

### Key Stage 3 Science Knowledge Booklet

To support pupils to make progress and to ensure they are fully prepared for GCSE Science we recommend that all pupils spend at least 15 minutes after each Science lesson consolidating their learning on key concepts and terminology. The table below identifies the specific pages within the revision guide that need to be used and completed (available for purchase from the Science Department for £3.50; ISBN 978-0-00-756283-1)

Tasks that pupils could complete are:

- 1) Answer questions related to the double page spread into exercise book.
- 2) Write definitions for key words on flash/memory cards or thinking maps.
- 3) Answer exam style questions within the revision guide.

Examples of activities within the revision guide are below:

**Quick Test**

1. Name one structure that is found in plant cells but not animal cells.
2. Where in a cell is energy released from food?
3. Name the process where molecules move from where there are lots of them to where there are only a few.
4. Put these words in order of complexity starting with 'cell': cell, organism, organ, system, tissue.

**Key Words**

- membrane
- cytoplasm
- nucleus
- mitochondria
- cell wall
- vacuole
- chloroplast
- diffusion
- unicellular
- tissue
- organ
- organ system

1 Match the part of a cell to its function.

#### Part of cell

Membrane

Cytoplasm

Nucleus

Mitochondria

Cell wall

Vacuole

Chloroplast

#### Function

Changes light energy into food energy

Inflates the cell

Supports the cell

Releases energy from glucose

Stores information and controls the cell

Where chemical reactions take place

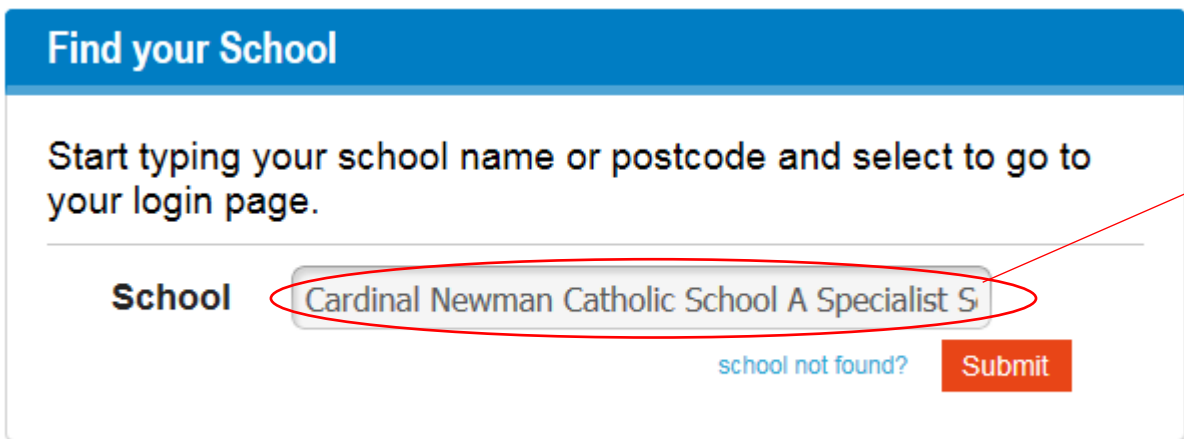
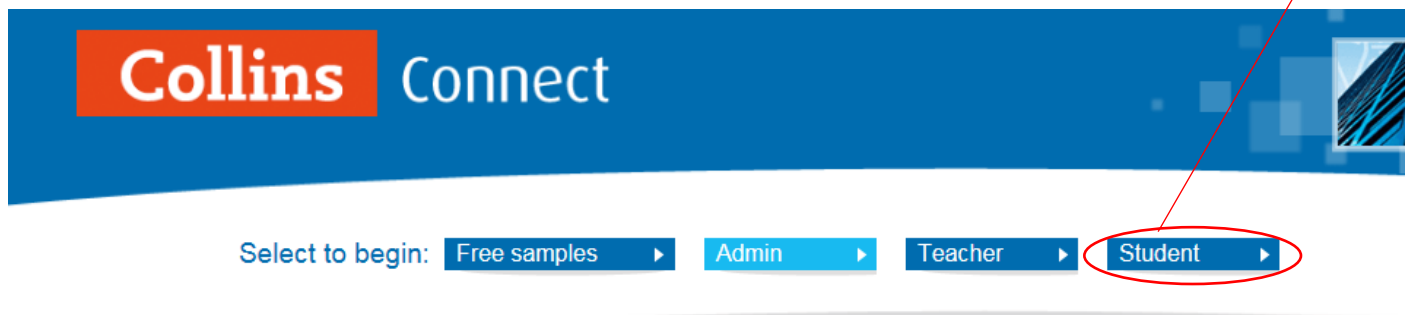
Controls what enters and leaves a cell

The topics covered within each year group are divided into each of the three terms. All pupils do the same topics in each term but may do them in different orders to the way they are presented below.

