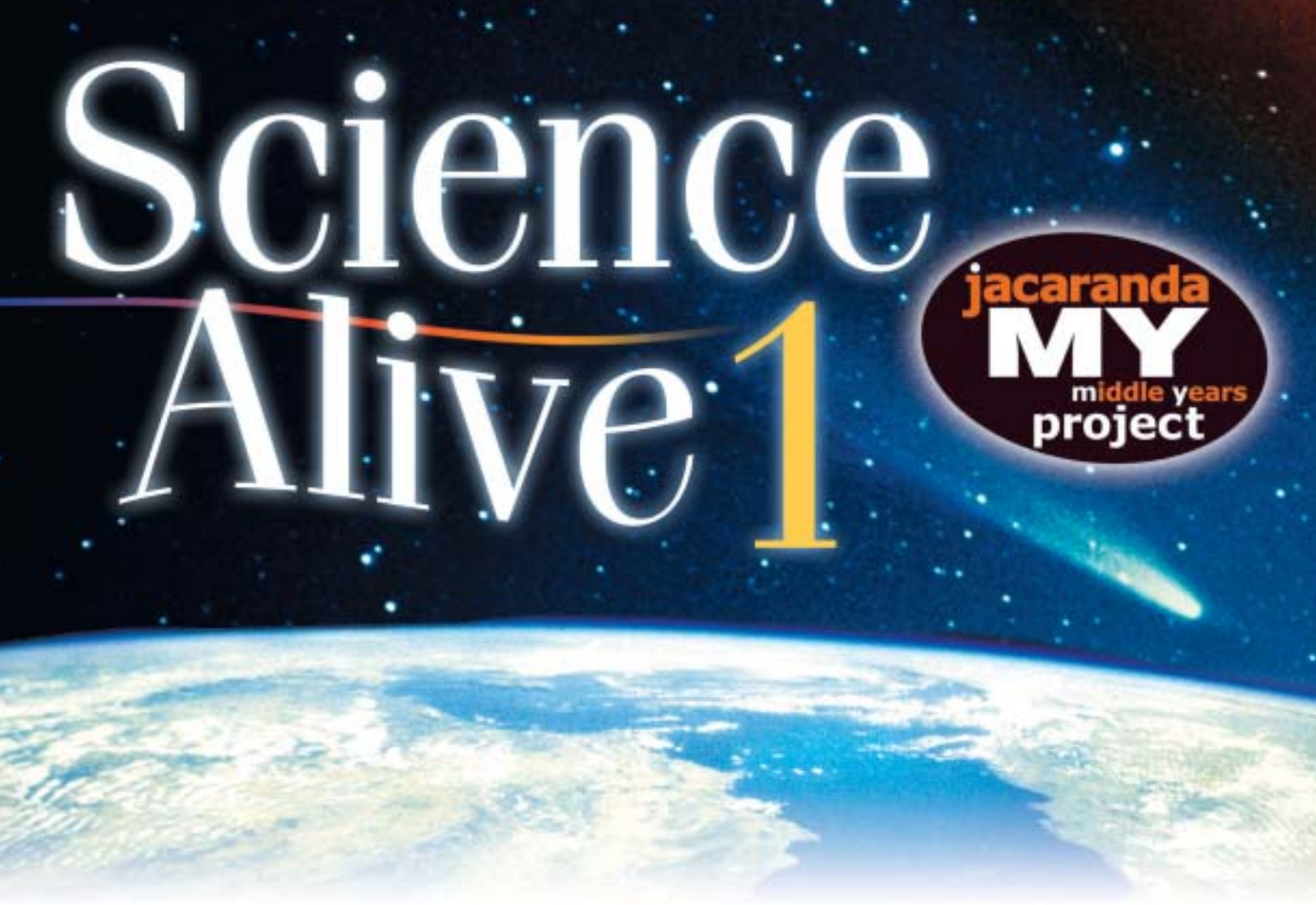
Science
Alive 1
jacaranda
MY
middle years
project

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Contents

Coverage of Multiple Intelligences

Activities in *Science Alive 1*, and in its companion text *Science Worksheets for Multiple Intelligences 1*, cater for a wide range of learning abilities and styles. Many address more than one learning style, and almost all require the exercise of some degree of verbal/linguistic intelligence.

The following grid lists the activities in these two texts that have been specifically written to engage a predominant intelligence.

