

Mathematics Level 6

Investigation and modelling tasks

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Contents

Section	Page
Task	2
Running Task I1	4
Task	13

Task

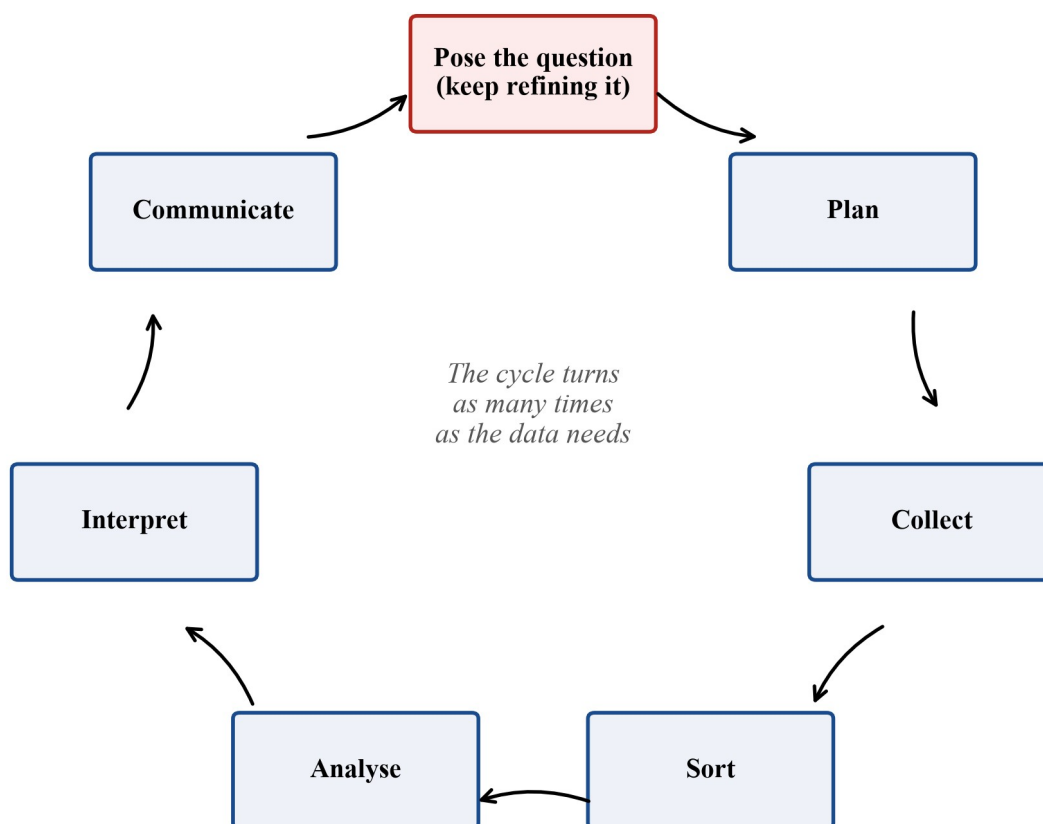
Task II — Posing, refining and conducting a statistical investigation · Investigation task · 20 marks · Chapter 7 (7C, supported by 7A, 7B and 6B)

Codes: VC2M6ST03 (.E01–.E06) · supported by VC2M6ST01 (7A), VC2M6ST02 (7B) and VC2M6SP02 (6B)

plan and conduct statistical investigations by posing and refining questions to collect categorical or numerical data by observation or survey, or identifying a problem and collecting relevant data; analyse and interpret the data and communicate findings within the context of the investigation — VC2M6ST03

This is a school-designed task. It is not a VCAA instrument. Achievement in the Victorian Curriculum is reported against the Level 6 achievement standard, not against a mark on this task.

Task II is a statistical investigation with your own question. In 7C you worked the cycle with questions the book gave you; here you pose the question, keep refining it until data can answer it, collect and organise the data yourself, build the display, and report what you found — in your own words, about your own investigation.



A finding can send you back refining the question — that is not a failure, it is the cycle working.

A cycle of seven boxes joined clockwise by arrows: Pose the question (outlined in red, with a note to keep refining it), Plan, Collect, Sort, Analyse, Interpret, Communicate, with the note that the cycle turns as many times as the data needs

Two decisions shape your plan.

- **The route.** In a **survey**, every person in the group answers the same question. In an **observation**, nobody is asked anything — you watch, time, weigh or measure.
- **The comparison.** This task compares **two groups** or **two conditions**: our class and another class, one pot watered every day and one pot never watered, the canteen queue timed on two different days. Part C asks for a comparative display — both data sets on one scale — so plan for two data sets from the start.

