Nova’s Guide to Skeletons and Muscles

Learning objective: To understand the roles of the skeleton and muscles in human movement and protection.

Read the passage carefully and answer the questions using full sentences. Ensure you refer back to the text for evidence.

Nova the barn owl loves observing how different creatures move. She knows that the human skeleton is a marvel of engineering. It acts as a sturdy frame that gives the body shape, provides essential support, and offers vital protection to delicate organs. For instance, the skull shields the brain, while the ribcage guards the heart and lungs. However, the skeleton cannot move on its own. It relies on the muscular system to function. Muscles are attached to bones by tough cords called tendons. Because muscles can only pull and not push, they work in pairs known as antagonistic pairs. When one muscle, such as the bicep, contracts and shortens to pull the bone, its partner, the tricep, relaxes. By working together in this rhythmic cycle of contraction and relaxation, they allow us to run, jump, and climb. Without the strength of our muscles and the solid structure of our bones, we would be unable to perform even the simplest daily tasks. Understanding this partnership is the key to mastering how our bodies operate in the physical world.

Word bank: vertebrae · antagonistic · contraction · support · protection · skeleton · muscles

1. Identify two specific parts of the skeleton mentioned in the text and explain what they protect. (2 marks)

2. According to the passage, what is the role of tendons in the human body? (1 mark)

3. Why is it necessary for muscles to work in 'antagonistic pairs' rather than working alone? (2 marks)

4. Explain why Nova describes the human skeleton as a 'marvel of engineering' based on the text. (2 marks)

5. Do you think the skeleton or the muscles are more important for movement? Justify your answer using information from the text. (3 marks)

Draw: Draw a diagram of a human arm showing how the bicep and tricep muscles are positioned. Label the bones and the muscles.

Extension challenge: Research what happens to muscles when they are not used for a long period, such as when someone is in a cast. Write a short paragraph explaining the term 'atrophy'.