speed (1) |
| | d | **Any two from the following:**<br>• Heart rate monitors<br>• Smartwatches<br>• Apps (applications) |
| | e | Rating of perceived exertion (RPE) (1) measured with the Borg Scale (1) |
| 5 | a | Reversibility |
| | b | **FITT principle:** Time (1)<br>**Application to activity:** > 30 mins (1) |
| 6 | | By choosing a suitable method of training based on the participant's needs (e.g. component of fitness for a specific sport) (1), taking into account their individual differences (e.g. fitness status between an elite athlete and a beginner) (1) |
| 7 | a | i) • Maximum heart rate = 220 – 21 (age) (1)<br>= 199 (bpm) (1) |
| | | ii) • Lower range = maximum heart rate value (199) × 0.7<br>= <u>139 bpm</u> (1)<br>• Upper range = maximum heart rate value (199) × 0.8<br>= 159 bpm (1) |
| | b | **2 marks for:**<br>• Calculation of RPE = HR/10 **OR** 139/10 to 159/10 (1)<br>• = 14 to 16 **OR** 13.9 to 15.9 (1) |

| Q. | | Answer |
|---|---|---|
| | c | Allows the performer to manipulate work rate to ensure they are performing at the right intensity / heart rate range / RPE (1) to elicit the desired adaptations (e.g. 60–85% for cardiovascular fitness) (1) |
| 8 | a | **Frequency:** How many times / how often a participant trains (usually per week) (1)<br><br>**Progressive overload:** Gradually increasing workload over time to encourage the body to adapt / fitness improvements (1) |
| | b | Caomhan is currently training three times a week, so they could increase their frequency by training four days a week (1). They could also increase the duration and/or intensity of their training sessions (e.g. adding in more intervals / cycles / lifting heavier weights at the gym) (1). |
| | c | **Type:** The method of training that a participant decides to use to improve their selected component of fitness (1)<br><br>**Specificity:** Selecting appropriate training methods/activities that will improve the components of fitness required for a given sport/activity (1) |
| | d | As a long-distance road cyclist, he should select the type of training methods that focus on muscular endurance, e.g. free weights or circuit training using body weight exercises with a high number of reps (1). To ensure this is specific to long-distance cycling, he should perform with low loads and high reps and focus on leg exercises to replicate the demands of cycling (1). |
| 9 | | **Indicative content:**<br>• **Specificity of FITT principles**<br>o % of HR max is an effective way of measuring the **intensity** of training, but working at 60–85% HR max in weeks 1–2 is not specific to her aim of improving anaerobic capacity<br>o In order for her training to be specific, she should aim for an **intensity** in the anaerobic training zone of 80–100% HR max (but she does only this in Week 5)<br>o **Time** of training sessions might be an excessive amount for improving anaerobic capacity<br>o Shorter, high-intensity training sessions that focus more closely on her 2 km rowing time (8–9 mins long) might be a more appropriate application of the **time** principle<br>o **Type** of training (rowing) is specific to her sport<br>• **Progressive overload of FITT principles**<br>o The progression from Week 1 to Week 2 is a sensible application of progressive overload in terms of frequency<br>o There are no progressive overload patterns between intensity and time<br>o An inverse relationship between intensity and time (i.e. increasing intensity with a decreasing time) would be an appropriate way to progressively overload these principles<br>• **Adaptation / rest and recovery**<br>o Training two or three times per week gives 4–5 recovery days, which is enough for adaptation to take place<br>o By increasing training load as the weeks progress, Martha challenges her ability to cope with these loads<br>• **Reversibility**<br>Martha might experience a de-training effect over Week 3 and Week 4, when she is not taking part in any training<br>• **Variation**<br>o Martha might wish to apply principles of anaerobic training to different training methods in order to avoid boredom |

# Appendix A: Levelled Mark Sch

Levelled marking will be used to decide on the marks awarded for extended-answe
the examiner/marker will look at various aspects of the student's answer (including
understanding, as well as their application and evaluative skills) to decide which gra

The table below contains a summary of details found in t[illegible]ark scheme in the st
different answer levels, how these are demonstrated in [illegible]tudents' answers to the
marks awarded for each level.

Examiners will take a 'b[illegible]' approach to marking answers. This involves the foll

1. Making a [illegible]stic judgement on which band the answer most closely matches
2. Deciding which mark *within* that band the student should receive.
   a. This is based on the quality of the answer, linked to how securely key ele
   points in the table below) are covered.
   b. Whether the answer falls into the bottom, middle or top of that band de
   covering key elements of that band within the answer.

| | Marks | Description |
|---|---|---|
| **Level 1** | **1–2** | • Demonstrates **isolated** knowledge and understa question and has gaps in knowledge<br>• Makes **only a few** points that are related to the<br>• **Little** analysis/evaluation made with points bein with unsupported conclusion |
| **Level 2** | **3–4** | • Demonstrates **some acc[illegible]e** knowledge and u **way linked** to th[illegible]n<br>• **A fair f[illegible]** the points are related to the conte [illegible]<br>• **[illegible]igns** of analysis/evaluation but **not always det** conclusion |
| **Level 3** | **5–6** | • Demonstrates **accurate** knowledge and underst the question<br>• The **majority** of points are related to the contex<br>• Analysis is **well-developed, detailed and logical** |

**0 marks should be awarded if no part of the answer is worthy of credit**

## Preview of Answers Ends Here