**Exercise Physiology Workbook 3**

Teacher:

Student:

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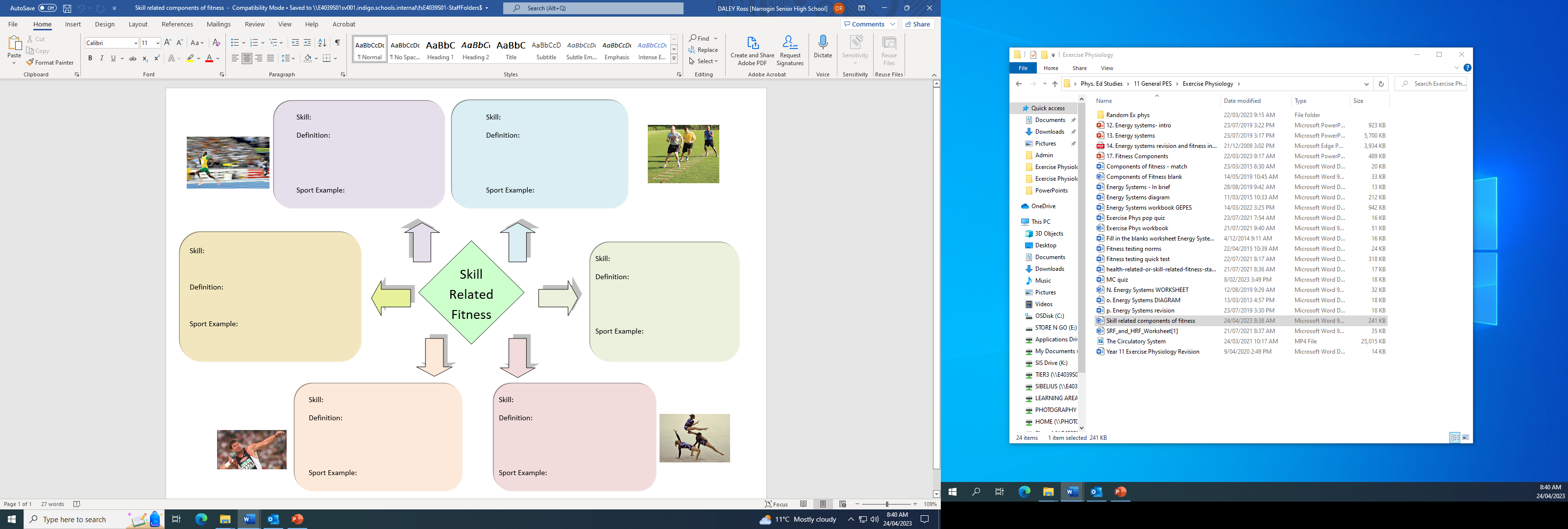
**Learning Intentions:**

* Understanding the components of fitness
* Identifying the principles of training
* Understanding the role of different types of training
* Discussing the interrelationship between training types, principles of training and fitness components