This task is worth 20 marks, in four parts of 5 marks each. It runs over about two lessons, and it is untimed: there is no time limit. If you collect your data with a partner, the plan, the organised data, the display and the findings statement are still each your own work.

You will need: the sheets in Parts A to D of this task, a pencil, a ruler, and grid paper for drafts. If your school permits it, you may use a spreadsheet or a graphing tool — every part can also be done on paper, and the paper path earns full marks. See the Equipment list for route-specific items.

Running Task I1

Teacher-facing. Task I1 is a classroom check, not an exam.

- **When** — after sections 7A, 7B and 7C of Chapter 7 have been taught. The axis-scale checks in Part C draw on 6B.
- **Format** — each student poses and refines their own question and runs their own investigation, by survey or by observation. The question must compare two groups or two conditions (the achievement standard carried on VC2M6ST03 is about comparing distributions). Students may collect in pairs, but the plan, the organised data, the display and the findings statement are each student's own.
- **Timing** — the students are not timed. The guidance here is for planning: about two lessons (TOC section 7.2), Parts A and B in lesson 1, Parts C and D in lesson 2.
- **Equipment** — the list below. Digital tools are permitted, not required (D8: VC2M6ST03 names tools only in its elaborations); the pencil-and-paper path earns full marks in every part.
- **Calculator** — permitted but not needed; the arithmetic is counts, tallies, and differences of two readings.
- **Approval gate** — approve each student's question and method before collection starts. This is also the privacy and safety check (see Safety).
- **Running with Science** — Task I1 may share one investigation with a VC2 Science Level 6 investigation (VC2S6I01, VC2S6I02; TOC sections 5.3 and 7.2): planned once, collected once, reported once. Mark against VC2M6ST03 only, using the marking guide in this file.
- **Marking** — use the marking guide at the end of this file.
- **If a student is absent** — VC2M6ST03 is also assessed in written form in Test T7, so no student is left with an unassessed CD (TOC section 7.2).

Words you need

Every word here was introduced in Chapter 7 (the last one in 6B). This is a quick look-back.

- A **statistical investigation** is the whole cycle: posing and refining a question, collecting and organising the data, analysing and interpreting it, and communicating the finding.
- To **pose** a question is to put forward a question that data could answer. **Refining** a question is sharpening it until it names the group and says what will be counted or measured.
- A **survey** collects data by asking every person in the group the same question. An **observation** collects data by watching, timing, weighing or measuring — nobody is asked.
- The four variable types (7A): **nominal** (labels with no order), **ordinal** (labels in order, like a 1 to 5 rating), **discrete** numerical (counted, in steps) and **continuous** numerical (measured, any value in a range).
- A **comparative display** shows two data sets on the one scale: a side-by-side column graph, or two dot plots on one axis (7A).
- The **mode** is the value or label that occurs most often. The **range** is highest value – lowest value, for numerical data. The **shape** is what the whole display looks like — even on both sides, lopsided or flat (7A).
- A **cell format** is a spreadsheet's setting for a cell — date, numerical or text — and the format has to fit the data (7C).
- A **finding** is the answer to the investigated question, said in terms of the question and the group (7C).
- The **scale** of an axis is the step size chosen for it, starting from 0 (6B).

Equipment

Teacher. One set per student, or per pair where noted.

Everyone

- a printed copy of this task — the sheets in Parts A to D are the students' recording sheets
- pencils, rulers, and grid paper for drafts
- a device with spreadsheet or graphing software, where the school permits it (one device between two is enough) — optional in every part

Survey routes

- tally sheets and clipboards

Observation routes — as the approved plan requires

- a stopwatch for timing
- a scale for weighing, and a measuring tape for length
- a thermometer, or a probe with its logging software where the school has one (VC2M6ST03.E01)

No specialist item is required: every plan can run with pencil, paper and ordinary classroom equipment.

Safety

Controls at the point of use. Read these to the class before collection starts.

For students:

- **Asking people.** Ask politely, and accept “no, thank you” — anyone may pass. Survey only the group your teacher has approved. Ask no names and no personal details, and ask only the question you planned.
- **Moving around the school.** Walk. If you are timing a queue, stand where you can see it without blocking it.
- **Outside (observation routes).** Stay inside the area your teacher marks. Hat on and sunscreen on before you go out — the sun can be strong even on cloudy days. Watch where you step and kneel; if you see glass or anything sharp, do not pick it up — tell your teacher.
- **Weighing and measuring.** Ask for help with anything heavy. Lift with two hands, and nothing above shoulder height.
- **Devices.** School accounts and school devices only. Your data stays in the class.
- **Afterwards.** Wash your hands after working outside.

