

Science F-2

Contents

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Contents

This book is the **Science F–2** student workbook. It is written for the **Foundation to Level 2** band of the Victorian Curriculum 2.0 (Science). **The book starts at Foundation.** It covers the three levels of the band — Foundation, Level 1 and Level 2 — and there is one set of content descriptions for all three levels.

The series is nine books:

- **Chapter 0 — Contents** — this book: how to use the book, what it covers, teacher notes, safety notes and the band word list (15 pp)
- **Chapter 1 — Science as a human endeavour: observing, and using what we observe** — topics 1A and 1B (51 pp)
- **Chapter 2 — Biological sciences: living things, what they need, and how they are built** — topics 2A, 2B and 2C (88 pp)
- **Chapter 3 — Chemical sciences: materials, mixtures and physical change** — topics 3A, 3B and 3C (86 pp)
- **Chapter 4 — Earth and space sciences: changes, the sky, and caring for Earth** — topics 4A, 4B and 4C (90 pp)
- **Chapter 5 — Physical sciences: movement, forces and sound** — topics 5A, 5B and 5C (38 pp)
- **Chapter 6 — Asking, predicting and investigating safely** — topics 6A, 6B and 6C (45 pp)
- **Chapter 7 — Making sense of what we found, and telling others** — topics 7A, 7B and 7C (66 pp)
- **Chapter 8 — Assessment — topic checks and end-of-band review** — seven topic checks and the end-of-band review, with answers and marking notes at the back (62 pp)

Series total: nine books ≈ 541 pages. The built books — ScienceF2_Chapter00_Contents and ScienceF2_Chapter01 to ScienceF2_Chapter08 — are in S:\Files\VC2Science\TextbookF_2\.

How to use this book

The book is written to be read aloud. In every student-facing part, the teacher reads all the words. Children answer by looking, saying, pointing, circling, sorting, matching, drawing, labelling with one word, and doing. There is no independent extended writing in the book.

The order of the chapters is not a teaching order. The chapters go knowledge-first: Chapter 1 looks at science as human work, Chapters 2–5 are the four knowledge strands, and Chapters 6–7 are the inquiry strands. VCAA states no order inside a band, and at this age the inquiry strands are learned through real, hands-on content — three inquiry chapters ahead of any material would be wrong for five- to seven-year-olds. Most schools will interleave Chapters 6–7 with Chapters 2–5 across the three years of the band.

A topic is not one class. Each of the 20 topics is a piece of work that runs across the whole band: topic 2A, for example, is several weeks of grouping work across Foundation, Level 1 and Level 2. The book is sized for about 64 content classes and about 10 check classes — about 74 classes across the band, or about one science class a week over three years — with room left to go back over things, for outdoor work that waits on the weather, and for the month-long Moon diary.

Harder and easier work lives inside each topic. Where a topic needs harder or easier work for different levels of the band, the task is labelled F, L1 or L2. The band has one set of content descriptions; VCAA does not split them across Foundation, Level 1 and Level 2.

Checks are untimed and short. Every check in Chapter 8 is given by the teacher, has no time to beat, and is made for two sittings of about 15 minutes each. See the teacher notes below.

Every science word is named and explained when it first appears, and every topic's words are gathered in the band word list at the back of this book.

What this book covers

The table below lists all 20 content descriptions of the Foundation to Level 2 band, word for word as the Victorian Curriculum 2.0 gives them. Each content description is owned by exactly one topic, and each topic owns exactly one content description. This table is the map of what the book covers; the series checks itself against this map.

