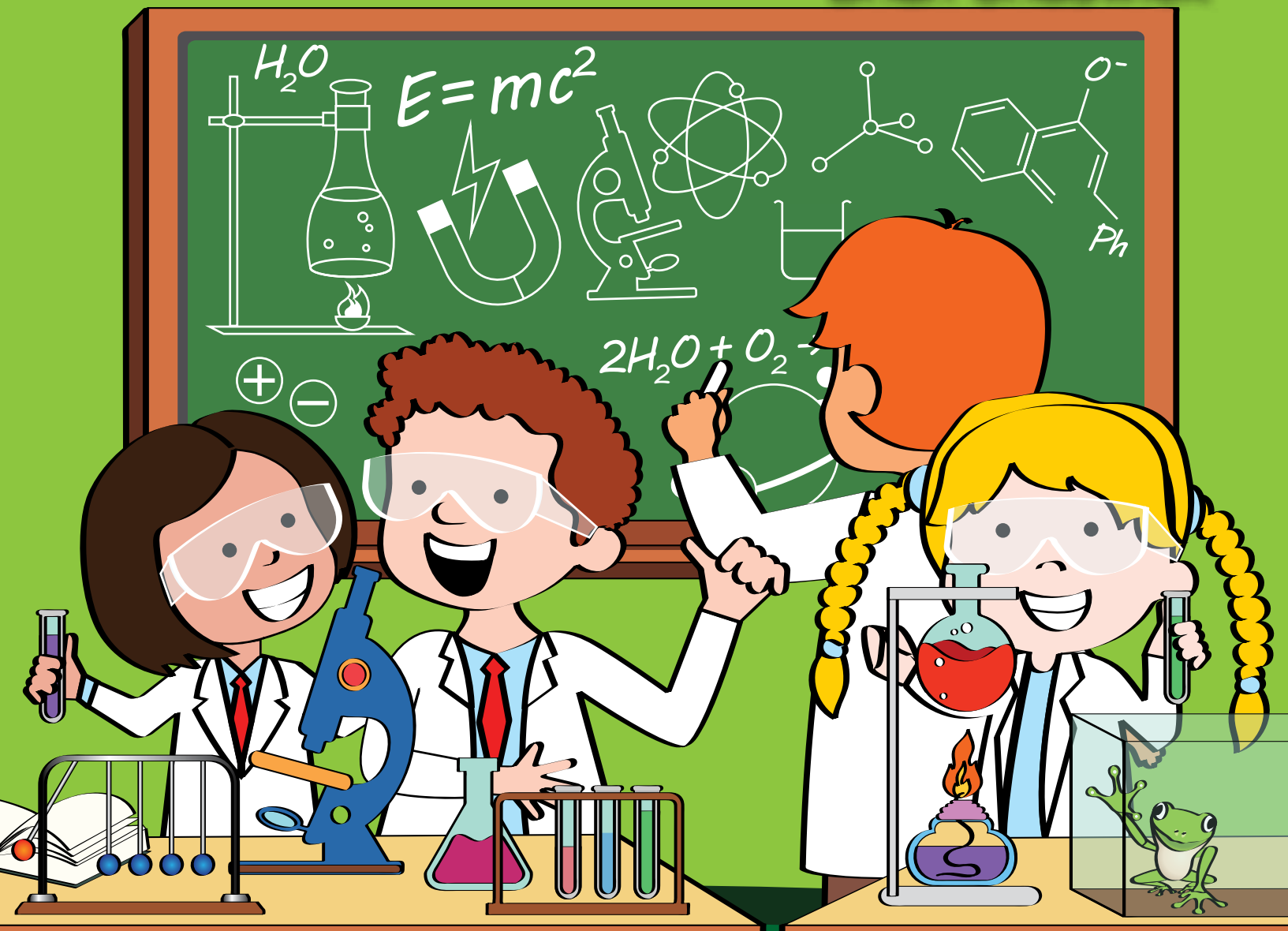
Key

SKILLS THROUGH SCIENCE

LITERACY ◦ NUMERACY ◦ SCIENCE

Brian Shadwick



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Unit 7, 23-31 Bowden Street
Alexandria NSW 2015 Australia
Tel: +61 2 9020 1840 Fax: +61 2 9020 1842
sales@sciencepress.com.au
www.sciencepress.com.au

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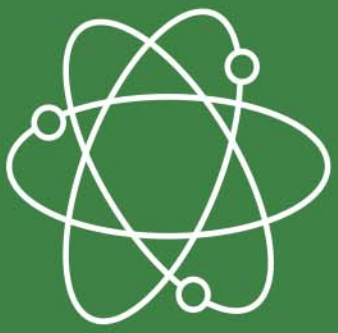

Hi!