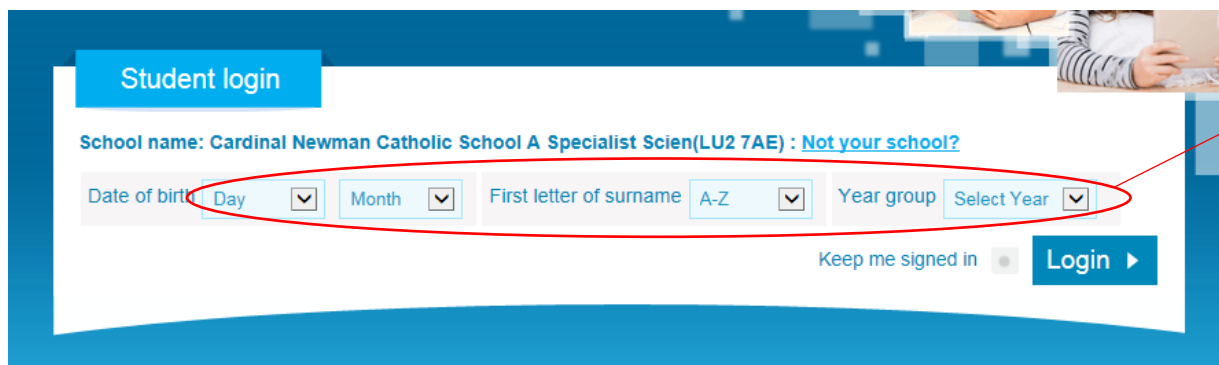
Another resource pupils could use in Collins Connect (available to all pupils with no additional cost)

Pupils need to log into Collins Connect: <https://connect.collins.co.uk/school/portal.aspx>

1) Click Student



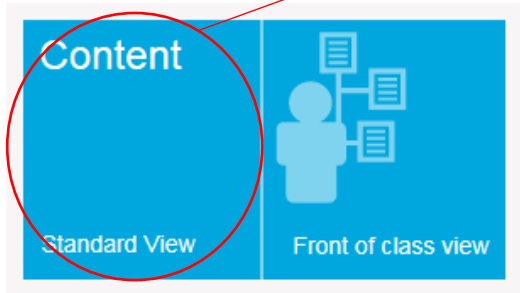
2) Select our school LU2 7AE



3) Select your own details



4) Select the book outlined in the table below in the table below as the relevant link on Collins Connect.



5) Select Content

## Chapter 1: Forces – Speed and Gravity

1.0 Introduction

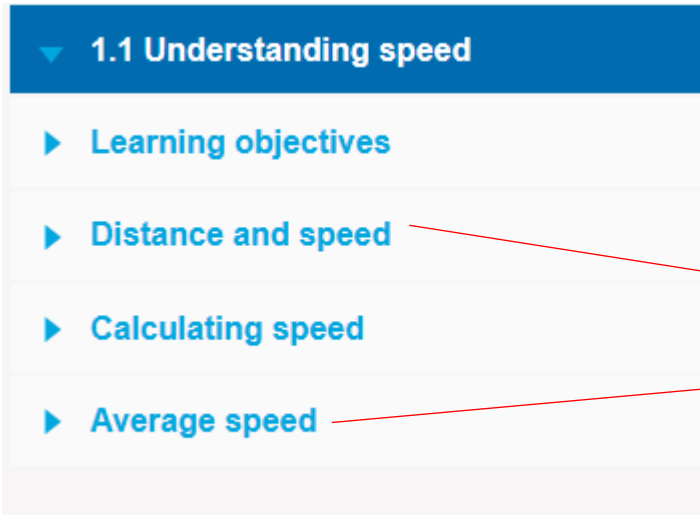
1.1 Understanding speed

1.2 Describing journeys with distance–time graphs

1.3 Exploring journeys on distance–time graphs

1.4 Investigating the motion of a car on a ramp

6) Select the chapter and pages outlined in the table below as relevant link on Collins Connect.



