

Mathematics Level 5

Assessment tasks

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Contents

Section	Page
Task	2
Task I2 — Model and cost a class event	12

Task

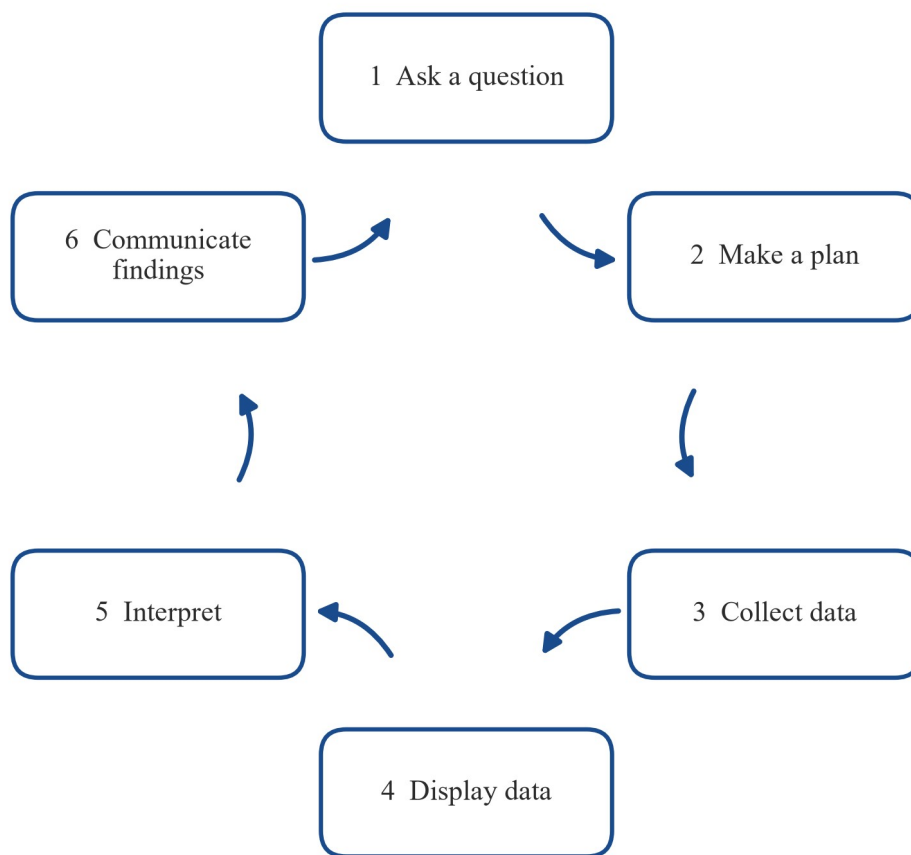
Task II — Plan and conduct a statistical investigation · Investigation task · 20 marks · Chapter 7 (7C, supported by 7A and 7B)

Codes: VC2M5ST03 (.E01, .E02, .E03) · supported by VC2M5ST01 (7A) and VC2M5ST02 (7B)

plan and conduct statistical investigations by posing questions or identifying a problem and collecting relevant data; choose appropriate displays and interpret the data; communicate findings within the context of the investigation — VC2M5ST03

Task II is an investigation task. It is not a test. You will pose your own statistical question, make a plan, collect the data, check it, display it, and tell the class what you found. You follow the same six steps you learned in 7C.

The statistical investigation cycle



A circle of six boxes joined by arrows: 1 Ask a question, 2 Make a plan, 3 Collect data, 4 Display data, 5 Interpret, 6 Communicate findings.

You can collect your data two ways:

- **Survey** — ask people. A survey fits questions like “What is the most common favourite sport in our class?”
- **Observe** — watch and count. Observing fits things people cannot tell you, like the insects in a one-metre square of playground.

This task is worth 20 marks. Each part is worth 5 marks. The task runs over about two lessons: Parts A and B in lesson 1, Parts C and D in lesson 2. Nothing here is timed.

You will need: the planning and findings sheets in Parts A to D, a pencil, a ruler, and a device with spreadsheet software. If you choose to observe, you will also need a one-metre square (see Equipment).

How to run I1

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

- **When** — after sections 7A, 7B and 7C of Chapter 7 have been taught.
- **Format** — each student poses their own question and runs their own investigation, by survey or by observation. Students may collect in pairs, but the plan, the spreadsheet, the display and the findings are each student's own. Score what you see and hear as you move between students, and check each student's spreadsheet and sheet at the end of lesson 2.
- **Timing** — nothing is timed; there is no time limit on the students. The guidance here is for your planning: about two lessons, lesson 1 for Parts A and B, lesson 2 for Parts C and D. Observation students spread their three visits across lesson 1 (for example morning break, lunch and afternoon, as in 7C).
- **Equipment** — the list below. Spreadsheet access is part of the task, not an aid: VC2M5ST01 (supporting this task) requires software including spreadsheets, and the validation step is scored.
- **Calculator** — not needed. The arithmetic in this task is counts, tallies and totals, and the spreadsheet does the adding.
- **Marking** — use the marking guide at the end of this file.
- **If a student is absent** — VC2M5ST03 is also assessed in written form in Test T7 (choosing and reading displays), so no student is left with an unassessed CD (§7).

