

Nova's Guide to Skeletons and Muscles

Learning objective: To identify that humans and some other animals have skeletons and muscles for support, protection, and movement.

Use this scaffold to structure your scientific report. Nova the owl wants to know how your body works! Use the word bank to help you write in detail, ensuring you explain the 'how' and 'why' behind our physical movements.

Our bodies are incredible machines, held together by a sturdy framework called a skeleton and powered by a complex system of muscles.

Word bank: exoskeleton · endoskeleton · vertebrae · protection · support · contraction · biceps · triceps · tendons · flexible · consequently · furthermore · in contrast · therefore

1. The Purpose of the Skeleton: Describe the three main roles of the human skeleton. Start by saying: 'The skeleton acts as a framework because...' (3 marks)

2. Comparing Skeletons: Explain why humans have an endoskeleton rather than an exoskeleton. Consider: 'What might happen if humans had a hard shell on the outside?' (4 marks)

3. How Muscles Move: Explain the process of muscle contraction. Use these starters: 'Muscles work in pairs because... When one muscle contracts, the other...' (4 marks)

4. Justify your answer: Why is it important for our joints to be flexible? Explain the relationship between bones, joints, and movement. (3 marks)

5. Critical Thinking: Compare and contrast the way a lion's skeleton helps it hunt compared to how a bird's skeleton helps it fly. Use the phrase: 'In contrast to a lion...' (4 marks)

6. Creative Extension: Design a 'bionic' limb. Describe how you would use materials to represent a bone, a muscle, and a joint. Explain why your design would be effective. (5 marks)

Extension challenge: Imagine a world without muscles. Write a short, creative paragraph describing the challenges a human would face during a simple task like eating breakfast. Use scientific terminology to explain which specific movements would be impossible.