

Sports, exercise and health science data booklet

For use during the course and in the examinations
First assessment 2026

Version 1.0

Diploma Programme

Sports, exercise and health science data booklet

Published February 2024

Published by the International Baccalaureate Organization, a not-for-profit educational foundation of Rue du Pré-de-la-Bichette 1, 1202 Genève, Switzerland.

Website: ibo.org

© International Baccalaureate Organization 2024

The International Baccalaureate Organization (known as the IB) offers four high-quality and challenging educational programmes for a worldwide community of schools, aiming to create a better, more peaceful world. This publication is one of a range of materials produced to support these programmes.

The IB may use a variety of sources in its work and check information to verify accuracy and authenticity, particularly when using community-based knowledge sources such as Wikipedia. The IB respects the principles of intellectual property and makes strenuous efforts to identify and obtain permission before publication from rights holders of all copyright material used. The IB is grateful for permissions received for material used in this publication and will be pleased to correct any errors or omissions at the earliest opportunity.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, without the IB's prior written permission, or as expressly permitted by the [Rules for use of IB Intellectual Property](#).

IB merchandise and publications can be purchased through the [IB Store](#) (email: sales@ibo.org). Any commercial use of IB publications (whether fee-covered or commercial) by third parties acting in the IB's ecosystem without a formal relationship with the IB (including but not limited to tutoring organizations, professional development providers, educational publishers and operators of curriculum mapping or teacher resource digital platforms, etc.) is prohibited and requires a subsequent written licence from the IB. Licence requests should be sent to copyright@ibo.org. More information can be obtained on the [IB public website](#).

Contents

Introduction.....	1
1. Endocrine glands	2
2. Structure of the heart	3
3. Cardiovascular system	4
4. Respiratory system	5
5. Digestive system	6
6. Menstrual cycle	7
7. Skeletal system	8
8. Anatomical planes and axes	9
9. Muscular system	10
10. Muscle fibre.....	11
11. Sarcomere in a relaxed myofibril.....	11
12. Classes of lever.....	12
13. Metric (SI) multipliers.....	13
14. Unit conversion and constants	13
15. Equations of motion and mechanics	14
16. Uncertainties	15
17. Variation in data sets.....	16

This page is intentionally blank.

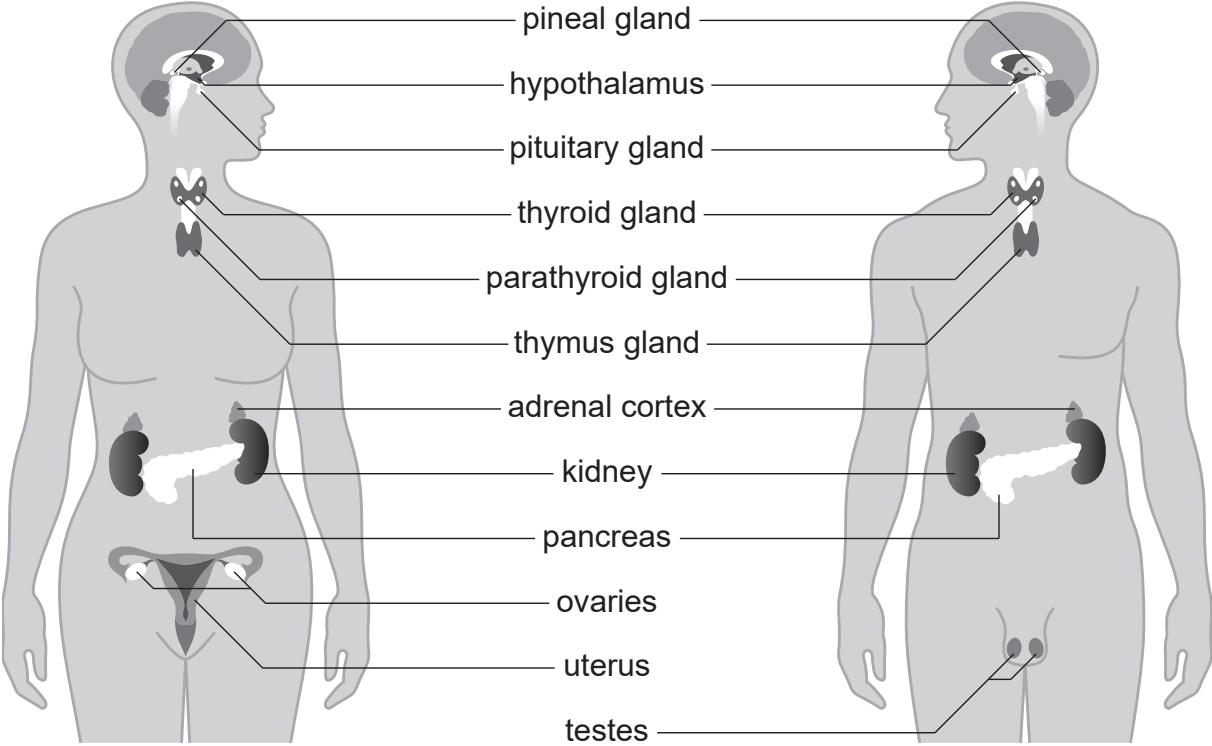
Introduction

This Diploma Programme (DP) *Sports, exercise and health science data booklet* accompanies the DP *Sports, exercise and health science guide* and DP *Sports, exercise and health science teacher support material*. It contains physiology diagrams, physical equations and constants, and other data relevant to the course.