For the teacher:

- Approve every question and method before collection starts — this is the privacy gate as well as the planning gate: no names, no personal details, no questions about bodies or money, and only approved groups are surveyed.
 - Keep survey data anonymous: no names in any table, spreadsheet or display.
 - For observation routes, mark the area before going out, keep it within the school grounds, and check it first for hazards. Keep the school’s first-aid kit with you, and know the school’s allergy plan for stings.
 - Check that any scale, probe or stopwatch issued is in working order before the lesson.
-

Part A — Posing and refining the question (5 marks)

a. Pose a starting question for your investigation. (1 mark)

Your question must need data, and the answers must vary. It may be rough — making it ready is the next step.

My starting question:

b. Refining: say what your starting question is missing. (1 mark)

Check it against the ready-question tests from 7C. Does it name the group? Does it say what will be counted or measured?

What is missing:

c. Write your refined question. (1 mark)

It must name the group and say what will be counted or measured.

My refined question:

d. Name the two groups, or the two conditions, your investigation compares. (1 mark)

Both must give the same data, collected the same way.

First group or condition:

Second group or condition:

e. Circle your route, and give the reason. (1 mark)

survey · observation

Reason — does someone have to tell you, or can you see it for yourself?

.....

Part B — Collecting and organising the data (5 marks)

a. Collect your data the way you planned. (1 mark)

Record each answer or reading as it comes in, the same way every time. If your route is a survey, everyone in the group answers the same question, worded so it does not push an answer.

b. Check that your collection is complete. (1 mark)

I recorded answers (or readings). I planned

c. Organise the data into a table or a spreadsheet. (1 mark)

One column for each part of the record, and a heading row that names each column. Keep the two groups or two conditions separate and side by side — for example, one column for each — so they can be compared.

d. Make the format fit the data. (1 mark)

In a spreadsheet, set each column's format before you type — numerical for counts and measurements, date for dates, text for notes; a number typed into a text cell is just a picture of a number (7C). On paper, write the unit — minutes, litres, votes — in each column heading.

e. Name the variable type of your data, and give the reason. (1 mark)

Circle one: nominal · ordinal · discrete · continuous

Reason — labels with no order, labels in order, counted, or measured:

.....

Part C — Choosing and constructing the comparative display (5 marks)

a. Choose the display that fits your data type and shows the comparison. Circle one. (1 mark)

side-by-side column graph · column graph with both groups · dot plot with the labels in order · two dot plots on one axis

b. Why does that display fit? Write one sentence about your data type. (1 mark)

.....

c. Construct your display, with both groups or both conditions on the one scale. (1 mark)

Give it a title that says what was investigated, and who or where. On paper, use grid paper and a ruler; with a graphing tool, check that both data sets are drawn on the one pair of axes.

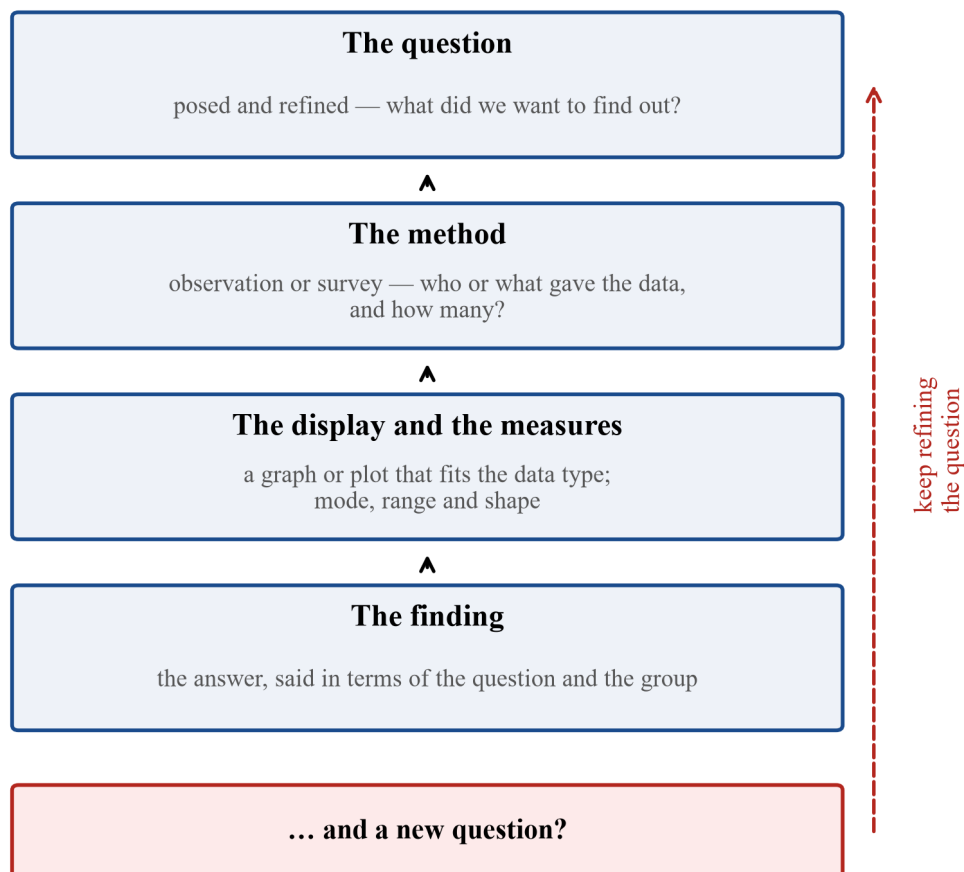
d. Label both axes, and choose a scale that fits. (1 mark)