Chapter	Intelligence type	Activity in *Science Alive 1**	Worksheet in *Science Worksheets for Multiple Intelligences 1***
1. Science alive!	Verbal/linguistic	5(10), 23(1f)	
	Visual/spatial	5(9), 7(5), 11(7), 15(8), 5(HOS***)	
	Bodily/kinaesthetic	7(HOS)	1
	Intrapersonal	13(8), 17(5)	4
	Interpersonal	3(8), 13(7), 17(4), 19(4), 21(7)	3
	Logical/mathematical	9(7), 11(6), 13(4, 5, 6), 15(5), 8(HOS), 22(8), 23(11)	2
	Musical/rhythmic		
	Naturalist	19(5, 6), 21(5, 6)	5
2. Separating mixtures	Verbal/linguistic	45(7)	7, 9
	Visual/spatial	39(6), 43(6)	6
	Bodily/kinaesthetic	27(HOS), 32(HOS), 33(8), 35(HOS), 37(HOS, 7), 39(HOS)	8
	Intrapersonal		
	Interpersonal	29(8), 31(9), 39(8)	10
	Logical/mathematical	27(6, 7, 8), 35(6, 7), 39(7), 44(HOS), 46(4b), 47(13, 1c)	
	Musical/rhythmic	45(7)	
	Naturalist	29(9), 41(5, 6)	
3. Machines everywhere	Verbal/linguistic	67(1), 71(4)	14
	Visual/spatial	59(6), 61(5), 63(8, 9), 65(7), 69(1, 6, 7), 70(3), 71(14, 3)	13
	Bodily/kinaesthetic	57(5), 61(HOS, 6)	12, 15
	Intrapersonal		
	Interpersonal		
	Logical/mathematical	53(5), 55(2, 4, 5, HOS), 59(5)	11
	Musical/rhythmic		
	Naturalist		
4. The changing Earth	Verbal/linguistic	77(8), 79(7), 93(9)	
	Visual/spatial	95(1, 4)	19
	Bodily/kinaesthetic	75(7), 79(HOS), 83(HOS), 85(HOS), 91(7)	16
	Intrapersonal		17
	Interpersonal		
	Logical/mathematical	75(8), 77(7), 87(7), 89(7), 81(7), 94(16), 95(4)	20
	Musical/rhythmic		
	Naturalist	85(7, 8)	18
5. Forensic science	Verbal/linguistic	99(10), 101(4, 9), 103(6), 115(7)	
	Visual/spatial	102(HOS), 103(3), 105(7), 118(10, 18)	22, 23
	Bodily/kinaesthetic	105(HOS), 107(HOS), 109(HOS), 111(HOS), 113(HOS)	24
	Intrapersonal	99(11), 103(8), 110(HOS)	
	Interpersonal	109(8), 111(6)	21
	Logical/mathematical	99(9, 10), 101(5), 107(7), 109(7), 113(5), 117(6, 8), 119(1–3)	25
	Musical/rhythmic		
	Naturalist		