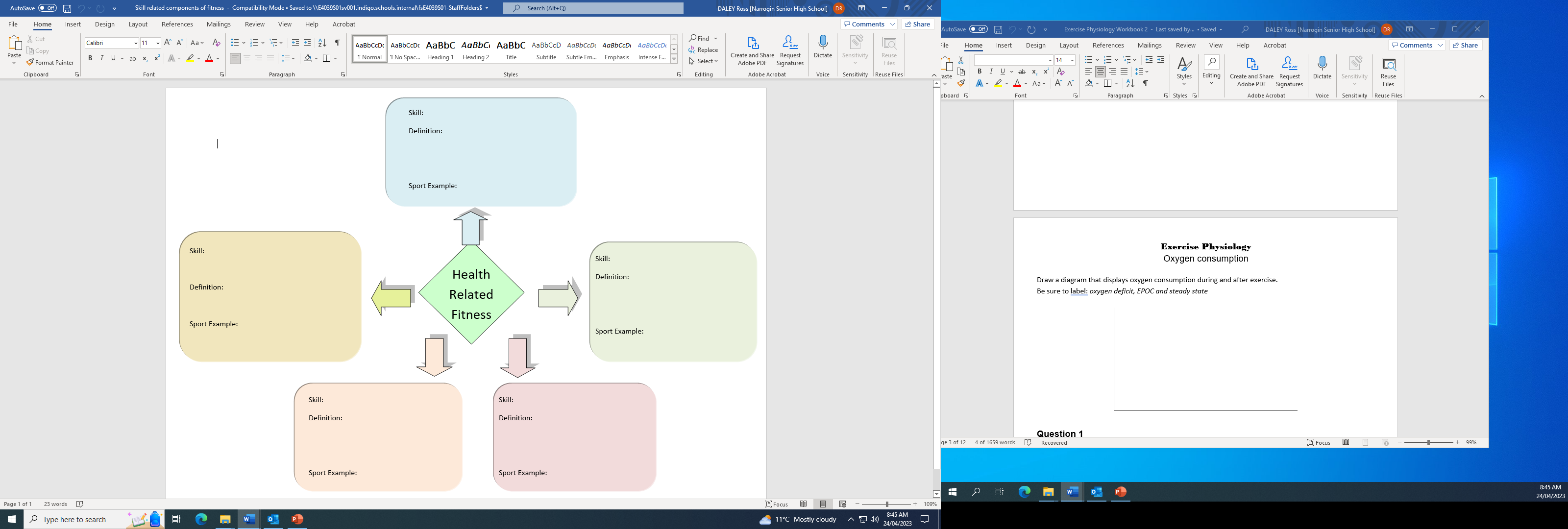
**Success Criteria:**

* Define each of the components of fitness
  + Cardiorespiratory endurance Muscular strength
  + Muscular endurance Flexibility
  + Body composition Agility
  + Balance Coordination
  + Reaction time Speed
  + Power

* Explain each of the principles of training;
  + Progressive Overload
    - Frequency, Intensity, Time, Type
  + Specificity
  + Reversibility
* Define training types
  + Resistance training
  + Interval Training
  + Continuous Training
  + Circuit Training
  + Fartlek Training
  + Flexibility
  + Plyometrics
* Interrelationship between training types, principles of training and fitness components

Exercise Physiology

Components of fitness

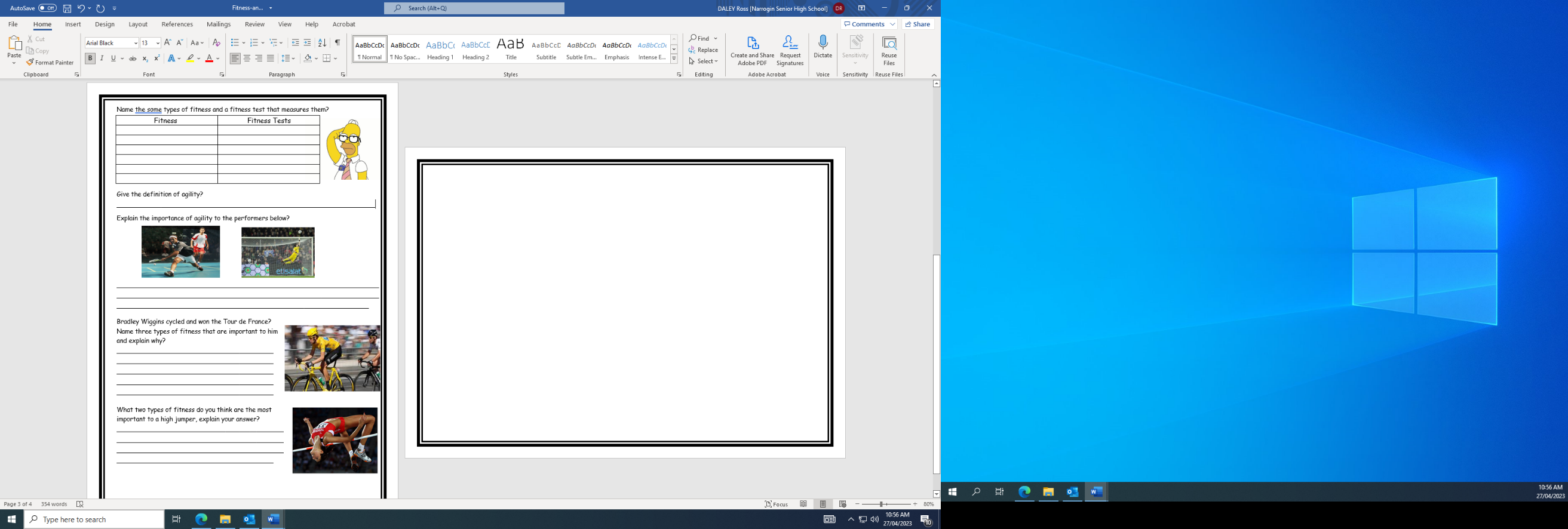


Match the component of fitness with its correct definition by drawing a line.

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| --- | --- | --- |
| **Component** |  | **Definition** |
| Muscular endurance |  | This is the ability to change the body’s position and direction quickly. You need to be \_\_\_\_\_\_\_\_\_ when playing most games. It helps to avoid injury. |
| Speed | This is the ability of the heart to deliver oxygen to your muscles over long periods of exercise, such as during a netball game. The lungs are also involved. |
| Body composition | This is the ability to hold a posture without wobbling or falling over, for example when you are standing on one leg to shoot a goal. |
| Flexibility / suppleness | This is a combination of strength and speed. You need this to hit the ball hard or jump high. |
| Reaction time | This is the range of movement at a joint. Poor \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can contribute to injury. |
| Cardio-vascular endurance | This is the time taken to move the body or part of the body over a given distance. You need to move quickly to chase the ball in a game. |
| Power | This is the ability of your muscles to maintain and repeat contractions without getting tired. |
| Strength | This is the time it takes to respond to a stimulus. Fast \_\_\_\_\_\_\_\_\_\_\_\_ is an advantage in most sports e.g. to successfully rebound a shot. |
| Co-ordination | This is the force muscles exert when they contract. You need this to push in a rugby scrum, for example. |
| Agility | This describes the shape of the body. It is also known as somatotype. |
| Balance | This is the ability to move your body parts smoothly and accurately in response to what your senses tell you. For example, when you return a serve in tennis. |