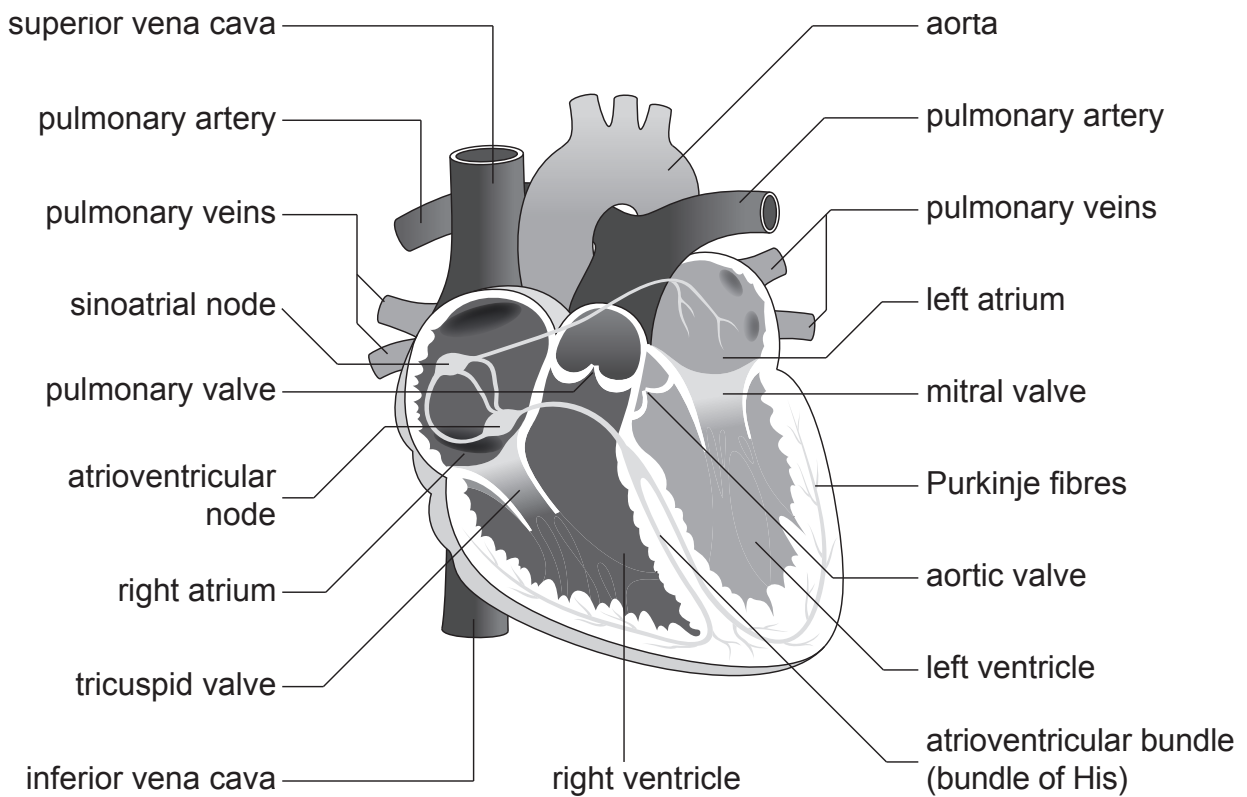
Students must have access to a copy of this booklet for the duration of the course, so that they can become familiar with its contents. Direct reference is made to relevant equations in the “Understandings” of the guide. This helps to maintain the emphasis on interpretation and application rather than memorization of symbols, constants and equations.

Each student must have access to a clean copy of the *Sports, exercise and health science data booklet* during examinations. It is the responsibility of the school to download a copy of this booklet from IBIS or the Programme Resource Centre and to ensure that there are sufficient copies available for all students.