Chapter	Intelligence type	Activity in *Science Alive 1**	Worksheet in *Science Worksheets for Multiple Intelligences 1***
6. Magnetic and electric effects	Verbal/linguistic	123(7), 133(6), 135(9)	29
	Visual/spatial	125(7), 129(6), 141(8), 142(8)	26
	Bodily/kinaesthetic	123(HOS), 124(HOS), 125(HOS), 128(HOS), 129(HOS), 136(HOS), 137(HOS)	
	Intrapersonal		
	Interpersonal		28
	Logical/mathematical	123(8), 129(8), 131(5, 6), 137(6), 139(HOS, 9), 141(7), 142(11), 143(5, 6)	27
	Musical/rhythmic		30
	Naturalist		
7. Cells	Verbal/linguistic	165(13)	
	Visual/spatial	155(8), 157(10, 12), 159(10), 161(9)	32, 34
	Bodily/kinaesthetic	152(HOS), 153(HOS, 9), 157(HOS), 159(HOS)	35
	Intrapersonal	167(5, 6, 7)	
	Interpersonal	147(11)	
	Logical/mathematical	153(5, 8), 159(9), 163(10)	31
	Musical/rhythmic		
	Naturalist	165(12)	33
8. Classification	Verbal/linguistic		36
	Visual/spatial	171(8), 173(3), 181(6)	
	Bodily/kinaesthetic	181(7), 191(16)	
	Intrapersonal		40
	Interpersonal	191(3)	
	Logical/mathematical	171(4, 5, 6), 173(2, 3), 175(8), 185(8, 9), 187(8), 190(10, 11)	39
	Musical/rhythmic		
	Naturalist	171(7), 177(9), 179(4, 5, 6), 181(5, 8), 184(HOS), 185(10, 11), 187(7, 9), 189(HOS, 5)	37, 38
9. Neighbours in space	Verbal/linguistic	201(7, 8), 207(8), 213(8), 214(5), 215(3b,c)	41
	Visual/spatial	199(HOS, 7, 8), 203(6, 7), 207(5, 6), 209(6, 7), 211(5), 214(1), 215(3a)	45
	Bodily/kinaesthetic	197(6), 205(HOS), 207(HOS), 209(HOS), 211(8), 214(6), 215(2)	42, 43
	Intrapersonal	195(3), 201(4, 6), 214(7)	
	Interpersonal	197(6), 213(9), 215(9)	
	Logical/mathematical	195(7), 197(4, 5), 199(6), 201(5), 211(5, 7)	44
	Musical/rhythmic		
	Naturalist		
10. Light and sound	Verbal/linguistic	219(9)	46
	Visual/spatial	225(4, 5), 227(7), 238(1, 3, 6)	47
	Bodily/kinaesthetic	219(HOS), 221(HOS), 222(HOS), 227(HOS), 233(9), 239(1)	
	Intrapersonal		
	Interpersonal		50
	Logical/mathematical	219(8), 229(6, 7, 8), 231(9), 239(2, 10, 13)	48
	Musical/rhythmic	229(9), 232(HOS)	49
	Naturalist	219(10)	

* Page number followed by activity number in brackets
** Worksheet number
*** Hands on Science

Coverage of outcomes

Science Alive 1 (with its companion text *Science Alive 2*) has been designed to allow students to achieve Science Level 5 CSF II outcomes. The learning outcomes listed below are extracts from the Curriculum and Standards Framework II document. (The Victorian Curriculum and Assessment Authority recommends that teachers and students address the entire text of the document.) The page references cited are those on which there are activities related to the outcome indicator.

Biological science

Living together: past, present and future

Learning outcome and chapter	Indicators. Evident when student can:	Page references
5.1 Explain the biological basis of classification of organisms into major groups. *Science Alive 1* Chapter 8: Classification	■ identify patterns of similarities and differences between a range of living things ■ define the major characteristics used in the 5-Kingdom system of classification ■ explain why particular sets of features, for example, colour, movement and structural features, are useful or not useful, to sort organisms using dichotomous keys.	171, 173, 175, 177, 179, 181, 184, 185, 190, 191 175, 187, 189, 190, 191 173, 177, 179, 181, 185, 190
5.2 Describe interactions between living things and between living things and their non-living surroundings. *Science Alive 2* Chapter 7: Living together Chapter 8: Changing times	■ describe different interactions in an ecosystem, including competition, predation, collaboration, parasitism, pollination, reproduction and parenting ■ construct a food web of organisms in an ecosystem ■ show graphically relationships between members of food chains, including a parasite-host relationship and producer-consumer relationships ■ describe the effect of changes in the environment on interactions in an ecosystem.	*Science Alive 2*

Structure and function

Learning outcome and chapter	Indicators. Evident when student can:	Page references
5.3 Relate the structure and organisation of different cells to their function. *Science Alive 1* Chapter 7: Cells	■ identify major structural components of cells as viewed at light microscope level ■ determine the functions of cells from their observable features ■ describe organisational relationships between organs, tissues, cells and systems.	152, 153, 155, 157, 159, 161, 166, 167 147, 149, 159, 161, 166, 167 163, 165, 167
5.4 Explain how plants and animals obtain, transport and use nutrients. *Science Alive 2* Chapter 3: Nutrients	■ describe the mechanical and chemical processes of digestion ■ describe the role of the circulatory system in transporting the products of digestion to cells ■ illustrate the pathway taken by water and minerals from the soil to the leaves of a flowering plant ■ identify the categories of inorganic and organic nutrients required by plants and animals and the uses to which they are put.	*Science Alive 2*