Words you need

Every word here was introduced in Chapter 7. This is a quick look-back.

- A **statistical question** is a question you answer by collecting data, and the answers can vary.
- **Data** is the information we collect.
- A **survey** collects data by asking people. **Observing** collects data by watching and counting.
- A **tally chart** records each answer as one line; every fifth line crosses the four before it.
- The three types of data at Level 5: **nominal categorical** (names or labels, with no order), **ordinal categorical** (categories that do have an order), **discrete numerical** (counts — whole numbers we get by counting).
- A **fair question** does not push one answer, and its choices cover every answer with no overlap. A question that pushes one answer is **biased**.
- A **spreadsheet** is software that keeps data in cells, in rows and columns.
- To **validate** data is to check it for mistakes before trusting it.
- A **display** is a way to show data: a table, a column graph or a line graph.
- The **mode** is the value that comes up most often. The **shape** of the data is what the display looks like as a whole. Your **findings** are what the data tells you, in the context of your investigation.

Equipment

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

Everyone

- a device with spreadsheet software, with room to save each student's file (one device between two is enough)
- a printed copy of this task — the sheets in Parts A to D are the students' recording sheets
- pencils and rulers; grid paper for drafts (optional)

Survey groups

- clipboards for the tally sheets (optional)

Observation groups

- a one-metre square per group — four pegs and string, masking tape, or a taped paper square as in 7C
- clipboards
- sun hats, and sunscreen available before going out

Safety

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

For students:

- **Asking people.** Walk, do not run, when you move to ask. Ask politely. If someone cannot answer, thank them and move on.
- **Outside (observation groups only).** Stay inside the area your teacher marks.
- **The sun.** Hat on, and sunscreen on, before you go out. The sun can be strong even on cloudy days.
- **Insects.** Look, do not touch. Some insects bite or sting. Do not disturb nests, and do not lift rocks or logs. Tell your teacher straight away if you are stung.
- **Underfoot.** Watch where you step and where you kneel. If you see glass or anything sharp, do not pick it up — tell your teacher.
- **Afterwards.** Wash your hands after working outside.

For the teacher:

- Mark the observation area before going out, and keep it within the school grounds.
 - Check the site before the visits — glass, holes, and stinging insects such as wasps.
 - Keep the school's first-aid kit with you. A sting may need the school's allergy plan, so know it before going out.
-

Part A — Pose the question and plan the collection (5 marks)

a. Write your statistical question, and say who or what you will investigate. (1 mark)

Your question must need data, and the answers must vary.

My question:

Who or what I will investigate:

b. Circle the type of data you will collect. (1 mark)

nominal categorical · ordinal categorical · discrete numerical

c. Say how you will collect the data, and from whom or what. (1 mark)

Circle one: survey · observe

I will collect my answers from

I will collect answers (or visits).

d. Write your fair question and its answer choices, or your observation categories. (1 mark)

A fair question does not push one answer, and it does not ask for feelings. The choices cover every answer, with no overlap.

.....
.....

e. Draw your recording plan before you collect. (1 mark)



Make a tally chart, or a table, with one row for every choice (or one column for every visit), ready to fill in as the answers come.

Part B — Collect and validate the data (5 marks)

a. Collect your data the way you planned. Record every answer as it comes in. (1 mark)

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

The total on my tally chart is I planned answers (or visits).

c. Key your data into the spreadsheet. (1 mark)

One column for the choices (or the visits), one column for the counts, and one row for each choice.

d. Validate your data: set the count column to the number type. (1 mark)

A number column will not accept a word, so a wrong entry shows up straight away (7A).

e. Check every entry, and check the total. (1 mark)

Every entry fits exactly one choice. The spreadsheet's total matches the number of answers you collected (or visits you made). If you find a mistake, fix it, or ask about it.

Part C — Choose and construct a display (5 marks)

a. Choose the display that fits your question. Circle one. (1 mark)

column graph · line graph · table

b. Why does that display fit? Write one sentence. (1 mark)

.....

c. Build your display in the spreadsheet. Give it a title. (1 mark)

The title says what was investigated, and who — or where.

d. Label both axes, and start the count scale at 0. (1 mark)

If your display is a table: line up the choices and the counts in columns, and add a total row.

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

Every choice, and every count, in the display matches the spreadsheet.