#	CD code	Strand	Content description (verbatim)	Owner	Elaboration ids	MCQs
1	VC2S2H01	Nature and development of science	“scientific knowledge is based on observations of the natural world using the senses, and scientific tools and instruments”	1A	.E01–.E05 (5)	81
2	VC2S2H02	Use and influence of science	“science is used by people in their daily lives, including asking questions and using patterns from observations of the world around them to make scientific predictions”	1B	.E01–.E06 (6)	71
3	VC2S2U01	Biological sciences	“plants and animals have observable features that can be used to group them in different ways”	2A	.E01–.E06 (6)	62
4	VC2S2U02	Biological sciences	“plants and animals have basic needs, including air, water, food and shelter; the places where they live meet those needs”	2B	.E01–.E06 (6)	94
5	VC2S2U03	Biological sciences	“plants and animals have external	2C	.E01–.E06 (6)	88

#	CD code	Strand	Content description (verbatim)	Owner	Elaboration ids	MCQs
			features that perform different functions to enable their survival; in plants these features include roots, stems, leaves, flowers, fruit, bulbs, trunks and branches while different features in animals enable them to move, breathe, eat and respond to their environment”			
6	VC2S2U04	Chemical sciences	“objects can be made of one or more different materials; these materials have observable properties”	3A	.E01–.E07 (7)	93
7	VC2S2U05	Chemical sciences	“materials can be combined in a variety of ways for particular purposes; the properties of objects and mixtures can differ from the properties of the materials from which they are made”	3B	.E01–.E05 (5)	87
8	VC2S2U06	Chemical sciences	“materials can be changed physically by different	3C	.E01–.E05 (5)	79

#	CD code	Strand	Content description (verbatim)	Owner	Elaboration ids	MCQs
			actions without changing their material composition, including by bending, twisting, stretching, crushing, squashing and breaking into smaller pieces”			
9	VC2S2U07	Earth and space sciences	“daily and seasonal changes in the weather and the environment can be observed and affect decisions made in everyday life”	4A	.E01-.E06 (6)	81
10	VC2S2U08	Earth and space sciences	“Earth is one of 8 planets in our solar system; observing the sky reveals patterns in the changing positions of the Sun, Moon, planets and stars”	4B	.E01-.E06 (6)	82
11	VC2S2U09	Earth and space sciences	“taking care of Earth’s water, land and air involves consideration of reducing, re-using and recycling materials to conserve Earth’s resources”	4C	.E01-.E06 (6)	77

#	CD code	Strand	Content description (verbatim)	Owner	Elaboration ids	MCQs
12	VC2S2U10	Physical sciences	“the way objects move depends on a variety of factors including their size, shape and material”	5A	.E01–.E05 (5)	77
13	VC2S2U11	Physical sciences	“pushes and pulls are forces that can change an object’s movement or shape and can be represented in terms of strength and direction”	5B	.E01–.E06 (6)	69
14	VC2S2U12	Physical sciences	“sound can make materials vibrate and vibrating materials can make sound; different actions can be used to produce sounds of varying pitch and volume”	5C	.E01–.E06 (6)	83
15	VC2S2I01	Questioning and predicting	“experiences can be used as a basis for posing questions to explore observed patterns and relationships, and to make predictions”	6A	.E01–.E06 (6)	90
16	VC2S2I02	Planning and conducting	“scientific questions and predictions can be investigated safely by	6B	.E01–.E06 (6)	87

#	CD code	Strand	Content description (verbatim)	Owner	Elaboration ids	MCQs
17	VC2S2I03	Planning and conducting	following procedures that have sequenced steps” “observations are made using the senses and recorded, including informal measurements , using digital tools as appropriate”	6C	.E01-.E05 (5)	89
18	VC2S2I04	Processing, modelling and analysing	“data and information can be sorted and ordered using provided tables and organisers, and visual or physical models, to show simple patterns”	7A	.E01-.E06 (6)	82
19	VC2S2I05	Evaluating	“observations can be compared to predictions and the observations of others, which may lead to further questions being identified”	7B	.E01-.E06 (6)	70
20	VC2S2I06	Communicating	“observations, findings and ideas can be shared with others by using everyday and some scientific vocabulary”	7C	.E01-.E03 (3)	82

#	CD code	Strand	Content description (verbatim)	Owner	Elaboration ids	MCQs
				20 owners	113	1,624

Notes on this table:

- The **Elaboration ids** column is the full set VCAA gives for each code — this is what joins the book to the question bank. Elaborations are examples of what a content description might look like — they are not the content description itself, and an elaboration that is not used is not a gap.
- **Thirteen of the elaborations are held back** under the estate’s decision on Aboriginal and Torres Strait Islander cultural knowledge; the notice on the first page of this book says this. Every code still has at least four elaborations that are used.
- **The counts close:** 20 codes, 113 elaborations, and 1,624 banked questions keyed to these codes.