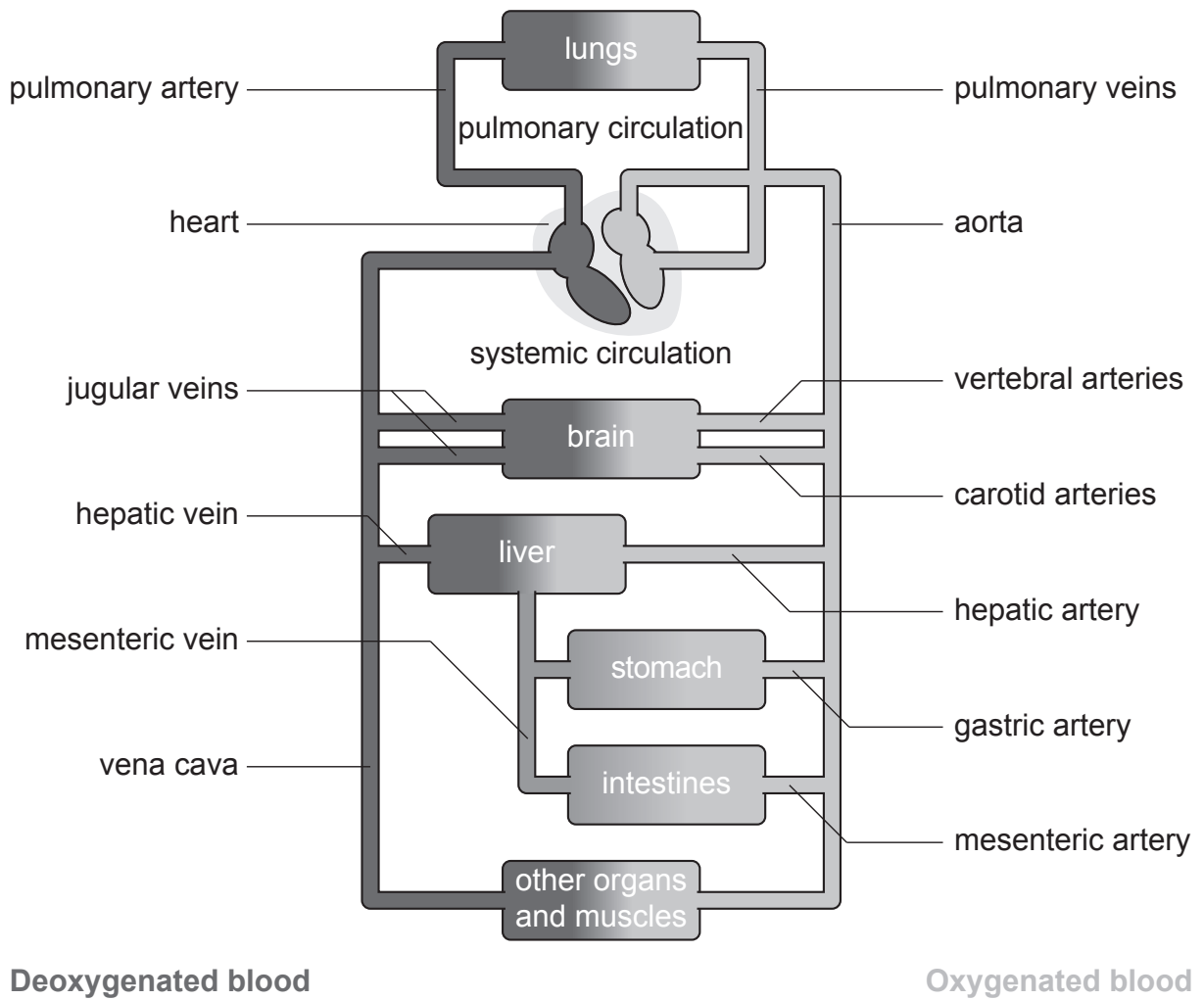
1. Endocrine glands



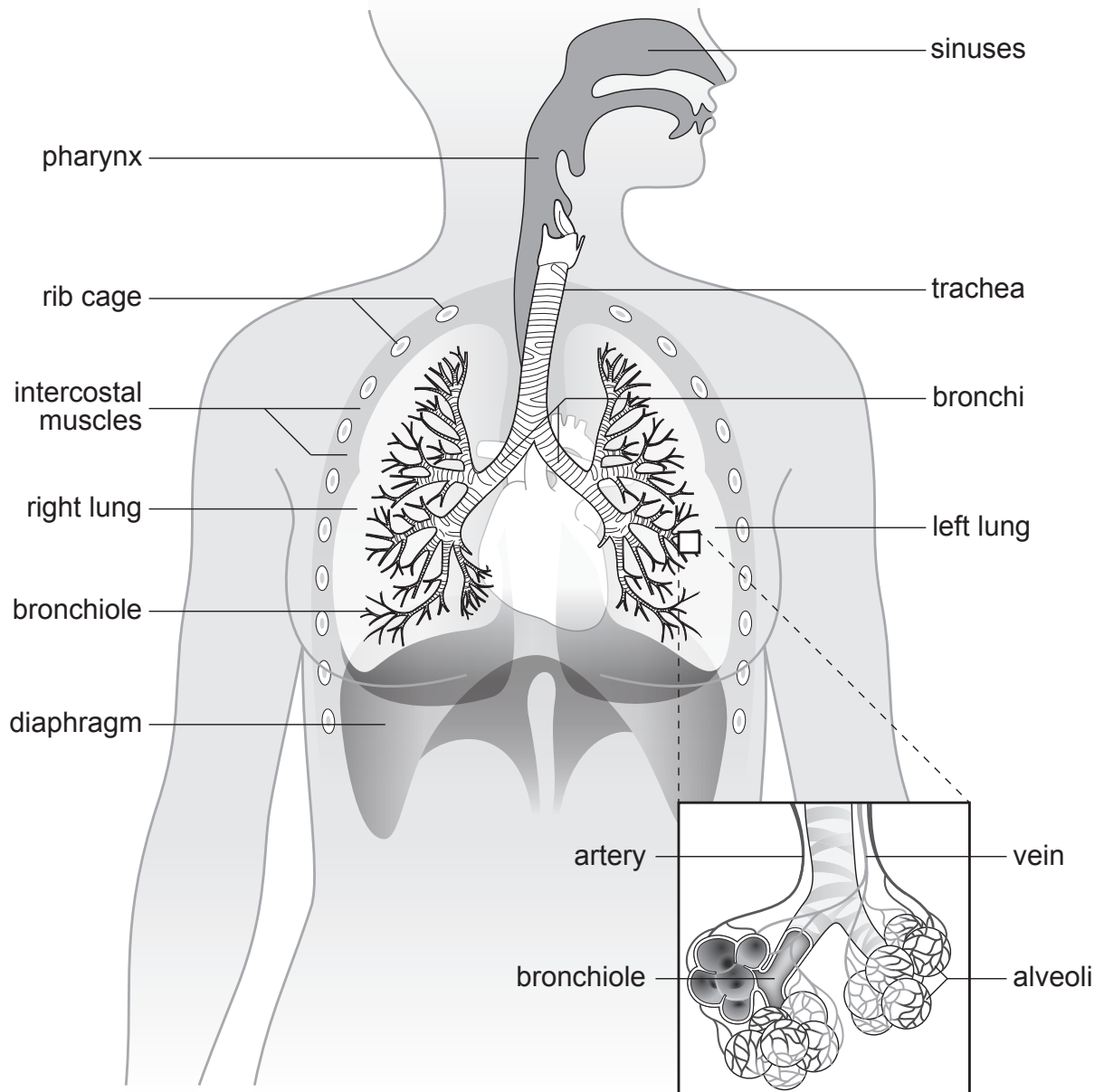
2. Structure of the heart



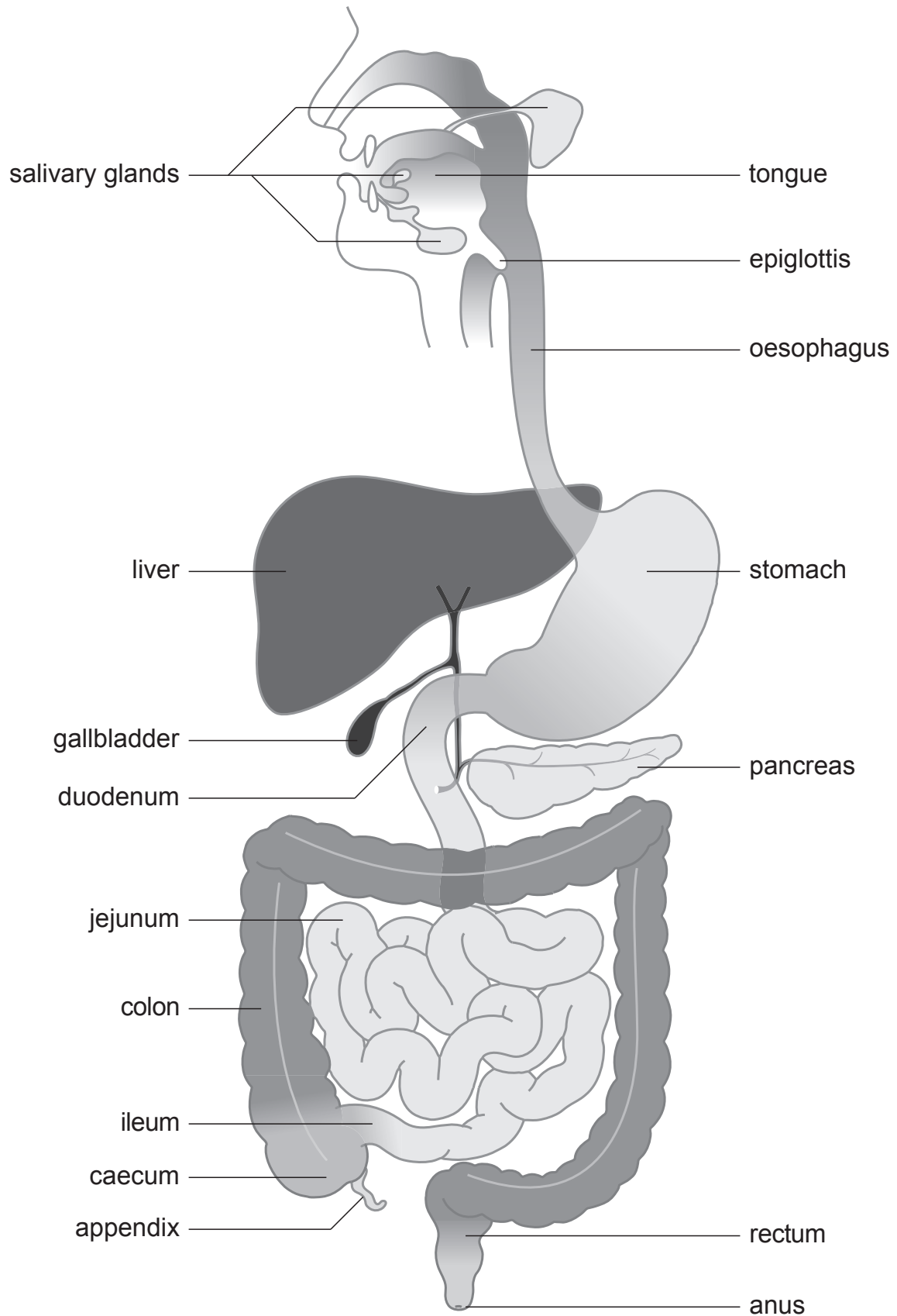