Tasks that pupils could complete are:

- 1) Use the introduction pages to see what they should have covered before at KS2 and what they are going on to cover now
- 2) Answer the questions that can be found on each of the links. The level of difficulty within these questions; green is easier, blue is medium and pink is more of a challenge.
- 3) Write definitions for key words on flash/memory cards or thinking maps.
- 4) Use the Checking your progress sheet at the end of the chapter to review knowledge (green) application (blue) and extension of knowledge (pink).
- 5) Practise questions at the end of the chapter, split into sections (know, apply, extend)
- 6) Use BBC bitesize links to learn and test themselves on topics.
- 7) Set themselves a quiz on the topic using Educake ([www.educake.co.uk](http://www.educake.co.uk))

**Year 8**

<u>TERM</u>	<u>Topic</u>	<u>Relevant Pages in Revision Guide</u>	<u>Relevant Links on Collins Connect</u>	<u>Possible Web Links</u>
<u>1</u>	<p>Book 1: Universe</p> <p>Book 1: Human reproduction</p> <p>Book 2: The periodic table</p> <p>Book 2: Elements</p> <p>Book 2: Breathing</p> <p>Book 2: Digestion</p> <p>Book 1: Sound</p> <p>Book 1: Light</p> <p>Book 1: Earth Structure</p>	<p>All of these topics are the year 7 topics that were not covered in school due to the lockdown from March 2020.</p> <p>All the details for these topics can be found on the year 7 knowledge booklet document</p>		
<u>2</u>	<p><b>Reactions - Chemical energy</b></p> <p>(At)</p>	p.57	<p><b>Book 2 Chapter 6</b></p> <p>6.1 Understanding exothermic reactions p.102-103</p> <p>6.2 Comparing endothermic and exothermic changes p.104</p> <p>6.3 Investigating endothermic reactions p.106-107</p> <p>6.4 Explaining the use of catalysts p.108</p>	<p><a href="#">What are reactions? - BBC Bitesize</a></p>
	<p>(Above (As AT and topics included here))</p>	p.57	<p>6.1 Understanding exothermic reactions – energy diagrams for reactions p.103</p> <p>6.2 Comparing endothermic and exothermic changes – explaining endothermic changes p.104</p> <p>6.4 Explaining the use of catalysts – how do catalysts work? p.109</p>	
	<p><b>Ecosystems - Respiration and Photosynthesis</b></p> <p>(At)</p>	p.16-17 p.20-21	<p><b>Book 2 Chapter 9</b></p> <p>9.1 Understanding aerobic respiration p.166-177</p> <p>9.2 Exploring respiration in sport p.168-169</p> <p>9.3 Understanding anaerobic respiration p.170</p> <p>9.4 Investigating fermentation p.172-173</p>	<p><a href="http://www.bbc.co.uk/education/guides/zq349j6/revision">http://www.bbc.co.uk/education/guides/zq349j6/revision</a></p> <p><a href="http://www.bbc.co.uk/bitesize/ks3/science/organisms_behaviour_health/life_processes/revision/3/">http://www.bbc.co.uk/bitesize/ks3/science/organisms_behaviour_health/life_processes/revision/3/</a></p> <p><a href="https://www.youtube.com/watch?v=MF9DBxLRGIU">https://www.youtube.com/watch?v=MF9DBxLRGIU</a></p> <p><a href="https://www.youtube.com/watch?v=Xp0o19gWX7E">https://www.youtube.com/watch?v=Xp0o19gWX7E</a></p>

