

**HARD WORK
BEATS TALENT
WHEN TALENT
DOESN'T WORK
HARD.**

Welcome to your summer BTEC Sport transition booklet.

In order to give yourself the best possible start to Year 12, we suggest that you complete the following tasks to the best of your ability. We hope you enjoy them and we can't wait to start teaching you again! If you need help go to: <https://www.pearsonactivelearn.com/app/Home>

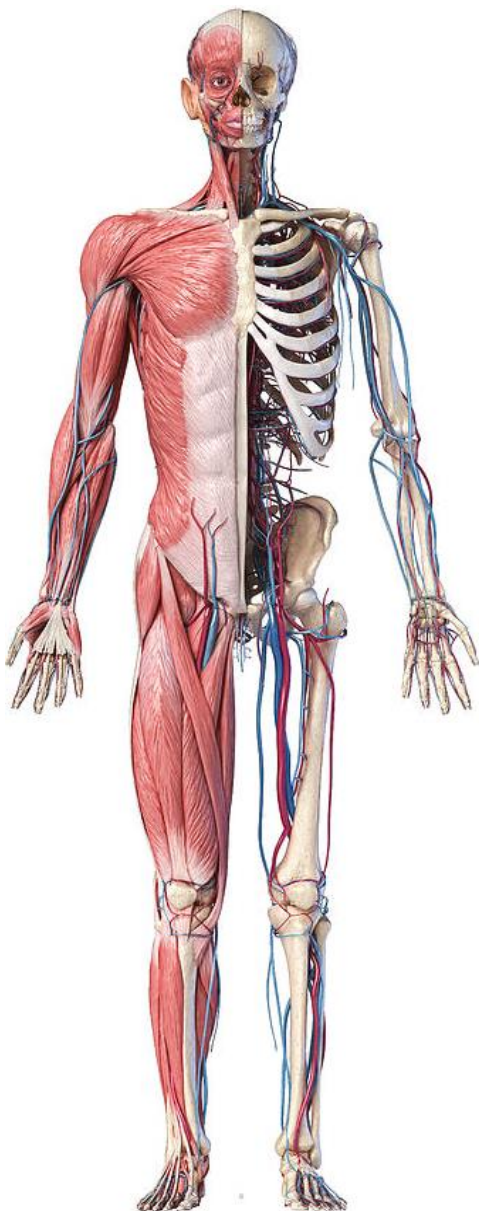
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Task 1. Make a person.

This task is for the artists amongst you! You can draw this, make a body suit or go digital.

- Produce a labelled body diagram that places the 20 key bones and 20 key muscles in their correct locations
- Label the axial skeleton, appendicular skeleton, neutral spine alignment & potential postural deviations
- Label the 5 different types of bone with examples & explain their function in relation to sport
- Identify the movements that the specific muscles produce
- Label the 3 different types of muscle in the body
- Label the movement of muscles in antagonistic pairs and their use in a variety of sports

