Athletics Mastery: Speed, Power, and Precision

Learning objective: To understand the biomechanics of sprinting, jumping, and throwing, and to apply tactical awareness to athletic performance.

Read each question carefully. Use your knowledge of body movement and athletic technique to provide detailed, reasoned answers. Max the monkey is looking for precision in your explanations!

Athletics is the ultimate test of human movement. Whether you are sprinting down a track, leaping into a sandpit, or launching a heavy object, your success depends on how you use your muscles, balance, and energy. Think about how your arms drive forward to create power and how your body posture changes to maintain speed.

Word bank: acceleration · momentum · trajectory · velocity · extension · coordination · stamina · biomechanics

1. Explain why a sprinter leans forward during the initial 'acceleration' phase of a race rather than standing upright immediately. (2 marks)

2. When performing a long jump, how does the 'extension' of your legs right before landing affect the total distance measured? Justify your answer. (3 marks)

3. Compare and contrast the breathing techniques required for a 60-metre sprint versus an 800-metre middle-distance run. Why do they differ? (3 marks)

4. Max the monkey is calculating the trajectory of a thrown beanbag. If he wants the bag to travel the furthest horizontal distance, should he throw it at a low, flat angle or a high, steep arc? Explain the reasoning behind your choice. (2 marks)

5. If you were designing a new athletics event that combines speed and coordination, what would it look like? Describe the rules and the physical skills involved. (4 marks)

Draw: Draw a diagram of a person in the middle of a triple jump. Use arrows to show the direction of their momentum and label the 'extension' phase of their limbs.

Extension challenge: What might happen to an athlete's performance if they ignored the principles of biomechanics? Write a short paragraph explaining how understanding physics (like gravity and force) can help an athlete beat their personal best.