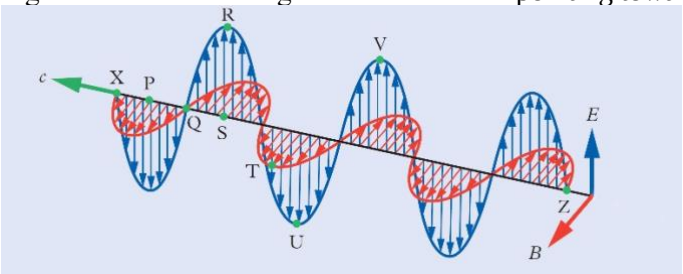
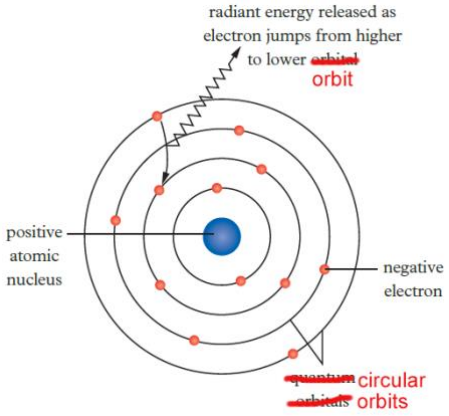
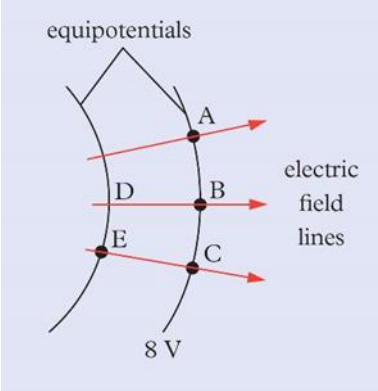
NCPQ 3ed. U3&4. Corrections still to be made to student book (SB) and online obook files. Richard Walding 10 December 2022.

	UNIT 3&4 STUDENT BOOK
Page	Correction
SB p84 Added 16 June 2022 Not fixed as of 10 Dec 2022	Chapter 2.3. Worked example 2.3D page 84. Delete "(tension)" in the second line. It should just read "…provide the applied force in the …"
SB p101 New correction 28 March 2022 Not fixed as of 10 Dec 2022	Change **WORKED EXAMPLE 3.2D** It is suggested that you can increase the speed of a dryer by doubling the diameter or doubling the rotational speed. Dryer A has a tub radius of 50.0 cm and a rotational speed of 1200 rpm, and dryer B with a diameter of 100 cm and a speed of 600 rpm. to **WORKED EXAMPLE 3.2D** It is suggested that you can increase the speed of a dryer by doubling the diameter or doubling the rotational speed. Dryer A has a tub radius of 50.0 cm and a rotational speed of 1200 rpm, and dryer B with a radius of 100 cm and a speed of 600 rpm.
SB p121 New correction 23 April 2022 Not fixed as of 10 Dec 2022	Change text in explanation of Cavendish experiment: Each of the two large lead spheres used by Cavendish had a mass of 158 kg and each of the two smaller spheres had a mass ~~0.73 kg~~ 2.92 kg. Cavendish didn't actually make the apparatus he used. He inherited it from John Mitchell who died in 1793 before he could try the experiment himself. The total force between the two pairs of lead masses was determined for various separation distances. ~~Table 1 gives the results for the total force on the fibre with the masses at various distances. These are not Cavendish's results but are derived from them.~~ The force between each pair was calculated by dividing the total force by two. Table 1 gives the results for the force on the fibre for one pair of masses (158 kg and 2.92 kg) at various distances. These are not Cavendish's results but are derived from them.
SB p 122 New correction 23 April 2022 Not fixed as of 10 Dec 2022	Page 122. Amend as shown below (about half-way down).: The mass of the large sphere is 158 kg and the mass of the small sphere is 2.92 kg. ~~The total mass of the small spheres is 0.73 kg + 0.73 kg = 1.46 kg. The total mass of the two large spheres is 158 kg + 158 kg = 316 kg. Use these total masses in the calculations.~~ Therefore: $G = \frac{Fr^2}{Mm}$ $= \frac{\text{gradient}}{Mm}$ $= \frac{0.0306 \times 10^{-6}}{158 \times 2.92}$ $= 6.63 \times 10^{-11}\,\text{N kg}^2\,\text{m}^{-2}$
SB p146 New correction 16 July 2022 Not fixed as of 10 Dec 2022	Chapter 5.3 page 146. Six lines up from bottom. Change "When a satellite's orbit matches the rotation of the earth, and it's position over the earth remains fixed, it's called geostationary or geosynchronous orbit." Correction: "When a satellite's orbit matches the rotation of the earth, it is called a geosynchronous orbit. If it's position over the earth remains fixed, it is called a geostationary orbit."
SB p147	Chapter 5.3 page 147

