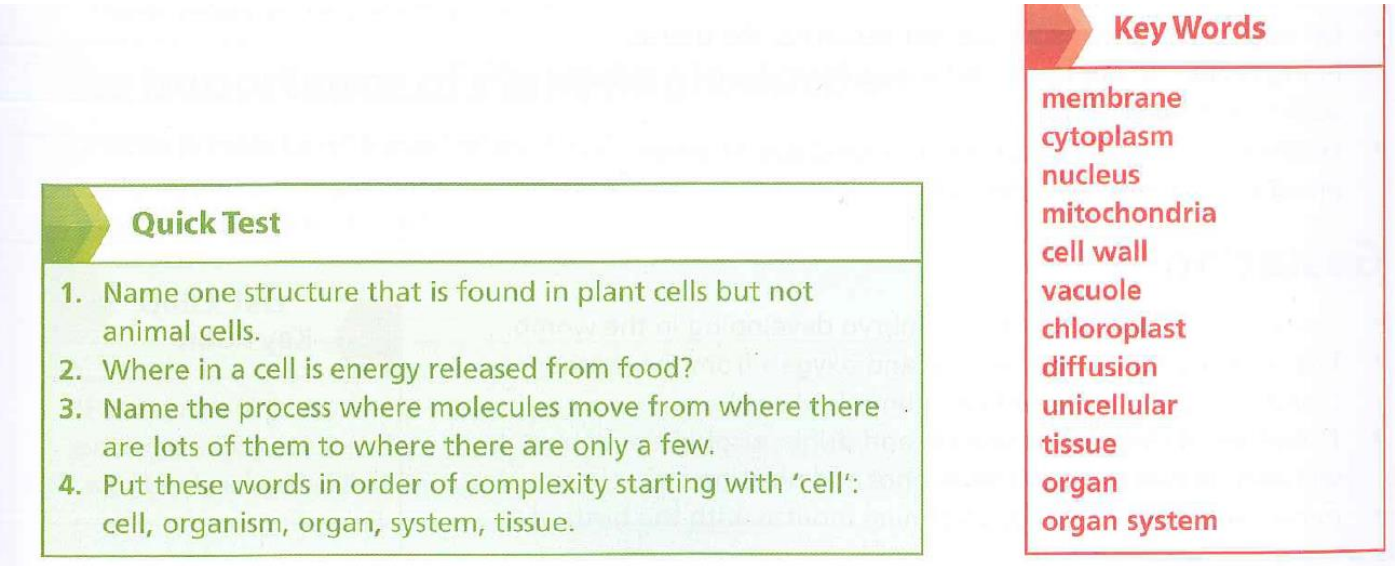
Key Stage 3 Science Knowledge Booklet

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 or retail price of £10.99; 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:

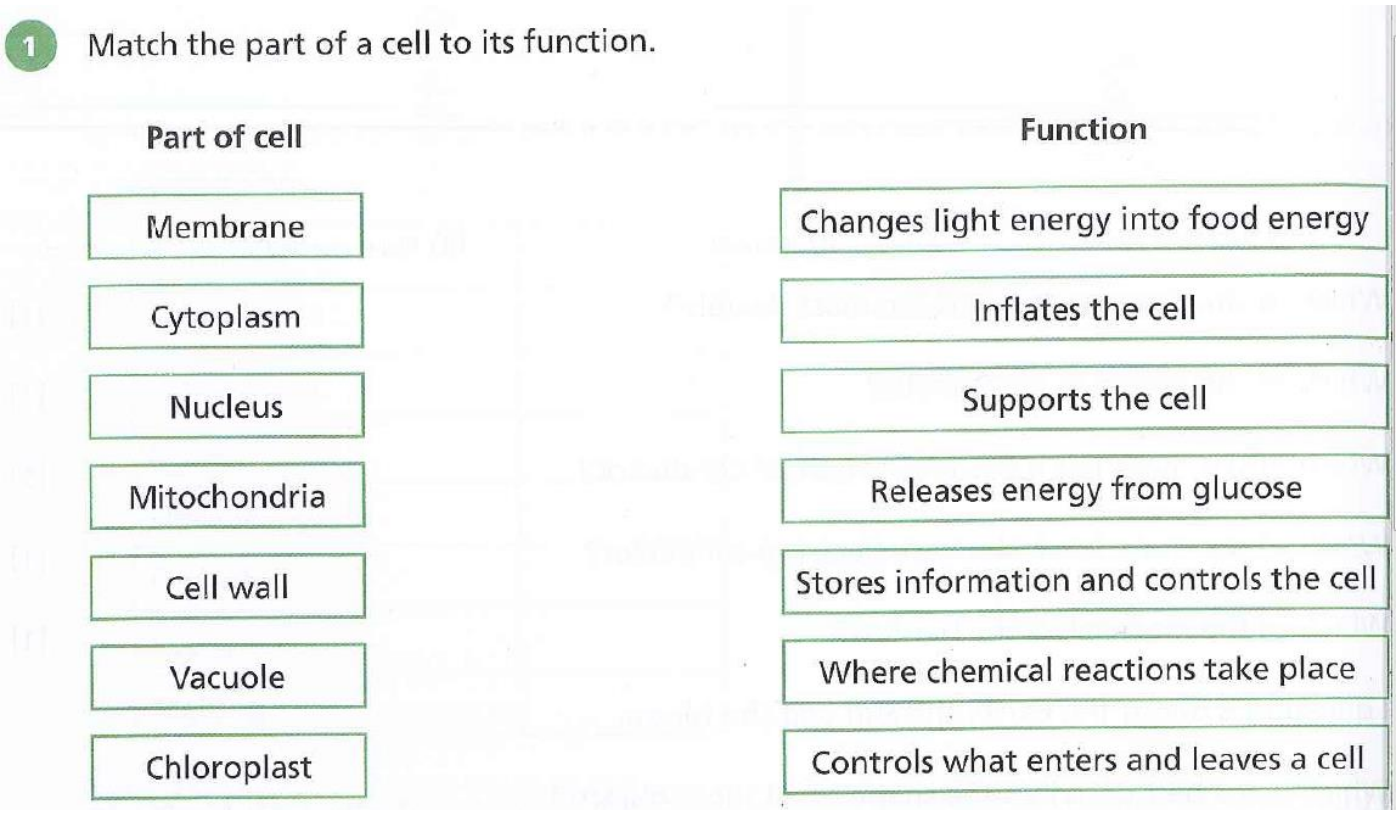


Quick Test

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.

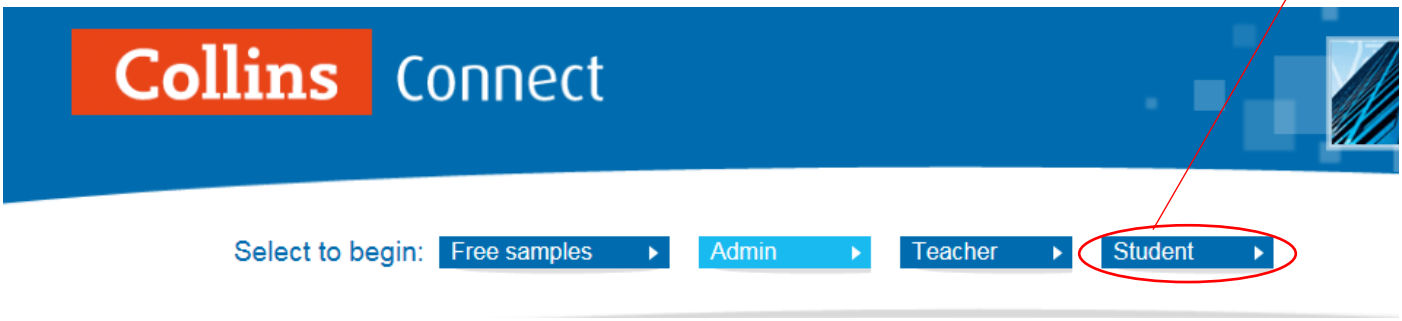
Part of cell	Function
Membrane	Changes light energy into food energy
Cytoplasm	Inflates the cell
Nucleus	Supports the cell
Mitochondria	Releases energy from glucose
Cell wall	Stores information and controls the cell
Vacuole	Where chemical reactions take place
Chloroplast	Controls what enters and leaves a cell