The number scale starts at 0, and every step is the same size (6B).

e. Check your display against your organised data. (1 mark)

Every value in the display matches your table, and each group's total matches the number of answers or readings you collected. Run the same checks you learned for other people's displays in 7B: nothing broken, nothing skipped, everything drawn to scale.

Part D — Communicating the findings in the context of the investigation (5 marks)



The parts of a findings statement stacked with arrows: The question (posed and refined - what did we want to find out?), The method (observation or survey - who or what gave the data, and how many?), The display and the measures (a graph or plot that fits the data type; mode, range and shape), The finding (the answer, said in terms of the question and the group), then a red box "... and a new question?" with a dashed red arrow running back up the side labelled keep refining the question

a. Write a findings statement that answers your refined question. (1 mark)

.....
.....

b. Report the measures for each group. (1 mark)

The mode of each group, with its count — and, if your data is numerical, the range of each group, highest – lowest.

.....

c. Describe the shape of each group. (1 mark)

Even on both sides, lopsided, or flat — say where each peak sits, and any tail.

.....

d. Stay inside your investigation. (1 mark)

Name the group you actually asked or measured, and how many. If your data is about your class, do not claim it is about all students.

e. Close the cycle. (1 mark)

Write one thing you would change, or one new question you would pose, if the cycle turns again.

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Total for this task: ☐ out of 20 marks

Marking guide

Teacher-facing. Score only what you can see in the student's work or hear the student say. Investigations will differ — score the action against the student's own question and data, not against any particular topic. If you have to tell a student what to do before an action, do not give the mark for that action; record the prompt instead, so you know what to teach next.

Task I1 carries 20 marks in the four criteria of the assessment plan (TOC section 7.2), 5 marks each: **posing and refining the question · collecting and organising the data · choosing and constructing the comparative display · communicating findings within the context of the investigation**. It assesses VC2M6ST03, supported by VC2M6ST01 (7A), VC2M6ST02 (7B) and VC2M6SP02 (6B). Digital tools are permitted, not required (D8): every action below can be evidenced on paper.

The rubrics below are written against the achievement-standard extract carried on VC2M6ST03 in the authority file (maths_6.json), quoted verbatim, so a teacher's judgement maps to the VCAA wording without translation.

Students compare distributions of discrete and continuous numerical and ordinal categorical data sets as part of their statistical investigations, using digital tools. — VC2M6ST03, achievement-standard extract

Criterion A — Posing and refining the question — 5 marks

Mark	What you can see the student do	Accept
a (1)	Poses a starting question that needs data and whose answers can vary.	“Do students in our class and in the Year 5 class read the same number of books a month?” qualifies, comparison included or not. A question with one fixed answer (“How many colours are in the Australian flag?”) or an opinion with nothing counted or measured (“Is sport good?”) does not — yet.
b (1)	Says what the starting question is missing, against the ready-question tests of 7C.	“It does not say who.” “‘Healthy’ is an opinion — nothing is counted.” A student whose starting question already passes both tests may say so, and say what the refining then added — usually the two groups to compare.
c (1)	Writes a refined question that names the group and says what will be counted or measured.	The refined question passes both checklist tests of 7C. If one test still fails, ask the student to run the checklist again; give the mark when the final written question passes. Refining sharpens the original question — a different question altogether does not earn the mark.
d (1)	Names two groups, or two conditions, that give the same data, collected the same way.	Our class and another class answering the same survey; two pots, one watered and one not; the same queue timed at two times of day. Two unrelated questions (“favourite colour and number of pets”) do not make a comparison.
e (1)	Chooses survey or observation, with the reason right for their own plan.	Something that must be told (a favourite, a rating) → survey; something that can be watched,

Mark	What you can see the student do	Accept
		timed, weighed or measured → observation (VC2M6ST03: “by observation or survey”). The reason must fit the student’s own question.

