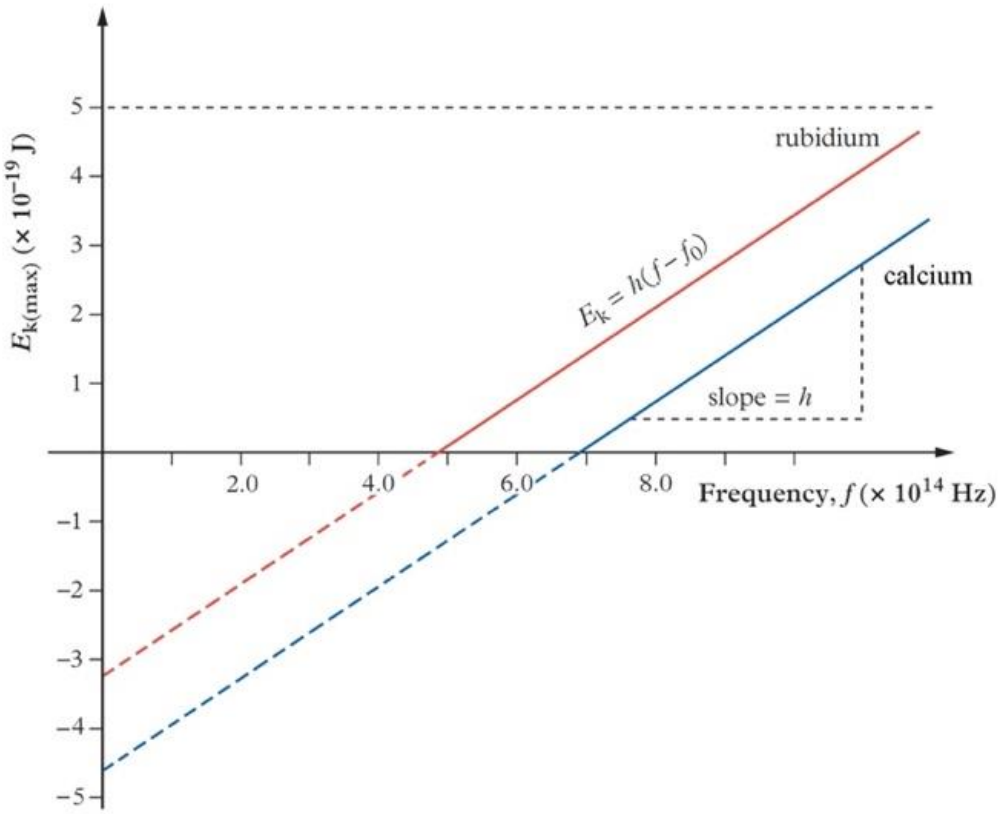
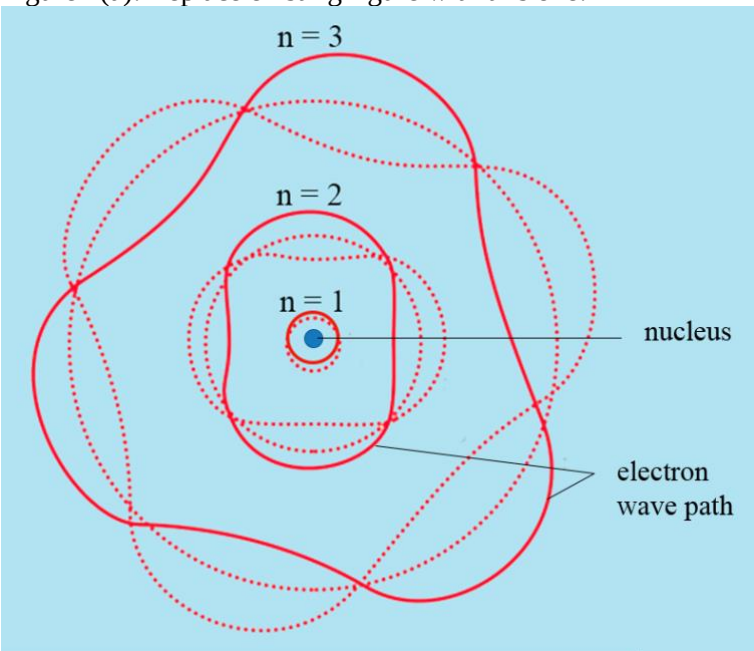
NCPQ 3ed. Corrections still to be made to student book (SB) and online obook files. Richard Walding 21 August 2021.