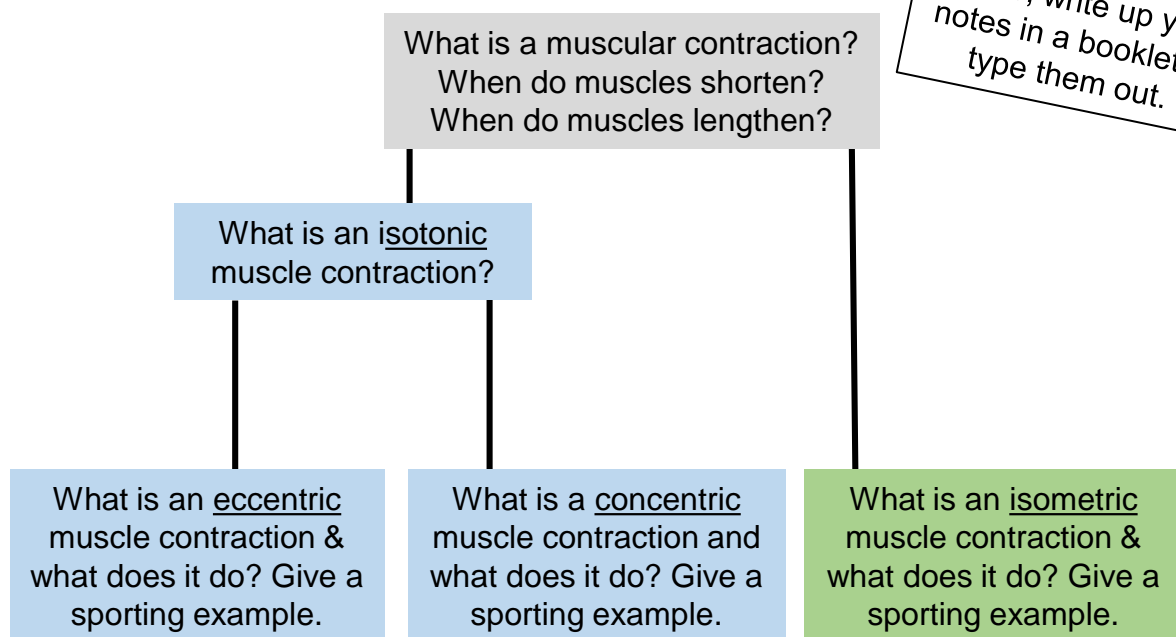


Task 2. Muscle fibres.

Research the 3 muscle fibre types and complete the table below. Use words such as high, low, moderate, fast.







Characteristic	Type 1	Type 2a	Type 2x
Contraction speed?			
Force produced?			
Fatigue levels?			
Mitochondria levels?			
Glycogen stores?			
Phosphocreatine (PC) levels?			
Capillary density?			
Colour?			

Task 3. Muscle contractions.



Task 4. Joints in the body.

Using your knowledge of synovial joints, complete the table to identify the following:

Type	Diagram	Location (including articulating bones)	Characteristics of joint	Types of movement
Ball & socket				
Hinge				
Pivot				
Condyloid				
Saddle				
Gliding				