Criterion B — Collecting and organising the data — 5 marks

Mark	What you can see the student do	Accept
a (1)	Collects the data by the planned method, recording each answer or reading as it comes in, the same way every time.	Tally lines or entries appear during collection, not all at once afterwards. Survey students ask everyone in the approved group the same neutral question — no push wording (7C).
b (1)	Checks that the collection is complete: the recorded total matches the number planned.	The student states both numbers and they agree. A shortfall the student notices and tops up still earns the mark.
c (1)	Organises the data into a table or spreadsheet: one column per part of the record, a heading row naming the columns, and the two groups or conditions kept separate and side by side.	One column per group, or one labelled set per condition, ready for the comparative display (VC2M6ST03 .E04).
d (1)	Makes the format fit the data.	Spreadsheet: counts and measurements in numerical cells, dates as dates, notes as text — the teacher checks the file or the student shows the step (VC2M6ST03 .E02). Paper: the unit written in each column heading.
e (1)	Names the variable type of their own data, with the reason.	Counted → discrete; measured → continuous; labels in order, such as a 1 to 5 rating → ordinal; labels with no order → nominal (7A). Mark against the student’s own data.

Criterion C — Choosing and constructing the comparative display — 5 marks

Mark	What you can see the student do	Accept
a (1)	Chooses a display that fits the variable type and shows the comparison.	Nominal labels → side-by-side column graph; ratings → dot plot with the labels in order; counted or measured data → dot plots or columns with both groups on one axis (7A’s display table).
b (1)	Gives one reason for the choice, tied to the data type.	“The ratings are in order, so dots stacked over each rating show the shape.” “Side-by-side columns let me compare the two classes label by label.” A reason that only names the display (“because it looks good”) does not.
c (1)	Constructs the display with both data	“Books read in a month: our class

Mark	What you can see the student do	Accept
	sets on the one scale, with a title saying what was investigated, and who or where.	and the Year 5 class.” “Soil moisture, watered pot and unwatered pot, week 1.” Hand-drawn displays count fully.
d (1)	Labels both axes and chooses a scale that fits: the number scale starts at 0 and every step is the same size.	The axis-scale choice taught in 6B. A broken or skipped scale is the fault 7B names in other people’s displays — here the student avoids it in their own.
e (1)	Checks the display against the organised data.	Every value matches the table, and each group’s total matches the count collected. Give the mark when the student runs the check, even if nothing needs fixing.

Criterion D — Communicating findings within the context of the investigation — 5 marks

Mark	What you can see the student do	Accept
a (1)	Writes a findings statement that answers the refined question of Part A.	The statement answers the student’s own question, not a different one, and names both groups or both conditions.
b (1)	Reports the mode of each group with its count — and, for numerical data, the range of each group as highest – lowest.	“Our class: mode 3 books, 8 students; Year 5: mode 2 books, 9 students.” “Range of the watered pot: $67 - 62 = 5$.” If two values tie for most frequent, accept both named. For nominal data, the modes of the two groups are the measure — no range is expected.
c (1)	Describes the shape of each group.	Where each peak sits, any tail, gaps — “even on both sides”, “lopsided towards the high ratings”, “flat”. One word per group with a pointer to the display is enough.
d (1)	Keeps the findings inside the investigation: names the group actually asked or measured, and how many, and claims nothing beyond it.	“In our class of 24 ...”, “In the two pots we measured ...”. A claim about “all students” or “every school” does not earn the mark.
e (1)	Writes one genuine refinement or new question for the next turn of the cycle.	“Survey the Year 5 class again in Term 4 and compare the terms.” “Add a third pot watered twice a week.” “Ask whether the difference is bigger in winter.” “Nothing” does not earn the mark — the cycle turning is the assessable action, and the finding must feed it (VC2M6ST03: posing and refining).