Chemical science

Substances: structure, properties and uses		
Learning outcome and chapter	**Indicators. Evident when student can:**	**Page references**
5.1 Use a simple particle model to explain the structure and properties of solids, liquids and gases. *Science Alive 2* Chapter 1: Substances: A look inside	■ describe the structure of solids, liquids and gases in terms of the arrangement and motion of particles in each physical state ■ relate readily observable properties of matter to particle bonds and energy.	*Science Alive 2*
5.2 Relate the safe use and disposal of common substances to their physical and chemical properties. *Science Alive 1* Chapter 2: Separating mixtures Laboratory toolbox (Also in *Science Alive 2* Chapter 3: Chemical reactions Chapter 8: Changing times)	■ describe and demonstrate safe laboratory techniques in the handling of substances used in the classroom when heating, cooling, transferring and cleaning up ■ distinguish between common substances that are safe for sink disposal, and those that are not, in terms of solubility in water and effect on the environment ■ describe alternative methods of disposal of common substances that are not safe for sink disposal ■ outline and analyse several environmental problems caused by the inappropriate disposal of toxic substances.	5, 7, 8, 22 5, 41 43 *Science Alive 2*

Chemical reactions		
Learning outcome and chapter	**Indicators. Evident when student can:**	**Page references**
5.3 Describe ways of producing a chemical change and influencing its rate. *Science Alive 2* Chapter 4: Chemical reactions	■ describe the particular conditions needed for some chemical reactions to occur ■ fully explain slow and fast chemical reactions ■ describe factors which affect the rate of a reaction.	*Science Alive 2*
5.4 Relate simple procedures for preparing and separating mixtures to medical and industrial procedures. *Science Alive 1* Chapter 2: Separating mixtures	■ describe a range of techniques for separating and concentrating mixtures ■ apply an appropriate method for separating the components of a mixture ■ describe the formation of colloids, including emulsions ■ describe medical and industrial applications of separating techniques.	27, 29, 31, 32, 33, 37, 39, 41, 43, 45, 46, 47, 111 27, 32, 33, 37, 39, 44, 45, 46, 47, 111 35, 46 37, 39, 41, 43, 45, 47

Earth and space sciences

The changing Earth

Learning outcome and chapter	Indicators. Evident when student can:	Page references
5.1 Describe the formation, composition and cycling of rocks. *Science Alive 1* Chapter 4: The changing Earth	■ identify the lithosphere as the region of the Earth where rocks are formed	75, 77, 79, 81, 83, 87, 94
	■ distinguish between sedimentary, igneous and metamorphic rocks on the basis of their formation and composition	77, 79, 81, 83, 87, 89, 91, 94, 95
	■ describe ways to estimate the age of rocks	87, 91, 94, 95
	■ explain the rock cycle.	83, 85, 87, 89, 95
5.2 Relate the properties of rocks to the ways in which they are used. *Science Alive 2* Chapter 5: What's in a rock?	■ describe properties of igneous, sedimentary and metamorphic rocks in terms of composition, grain size, colour and texture	*Science Alive 2*
	■ describe the relationship between rocks, ores and minerals	
	■ explain why igneous, sedimentary and metamorphic rocks are used for particular purposes.	

Our place in space

Learning outcome and chapter	Indicators. Evident when student can:	Page references
5.3 Describe how the positions of the planets, moon, sun and stars affect natural phenomena. *Science Alive 1* Chapter 9: Neighbours in space	■ describe how the tides are affected by the positions of the Earth, moon and sun	209, 211, 214
	■ account for the different phases of the moon in the lunar cycle	209, 211, 214
	■ explain the phenomenon of the seasons in terms of relative positions of the Earth and sun	201, 205, 207, 214
	■ account for the apparent annual movement of the stars and constellations across the sky.	199, 201, 203, 215
5.4 Describe major components of the universe. *Science Alive 2* Chapter 9: The universe	■ define, in simple terms, what is meant by 'the universe'	*Science Alive 2*
	■ summarise major characteristics of selected features of the universe beyond our solar system	
	■ describe different kinds of evidence which contribute to knowledge of the universe.	