In this bumper book packed full of fun science activities, you'll:

- Develop some really useful basic skills and knowledge that will help you in everyday life.
- Find your confidence growing as you juggle numbers, new words and science ideas.
- Discover interesting new facts through learning how, why and when to do things.
- Tackle new information and react critically to it because of all the new things you have learnt.
- Be able to check your progress and understanding with the detailed answers at the back of the book.

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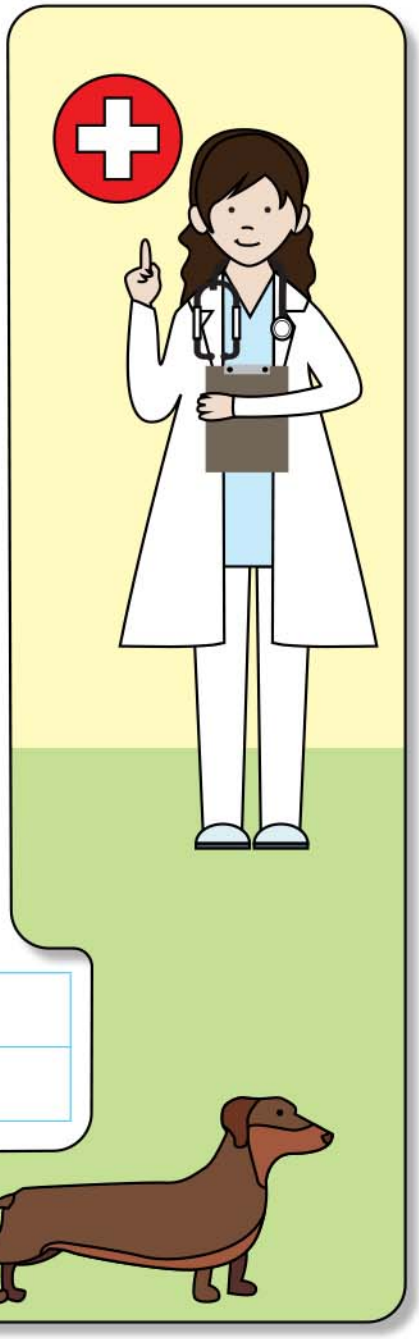

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EXERCISE
2

Safety In a Laboratory

The 10 cartoons below each illustrate a laboratory safety rule. Your task is to identify the rule each refers to and to write the rule in the appropriate space in the table.

1.

2.

3.

4.

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8.

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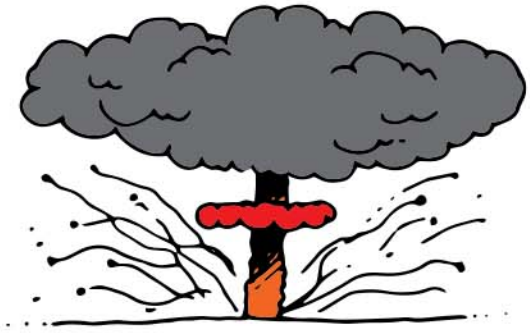

10.

Cartoon	Laboratory rule illustrated by cartoon
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

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EXERCISE
3

Measurement In Science – Comprehension

Read the information below then answer the questions which follow it.

One of the ways in which science differs from other subjects is that many of the observations we make involve measuring something. We might measure the length of something, a volume, a time, mass, temperature, electrical current or voltage or the force acting on something, or many other quantities that you will meet in your science studies.

To measure something, we need two things:

1. A system of units.
2. A measuring instrument.

The units we use tell others what the measurement is. It might be a distance (metres or kilometres) or a volume (litres) or a period of time (seconds). Each different quantity we measure will have its own system of units, for example as follows.

The system we use for distance includes:

The kilometre (km)	Where	1 km = 1000 m
The metre (m)		1 m = 100 cm
The centimetre (cm)		1 cm = 10 mm
The millimetre (mm)		

These units, and all the others we will use, are based on the **metric system of measurement**, derived in France in 1795. The metric system is used internationally and is sometimes referred to as the SI (Système Internationale) system of units.

There are many advantages of having a universal system throughout the world. It makes communicating in all areas involving measurement, including engineering, architecture, medicine, banking, buying and selling much easier to understand.

Another important idea about a system of units is having a standard. A standard has three main properties. It is:

- Convenient to use.
- Easily reproduced.
- Widely known.

The standard metric units used for mass, length and time, the three fundamental quantities in science, from which all others are derived are shown in the table below.

Fundamental quantity	Standard metric unit	Symbol for unit
Mass	kilogram	kg
Length	metre	m
Time	second	s

An example of a derived unit is the unit for speed – how fast something is moving. It is the metre per second, usually written as m s^{-1}.

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QUESTIONS

1. Fill in the missing words in the sentences below.

(a) Science is different from other subjects _____ it often involves making _____.

(b) To measure something we need a _____ of _____ and a _____ instrument.