How the marks map to the curriculum

Curriculum words	Marks
Posing and refining questions (VC2M6ST03)	A a, A b, A c, D e
Collecting categorical or numerical data by observation or survey (VC2M6ST03)	A e, B a, B b
Organising the data; spreadsheet cell formats (VC2M6ST03.E02)	B c, B d, B e
Comparing two groups or conditions (achievement-standard extract: compare distributions; VC2M6ST03.E04)	A d, C c, D b, D c
Choosing and constructing a comparative display (VC2M6ST03; comparative displays VC2M6ST01.E02; axis scale VC2M6SP02)	C a, C b, C c, C d, C e
Analysing and interpreting — mode, range and shape (VC2M6ST01, supporting)	D b, D c
Communicating findings within the context of the investigation (VC2M6ST03)	D a, D d

Teacher recording sheet

Part	Criterion	Marks	Action notes
A	Posing and refining the question	/5	
B	Collecting and organising the data	/5	
C	Choosing and constructing the comparative display	/5	
D	Communicating findings within the context of the investigation	/5	
		/20	

What the marks say

The four criteria use the words VCAA carries on VC2M6ST03: *pose and refine ... collect ... analyse and interpret ... communicate findings within the context*. A student who scores across all four has run the whole investigation cycle of 7C on their own question — and has shown the two things no timed written item can show: conducting the investigation, and refining the question when the data answers back. A mark not scored here is a gap to teach next; VC2M6ST03 is also assessed in written form in Test T7.

Record the total: ☐ out of 20

Task

Task 12 — Model a real financial decision and justify the choices made. Assesses VC2M6N09 (subtopic 3B) · Supported by 2E, 3A and 5A · 20 marks · about two lessons

This is a school-designed paper. It is not a VCAA instrument. Achievement in the Victorian Curriculum is reported against the Level 6 achievement standard, not against a mark on this paper.

Content description VC2M6N09: use mathematical modelling to solve practical problems involving rational numbers and percentages, including in financial contexts; formulate the problems, choosing operations and using efficient mental and written calculation strategies, and using digital tools where appropriate; interpret and communicate solutions in terms of the situation, justifying the choices made

Timing and rules. This task runs over about two lessons. It is not a timed test — the marks are for careful modelling and for your reasons. A calculator is permitted. A spreadsheet is optional. Internet research happens only with an adult, and only for the optional Stretch at the end.

The situation

Sam's family — 2 adults and 2 children, aged 8 and 12 — loves going to Melbourne Zoo. Over the next 12 months, the family thinks it will visit about 4 times. They usually go on a weekend, but this year they might go on a weekday instead.

The family has to decide the cheapest way to pay for entry:

- **pay per visit** — buy a day entry ticket each time, or
- **buy a membership** — pay once, and visit all year without paying day entry again. In this task, assume one membership covers one person.

An **assumption** is something you accept as true so that a model can work. The one above is given to you; you will make and record your own in Step 1.

Your job is to model the family's zoo year and give the family your advice — in words, backed by numbers, with reasons that someone else can check. There is more than one sensible answer. The marks are for the modelling and the reasons, not for which option you land on.

The data card

Every number on this card is real. Copy the ones you need into your work, and write what each one means.

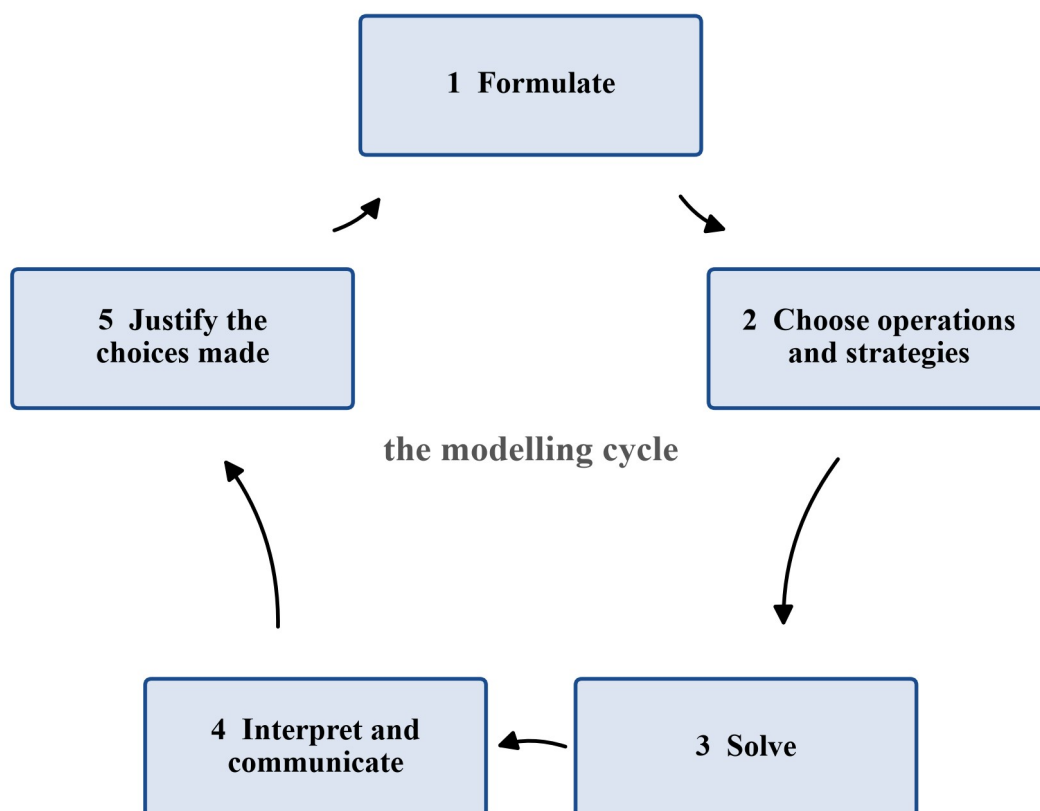
Item	Price
Melbourne Zoo day entry, adult	\$58.00
Melbourne Zoo day entry, child 4 to 15 years, weekday	\$29.00
Melbourne Zoo day entry, child 4 to 15 years, weekend or public holiday	free
Zoos Victoria membership, one person, paid each month	\$12.42 per month over 12 months