Physical science

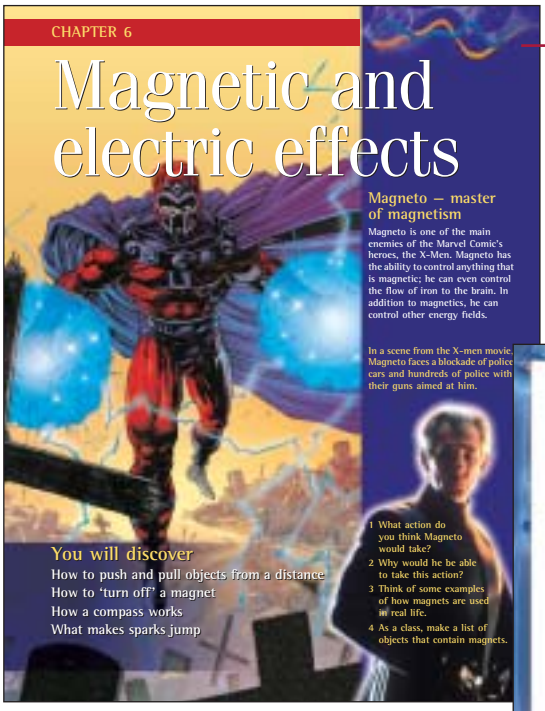
Energy and its uses		
Learning outcome and chapter	**Indicators. Evident when student can:**	**Page references**
5.1 Describe the characteristics and applications of the transmission and reflection of energy in the form of heat, light and sound. *Science Alive 1* Chapter 10: Light and sound (Also in *Science Alive 2* Chapter 2: Heat)	■ use the terms conduction, radiation and absorption to describe heating and cooling effects ■ describe how insulated containers maintain the temperature of the contents	*Science Alive 2*
	■ recognise patterns of reflection of light from plane and curved mirrors and relate these to applications of mirrors	225, 226, 227, 238, 239
	■ describe similarities and differences in the way light, heat and sound are transmitted.	219, 221, 222, 223, 225, 229, 231, 232, 233, 235, 237, 238, 239 and *Science Alive 2* Chapter 2
5.2 Describe the operation of direct current (DC) series and parallel circuits in terms of current and voltage. *Science Alive 2* Chapter 6: Electric circuits	■ correctly connect commonly used components in series and parallel circuits ■ describe the operation of series and parallel circuits, using terms such as current and voltage ■ identify from circuit diagrams those circuit elements that are connected in series and those that are connected in parallel ■ relate the brightness of a torch globe to the magnitude of the current in it and the voltage across it ■ link the brightness of two or more globes connected in series and in parallel circuits to the magnitude of the voltage and current.	*Science Alive 2*

Forces and their effects		
Learning outcome and chapter	**Indicators. Evident when student can:**	**Page references**
5.3 Describe simple magnetic and electrostatic effects in terms of a field model. *Science Alive 1* Chapter 6: Magnetic and electric effects	■ describe field patterns surrounding differently shaped magnets and simple combinations of magnets	128, 129, 142
	■ describe attraction and repulsion of magnets and objects near magnets as effects of the magnetic field	123, 124, 125, 127, 129, 142, 143
	■ explain the action of a compass as the movement of a magnet in the magnetic field of the Earth	129, 131, 142
	■ explain attraction and repulsion of charged objects in terms of the electric field around them	136, 137, 139, 141, 143
	■ describe the behaviour of objects in an electric field.	136, 137, 139, 141, 143
5.4 Explain how mechanical systems can direct and modify force and motion. *Science Alive 1* Chapter 3: Machines everywhere	■ describe the action of mechanical parts, such as gears, pulleys and levers in transmitting and modifying forces	51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 70, 71
	■ describe the action of simple machines that change the size or direction of movement	51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 70, 71
	■ define the operation of one or more examples of simple mechanical systems	53, 55, 57, 59, 63, 65, 67, 69, 70, 71
	■ construct a model to demonstrate the operation of an everyday piece of equipment, tool or appliance	55, 57, 59, 61, 71
	■ describe how the model produces a mechanical advantage.	51, 55, 57, 59, 61, 69, 71

Skills, processes and procedures
The science skills, processes and procedures described in the Victorian Curriculum and Standards Framework II as appropriate to Level 5 are addressed in the 'Hands on Science' activities throughout the text, and especially in the Laboratory Toolbox and Chapter 5: Forensic Science.