What this book does not cover. This book starts at Foundation; the years before Foundation are not in it. Towards Foundation Levels A–D are a separate product for students working towards Foundation, and are not in this book. The content descriptions of other Science bands (Levels 3–4 and above) live in the other books of this series, and VCE content is not in this book.

Teacher notes

Chapter 8 holds eight instruments: seven topic checks and the end-of-band review.

- **Every instrument is given by the teacher and read aloud.** Reading is not what is being looked at. The child does not need to read, and the child does not need to write.
- **Responses are by pointing, sorting, matching, circling, drawing, labelling with a single word, doing and saying.** There is no independent extended writing in any check. Where a spoken answer is needed, the teacher writes it down as the child says it.
- **Every check is made for two sittings of about 15 minutes each**, so no Foundation student sits for more than about 15 minutes at a time.
- **There is no time to beat.** Children may take as long as they need on every check, and each instrument says so.
- **Two of the eight instruments are not written checks.** The Topic 6 check is an observation record: the teacher completes it while the student runs a short guided investigation. The Topic 7 check is part observation record, part written.
- **A mark is a record that evidence was seen.** Item marks are 1 or 2; there are no part-marks and no half-marks. The records are evidence for reporting against the achievement standard for the band. They are not used to rank children.

The marking plan is regular by design: every content description is worth 4 marks in its topic check — 20 content descriptions $\times$ 4 = 80 — and the end-of-band review adds 20, for a series total of 100 marks.

Instrument	Covers	Codes evidenced	Marks
Topic 1 check	Chapter 1	VC2S2H01, VC2S2H02	8
Topic 2 check	Chapter 2	VC2S2U01, VC2S2U02, VC2S2U03	12
Topic 3 check	Chapter 3	VC2S2U04, VC2S2U05, VC2S2U06	12
Topic 4 check	Chapter 4	VC2S2U07,	12

Instrument	Covers	Codes evidenced	Marks
		VC2S2U08, VC2S2U09	
Topic 5 check	Chapter 5	VC2S2U10, VC2S2U11, VC2S2U12	12
Topic 6 check	Chapter 6	VC2S2I01, VC2S2I02, VC2S2I03	12
Topic 7 check	Chapter 7	VC2S2I04, VC2S2I05, VC2S2I06	12
End-of-band review	Chapters 1–7	all 20 codes	20
		Total	100

Chapter 1 is worth 8 rather than 12 because it holds two content descriptions, not three — the rate stays the same; the chapter total does not.

The end-of-band review is run once, at the end of Level 2. It is in two parts: a portfolio review of the child's own work from across the band (11 marks, one per strand — the band has eleven strands), and a short practical task (9 marks). All 20 codes are reachable through the portfolio, and every code is also covered by its topic check, so no code is evidenced only in the review.

Answers and marking guidance for every item in all eight instruments — the acceptable answers, the code each item evidences, and what to ask when an answer is right but the reason is unclear — are at the back of the Chapter 8 book. Acceptable-answer ranges are wide by design: many sorting rules can be right, and marking one rule as the only right one would go against the content description.

The question bank. The bank holds 1,624 items keyed to the 20 codes in the table above. **They are not printed as multiple-choice papers in this series.** Under this book's rules, no F–2 student reads an item alone, and a printed pick-one item cannot show the doing words the achievement standard is written in — group, compare, describe, explain, pose, suggest, demonstrate. The bank is used as teacher-read oral check questions, as a source of the wrong-but-common answers worth planning against, as question stems changed into the sort, match and point work of the topic checks, and as the cross-check that each topic teaches what the bank believes its code is about.