3. Cardiovascular system



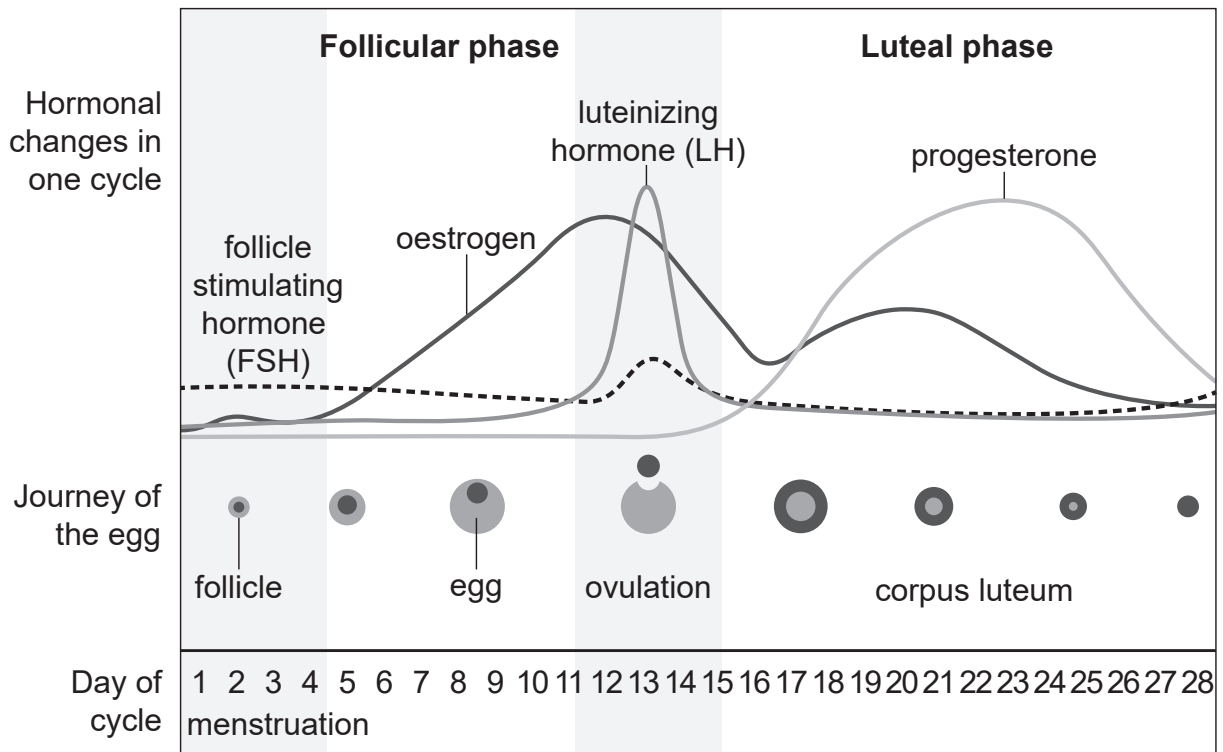
4. Respiratory system



5. Digestive system

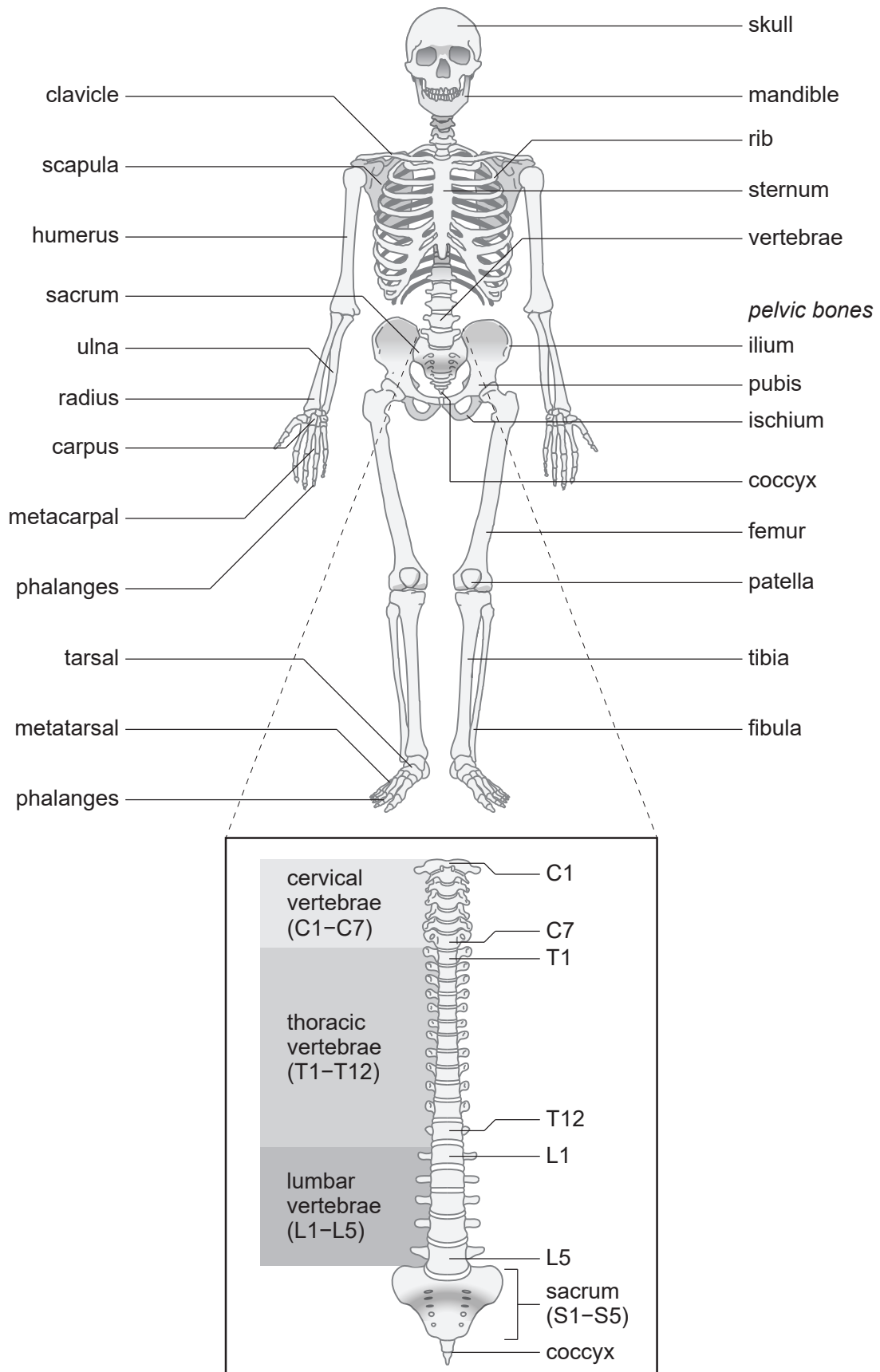