How to use this book

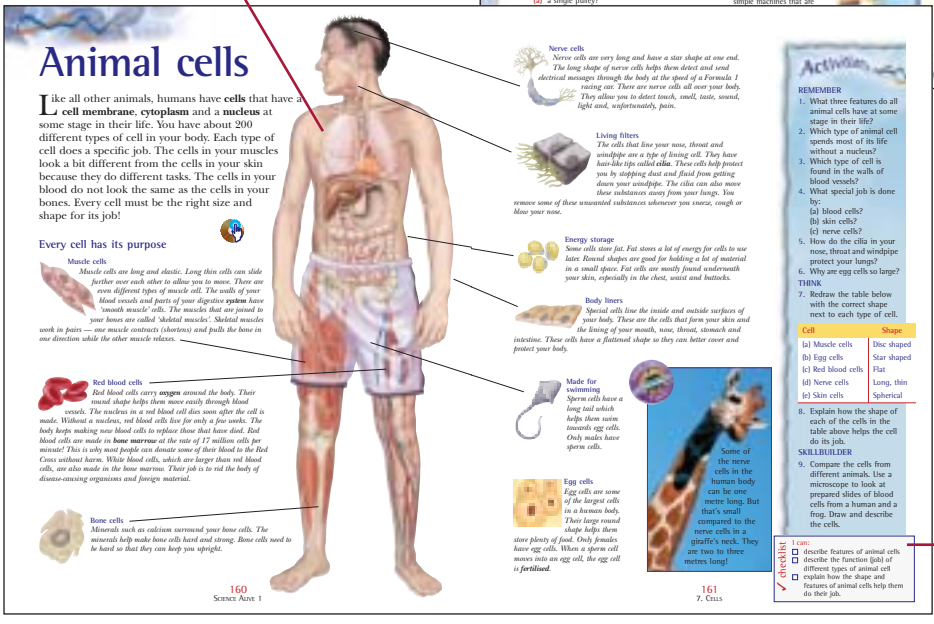
Science Alive 1 has been designed to engage and challenge young adolescent students of science. The features outlined here demonstrate how to use this stimulating resource most effectively.



Stunning opening pages build on what students know and think now.

Concluding page in each chapter is both a glossary and a summary of key terms.

Spectacular labelled illustrations will engage both the visual and linguistic learner.



'Check and challenge' spread — the last full spread in each chapter — allows students to revise, apply and extend their learning.

Checklists at the end of every spread allow students to check and acknowledge their progress.

'How about that!' features provide snippets of special interest to motivate and arouse curiosity.

The 'Then and now' features link the science of today with the science of the past.

Many spreads are linked to exciting worksheets that test the full range of multiple intelligences.

Practical multiple intelligence worksheets link to icons in the textbook.

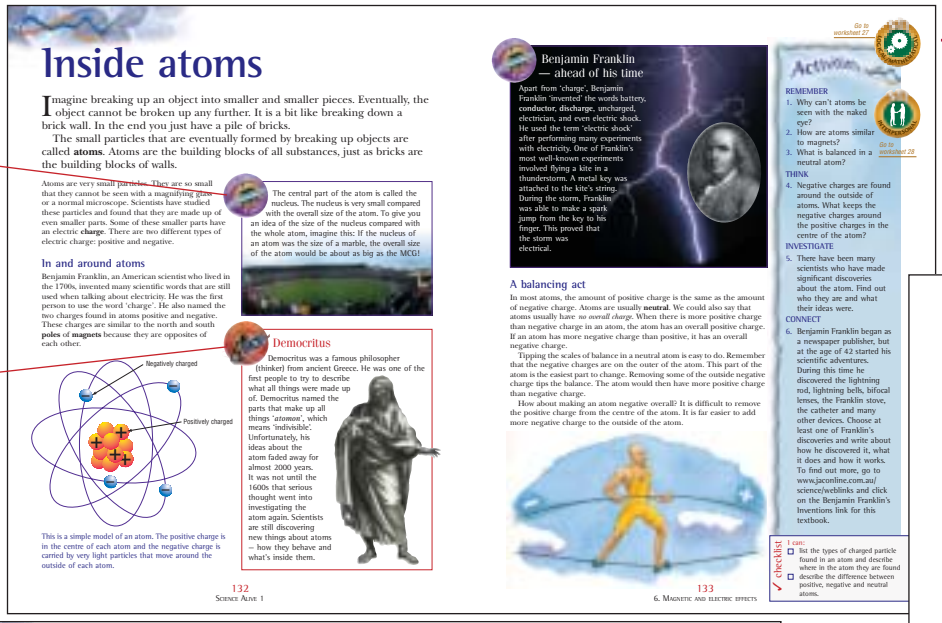
The 'How it works' features show how scientific knowledge is applied to technology or how important scientific processes occur.