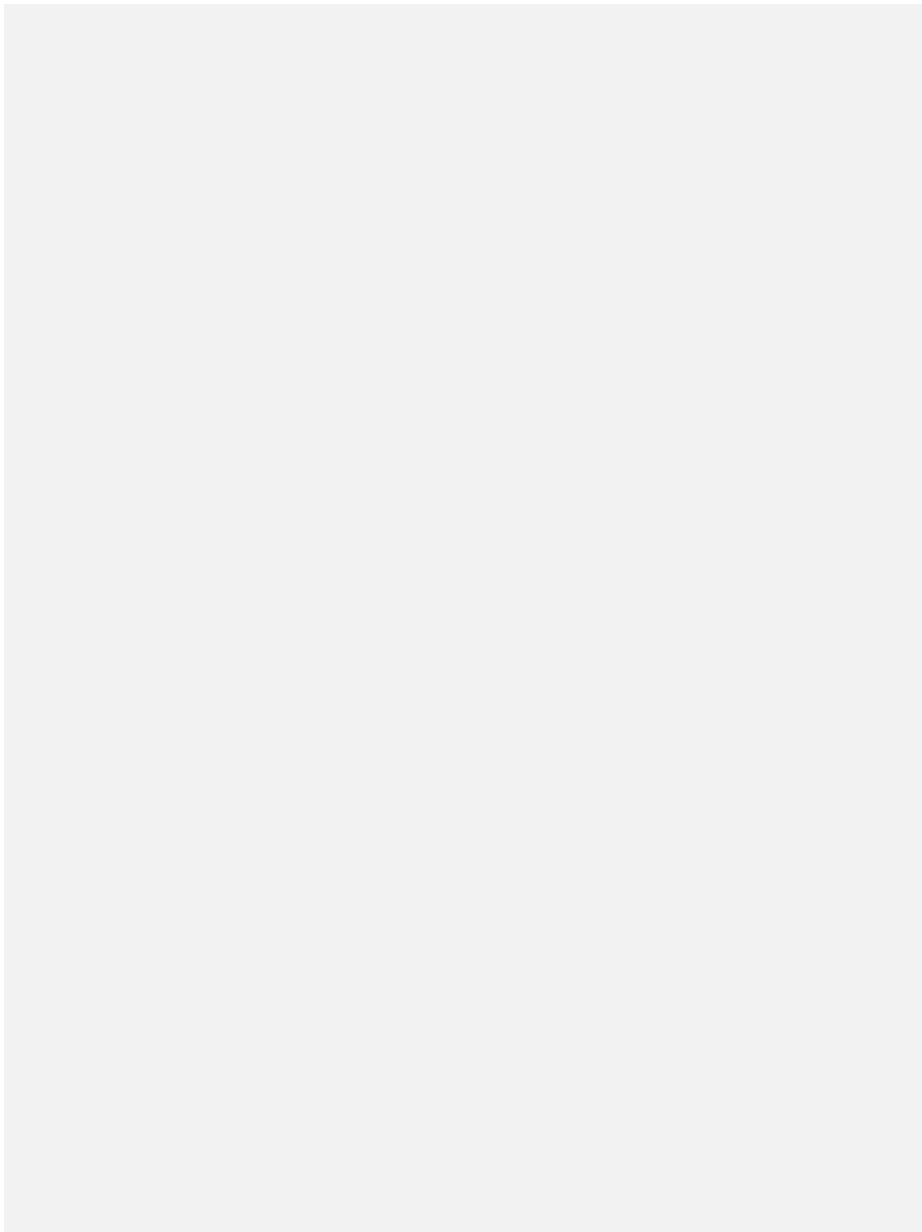
How does the skeletal system respond to a single sport or exercise session?

How does the skeletal system adapt (long term) to exercise?

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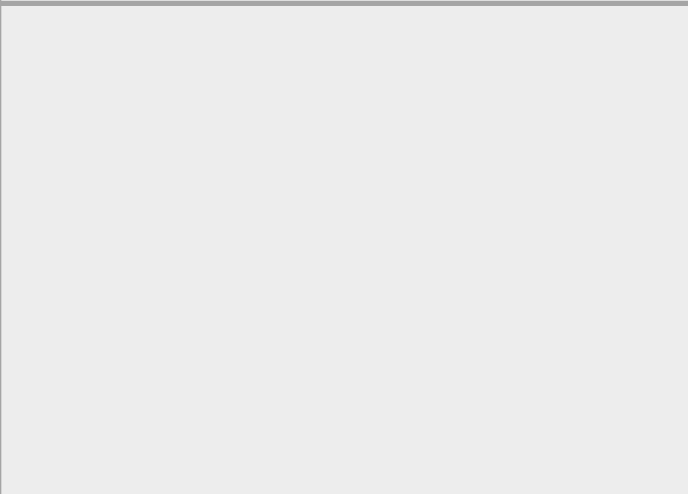
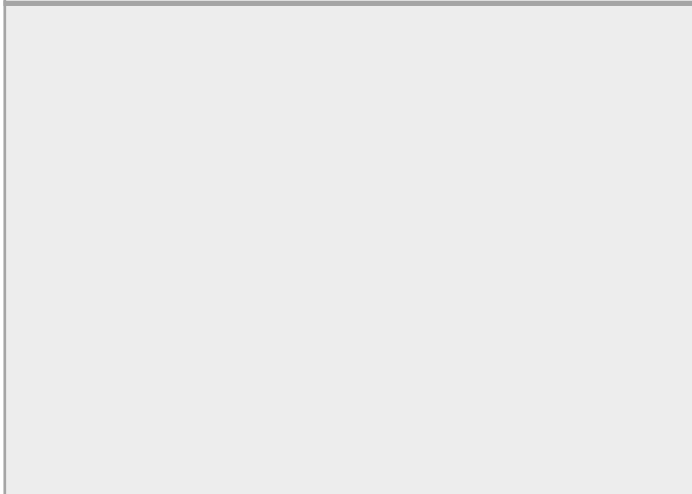
Task 5. Time to apply.