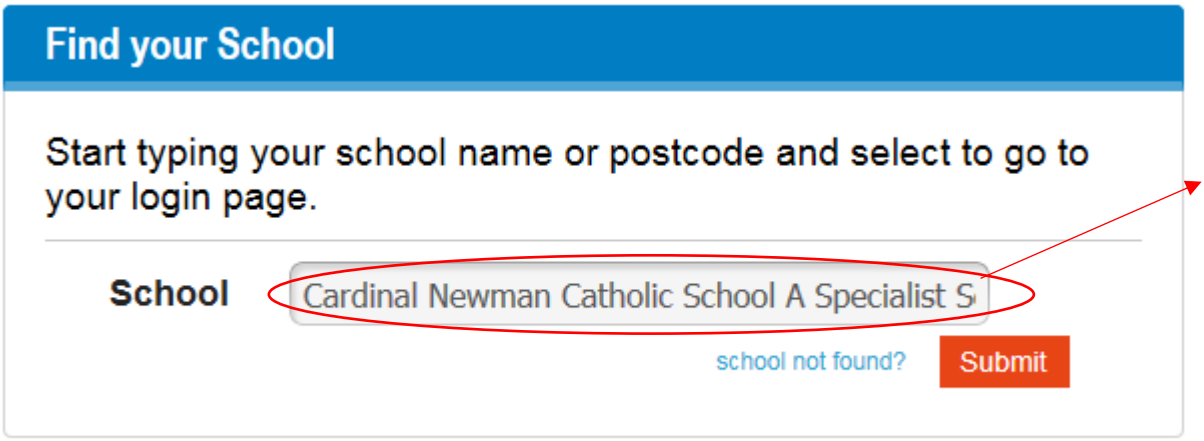
The topics covered within each year group are divided into each of the three terms. All pupils do the same topics in each term but may do them in different orders to the way they are presented below.

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

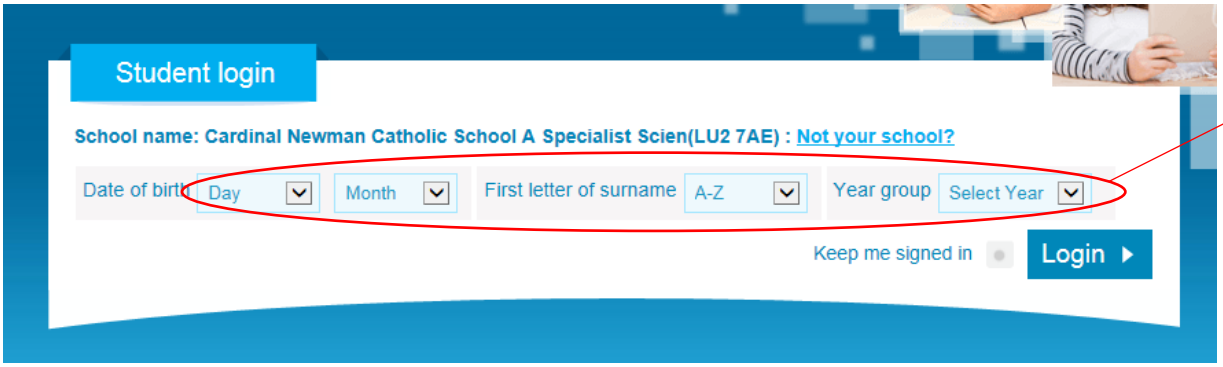
Pupils need to log into Collins Connect: https://connect.collins.co.uk/school/portal.aspx