Source: Zoos Victoria, Melbourne Zoo entry prices, 2026. Retrieved 19 August 2026. Source: Zoos Victoria, memberships, 2026. Retrieved 19 August 2026.

(Prices as at August 2026. Sam and the family's plans are made up for this task; the prices are not.)

What you are making

One finished response — on paper, or in a spreadsheet if you choose — that runs the whole modelling cycle you learned in 3B: turn a real situation into maths, work out the maths, and bring the answer back to the situation. Work on your own. Keep every page of your working together to hand in.



Every question runs all five steps, in order. A bare number is not an answer.

The five steps of the modelling cycle in order, with an arrow from the last step back to the first: 1 formulate, 2 choose operations and strategies, 3 solve, 4 interpret and communicate, 5 justify the choices made

Step 1 — Formulate. Write, in your own words:

- the decision the family has to make
- what you will model: how many visits (start with 4 if you like), and on which day or days
- the numbers from the data card that you will use, and what each one means
- at least one assumption your model makes

Step 2 — Choose operations and calculation strategies. Before you calculate, write your plan:

- which operations you will use — multiply, add, subtract — and why each one fits the situation
- which tool you will use for each calculation — head, paper, calculator or spreadsheet — with a reason for each choice

Step 3 — Solve. Estimate first. Then find the exact cost of **each** option for the same family year, showing all your working so someone else can follow it. Check at least one calculation by going back — use the reverse operation or a different strategy. Compare your exact totals with your estimate, and say whether they make sense.

Step 4 — Interpret and communicate. Answer in words, for Sam's family. Which option do you recommend, and what does it cost them? A bare number is not an answer yet.

Step 5 — Justify the choices made.

- Give the numbers that support your recommendation — for example, the difference in cost between the two options.
- Say when your advice would change — if the family visited more often, less often, or on different days.
- Answer the what-if question: *If every listed price rose by 10%, how much more would one weekday visit cost the whole family? Would your advice change? Show your working. (Hint from 2E: find 10% of each price first.)*

Equipment

- Pencil and eraser
- Ruler, for tables and bar models
- Calculator — **permitted** (VC2M6N09 allows digital tools where appropriate)
- Spreadsheet on a device — **optional**, if your teacher allows it
- The data card on this page
- A device with internet access — **only with an adult**, and only for the optional Stretch

Safety

- **Internet:** any research happens with an adult present. Do not send messages to organisations to ask for prices, and do not type personal information into any website.
- **Privacy:** Sam's family is made up. Keep it that way — do not write your own family's income, bills or money details in your work, and do not share them with the class.
- **Respect:** families have different amounts of money, and this task never asks about your own home. Do not compare families' money in class.

Stretch (optional — no marks)

With an adult, look up one more real cost for the family's zoo day — how they would get there, or food for a picnic, for example. Add it to your model, and copy the source line the way the data card does: name the source, and the day you retrieved it.

Marking guide

*Teacher-facing. This is a classroom task, marked against VC2M6N09. It is not an exam. Total: 20 marks — four criteria at 5 marks each, exactly the criteria of TOC §7.2. Each criterion is a checklist of five **observable student actions**, worth 1 mark each: award the mark when the action is present in the work handed in.*

Marker notes.

- Responses vary by design: students choose how many visits to model and on which days. Mark the modelling and the reasons against the numbers the student chose — not which option they picked, and not whether it matches your own choice. A well-justified “pay per visit” earns exactly what a well-justified “membership” earns.
- Accuracy marks (Criterion 3) are checked against the student’s own chosen situation. The worked reference values below cover the four-visit situation for quick checking.
- The task is supported by 2E (percentages of a quantity — the 10% what-if), 3A (estimation before calculating) and 5A (where a Stretch item carries a metric quantity).