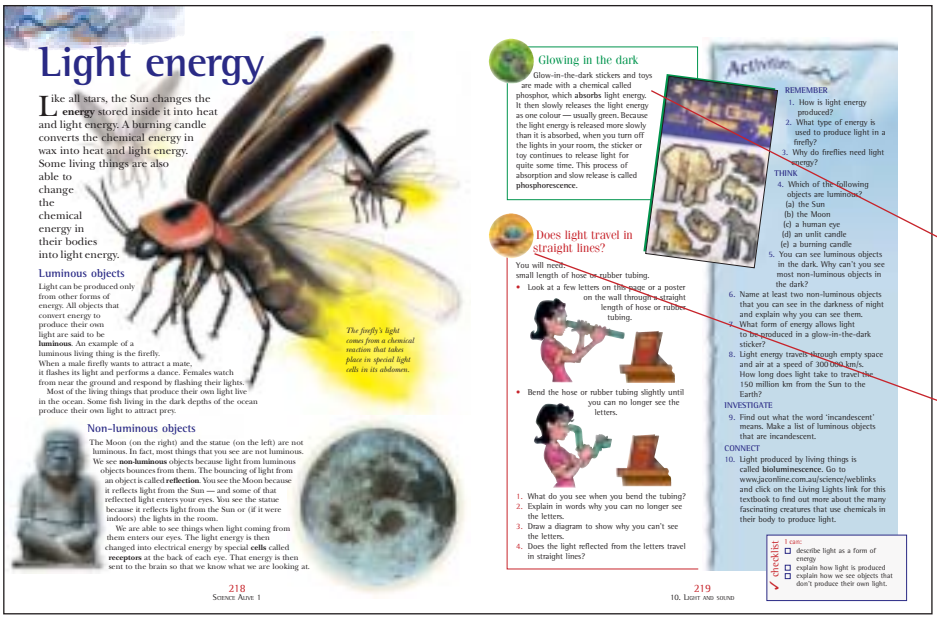
'Hands on science' activities and experiments support concept development and provide opportunities to practise science skills, processes and procedures.

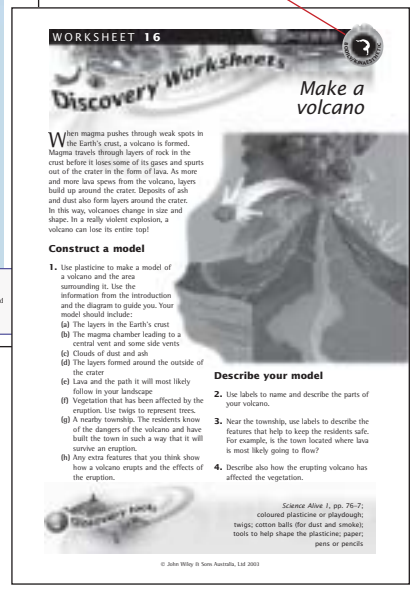
Newspaper spreads appearing in each chapter present information in a vibrant and interesting way.

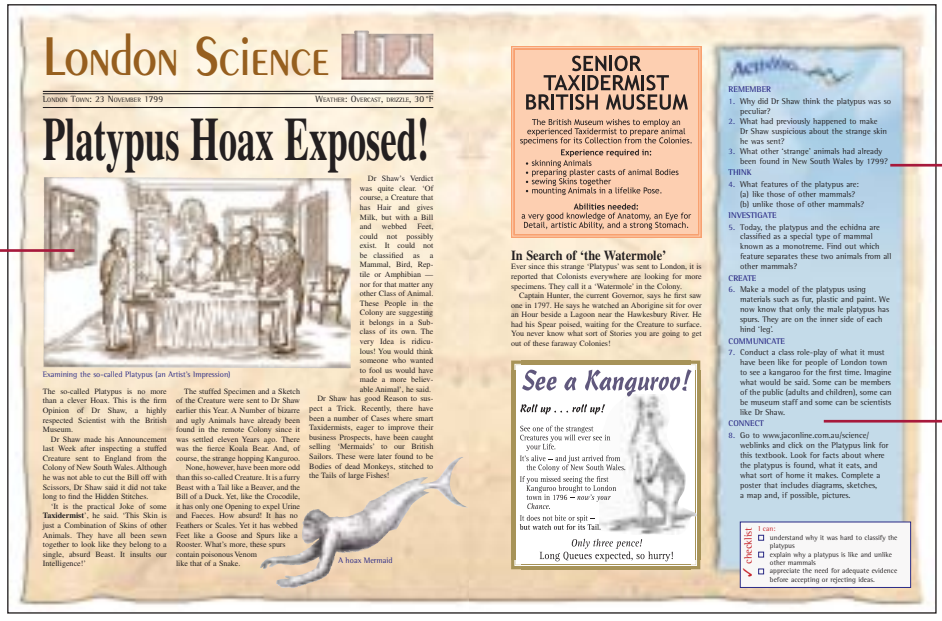
Graded activities test a range of abilities and intelligences.