1) Click Student



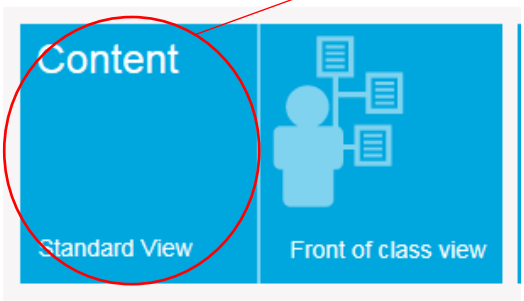


2) Select our school LU2 7AE

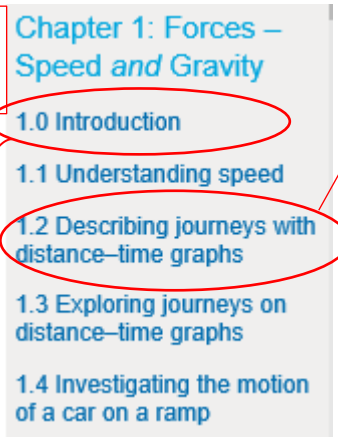


3) Select your own details

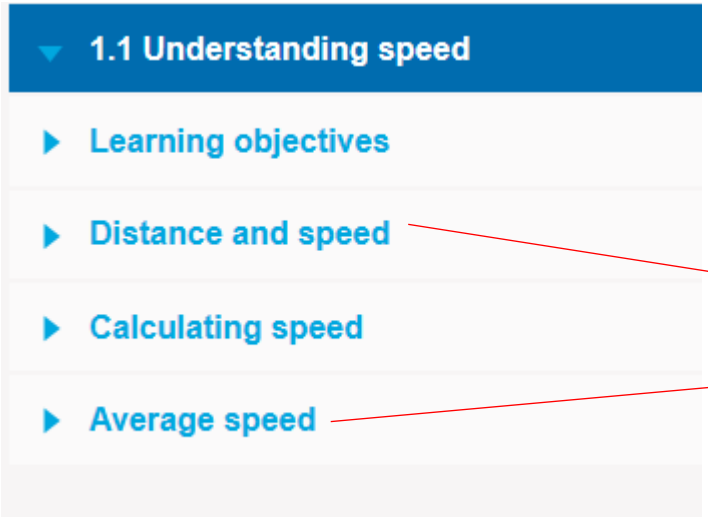
4) Select the book outlined in the table below in the table below as the relevant link on Collins Connect.



5) Select Content



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 progess 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)

Year 7

TERM	Topic	Relevant Pages in Revision Guide	Relevant Links on Collins Connect	Possible Web Links
1	**Introductory Unit** (At and Above)	None	None	https://sciencefirst.com/10-science-lab-safety-rules-for-kids/ https://www.slideshare.net/giordepasamba/scientific-drawings http://www.sciencekids.co.nz/projects/thescientificmethod.html
	Forces – Speed and Gravity (At)		**Book 1 Chapter 1** 1.1 Understanding speed p.8-9 1.2 Describing journeys with distance-time graphs p.10 1.3 Exploring journeys on distance-time graphs p.12 1.4 Investigating the motion of a car on a ramp p.14-15 1.5 Understanding relative motion p.16 1.6 Understanding forces p.18-19 1.7 Understanding gravitational fields p.20 1.8 Understanding mass and weight p.22-23 1.9 Understanding gravity p.24	https://www.bbc.co.uk/bitesize/guides/zwwmxnb/revision/1 https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/zkcpfcw https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/z7hdqhv https://www.bbc.co.uk/bitesize/guides/zttfyrd/revision/1 https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/zr3xh39
	(Above (As AT and topics included here))		**Book 1 Chapter 1** 1.2 Describing journeys with distance-time graphs – complex journeys p.11 1.3 Exploring journeys on distance-time graphs – acceleration p.13 1.5 Understanding relative motion – looking at events differently p.17 1.7 Understanding gravitational fields – acceleration in gravitational fields p.21 1.8 Understanding mass and weight – gravity in orbit p.23 1.9 Understanding gravity – a gravity puzzle p.25	