	UNIT 3&4 STUDENT BOOK
Page	Correction
SB p101	**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 cm and a rotational speed of 1200 rpm, and dryer B with a diameter of 100 cm and a speed of 600 rpm. **a** Determine which dryer gives the higher speed. **b** Propose which would be preferred for a household laundry. **SOLUTION** **a** Period or revolution Dryer B: $T = \frac{1}{1200}$ minutes $= \frac{60}{1200}$ seconds $= 0.05$ s Dryer B: $T = \frac{1}{600}$ minutes $= \frac{60}{600}$ seconds $= 0.10$ s Average speed Dryer A: $v = \frac{2\pi r}{T} = \frac{2\pi \times 0.50}{0.05} = 62.8 \text{ m s}^{-1}$ Dryer B: $v = \frac{2\pi r}{T} = \frac{2\pi \times 1.00}{0.10} = 62.8 \text{ m s}^{-1}$ **b** As they both have the same velocity, the dryer with the smaller radius is preferred. It will have a greater change of velocity (centripetal acceleration) as it is moving in a smaller circle and so the change in direction will be greater in the same period of time. Thus, the clothes are being pulled away from the water with greater (centripetal) force and allowing the water to continue to move outward from the clothes.
SB p136	Replace "When referring to an elliptical orbit in general" with "When referring to an elliptical Earth orbit"
SB p159	Chapter 6. Worked example 6.1D. Change answer "44.6 N attraction" to 44.6 N repulsion"
SB p160	Chapter 6. Worked example 6.1E. Change "attraction" to "repulsion" in: $F_{CA} = 3.6 \times 10^{-4}$ N attraction $F_{CB} = 3.6 \times 10^{-4}$ N attraction
SB p161	Chapter 6, CYL 6.1 Q1. Change to **"…** to 1 significant figure, including units."
SB p178	Chapter 7, Q9. Change "to the left" to "from the left"
SB p210	Chapter 8. Section 8.1 (half way down). Spelling "magnetic field strength = flux density"
SB p212	Chapter 8. Section 8.1. Corrections to text under Figure 3: "…loop (black arrow) makes with the direction of the field (red arrows)."
SB p231	Chapter 8 Electromagnetic Induction and Radiation page 231. See 5th dot point in the Summary. Delete the words in red. The oscillations are in phase ~~and of equal amplitude~~.
SB p 238	Chapter 8 Revision, Q 13. Delete the word "In". It should read: "Explain whether angle X or angle Y ~~In~~ represents θ."
SB p231	Chapter 8 Electromagnetic Induction and Radiation page 231. See 7th dot point in Summary. Delete the following words: ~~The energy associated with the electric field is equal to the energy associated with the magnetic field (represented by equal amplitudes).~~
SB p233	CYL 8.5 Question 1(e). Identify two points that are one wavelength apart.
SB p309	CYL 11.3 Q1. Change to "..and the radiation from Earth ~~and~~ emitted…" (delete "and")
SB p315	Chapter 11 Fig 5. The x-axis scale has to be fixed. Correct figure is:

	
SB p332	Chapter 12. Figure 4. Change to: "The hydrogen emission spectrum"
SB p334	Delete the last sentence on page: ~~"Bohr also proposed that within the atom only two electrons could occupy the same orbital at any one time."~~
SB p336	Formula in shaded box in Figure 2 should be $E_n = \frac{E_1}{n^2}$
SB p337	Chapter 12. 4th para, 1st line. Notice that in the energy level diagram of atomic hydrogen (Figure 2),
SB p341	Figure 1(a). Replace existing figure with this one: 
SB p342	Chapter 12. Please amend the four lines above the Worked Example 12.3D to read: where λ is the de Broglie wavelength (m), n is the energy level and r is the

	radius of the orbital (m). Using this formula, the wavelength of the ground state electron in hydrogen is 0.166 nm and successive energy levels will have wavelengths that are integer multiples of that value.
SB p356	Challenge 13.1B (d). Correct symbol and quark content for a double charmed Xi baryon is: $\left(\Xi_{cc}^{*+}\right): d_b c_g c_r$
SB p375	Ch 14.1. For the antineutron in Table 1: $B = \frac{1}{3}(0-3)$
SB p 390	Change $B \rightarrow \overline{A} + B + C$ to $B \rightarrow \overline{A} + C + D$
SB p 400	Unit 4 Practice Exam Q3. Option B should be 9×10^{13} J
	UNIT 3&4 OBOOK
U 3&4 obook	Chapter 6 Review Q14

b **Calculate** the acceleration of the particle in the field.

$$a = \frac{F}{m}$$
$$= \frac{1.6\times10^{-17}}{9.6\times10^{-26}}$$
$$= 1.67\times10^{8}\ \text{ms}^{-1}\ (1.7\times10^{8}\ \text{ms}^{-1}\ \text{to 2 sf})\ \text{down the page}$$

c **Calculate** the time of travel of the particle in the field.