(c) The system of units we use is the _____ system.

(d) The units for mass, length and _____ in the _____ system are _____, _____ and seconds respectively.

(e) The symbols we use for these units, in the same order are _____, _____, _____.

2. What are the three characteristics of a standard unit?

3. What is the main advantage of having a standard, or universal system of measurement?

4. Complete the following table.

To change	into	× or ÷	by
kilometres	metres		
metres	centimetres		
centimetres	millimetres		
	centimetres	÷	10
millimetres		÷	1000
centimetres		÷	100
	kilometres	÷	1000
	kilometres	÷	1 000 000
litres	millilitres		
	litres	÷	1000
gram	kilogram		
milligram	gram		
gram		×	1000
kilogram		×	1000

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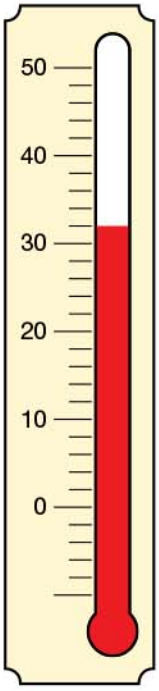
EXERCISE
5

Reading Scales – Temperature

Determine the reading on each of the thermometers shown below to the closest degree.



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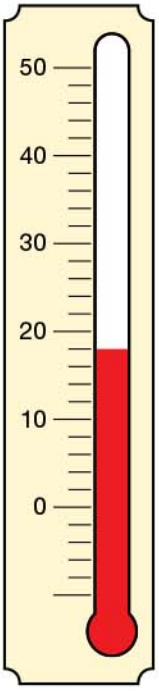

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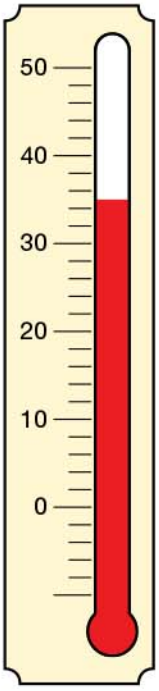

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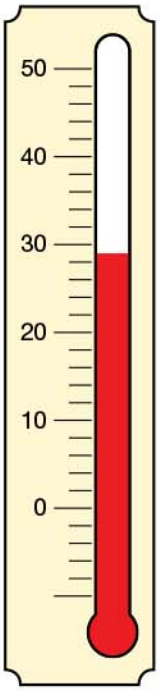

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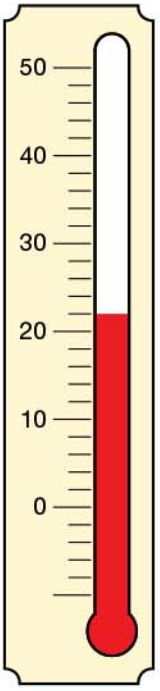

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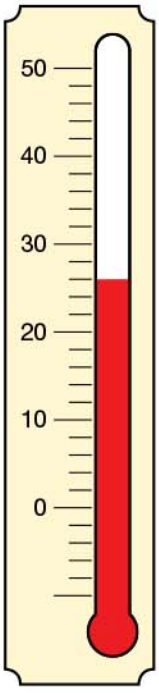

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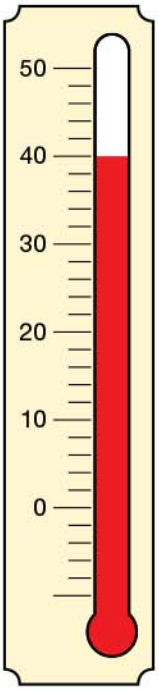

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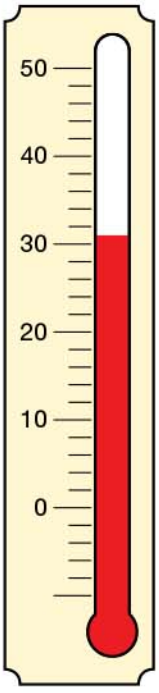

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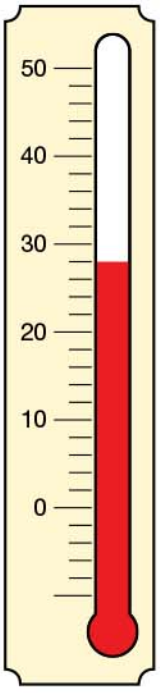

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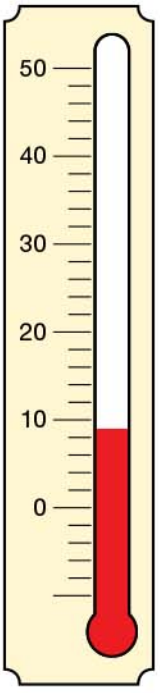