		<p>9.5 Comparing aerobic and anaerobic respiration p.174</p> <p>9.6 Exploring how plants make food p.176-177</p> <p>9.7 Looking at leaves p.178</p> <p>9.8 Exploring the movement of water and minerals in plants p.180-181</p> <p>9.9 Investigating the importance of minerals to plants p.182-183</p> <p>9.10 Investigating photosynthesis p.184-185</p>	<p><a href="http://www.docbrown.info/ks3biology/8BmcHP6.htm">http://www.docbrown.info/ks3biology/8BmcHP6.htm</a></p> <p><a href="https://www.youtube.com/watch?v=aXkA5igrVSo">https://www.youtube.com/watch?v=aXkA5igrVSo</a></p>
(Above (As AT and topics included here))	p.16-17 p.20-21	<p>9.1 Understanding aerobic respiration – building molecules p.177</p> <p>9.2 Exploring respiration in sport – energy stores p.169</p> <p>9.3 Understanding anaerobic respiration – exploring anaerobic respiration p.171</p> <p>9.5 Comparing aerobic and anaerobic respiration – respiration and enzymes p.175</p> <p>9.7 Looking at leaves – evaluation leaf adaptations p.179</p>	
<b>Contact and Non-Contact Forces (At)</b>	p.80-81	<p><b>Book 2 Chapter 1</b></p> <p>1.1 Analysing Equilibrium p.8-9</p> <p>1.2 What a drag! p.10-11</p> <p>1.3 Understanding stretch and compression p.12-13</p> <p>1.4 1.4 Investigating Hooke’s Law p.14-15</p>	<p><a href="#">What are forces? - BBC Bitesize</a></p> <p><a href="#">What is gravity? - BBC Bitesize</a></p> <p><a href="#">How to explain forces - BBC Bitesize</a></p> <p><a href="#">What is magnetism? - BBC Bitesize</a></p>
(Above (As AT and topics included here))	p.80-81	<p>1.1 Multiple forces in equilibrium p.9</p> <p>1.2 Championship cycling p.11</p> <p>1.3 Applications of elastic materials p.13</p> <p>1.4 Designing forcemeters p.15</p>	
<b>Pressure (At)</b>	p.82-83	<p><b>Book 2 Chapter 1</b></p> <p>1.5 Exploring Pressure on a solid surface p.16-17</p> <p>1.6 Exploring Pressure in a fluid p.18-19</p> <p>1.7 Calculating Pressure p.20-21</p>	<p><a href="#">What is pressure? - BBC Bitesize</a></p> <p><a href="#">How to show the difference between force and pressure - BBC Bitesize</a></p> <p><a href="#">What is water pressure? - BBC Bitesize</a></p> <p><a href="#">How to weigh a floating object without scales - BBC Bitesize</a></p>

		1.8 Explaining sinking and floating p.22-23	<a href="#">Pressure on surfaces - Pressure - KS3 Physics Revision - BBC Bitesize</a> <a href="#">How to show pressure exists in liquids - BBC Bitesize</a>
(Above (As AT and topics included here))	p.82-83	1.5 Solving engineering problems p.17 1.6 Explaining pressure in the atmosphere p.19 1.7 Solving pressure problems p.21 1.8 Applying ideas about upthrust p23	
<b>Variation</b> (At)	p.30-31	<b>Book 1 Chapter 10</b> 10.1 Looking at variation p222-223 10.2 Exploring causes of variation p..224-225 10.3 Exploring the importance of variation p.226-227	<a href="#">What is variation? - BBC Bitesize</a> <a href="#">What is variation? - Variation - KS3 Biology Revision - BBC Bitesize</a>
(Above (As AT and topics included here))	p.30-31	10.2 Genetic or environmental p.225 10.3 Superbugs p.227	
<b>Inheritance</b> (At)	p.28-29	<b>Book 2 Chapter 10</b> 10.4 Understanding the nature of the genetic material p.198-199 10.5 Exploring the role of chromosomes p.200-201 10.6 Understanding variation p.202-203 10.7 Modelling inheritance p.204-205	<a href="#">What is DNA? - BBC Bitesize</a> <a href="#">Structure of DNA - DNA - KS3 Biology Revision - BBC Bitesize</a>
(Above (As AT and topics included here))	p.28-29	10.4 Finding the structure p.199 10.5 Genetic mutations p.201 10.6 Identical twins p.203 10.7 Genetic counselling p.205	
<b>Evolution</b> (At)	p.31	<b>Book 2 Chapter 10</b> 10.1 Explaining Natural Selection p.192-193 10.2 Understanding the importance of biodiversity p.194-195 10.3 Explaining Extinction p.196-197	<a href="#">What is natural selection? - BBC Bitesize</a> <a href="#">Species - Species and selective breeding - KS3 Biology Revision - BBC Bitesize</a> <a href="#">Evolution - Evolution, extinction and biodiversity - KS3 Biology Revision - BBC Bitesize</a>
(Above (As AT and topics included here))	p.31	10.1 Evidence for natural selection p.193 10.2 The consequences of a lack of biodiversity p.195	