New correction 16 July 2022 Not fixed as of 10 Dec 2022	<table><tr><td>Geosynchronous Orbit GEO</td><td>35790</td><td>24</td><td>Direct broadcast, communications relay.</td><td>Orbits once a day, but not necessarily in the same direction as the rotation of the Earth - not necessarily stationary.</td></tr></table>
SB p210 Not fixed as of 10 Dec 2022	FIGURE 1. Change the caption to read: (a) Four lines of flux through an area of 1 m^2 represents a magnetic field strength of 4 Wb m^{-2} or 4 T.
SB p210 Not fixed as of 10 Dec 2022	Page 223. Fifth line down. Change: Imagine now, that the rod is moved to the right at a velocity of, say, 5.0 cm^{-1} to Imagine now, that the rod is moved to the right at a velocity of, say, 5.0 cm s^{-1}
SB p233 Not fixed as of 10 Dec 2022	CYL 8.5 Q1 Figure should have the green arrow and 'c' pointing towards the left as shown below: 
SB p313 New 28 Jul 2022 Not fixed as of 10 Dec 2022	Chapter 11.5 p 313. Study Tip in margin. Delete 'party lights' and replace with 'UV aquarium light, or UV LED Fishing Black Torch'.
SB p318 New 28 Jul 2022 Not fixed as of 10 Dec 2022	Chapter 11.5 p 318. Figure 6 caption. Change 'photon emitter' to 'photon absorber'.
SB p318 New 28 Jul 2022 Not fixed as of 10 Dec 2022	Chapter 11.5 p 318. Delete second and third sentences "If incident light…on or off'. Replace with: 'If the incoming photons make the electrons more mobile without ejecting them, the conductivity of the material varies with light intensity. This is a type of photoelectric device called a photoconductor.'
SB p318 New 28 Jul 2022 Not fixed as of 10 Dec 2022	Chapter 11.5 p 318. Study tip. Delete 'the photoelectric effect' and replace with 'photoelectricity'.
SB p334 Advised 7 Dec 2022 Not fixed as of 10 Dec 2022	Figure 1 Amend figure as shown: 

SB p 334 Advised 7 Dec 2022 Not fixed as of 10 Dec 2022	**WORKED EXAMPLE 12.2B** **a** Determine the energy of an electron in both the fourth and second quantum orbits ~~orbitals~~ of the hydrogen atom. **b** Calculate the frequency of the energy emitted when an electron jumps between these ~~orbitals~~. orbits
UNIT 3&4 OBOOK	
U 3&4 obook Not fixed as of 10 Dec 2022	Chapter 1 Revision Question 22 Change (add the ½ in front of g in the second line) $s_y = u_y t + gt^2$ $u_y = -gt \left(s_y = 0\right)$ $+6.72 = +4.89\ t$ $t = 1.37$ s to $s_y = u_y t + \frac{1}{2} gt^2$ $u_y = -\frac{1}{2} gt \left(s_y = 0\right)$ $+6.72 = +4.89\ t$ $t = 1.37$ s
U 3&4 obook New correction 28 March 2022 Not fixed as of 10 Dec 2022	Chapter 2, CYL2.2 Q9. Answers Change: Friction acts as soon as motion begins. It opposes motion so if there is no motion it doesn't act. To: It is not true. The surfaces do not have to be accelerating but they have to be moving or trying to move past one another. So, whenever you try to move two objects past each other friction gets created. If there is no motion it is called 'static' friction. If they are moving (at constant speed or accelerating) it is called 'dynamic' or 'kinetic' friction.
U 3&4 obook New correction 28 March 2022 Not fixed as of 10 Dec 2022	Chapter 2, CYL2.2 Q10(e). Change: $F_H = F_f$. Friction $= 86.6$ N The speed is constant, so the force is 86.6 N in the opposite direction to the motion. To: $F_f = F_H$ $= 86.6$ N (from part (b)) The speed is constant, so the frictional force is 86.6 N in the opposite direction to the motion.
U 3&4 obook New correction 28 March 2022 Not fixed as of 10 Dec 2022	Chapter 4 Student book answers CYL 4.2 Q2(b) Change "One-quarter the force" to "Four times the force"
U 3&4 obook New correction 28 March 2022 Not fixed as of 10 Dec 2022	Chapter 4 Student Book Answers CYL 4.3 Q 7. Error in answer. Change: $= 1.563 \times 10^7$ N kg^{-1} (towards Earth) To: = 0.613 N kg^{-1} (towards Earth)
U 3&4 obook New correction 28 March 2022	Student Book Answers, Chapter 6 CYL 6.3 Question 7. Change figure to the corrected one as used in the Student Book for this question, as shown below:

Not fixed as of 10 Dec 2022	 Needs to be fixed in Student Book 'Questions' obook document as well.
U 3&4 obook New correction 28 March 2022 Not fixed as of 10 Dec 2022	Student Book Answers, Chapter 6 CYL 6.3 Question 7 (b), and Q7 (c). Change spelling from "lime" to "line".
U 3&4 obook Not fixed as of 10 Dec 2022	Student Book Answers, Chapter 6 Revision Q14 **c** **Calculate** the time of travel of the particle in the field. $t = \frac{s}{v}$ $= \frac{0.01}{1200}$ $= 8.33\times10^{-6}\,\text{s}\,(8.3\times10^{-6}\,\text{s to 2sf})$ **d** **Calculate** the final displacement and velocity in the direction of the field. $s_y = u_y t + \frac{1}{2}\times a\times t^2$ $s_y = 0 + \frac{1}{2}\times1.67\times10^8\times(8.33\times10^{-6})^2$ $= 5.79\times10^{-3}\,\text{m}\,(5.8\times10^{-3}\,\text{m to 2sf})$ $v_y = u_y + at$ $= 0 + 1.67\times10^8\times8.33\times10^{-6}$ $= 1391\,\text{m s}^{-1}\,(1400\,\text{m s}^{-1}\,\text{to 2sf})$ *OR* $v_y^2 = u_y^2 + 2as_y$ $= 0 + 2\times1.67\times10^8\times5.8\times10^{-3}$ $v_y = \sqrt{2\times1.67\times10^8\times5.8\times10^{-3}}$ $= 1392\,\text{ms}^{-1}\,(1400\,\text{m s}^{-1}\,\text{to 2sf})$
U3&4 obook Added 5 November 2022 Not fixed as of 10 Dec 2022	Chapter 7 Review Questions, Q18 $n = \frac{N}{L} = \frac{turns}{length}$ $= \frac{3500}{0.700}$ $= 5000\,\frac{\text{turns}}{\text{metre}}$

	$= 1.26 \times 10^{-6} \times 5000 \times (75 \times 10^{-3})$ $= 4.725 \times 10^{-4}\ T$ (field is into the page)
U3&4 obook Added 16 June 2022 Not fixed as of 10 Dec 2022	Chapter 13.1, CYL 13.1 Q10. The answer should read: The conditions are that they must have the same mass but opposite charge. Explanation (optional): a particle and its antiparticle cannot be identical as the antiparticle must have the opposite charge to its corresponding particle. However, if the particle is uncharged, such as a photon or neutrino, then the particle and antiparticle are considered the same thing. [Note that the syllabus has the definition of an antiparticle incorrect. It says that an antiparticle is "a particle with the same mass and opposite charge and/or spin as a corresponding particle". However, while it has to have the opposite charge, it doesn't necessarily have to have the opposite spin. Besides, 'spin' is not a syllabus term that you have to know anyway.]
U3&4 obook Advised 8 Dec 2022 Not fixed as of 10 Dec 2022	Unit 3 Cumulative test answers MCQ 2. Please make correct answer *(B)
U 3&4 obook Partly fixed 20 Oct 2022. Change 'shifted' to 'placed'. And the correct answer is 32 cm. Not fixed as of 10 Dec 2022	Assess Quizzes Chapter 3 Extend Q5 Question should read: Determine what distance the coin should be placed from the centre so at the new velocity the coin will just begin to slip. [correct answer] 32 cm [incorrect answer] 2 cm [incorrect answer] 16 cm [incorrect answer] 24 cm This is how it reads at the moment (20 Oct 2022): 5 Determine what distance the coin should be shifted towards the centre so that the coin will just begin to slip at the new velocity. a. 24 cm b. 32 cm c. 16 cm d. 2 cm ◂ CORRECT ANSWER
U 3&4 obook New 20 Oct 2022 Not fixed as of 10 Dec 2022	U3&4 Assess Quizzes Chapter 13 Support Q6. Change "According to the Standard Model, the fundamental particles of an atom include" to According to the Standard Model, the elementary particles of an atom are
U 3&4 obook New 20 Oct 2022 Not fixed as of 10 Dec 2022	U3&4 Assess Quizzes Chapter 13 Consolidate Q1. Change "fundamental" to "elementary"