*Place each component of fitness that would be most appropriate into the table below*

|  |  |  |
| --- | --- | --- |
| **Sport** | **Most Important**  **Health Related Fitness Component** | **Most Important**  **Performance Related Fitness Component** |
| Netball Goal Shooter |  |  |
| Rock Climber |  |  |
| Marathon Runner |  |  |
| Badminton Player |  |  |
| Soccer Goalkeeper |  |  |
| 100m Sprinter |  |  |



Exercise Physiology

Components of fitness

**Question 1**

Using your knowledge of flexibility and power, evaluate the importance of these components of fitness for performers in the high jump. (6 marks)

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**Question 2**

Analyse the dominant components of fitness required of a touch football athlete rucking (running during attacking) the ball up the field for 2 minutes during a game. (6 marks)

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**Question 3**

Club level tennis players need agility, coordination and power. Explain how these components would help them perform effectively. (6 marks)

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**Question 4**

Evaluate the potential benefits and limitations of fitness testing. (8 marks)

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**Question 5**

Sporting commentators often use the words “speed” and “acceleration” to describe an object or athlete’s movement in competition. Describe the difference between speed and acceleration?

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**Question 6**

What type of exercise would you participate in if you were trying to improve the following fitness components: ***Agility Muscular endurance Balance***

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**Question 7**

In a sport of your choice:

* List three actions where agility is important
* Describe an activity that would help improve agility in the actions you have listed

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**Question 8** Complete the table below.

|  |  |
| --- | --- |
| **Component** | **Factors effecting component** |
| Muscular strength |  |
| Muscular Endurance |  |
| Power |  |
| Flexibility |  |
| Body composition |  |

Exercise Physiology

Types of training

**Question 1**

Analyse the use of specificity and overload as principles of training. (6 marks)

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**Question 2**

Evaluate the use of circuit training to improve power. (6 marks)

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**Question 3**

Compare continuous and fartlek training (2 marks) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Question 4**

Describe circuit training (4 marks)  
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**Question 5**

Why does plyometric training have a greater potential for causing injury than many other methods of training.   
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**Question 6**

Draw a graph the shows the anaerobic and aerobic training zones

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**Question 7**

Using one type of training, explain how that training method would be suitable for a professional rugby union player (3 marks)

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**Question 8**

Describe how the FITT principle can be applied to weight training (4 marks)

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**Question 9**

Outline the impact intensity has on the length of a training session

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**Question 10**

Explain the benefits of a warm up (5 marks)

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**Question 11**

Explain the benefits of a cool down (2 marks)

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**Question 12**

What factors may lead to a training plateau

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**Question 13**

Chronic adaptations may still occur without applying the principle of specificity. What significant advantage does specificity add?

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**Question 14**

Explain the benefits of a cool down (2 marks)

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**Question 15**

Describe the differences between the following types of stretching:

* Static Dynamic Ballistic Proprioceptive (5 marks)

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**Question 16**

Using a practical example explain how the SPOR principle can be used to plan a training program \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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S**ECTION THREE: EXTENDED ANSWER (45 MARKS)**

There are three questions in this section. **Attempt all questions**.

Write your answers on the lined pages provided. Ensure that you clearly identify each answer.

Suggested working time for this section is 60 minutes.

**Question 1 (15 marks)**

The fitness required to be an elite endurance athlete such as a marathon runner is developed over many years of training.



1. Identify and describe 5 important long term adaptations to training for marathon runners and explain how these adaptations will enhance performance.

(7 marks)

1. Describe the methods of training that would be used and the principles of training that would be applied in a training program for a marathon runner. Provide a reason for each of your answers.

(8 marks)

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**Question 2 (15 marks)**

The pre-season training program outlined below has been designed to prepare a team sport (e.g. soccer, netball, football) player for the start of a new season. No other training sessions have been prescribed for the player in addition to those outlined in the program below. Use the data in the training program below to answer the questions that follow.

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|  | **Sun** | **Mon** | **Tues** | **Wed** | **Thur** | **Fri** | **Sat** |
| **Week 1** |  | 10 min jog |  | 10 min cycle |  | 10 min swim | 10 min jog |
| **Week 2** |  | 11 min jog |  | 11 min cycle |  | 11 min swim | 11 min jog |
| **Week 3** |  | 20 min jog |  | 20 min cycle |  | 20 min swim | 20 min jog |
| **Week 4** |  | 22 min jog |  | 22 min cycle |  | 22 min swim | 22 min jog |

1. Explain why the pre-season training program is inadequate in terms of the principles of training that have not been correctly applied in the program. (6 marks)
2. Identify 3 training methods that have not been used in the program that a pre-season team sport program should include. Explain why these training types should be incorporated into the program. (9 marks)

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