Criterion 1 — Formulating the problem (5 marks)

Mark	Award the mark when the student’s work shows
1	the decision written in the student’s own words: pay per visit, or buy a membership
2	the situation chosen and recorded: a number of visits, and a day or mix of days
3	the needed numbers selected from the data card, each one labelled with what it means
4	what must be found, written in words before any calculating
5	at least one assumption the model makes, stated clearly

Criterion 2 — Choosing operations and calculation strategies (5 marks)

Mark	Award the mark when the student’s work shows
1	an operation named for each part of the plan — multiply for repeated visits, add for totals, subtract for differences
2	each operation tied to the situation — a reason why it fits
3	a tool chosen for each calculation — head, paper, calculator or spreadsheet
4	a reason given for at least one tool choice — for example, “friendly numbers, so in my head”
5	at least one efficient strategy used — building from 10%, doubling or halving, splitting, or friendly numbers — not every calculation sent to a calculator

Criterion 3 — Solving and checking for reasonableness (5 marks)

Mark	Award the mark when the student’s work shows
1	an estimate written down before the exact calculation
2	exact working shown for every option modelled (at least two), so that someone else can follow it
3	totals that are correct for the student’s own chosen situation
4	the exact totals compared with the estimate, with a statement about whether they make sense
5	at least one calculation checked by going back — a reverse operation or a different strategy

Criterion 4 — Interpreting the solution in terms of the situation and justifying the choices made (5 marks)

Mark	Award the mark when the student's work shows
1	the answer written in words about Sam's family — not left as a bare number
2	a clear recommendation: which option, and for whom
3	numbers used to support the recommendation — for example, the difference in cost between the options
4	the 10% what-if question answered, with working
5	a statement of when the advice would change — different visit numbers or days — with reasons tied to the situation

Reference working — the four-visit situation

For the marker. One full run of the task with 4 visits in the year. Student methods may differ and still earn full marks.

Membership total for one person: $12 \times \$12.42 = \149.04 ($12 \times \$12 = \144 , and $12 \times \$0.42 = \5.04 , so $\$144 + \$5.04 = \$149.04$).

Weekend visits — children go free.

- Pay per visit: adults $2 \times 4 \times \$58.00 = \464.00 ; children \$0. Total \$464.00.
- Membership: adults $2 \times \$149.04 = \298.08 ; children \$0, because entry is already free — a membership saves them nothing. Total \$298.08.
- Membership is cheaper by $\$464.00 - \$298.08 = \$165.92$.
- Estimate check: round \$58.00 up to \$60, and \$149.04 up to \$150: $8 \times \$60 = \480 and $2 \times \$150 = \300 . Rounding up gives estimates above the true costs, and both exact totals sit below theirs. ✓

Weekday visits — children pay \$29.00.

- Adults: unchanged — \$464.00 pay per visit, \$298.08 with memberships.
- Children: pay per visit $2 \times 4 \times \$29.00 = \232.00 ; memberships $2 \times \$149.04 = \298.08 . Paying per visit is cheaper by $\$298.08 - \$232.00 = \$66.08$.
- The cheapest mix is memberships for the adults and pay per visit for the children: $\$298.08 + \$232.00 = \$530.08$.
- Paying per visit for all four: $\$464.00 + \$232.00 = \$696.00$.

When the advice changes.

- Adults at 2 visits each: $4 \times \$58.00 = \232.00 , which is less than \$298.08 — pay per visit is cheaper. At 3 visits each: $6 \times \$58.00 = \348.00 — memberships are cheaper. For an adult, memberships take over between the second and third visit (\$116.00 vs \$149.04, then \$174.00 vs \$149.04).
- Children on weekdays: 5 visits cost $5 \times \$29.00 = \145.00 , still under \$149.04; 6 visits cost \$174.00 — a membership is cheaper from the sixth visit. Children on weekends: never, for entry alone, because their entry is free.

The 10% what-if.

- 10% of \$58.00 is \$5.80 → new adult price \$63.80. 10% of \$29.00 is \$2.90 → new child weekday price \$31.90.
- One weekday visit for the family: $2 \times \$63.80 + 2 \times \$31.90 = \$127.60 + \$63.80 = \$191.40$. That is \$17.40 more than \$174.00 — or find 10% of \$174.00 directly: \$17.40. ✓
- The rise hits the pay-per-visit side, so the membership option only looks better by comparison. A response that says the advice is unchanged (or strengthened) and points to this is a full-mark justification.