6. Menstrual cycle

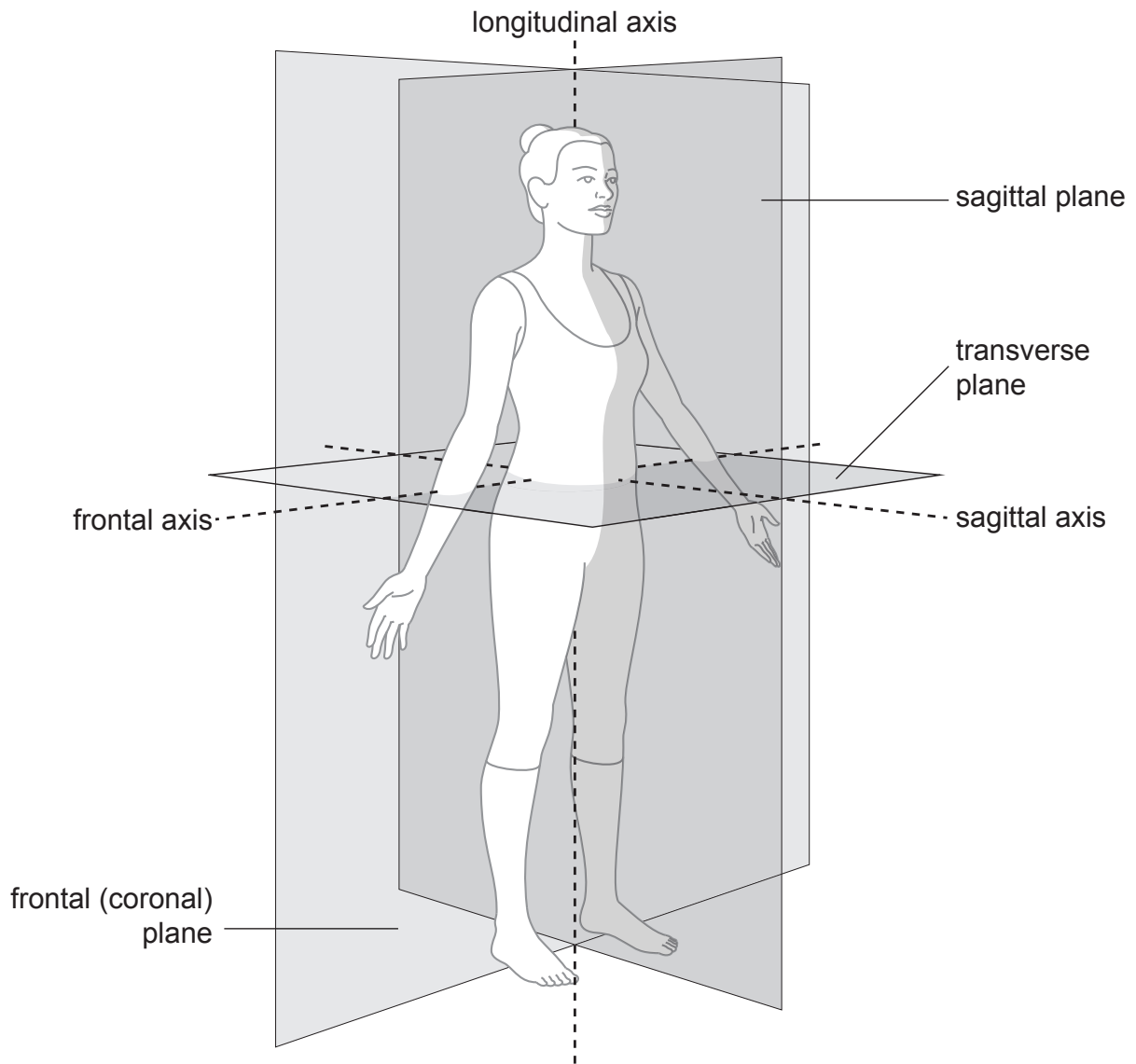


This example illustrates a 28-day cycle.
The day of ovulation and hormone levels can vary if the cycle length varies

