B3.3 Muscle and motility (HL)

What the Cell · DP Biology · worksheet · HL statements B3.3.1–10

Name _____ **Date** _____ **Total** _____ / 40

About 40 minutes, or one section at a time. The number of marks shows how many separate points to make.

Section A: Recall

10 marks

1 **Distinguish** between motile and sessile organisms, with an example of each. B3.3.1 **[2]**

2 **Name** the proteins in the thick and thin filaments of a sarcomere. B3.3.2 **[2]**

3 **Define** motor unit. B3.3.4 **[1]**

4 **State** the roles of cartilage and synovial fluid in the hip joint. B3.3.6 **[2]**

5 **Name** the two bones that meet at the hip joint. B3.3.6 **[1]**

6 **State** two reasons for locomotion, with an example of each. B3.3.9 **[2]**

Section B: Understanding

14 marks

7 **Explain** the roles of calcium ions and ATP in the contraction of a sarcomere. B3.3.2 **[4]**

8 **Explain** how the internal and external intercostal muscles act as an antagonistic pair. B3.3.3, B3.3.8 **[3]**

9 **Explain** how a bone acts as a lever. B3.3.5 [2]

10 **Compare** the range of motion at the hip and the knee. B3.3.7 [2]

11 **Explain** three adaptations of marine mammals for swimming. B3.3.10 [3]

Section C: Working with evidence

10 marks

All data in this section are invented for practice. The patterns are realistic.

12 B3.3.7

Students measured the range of hip flexion (raising the straight leg forward while lying on their back) with a goniometer, before and after 10 minutes of stretching. Each value is the mean of three readings.

Group	Number	Before / °	After / °
Students who play sport weekly	12	82 ± 6	91 ± 5
Students who do not	12	68 ± 9	75 ± 8

a **Calculate** the percentage increase in range after stretching for the sport group. [2]

b **Compare** the two groups. [2]

c **Suggest** why each value is the mean of three readings. [1]

d **State** two variables that should be controlled when measuring. [2]

e **Evaluate** the claim that playing sport causes a greater range of motion. [3]

Section D: Longer answer

6 marks

13 **Explain** how a skeletal muscle fibre contracts, using the sliding filament model. B3.3.2, B3.3.4 **[6]**