Safety notes

Safety in this book is stated **at the point of use**: every activity that uses small parts, heat or classroom tools carries its safety note on the same page as the activity. Two standing rules apply across the whole book:

1. **Materials are never tasted.** In Chapter 3 and Chapter 6, students observe materials with their other senses — sight, smell, touch and hearing — and never with taste. This rule comes from VCAA itself (VC2S2I03.E02 and VC2S2I03.E03).
2. **Nobody ever looks at the Sun.** In the shadow work of Chapter 6 and the daytime-sky work of Chapter 4, students watch the shadow or the sky away from the Sun — never the Sun itself.

Also, in every part of the book:

- **No open flame.** No activity in this book uses fire.
- **Scissors and classroom tools** are used only with the teacher, as each page says.
- **Wash your hands** after handling materials, soil or food.
- Where an activity uses **small parts**, the page says so, and the teacher watches.

Word list

Every science word in this book is named and explained the first time it appears. This list gathers those words, chapter by chapter. A word that is used again in a later chapter stays listed where it first appears.

Chapter 1 words

- **observation** — what you find out with your senses
- **observe** — to look, listen and find out
- **see** — to find out with your eyes
- **hear** — to find out with your ears
- **feel** — to find out with your skin
- **bark** — the rough outside skin of a tree
- **skin** — the outside part of the body we feel with
- **tool** — a thing we use to help us do something
- **magnifying glass** — a tool with a lens that makes small things look big
- **lens** — the part of a tool that we look through
- **digital camera** — a tool that takes a photo
- **photo** — a picture a camera takes
- **record** — to put something down so we can look at it again
- **label** — a word that names a part in a drawing
- **astronomer** — a scientist who watches the sky
- **comet** — a bright thing that moves across the sky over many nights
- **telescope** — a big tool, like binoculars, for looking at the sky
- **pattern** — something that happens again and again, in the same way
- **senses walk** — a walk where we use our senses to find things out
- **compare** — to look at what is the same and what is different
- **look** — to use your eyes to find out about a thing
- **listen** — to use your ears to find out about a thing
- **pick** — to choose
- **prediction** — what you say will happen, before it happens
- **forecast** — a prediction about the weather
- **doorbell** — a thing that rings when someone is at the door
- **smoke alarm** — a thing that beeps when there is smoke; when it beeps, go outside
- **phone** — a thing that rings when someone wants to talk
- **nest box** — a box that gives birds a safe place to live
- **frog hotel** — a cool, safe place for frogs and insects to hide
- **woodworker** — a person who makes things from wood
- **product designer** — a person who plans new things, like chairs and toys
- **fibre artist** — a person who works with fibre
- **sculptor** — a person who makes things by shaping wood

Chapter 2 words

- **feature** — a part of a living thing that you can see
- **trunk** — the part of a tree that grows up from the ground; the thick stem of a tree
- **group** — things put together by a rule
- **roots** — the parts of a plant under the soil
- **leaves** — the flat green parts of a plant
- **flower** — the part of a plant that makes seeds

- **fruit** — the part of a plant that holds the seeds
- **covering** — what is on the outside of an animal's body
- **fur** — the soft covering of an animal like the kangaroo
- **feathers** — the covering of a bird like the emu
- **scales** — the covering of an animal like the blue-tongue lizard
- **shell** — the hard covering of an animal like the snail
- **backbone** — the long bone down the middle of the back
- **vertebrate** — an animal with a backbone
- **invertebrate** — an animal with no backbone
- **model** — a small copy of a thing
- **camera** — a tool that takes a photo
- **need** — something a living thing must have to stay alive
- **air** — what living things breathe
- **water** — what living things drink
- **food** — what living things eat
- **shelter** — a place that keeps a living thing safe
- **soil** — the top part of the ground where plants grow
- **bank** — the land next to a river
- **tunnel** — a long hole like a tube
- **eucalypt** — a gum tree
- **fibre** — thin, soft material; cotton and wool are fibre
- **diorama** — a model of a place, made in a box
- **function** — the job of a feature
- **bulb** — a part of the plant under the soil that stores food; an onion is a bulb
- **branches** — the parts of a tree that grow out from the trunk
- **webbed** — webbed feet have skin between the toes, like a platypus
- **lungs** — the part of the body used to breathe air
- **gills** — the part some water animals use to breathe in water
- **herbivore** — an animal that eats plants
- **carnivore** — an animal that eats meat
- **omnivore** — an animal that eats plants and meat
- **eyes** — the part of the body used to see light
- **ears** — the part of the body used to hear sound
- **nose** — the part of the body used to smell smells
- **tongue** — the part of the body used to taste food
- **echolocation** — finding things with sound; a bat sends out sound and listens for it to come back