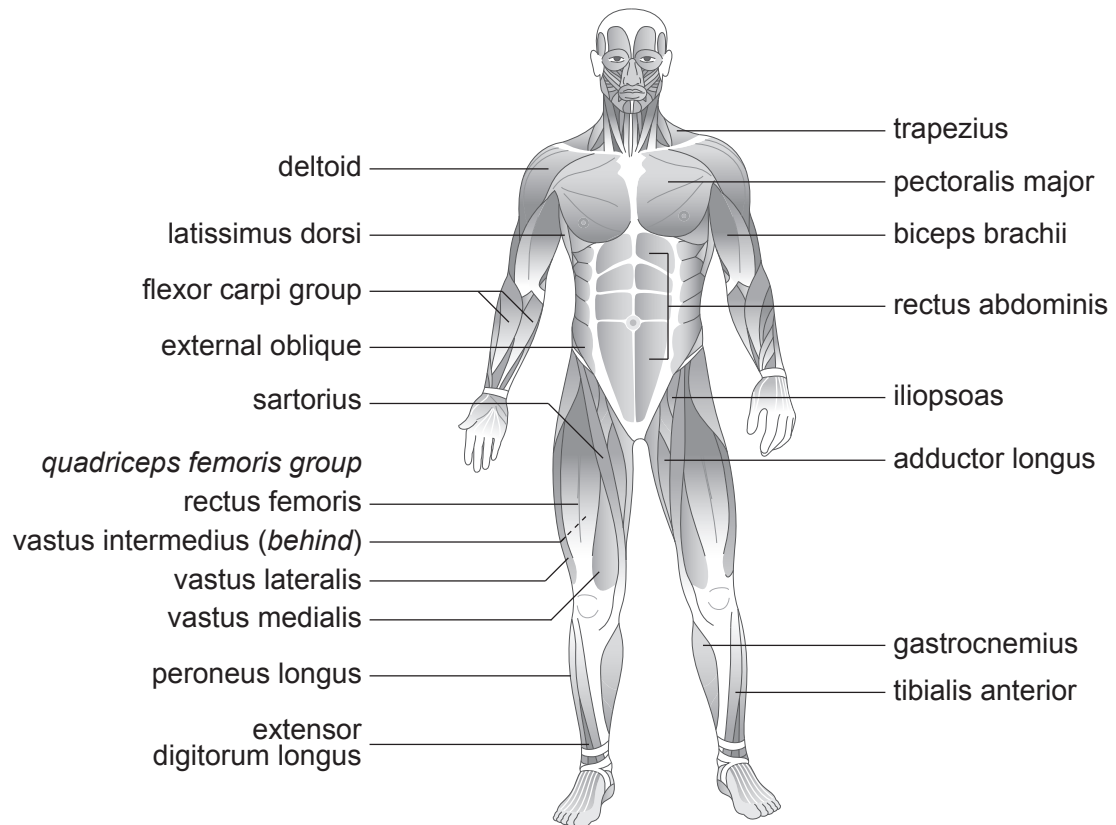
7. Skeletal system



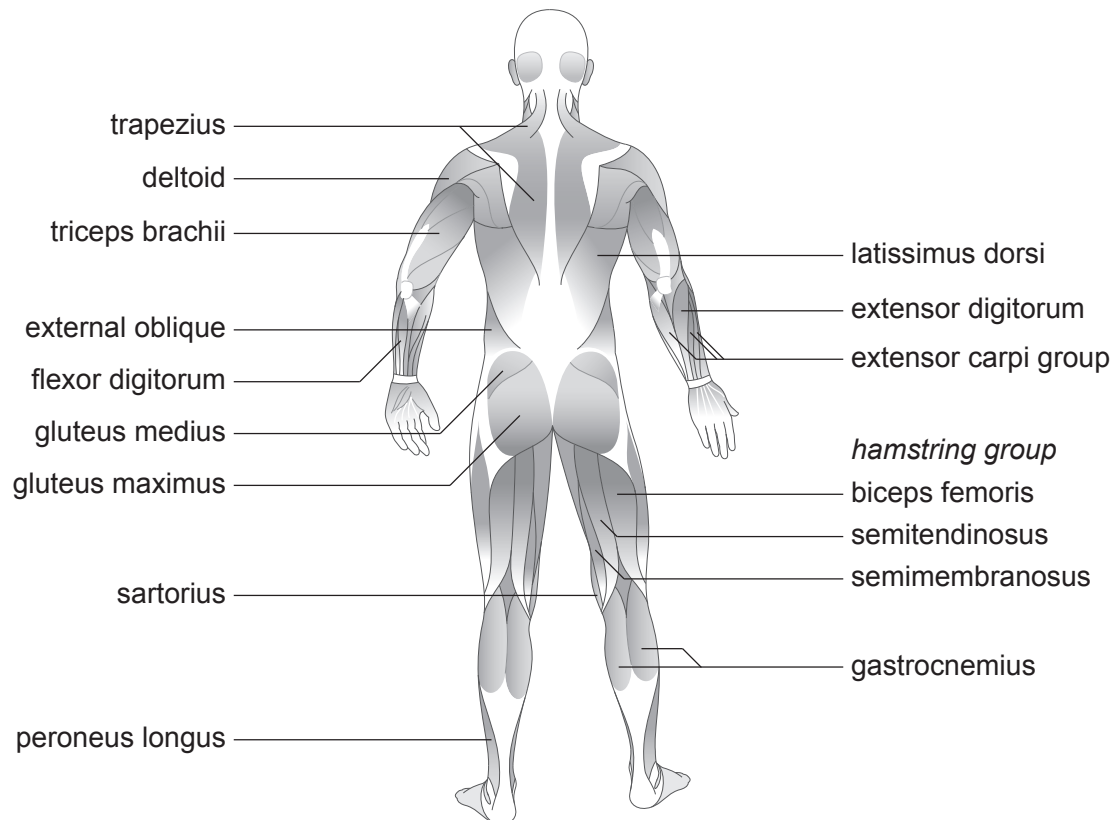
8. Anatomical planes and axes



9. Muscular system

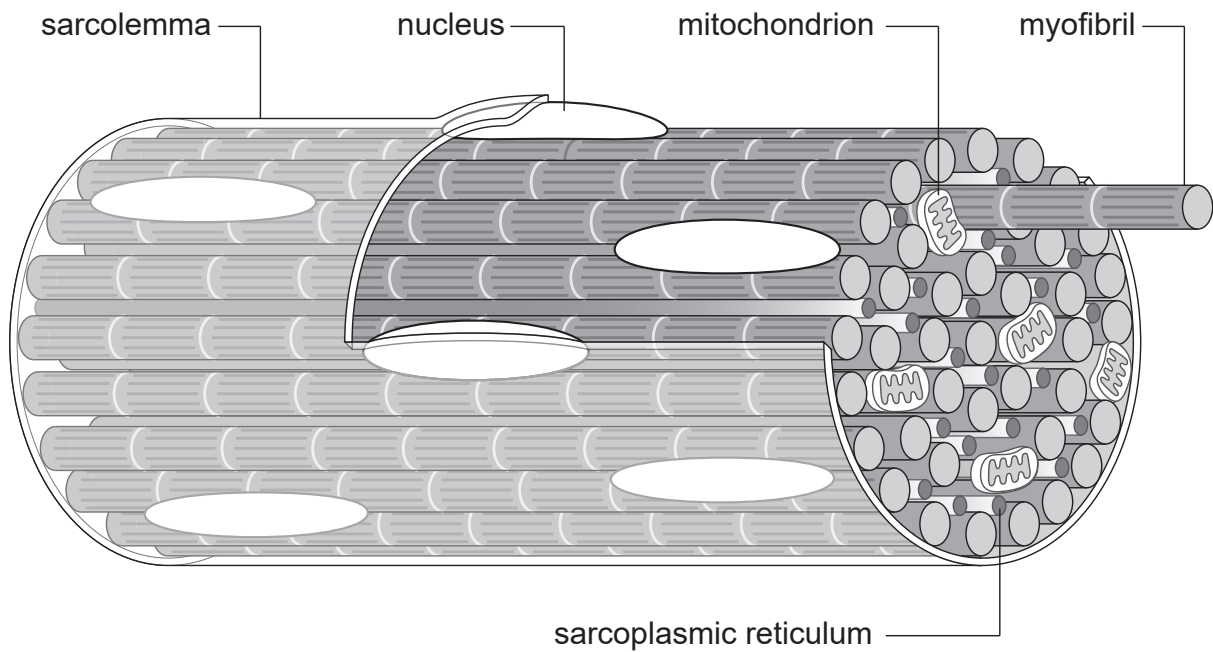


Anterior view

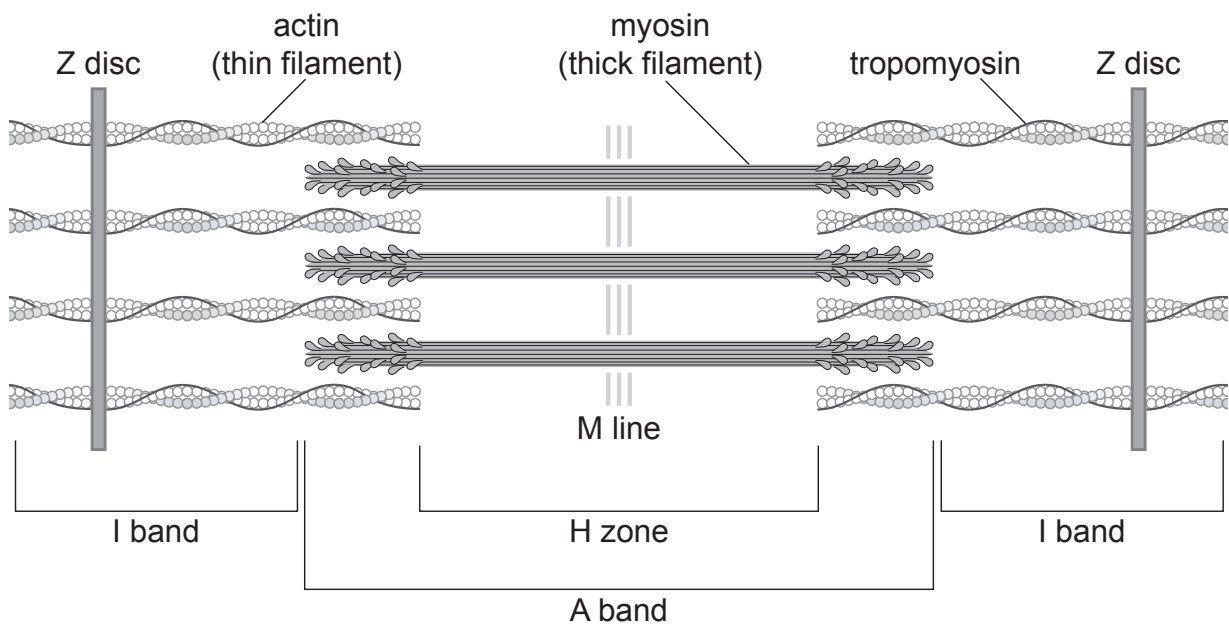


Posterior view

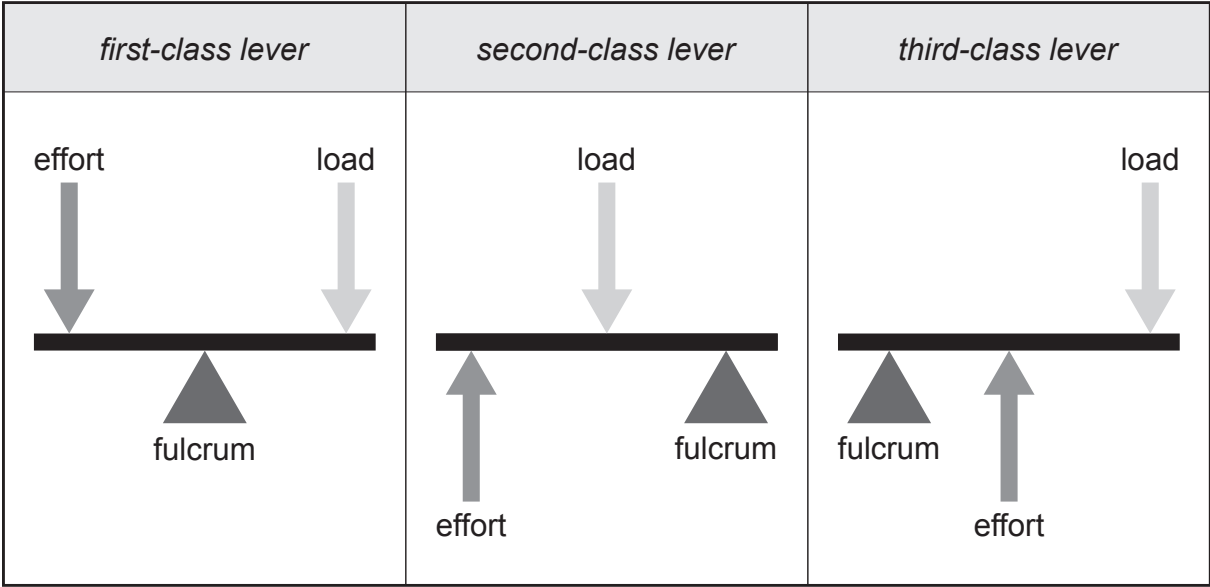
10. Muscle fibre



11. Sarcomere in a relaxed myofibril



12. Classes of lever



13. Metric (SI) multipliers

Prefix	Abbreviation	Value
mega	M	10^6
kilo	k	10^3
hecto	h	10^2
deca	da	10^1
deci	d	10^{-1}
centi	c	10^{-2}
milli	m	10^{-3}
micro	μ	10^{-6}
nano	n	10^{-9}
pico	p	10^{-12}