			10.3 Reviewing an extinction theory p.197	
	<b>Work (At)</b>	p.92	<b>Book 2 Chapter 3</b> 3.1 Doing work p.46-47 3.2 Making work easier p.48-49	<a href="#">What are forces? - Forces - KS3 Physics Revision - BBC Bitesize</a>
	(Above (As AT and topics included here))	p.92	3.1 Defining work done p.47 3.2 Applying ideas about machines p.49	
	<b>Heating and Cooling (At)</b>	p.92-93	<b>Book 2 Chapter 3</b> 3.3 Explaining thermal energy p.50-51 3.4 Heating p.52-53 3.5 How to stop energy from travelling p.54-55 3.6 Energy and temperature p.56-57	<a href="#">Stores of energy - Energy stores and transfers - KS3 Physics Revision - BBC Bitesize</a>
	(Above (As AT and topics included here))	p.92-93	3.3 Energy and temperature p.52 3.4 Radiation p.53 3.5 Applying ideas about insulation p.55 3.6 Vacuum Flask p.57	
3	<b>Electromagnets - Voltage, current and electromagnetism (At)</b>	p.100-103	<b>Book 1 Chapter 2</b> 2.1 Describing electric circuits p.32-33 2.2 Understanding energy in circuits p.34 2.3 Explaining resistance p.36 2.4 Describing series and parallel circuits p.38 2.5 Comparing series and parallel circuits p.40-41 2.6 Investigating static charge p.42 2.7 Explaining static charge p.44 2.8 Understanding electric fields p.46	<a href="https://www.bbc.co.uk/bitesize/topics/zgy39i6">https://www.bbc.co.uk/bitesize/topics/zgy39i6</a> <a href="#">Electricity - KS3 Physics - BBC Bitesize</a>
	(Above (As AT and topics included here))	p.100-103	2.2 Understanding energy in circuits - using analogies to explain voltage p.35 2.3 Explaining resistance – working out resistance p.37 2.4 Describing series and parallel circuits p.39 2.5 Comparing series and parallel circuits – household circuits p.41 2.6 Investigating static charge – factors affecting field strength p.42	



		2.7 Explaining static charge – charging by electron transfer p.45 2.8 Understanding electric fields – Loss of charge p.47	
<b>Reactions – Types of reaction (At)</b>	p.42-43 p.47	<b>Book 2 Chapter 6</b> 6.5 Exploring combustion – incomplete combustion p.110 6.6 Exploring the use of fuels p.112-113 6.7 Understanding thermal decomposition p.114 6.8 Explaining changes p.116	<a href="#">Chemical reactions - Types of reaction - KS3 Chemistry Revision - BBC Bitesize</a> <a href="#">What is combustion? - BBC Bitesize</a>
(Above (As AT and topics included here))	p.42-43 p.47	6.5 Exploring combustion – incomplete combustion p.111 6.7 Understanding thermal decomposition – applications of thermal decomposition p.114 6.8 Explaining changes – applying the law of conservation of mass p.117	
<b>Wave Effects (At)</b>	p.94-95 p.104-107	<b>Book 2 Chapter 4</b> 4.1 Exploring sound p.64-65 4.2 Sound systems p.66-67 4.3 Exploring light p.68-69 4.4 Comparing transverse and longitudinal waves p.70-71 4.5 Exploring waves p.72-73	<a href="#">Water waves - Features of waves - KS3 Physics Revision - BBC Bitesize</a> <a href="#">What are light waves? - BBC Bitesize</a> <a href="#">How light travels - Light waves - KS3 Physics Revision - BBC Bitesize</a> <a href="#">What is colour? - BBC Bitesize</a> <a href="#">What are sound waves? - BBC Bitesize</a> <a href="#">Properties of sound waves - Sound waves - KS3 Physics Revision - BBC Bitesize</a>
(Above (As AT and topics included here))	p.94-95 p.104-107	4.1 Using ultrasound p.65 4.2 Making audio recordings p.67 4.3 Uses of UV light p.69 4.5 Comparing wave types p.71	