Chapter 3 words

- **object** — a thing you can see and touch
- **material** — what a thing is made of
- **saucepan** — a pot we cook with
- **property** — something we can observe about a material
- **sponge** — a soft thing we use for washing
- **hard** — not easy to press or change
- **soft** — easy to press, like a sponge; of a sound, little, like a whisper
- **surface** — the outside of a thing
- **tile** — a hard, flat piece

- **rough** — not smooth; bumpy to touch
- **smooth** — not rough; flat and even to touch
- **tube** — a thing that is long and round, like a piece of hose
- **ruler** — a straight tool
- **bendy** — easy to bend
- **not bendy** — not easy to bend; it stays straight
- **snap** — to break in half
- **thread** — a long, thin string
- **detail** — the small parts of a thing we can look at
- **display** — things put out so we can look at them
- **hunt** — a game where we look for things
- **combine** — to put together
- **sole** — the bottom of a shoe
- **grips** — when rubber grips the ground, it holds on and does not slip
- **laces** — the strings you tie on a shoe
- **teddy** — a soft toy bear
- **raincoat** — a coat made of coated fabric that keeps water out
- **coated** — with a thin skin that keeps water out
- **beanie** — a soft hat for your head
- **mixture** — two or more materials put together
- **squeeze** — to press together, like two hands pressing a ball
- **crumble** — to break into little bits, like dry sand
- **scoop** — a small tool like a cup, used to move water or powder
- **powder** — lots of tiny bits, like sand
- **gritty** — feeling like rough tiny bits
- **runny** — able to flow, like water
- **wobbly** — moving from side to side, like jelly
- **spongy** — soft and springy, like a sponge
- **scrunch** — to squeeze a thing into a ball
- **actions** — things we do. In Chapter 3, the six actions that can change a material: bend, twist, stretch, crush, squash and break. In Chapter 5, what we do to make a sound: strike, blow, scrape, pluck or shake
- **bend** — to push a thing so it is not straight
- **twist** — to hold the ends and turn them different ways
- **rubber band** — rubber in a circle that we can stretch
- **stretch** — to pull a thing to make it longer
- **squash** — to press a thing to change its shape
- **can** — a thing that holds drinks
- **crush** — to press a thing very hard
- **tear** — to pull a thing into pieces
- **cut** — to make pieces with scissors
- **mark** — a line or spot left on a thing
- **strand** — one long, thin bit of wool
- **strong** — hard to break
- **fold** — to bend paper over on itself
- **plane** — a paper thing we fold so it can fly; in Chapter 4, a flying machine that carries things far away
- **odd one out** — the one that is different

