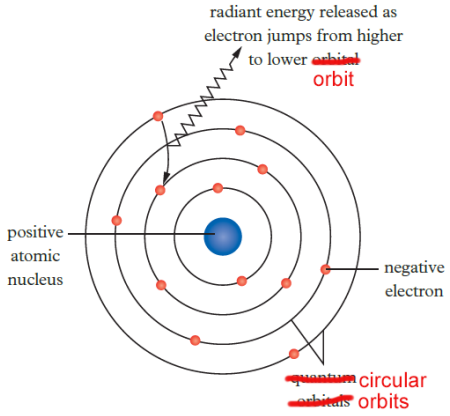
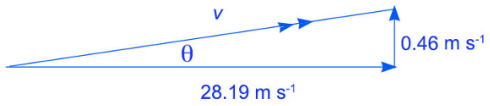
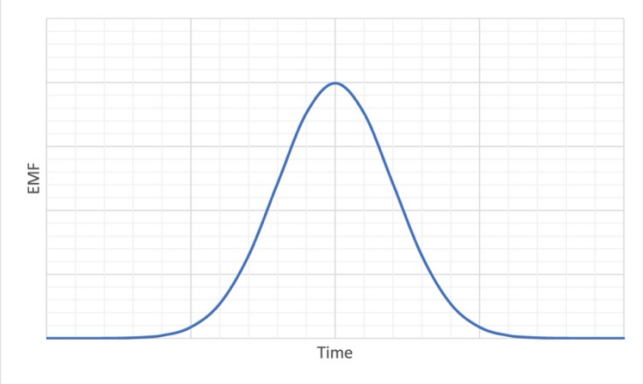
NCPQ 3ed. U3&4. Corrections still to be made to student book (SB) and online obook files. Richard Walding 5 February 2024.

	UNIT 3&4 STUDENT BOOK
Page	Correction
SP p79	CYL 2.2 Q7. The question should read "to the right" NOT "to the left"
SB p101	Worked Example 3.2 D, page 101. Should read "Period of revolution" and "Dryer A": **SOLUTION** **a** Period ~~or~~ of revolution Dryer ~~B~~ A: $T = \frac{1}{1200}$ minutes
SB p 122	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.~~
SB p140	Second paragraph under Kepler's Third law. Change from: It should not be confused with **synodic period** which is the time taken for a planet to appear in front of the same constellation of stars as seen from Earth TO It should not be confused with **synodic period** which is the time taken for a planet to return to the same position relative to the Sun as seen from Earth. Please change definition in margin and in Glossary.
SB p 189	Chapter 7, Worked example 7.2B page 189. The answer should be 3.0×10^{-6} T instead of 3.2×10^{-6} T.
SB p210	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 p334	Figure 1 Amend figure as shown: 
SB p 337	**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
Chapter 1 Revision Q	Rev Q 13(b). The second part of the answer was not provided. Here is the full answer for part (b): **b** velocity of the ball after 1.0 s v_y after $t = 1.0\ s$ $v_y = u_y + gt$ $= 10.26 + -9.8 \times 1.0$ $= +0.46\ \text{m s}^{-1}$ $v_x = 28.19\ \text{m s}^{-1}$  $v = \sqrt{(28.19)^2 + (0.46)^2} = 28.19\ \text{m s}^{-1}$ $\theta = tan^{-1}(\frac{0.46}{28.19}) = 0.93°$ to the horizontal
Chapter 8 CYL Solutions	Chapter 8, CYL8.2, Q6 Delete existing answer. A reasoned response to this question is as follows:  The positively charged particle is moving relative to the coil so it has a magnetic field around the axis of travel with the same orientation as the wires in the coil. As it passes through the coil the particle's magnetic flux lines cut the wires to generate an EMF as given by Fleming's right-hand rule. The total magnetic flux is constant so the EMF would increase as the particle goes from the start of the tube to the middle where it would reach a maximum, and then decrease to zero as it leaves the other end. At no time would the EMF go negative. The correct answer comes from physicist Ian McCulloch (Feb 2024): *There is no EMF, because the field is pointing in the wrong direction. Solar wind, for example, ends up mainly following along the direction of magnetic field lines because any motion perpendicular to the field line results in a Lorentz force and a spiral motion around the field line. The result is the motion is primarily in the direction of the field line, where there is no force. Similarly, a charged particle moving down the axial direction of a solenoid can't induce an EMF.*
Chapter 8 Revision Q	Revision Question 27(b) should read: (b) The solenoid experiences a S-pole moving towards its left hand end. By Lenz's Law a current is induced in the solenoid to generate a S-pole at its left hand end to oppose

<table>
<tr><td></td><td>(prevent) the S-pole approaching. To do this, a current is induced in the solenoid flowing down the front (from A to B through the voltmeter, or from B to A through the solenoid).</td></tr>
<tr><td>U3&4 obook</td><td>Practical worksheet answers. 1.3 Angled projection and distance.
The uncertainty column in the table is not fully correct. It should have these values.
<table>
<tr><th>angle (°)</th><th>δ (± m)</th></tr>
<tr><td>20°</td><td>δ = ± 0.02 m</td></tr>
<tr><td>30°</td><td>δ = ± 0.04 m</td></tr>
<tr><td>40°</td><td>δ = ± 0.04 m</td></tr>
<tr><td>45°</td><td>δ = ± 0.12 m</td></tr>
<tr><td>50°</td><td>δ = ± 0.04 m</td></tr>
<tr><td>60°</td><td>δ = ± 0.13 m</td></tr>
<tr><td>70°</td><td>δ = ± 0.07 m</td></tr>
<tr><td>80°</td><td>δ = ± 0.14 m</td></tr>
</table></td></tr>
<tr><td>U3&4 obook</td><td>Practical worksheet answers. 2.3 Parallel component on an inclined plane. The table in Q4 has the masses in grams instead of kg. You could just change the headings for the three columns to g instead of kg.
<table>
<tr><th colspan="3">Hanging mass (m)</th></tr>
<tr><th>m_{up} (kg)</th><th>m_{down} (kg)</th><th>m_{av} (kg)</th></tr>
<tr><td>121.5</td><td>91.0</td><td>106.3</td></tr>
</table>
to
<table>
<tr><th colspan="3">Hanging mass (m)</th></tr>
<tr><th>m_{up} (g)</th><th>m_{down} (g)</th><th>m_{av} (g)</th></tr>
<tr><td>121.5</td><td>91.0</td><td>106.3</td></tr>
</table>
Or you could change the values to kg by dividing by 1000. Sorry about that.</td></tr>
<tr><td>U3&4 obook</td><td>Assess Quizzes Chapter 2 Consolidate Q4
Answer is “Remains the same” NOT “be greater but less than double”</td></tr>
<tr><td>U 3&4 obook</td><td>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</td></tr>
<tr><td>U 3&4 obook</td><td>U3&4 Assess Quizzes</td></tr>
</table>

	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	U3&4 Assess Quizzes Chapter 13 Consolidate Q1. Change “fundamental” to “elementary”