A variety of 'Connect' questions allow students to explore fascinating web sites via Jacaranda's web site: www.jaconline.com.au









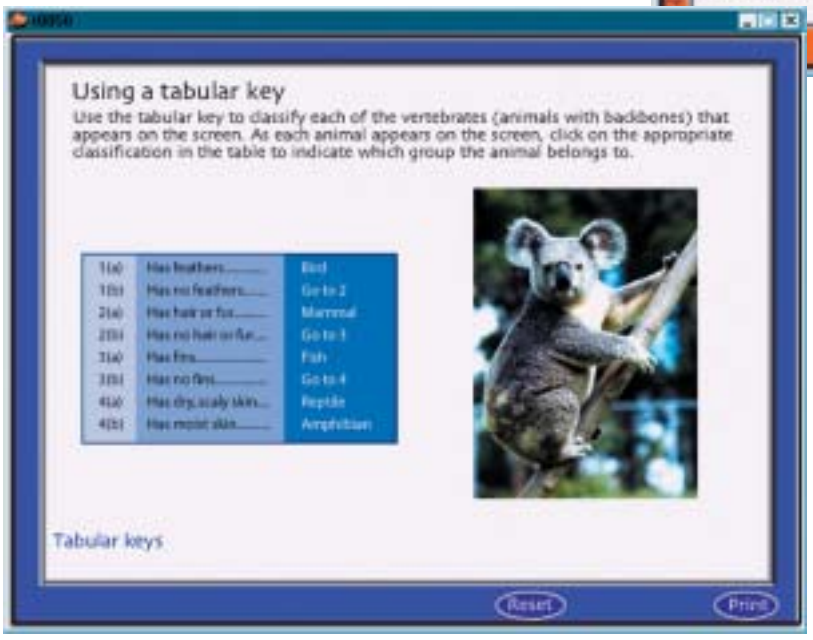
About the CD-ROM

The CD-ROM accompanying this textbook includes the text in pdf format. The text is linked to the following features that are designed to assist learning, review concept development at critical places within the text, and help students assess their own learning.

- Learning objects bring diagrams and other illustrations to life with the use of animation and provide a level of support for concept development that is not possible with a still picture. In turn, each learning object is linked to an e-tivity that tests understanding of the concept developed or re-inforces the learning object.
- Checkpoints are summaries of chapters, or parts of chapters. The checkpoints link all relevant learning objects and provide students with immediate feedback through five quick questions.
- Test yourself questions, placed at the end of each chapter, provide a link to tests that consist of 20 multiple-choice questions. Students can use these to review the chapter and/or prepare for class tests.

Running the CD-ROM

To run this CD-ROM — on both Windows 95/98 or NT, and Macintosh — simply place it in the CD-ROM drive.



Minimum system requirements

Windows 95/98 or NT
Processor: Pentium
CD-ROM drive speed: 4x
16Mb RAM
speakers

Macintosh
Macintosh OS 7.6
Processor: PowerPC
CD-ROM drive speed: 4x
6Mb RAM

Troubleshooting

If you have problems with the operation of this CD-ROM:

- Check that you have the right equipment (see Minimum system requirements).
- Visit www.jaconline.com.au/contact_us/faqs.html to check if the answer to your problem is provided under 'Frequently Asked Questions'.
- Either email or write to John Wiley & Sons Australia explaining the problem, and providing details of the type of computer and the amount of RAM you have, the processor type and the CD-ROM speed. If you return the disk, please package it appropriately to protect it during transit.

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