Chapter 4 words

- **season** — a part of the year
- **weather** — what the sky and the air are like outside
- **daily changes** — changes we can see from day to day
- **thermometer** — a tool that tells us how hot or cold the air is
- **seasonal changes** — changes that happen at the same season every year
- **bare** — with no leaves
- **wattle** — a tree with small gold flowers
- **hibernate** — to sleep deep and still through the winter
- **hibernation** — the long winter sleep of some animals
- **boulders** — very big rocks
- **migrate** — to make a long trip when the season changes
- **migration** — the long trip some animals make when the season changes
- **predict** — to say what will happen next, before it happens
- **decision** — what we choose to do
- **scarf** — warm cloth we wear around the neck
- **star** — a thing in the sky that makes its own light
- **planet** — a big ball in space
- **solar system** — the Sun and the 8 planets
- **trails** — the lines stars seem to make in a long photo
- **diary** — a book where we write or draw what we see, day after day
- **kerb** — the edge of the road where the bins wait
- **council** — the group of people who look after the place where you live
- **red-lid bin** — the bin for rubbish
- **yellow-lid bin** — the bin for recycling: jars, paper and bottles
- **green-lid bin** — the bin for garden waste: leaves and sticks
- **core** — what is left of a fruit after you eat it
- **melt** — to get so hot it turns soft and runny, like ice-cream in the sun
- **loop** — a circle that comes back to the start
- **tonne** — a way to say how heavy a thing is: about as heavy as a small car
- **scraps** — the bits of food we do not eat, like an apple core or a banana skin
- **landfill** — the place where rubbish is taken and buried
- **food miles** — the trip food takes from where it is grown to where we eat it
- **in season** — ready to pick near us at that time of year
- **litter** — rubbish that is dropped on the ground, or blown there
- **sustainability** — the big idea of looking after Earth's water, land and air so they last

Chapter 5 words

- **move** — to go from one place to another
- **roll** — to turn over and over as you go
- **slide** — to move along and stay flat
- **bounce** — to jump back up when you hit the floor
- **spin** — to turn round and round on the spot
- **slope** — like a slide: one end high, one end low
- **size** — how big or small a thing is
- **shape** — what a thing looks like: round, square, long
- **factor** — one thing that can change how a thing moves

- **push** — a force that makes a thing go away from you
- **pull** — a force that brings a thing to you
- **force** — a push or a pull
- **strength** — how strong a force is
- **direction** — which way a force goes
- **arrow** — a line with a pointy end; we draw it to show a force
- **start** — to make a still thing move
- **stop** — to make a moving thing still
- **turn** — to change the way a thing moves
- **sound** — what we hear when a thing is vibrating
- **vibrate** — to move up and down very fast, again and again
- **pitch** — how high or low a sound is
- **volume** — how loud or soft a sound is
- **loud** — a big sound, like *bang!*
- **high** — like a little bird's song
- **low** — like a big drum
- **echo** — a sound that goes out and comes back

Chapter 6 words

- **notice** — to see and say what you see
- **wonder** — to think “I wonder if...?”
- **question** — a wonder we say out loud, to find out
- **explore** — to look, watch and try, to find out
- **because** — the word that says what something is based on
- **why** — the word we ask for a reason
- **step** — one thing to do
- **order** — how the steps go: which is first, next and last
- **first, next, then, last** — words that tell the order
- **safe** — done so nobody gets hurt
- **procedure** — a set of steps in an order
- **set up** — to get everything ready before we start
- **pack away** — to put everything back when we finish
- **measure** — to find how long a thing is by counting units
- **unit** — the one thing we use to measure, like a block or a handspan
- **handspan** — one hand put-down, used as a unit
- **string** — we lay it along a wiggly path, then make it straight to measure
- **end to end** — each unit starts where the one before it ends
- **same** — not different; we use the same unit all the way

Chapter 7 words

- **data** — what we find out and write down
- **sort** — to put into groups using a rule
- **rule** — the one thing we use for a sort
- **table** — rows and columns of boxes that hold data; the book gives us the table
- **row** — the line of boxes that goes across
- **column** — the line of boxes that goes down
- **ramp** — a board with one end up high
- **matched** — the same as; if your prediction matched what happened, it was right

- **both** — the two of you, not just one
- **interesting** — makes you want to look and think
- **share** — to tell or show, so others know too
- **talk** — to say it in words
- **drawing** — a picture you make
- **collage** — lots of pictures put together on one page
- **finding** — what we found out
- **describe** — to say what a thing is like
- **everyday** — the words we use at home and at play
- **scientific** — to do with science