14. Unit conversion and constants

1 hour = 60 minutes = 3,600 seconds

1 litre = 1 dm³

1 joule = 0.239 calories

Acceleration due to gravity on Earth (g) = 9.81 ms⁻²

15. Equations of motion and mechanics

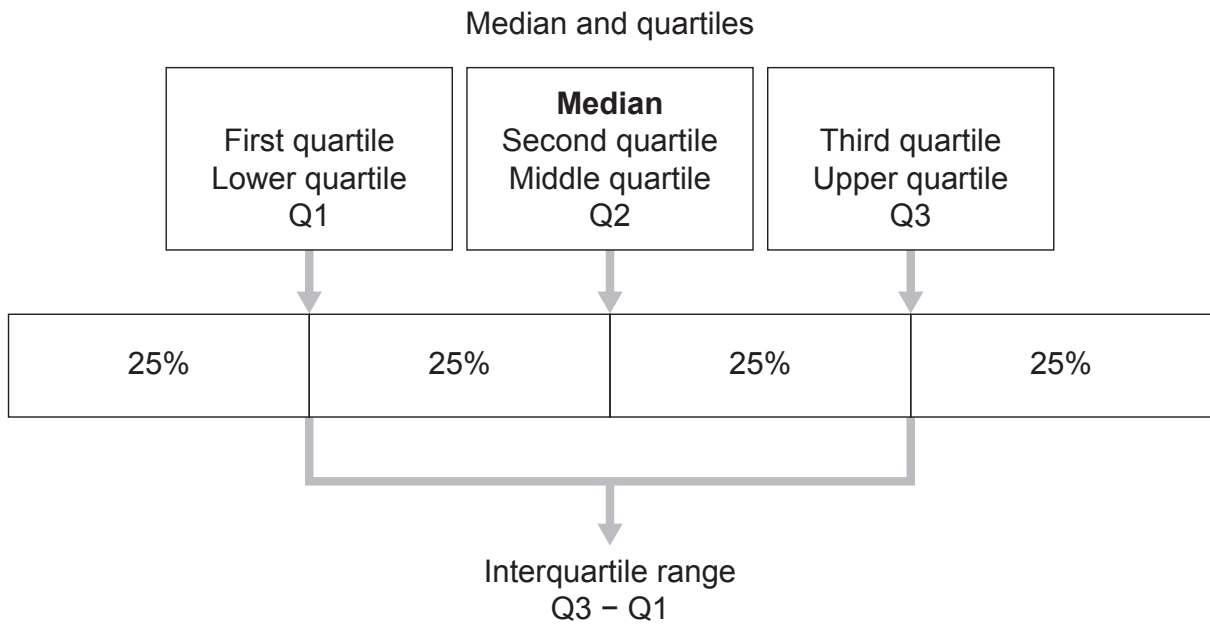
(a) Motion and mechanics	
Speed	$s = \frac{d}{t}$
Acceleration	$a = \frac{(v - u)}{t}$
Linear velocity	$v = \frac{\Delta s}{\Delta t}$
Angular velocity	$v = \frac{2\pi r}{T} = \omega r$
Force and weight	$F = ma = \frac{\Delta p}{\Delta t}$ $F_g = mg$
Impulse	$J = F\Delta t$
Linear momentum	$p = mv$
Coefficient of restitution	$C_R = \frac{v_b - v_a}{u_a - u_b}$
Coefficient of static friction	$F_f \leq \mu_s F_N$
Coefficient of dynamic friction	$F_f = \mu_d F_N$
(b) Energy, work and power	
Work done	$W = Fd$
Power	$P = \frac{\Delta W}{\Delta t} = Fv$

16. Uncertainties

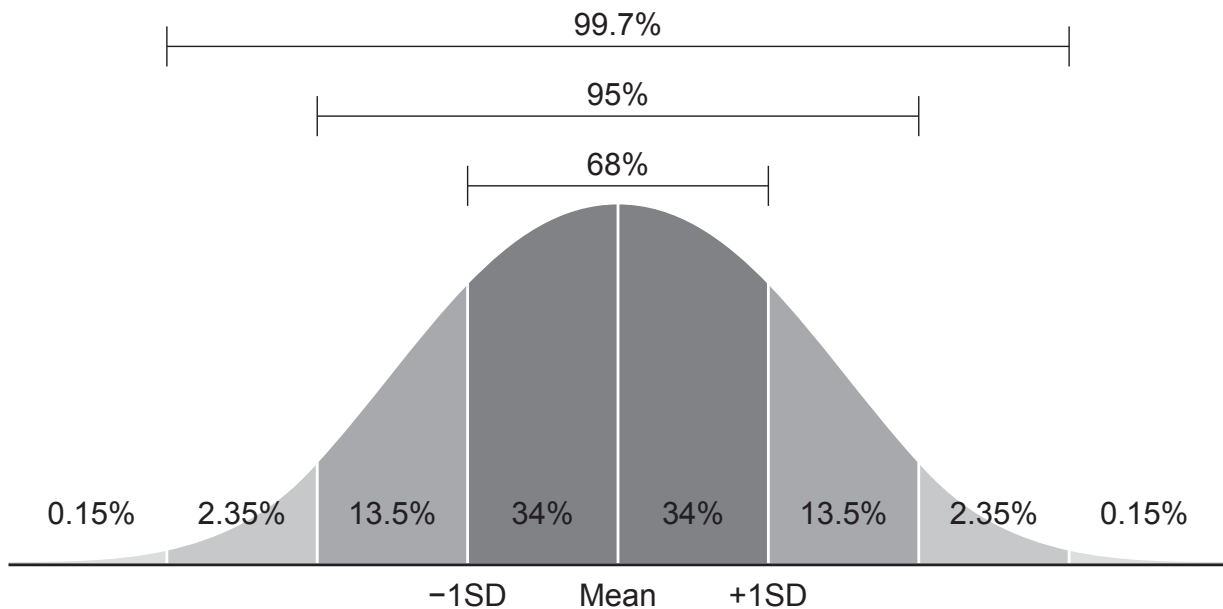
If: $y = a \pm b$	then: $\Delta y = \Delta a + \Delta b$
If: $y = \frac{ab}{c}$	then: $\frac{\Delta y}{y} = \frac{\Delta a}{a} + \frac{\Delta b}{b} + \frac{\Delta c}{c}$
If: $y = a^n$	then: $\frac{\Delta y}{y} = \left n \frac{\Delta a}{a} \right $

17. Variation in data sets

Interquartile range



Standard deviation



Coefficient of variation, V

$$V = \frac{100 \times SD}{mean}$$