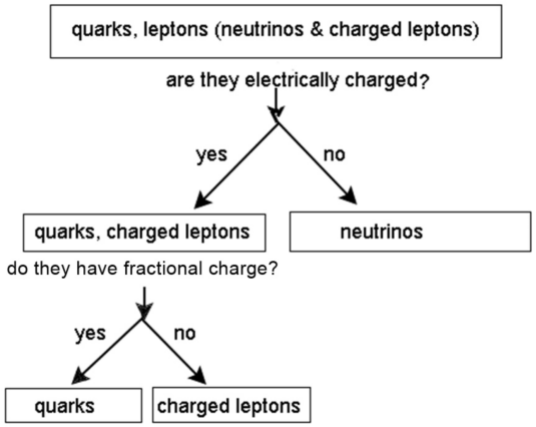
$$t = \frac{s}{v}$$
$$= \frac{0.01}{1200}$$
$$= 8.33\times10^{-6}\ \text{s}\ (8.3\times10^{-6}\ \text{s to 2sf})$$

d **Calculate** the final displacement and velocity in the direction of the field.

$$s_y = u_y t + \tfrac{1}{2}\times a\times t^2$$
$$s_y = 0 + \tfrac{1}{2}\times1.67\times10^{8}\times(8.33\times10^{-6})^2$$
$$= 5.79\times10^{-3}\ \text{m}\ (5.8\times10^{-3}\ \text{m to 2sf})$$
$$v_y = u_y + at$$
$$= 0 + 1.67\times10^{8}\times8.33\times10^{-6}$$
$$= 1391\ \text{ms}^{-1}\ (1400\ \text{ms}^{-1}\ \text{to 2sf})$$
$$OR$$
$$v_y^{\,2} = u_y^{\,2} + 2as_y$$
$$= 0 + 2\times1.67\times10^{8}\times5.8\times10^{-3}$$
$$v_y = \sqrt{2\times1.67\times10^{8}\times5.8\times10^{-3}}$$
$$= 1392\ \text{ms}^{-1}\ (1400\ \text{ms}^{-1}\ \text{to 2sf})$$

e **Describe** the probable path of the particle in the field.

The charge will move in a curved path from the top left to bottom right in the field.

U 3&4 obook	Chapter 10 Review Q15. Answer should be: $\Delta E = \Delta mc^2$ $= 1.0\times10^{-6}\times(3\times10^{8})^2$ $= 9.0\times10^{-10}\ \text{J (to 2 sf)}$
U 3&4 obook	Chapter 11.5 Practical worksheet answers. Threshold frequency column should have the exponent in the second row as 10^{14} NOT 1014
U 3&4 obook	Chapter 13 Student book answers, CYL 13.2 Q6 
U 3&4 obook	Unit 4 Practice exam answers. Q2. Answer is (A) not (B).
U 3&4 obook	Unit 4 Practice exam answers. Q14. **a** Determine the work function of the metal. $E_k = hf - W$ $\frac{1}{2}mv^2 = \frac{hc}{\lambda} - W$ $W = \frac{hc}{\lambda} - \frac{1}{2}mv^2$ $W = \frac{6.624\times10^{-34}\times3\times10^{8}}{310\times10^{-9}} - \frac{1}{2}\times9.11\times10^{-31}\times(0.0024\times3\times10^{8})^2$ $= 6.410\times10^{-19} - 2.361\times10^{-19}$ $W = 4.049\times10^{-19}\ \text{J}\ (4.0\times10^{-19}\ \text{J to 2 sf})$ Check if answer is reasonable. Work function of most metals is in the range of about 1 to 5 eV. $W = 4.049\times10^{-19}\ \text{J}$ $= \frac{4.049\times10^{-19}\ \text{J}}{1.60\times10^{-19}\ \text{J/ eV}}$ $= 2.53\ \text{eV (reasonable)}$
U 3&4 obook	Assess Quizzes Chapter 2 Support Q10. Add degree symbol after the 30
U 3&4 obook	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
U 3&4 obook	Chapter 1 Support Q8. The option "6.0 s" should be "6.1 s".
U 3&4 obook	Chapter 1 Consolidate Q3. The values in the four options should be: 29, 180, 34, 20. The answer of 20 m s^{-1} is still correct.

U 3&4 obook	Chapter 11 Support Q8 Change “Which of the phenomena can be verified by firing electrons at a metal…” to “Which of the phenomena can be verified by shining light on a metal…”
U 3&4 obook	U3&4 Assess Quizzes Chapter 11 Support Q1. Change “fundamental” to “elementary”