	Cells **Organisms movement and cells** (At)	Cells – The building blocks of life Pages 4-5 (sperm and egg on page 6)	**Book 1 Chapter 8** 8.1 Exploring the human skeleton p.176 8.2 Understanding the role of joints and muscles p.178 8.3 Examining interacting muscles p.180-181 8.4 Exploring problems with the skeletal system p182-183 8.5 Understanding organisation of organisms p.184-185 8.6 Describing animal and plant cells p. 186-187 8.7 Understanding adaptations of cells p188 - 189 8.8 Exploring cells p.190-191 Understanding unicellular organisms p.192-193	https://www.bbc.co.uk/bitesize/topics/znyycdm http://www.bbc.co.uk/education/guides/zpkq7ty/revision http://www.bbc.co.uk/education/guides/zpkq7ty/test http://www.bbc.co.uk/education/guides/zpkq7ty/revision/3 http://www.educationquizzes.com/ks3/science/skeleton-joints-and-muscles-01/ http://www.sciencekids.co.nz/humanbody.html http://www.s-cool.co.uk/gcse/pe/how-the-body-moves/test-it/exam-style-questions
	(Above (As AT and topics included here))		**Book 1 Chapter 8** 8.1 Exploring the human skeleton – comparing bones p.177 8.2 Understanding the role of joints and muscles- Are all joints the same p.179 8.4 Exploring problems with the skeletal system – medical advances p.183 8.8 Exploring cells – Advances in observing cells p. 191	http://www.bbc.co.uk/education/guides/z9hyvcw/revision/5 (unicellular organisms) http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/living_growing/celldivisionrev1.shtml (unicellular vs multicellular)
	Matter – Particle model and Separating mixtures (At)	The Periodic Table page 44 – 45 Practice page 51 question 3	**Book 1 Chapter 5** 5.1 Using particles to explain matter p.104 5.2 Understanding solids p.106-107 5.3 Understanding liquids and gases p.108-109 5.4Exploring diffusion p.110 5.5 Explaining changes of state p.112-113 5.6 Separating mixtures p.114-115 5.7 Exploring solutions p.116-117 5.8 Understanding distillation p.118-119 5.9 Exploring chromatography p.120	https://www.bbc.co.uk/bitesize/topics/z9r4jxs
	(Above (As AT and topics included here))		5.1 Using particles to explain matter – intermolecular forces p.105	

			5.2 Understanding solids – Explaining properties p.107 5.4 Exploring diffusion – explaining diffusion p.111 5.5 Explaining changes of state – differences between boiling and evaporation p.113 5.7 Exploring solutions - Explaining solubility p.117 5.9 Exploring chromatography – a special separation technique p.121	
2	**Elements and The Periodic Table** (At)		**Book 2 Chapter 5** 5.1 Looking at periodic table of elements pg 80,81 5.2 Exploring Metals in the periodic table pg. 82,83 5.3 Exploring non-metals in the periodic table pg. 84,85 5.4 Understanding the wider use of the periodic table pg. 86,87 5.5 Combining elements pg. 88,89 5.6 Comparing elements and compounds pg 90,91 5.7 Polymers pg. 92,93 5.8 Exploring ceramics and composites pg. 94,95	https://www.bbc.co.uk/bitesize/topics/zxhhvcw https://www.bbc.co.uk/bitesize/guides/zs7thyc/revision/1
	(Above (As AT and topics included here))		5.2 Exploring Metals in the periodic table – discussing trends in the patterns pg. 82,83 5.5 Combining elements – bonding of elements pg. 88,89	
	Energy – energy costs and energy transfer (At)		**Book 1 Chapter 3** 3.1 Understanding energy transfer by food and fuel p.54-55 3.2 Comparing rates of energy transfer p.56-57 3.3 Looking at the cost of energy use in the home p.58-59 3.4 Getting the electricity we need p.60-61 3.5 Using electricity responsibly p.62-63 3.6 Energy stores and transfers p.64	https://www.bbc.co.uk/bitesize/topics/zc3g87h

			3.7 Exploring energy transfers p.66 3.8 Understanding potential energy and kinetic energy p.68 3.9 Understanding elastic energy p.70-71	
	(Above (As AT and topics included here))		3.2 Comparing rates of energy transfer - quantities of energy transferred p.56-57 3.3 Looking at the cost of energy use in the home - calculating the cost of energy used p.59 3.6 Energy stores and transfers-applying the model p.65 3.7 Exploring energy transfers – sankey diagrams p.67 3.8 Understanding potential energy and kinetic energy – conservation of energy in falling objects p.69	
	Breathing and Digestion (At)		**Book 2 Chapter 8** 8.1 Understanding how we breath pg. 144,145 8.2 Measuring Breathing pg. 146,147 8.3 Explaining gas exchange in humans pg. 148,149 8.4 Exploring the effects of disease and lifestyle pg. 150,151 8.5 Exploring a healthy diet pg. 152,153 8.6 Understanding the effects of and unbalanced diet pg. 154,155 8.7 Understanding the human digestive system pg. 156,157 8.8 Understanding the roles of the digestive organs pg.158,159	https://www.bbc.co.uk/bitesize/topics/zgy39j6
	(Above (As AT and topics included here))		8.3 Explaining gas exchange in humans – how does it relate to respiration pg. 148,149 8.7 Understanding the human digestive system - How the system works and enzymes pg. 156,157	