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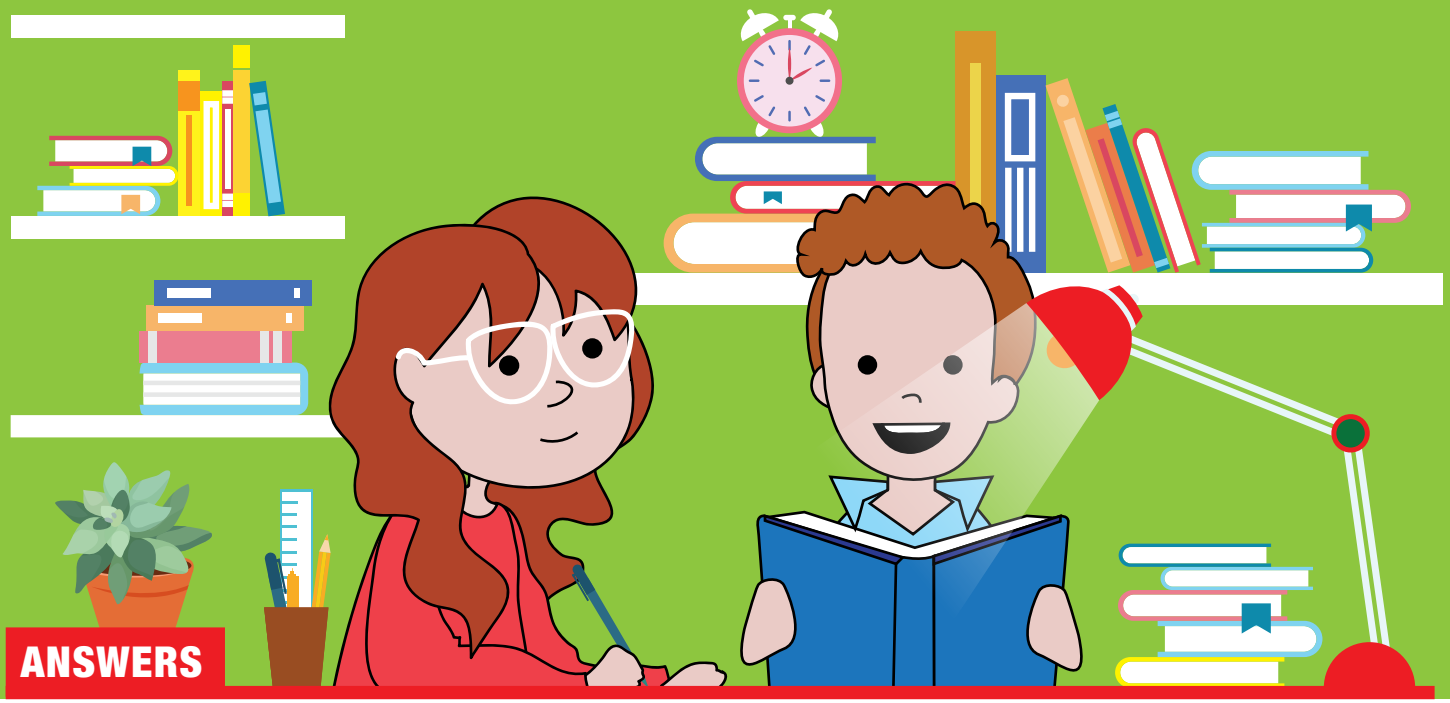

ANSWERS

1 Branches Of Science

1. Heart
2. Physics
3. Pharmacy
4. Seismology
5. Plants
6. Nerves
7. Chemistry
8. Lithology
9. Radiology
10. Hydrology
11. Botany
12. Ecology
13. Virology
14. Climatology
15. Vulcanology
16. Minerals
17. Skin
18. Zoology
19. Cosmology
20. Biology
21. Weather
22. Entomology
23. Cells
24. Geology
25. Birds

Final question: What does paleontology study?

Answer: Paleontology is the study of fossils.

2 Safety In a Laboratory

1. Don't taste or drink in the laboratory – it might be poisonous.
2. Clean up any spilt chemical immediately with the cloth provided by the teacher.
3. Watch where you walk about so you do not bump into others.
4. Clean all apparatus before putting it away.
5. If any chemicals spill anywhere, notify the teacher immediately.
6. Do not directly smell chemicals or gases given off during reactions.
7. Never leave reagent bottles unstoppered.
8. Do not touch chemicals directly.
9. Do not mix unauthorised chemicals – they may react in a bad way!
10. Don't run in the laboratory – walk sensibly.

3 Measurement In Science – Comprehension

1. (a) because, measurements
   (b) system, units, measuring
   (c) metric
   (d) time, metric, kilogram, metre
   (e) kg, m, s
2. Convenient to use.
   Easily reproduced.
   Widely known.
3. Communication and understanding across the world in all areas of interaction are easier.

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