Using your bone and muscle knowledge, can you explain how the following movements are brought about? Think about types of joint, joint movement, muscle contractions, antagonistic pairings, functions of the skeleton, type of muscle fibres, types of bone...



How does the muscular system **respond** to a **single** sport or exercise session?

How does the muscular system **adapt** (long **term**) to exercise?



Task 6. Exam questions.

Complete answers on a separate piece of paper. Take time to plan your long answer questions & show us evidence of your planning in your notes. Support on next page if you need it.

Total of 36 marks available.

Q1. This is GB Rugby Sevens player Deborah Flemming. She follows a sustained exercise programme and her muscular system starts to show adaptations. One adaptation is an increase in her muscle myoglobin stores.

Explain how an increase in myoglobin stores will benefit Flemming's rugby performance. (4 marks)



Q2. When Marcus Rashford plays football, the nervous system controls the force he applies to kick the ball. Describe the law associated with nervous control of muscle contraction. (3 marks)



Q3. As part of Marcus Rashford's pre-season training he has undertaken lactate threshold training. Explain how increasing Rashford's tolerance to lactate would be beneficial to his football performance. (5 marks)

Q4. Explain why arthritis causes pain. (3 marks)

Q5. Katrina Thomson Johnson is a heptathlete. She participates in a variety of events that involve running and jumping.

Explain why regular participation in weight bearing activities will help reduce the likelihood of osteoporosis. (3 marks)



Q6. Professional boxer Anthony Joshua has been boxing for 13 years. His skeletal system has adapted during this time.

Explain two long-term adaptations to Joshua's skeletal system from being a boxer. (4 marks)



Q7. This is Ishant Sharma bowling at cricket (see picture below left). The synovial joint of the shoulder allows Sharma to complete the bowling action. Analyse how the structure of Sharma's shoulder joint allows him to complete the bowling action. (6 marks)



Q8. This is Usain Bolt in action during a 100m race (see picture above right). Analyse how the muscular system and skeletal system work together to carry out the action of his leading leg. (8 marks)

(8 marks)

Support for exam questions.

- Q1.** What does myoglobin carry? What increases in the muscles? Impact on intensity / fatigue levels?
- Q2.** Remember the 'all or none' law for this question!
- Q3.** This makes the body more efficient at what? Reprocessing what & transporting what? Impact on performance?
- Q4.** Inflammation and swelling – where and why?
- Q5.** These key words will help you: ossification, osteoblasts, osteocytes and osteoclasts.
- Q6.** What increases and what impact will this have on his performance?
- Q7.** Type of joint movement? Articulating bones? Role of ligaments, cartilage, synovial fluid, joint capsule, bursa, membrane etc? Remember you are applying your knowledge to the analysis of a specific movement in cricket (think of analysing each stage of the picture).
- Q8.** Type of joint at knee and ankle? Joint movement? Muscle contractions? Muscle fibres? Muscle attachment? Remember to apply all your knowledge to his knee drive & leading leg.



Please do what you can to stay fit & healthy this summer; think about your diet, activity levels & lifestyle. Have a great summer & will look forward to seeing you all in September again ☺

These other websites all offer an amazing collection of resources that you can use for wider reading & engaging with anatomy & physiology content:

- <http://www.pe4learning.com/flippedlearning/>
- www.brianmac.co.uk
- www.getbodysmart.com
- <https://www.innerbody.com/html/body.html>