			8.8 Understanding the roles of the digestive organs – how the roles of each organs is adapted to its function pg. 158,159	
	Reactions – Metals and non-metals and Acids and alkalis (At)		**Book 1 Chapter 6** 6.1 Using metals and non-metals p.128-129 6.2 Exploring the reactions of metals with acids p.130-131 6.3 Understanding displacement reactions p.132-133 6.4 Understanding oxidation reactions p.134-135 6.5 Exploring acids p.136 6.6 Exploring alkalis p.138 6.7 Using indicators p.140-141 6.8 Exploring neutralisation p.142	https://www.bbc.co.uk/bitesize/guides/zqd2mp3/revision/1 https://www.bbc.co.uk/bitesize/topics/zn6hvcw https://www.bbc.co.uk/bitesize/guides/zqwmxnb/revision/2 https://www.bbc.co.uk/bitesize/guides/zqwmxnb/revision/3
	(Above (As AT and topics included here))		6.5 Exploring acids - what do acids have in common? p.137 6.6 Exploring alkalis – what do alkalis have in common? p.139 6.8 Exploring neutralisation – the neutralisation equation p.143	
3	Earth – Earth structure and Universe (At)		**Book 1 Chapter 7** 7.1 Understanding the structure of the Earth p.152-153 7.2 Exploring igneous rocks p.154 7.3 Exploring sedimentary rocks p.156-157 7.4 Exploring metamorphic rocks p.158 7.5 Understanding the rock cycle p.160-161 7.7 Explaining the effect of the Earth's motion p.164-165 7.8 Exploring our neighbours in the universe p.166-167 7.9 Using models in science p.168-169	https://www.bbc.co.uk/bitesize/topics/z8c9q6f/articles/zmhw7p3 https://www.bbc.co.uk/bitesize/guides/z8wx6sg/revision/1 https://www.bbc.co.uk/bitesize/guides/zysbgk7/revision/1 https://www.bbc.co.uk/bitesize/guides/zgb9kqt/revision/1 https://www.bbc.co.uk/bitesize/guides/zwd2mp3/revision/1

	(Above (As AT and topics included here))		7.2 Exploring igneous rocks – crystal size p.155 7.4 Exploring metamorphic rocks – metamorphic rocks in detail p.159 7.6 Describing stars and galaxies – stars and galaxies p.162-163 7.7 Explaining the effect of the Earth's motion – implications of the Earth's tilt p.165	
	Waves – Sound and Light (At)		**Book 1 Chapter 4** 4.1 Exploring sound p.78-79 4.2 Describing sounds p.80-81 4.3 Hearing sounds p.82-83 4.4 understanding how sounds travel through materials p.84-85 4.5 Learning about the reflection and absorption of sound p.86-87 4.6 Exploring properties of light p.88-89 4.7 Exploring reflection p.90-91 4.7 Exploring refraction p.93 4.9 Seeing clearly p.94 4.10 Exploring coloured light p.96	https://www.bbc.co.uk/bitesize/topics/zw982hv/articles/z7rtng8 https://www.bbc.co.uk/bitesize/topics/zw982hv/articles/z27mgdm https://www.bbc.co.uk/bitesize/topics/zw982hv/articles/z8mmb82 https://www.bbc.co.uk/bitesize/guides/zq7thyc/revision/1 https://www.bbc.co.uk/bitesize/guides/z8d2mp3/revision/1 https://phet.colorado.edu/en/simulation/sound http://www.pilkington.com/cmsapplications/soundsimulator/simulator_exp.html https://phet.colorado.edu/en/simulation/wave-on-a-string http://newonlinelearning.newpathlearning.com/free-curriculum-resources/virtual_lab/Speed_of_Sound/10/8,9,10,11,12,13,14/1905
	(Above (As AT and topics included here))		4.5 Learning about the reflection and absorption of sound – soundproofing p.87 4.7 Exploring refraction – types of lens p.93 4.9 Seeing clearly - correcting vision p.95 4.10 Exploring coloured light – frequency and behaviour p.97	