Part D — Communicate your findings (5 marks)

Sharing your findings



1 Say what you wanted to find out.



2 Say who you asked, or what you observed.



3 Give the mode and describe the shape of the data.



4 Answer your question, in the context of your class.



5 Say what your findings cannot tell you.

A checklist titled “Sharing your findings”: 1 Say what you wanted to find out. 2 Say who you asked, or what you observed. 3 Give the mode and describe the shape of the data. 4 Answer your question, in the context of your class. 5 Say what your findings cannot tell you.

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

.....
.....

b. State the mode, with its count, and as “out of”. (1 mark)

The mode is It came up times: out of

c. Describe the shape of the data. (1 mark)

.....

d. Stay inside your investigation. (1 mark)

Name who, or what, you investigated. Do not say “everyone” or “all students” if your data is about your class, or your square.

e. Write one thing your data cannot tell you. (1 mark)

.....

Total for this task: ☐ out of 20 marks

Marking guide

Teacher-facing. Score only what you can see the student do, or hear the student say. Investigations will differ — mark the action, not the student’s particular question or numbers. A spoken answer counts the same as a written one. 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 (§7), 5 marks each: **posing the question and planning the collection · collecting and validating the data · choosing and constructing an appropriate display · communicating findings within the context of the investigation**. It assesses VC2M5ST03, supported by VC2M5ST01 (7A) and VC2M5ST02 (7B). Spreadsheet use is required: the data must be keyed into a spreadsheet, validated there, and displayed there (D10, VC2M5ST01).

The rubrics below are written against the achievement-standard extract carried on VC2M5ST03 in the authority file (maths_5.json), quoted verbatim, so a teacher’s judgement maps to the VCAA wording without translation.

Students plan and conduct statistical investigations that collect nominal and ordinal categorical and discrete numerical data with and without digital tools. — VC2M5ST03, achievement-standard extract

Criterion A — Posing the question and planning the collection — 5 marks

Mark	What you can see the student do	Accept
a (1)	Writes a question that needs data and whose answers can vary, and names who or what will be investigated.	“What is the most common favourite sport in our class?” and “How does the number of insects in our square change across our three visits?” both qualify. A question with one fixed answer (“How many days are in a week?”), or a question with no named group, does not.
b (1)	Circles the type of data that matches their own plan.	Names or groups with no order → nominal categorical; ordered categories (a 1–5 rating, places in a race) → ordinal categorical; counts → discrete numerical. Ordinal data written with numbers stays categorical (VC2M5ST01.E01). Mark against the student’s own plan.
c (1)	Chooses survey or observe, and names whom or what they will collect from, and how many.	Asking people → survey; watching and counting → observe. Accept “everyone in our class”, “10 students”, or “our square, three times”. The method must fit the question.
d (1)	Writes a fair question with balanced choices, or clear observation categories.	No push words, nobody’s feelings, every answer fits exactly one choice, and nothing is left out (VC2M5ST03.E03). If a choice overlaps or is missing, ask the student to check their choices against the fair-question rules of 7C; give the mark when the final written choices are fair. Observation categories qualify when they are named and countable (ants, beetles, flies, ...).

Mark	What you can see the student do	Accept
e (1)	Draws a tally chart or table before collecting, with one row per choice (or one column per visit).	The plan is ready to fill in as answers come in. Rows may be left for “Other” or for categories not yet seen.

Criterion B — Collecting and validating the data — 5 marks

Mark	What you can see the student do	Accept
a (1)	Collects the data by the planned method, and records each answer as it comes in.	Tally lines or entries appear during collection, not all at once afterwards. Observation students complete all planned visits to the same square (VC2M5ST03.E01).
b (1)	Checks that the collection is complete: the tally total matches the number planned.	The student states both numbers and they agree. A shortfall that the student notices and tops up still earns the mark.
c (1)	Keys the data into the spreadsheet: one column for the choices (or visits), one column for the counts, one row per choice.	The spreadsheet table matches the validated tally.
d (1)	Sets the count column to the number type, and can say why.	“So a word can’t go in the count column.” The teacher checks the column’s type in the file, or the student shows the step (VC2M5ST01.E05).
e (1)	Checks that every entry fits exactly one choice, finds any mistake and fixes or queries it, and checks that the spreadsheet’s total matches the number of answers collected.	Give the mark when the student runs the check and states the total, even if no mistake is found — validation is the checking, not the finding (VC2M5ST03.E02).

Criterion C — Choosing and constructing an appropriate display — 5 marks

Mark	What you can see the student do	Accept
a (1)	Chooses the display that fits the question: column graph to compare categories, line graph to show change over time, table to show the counts as first collected.	The choice must match the student’s own question (VC2M5ST01.E03). A change-over-time question suits a line graph (VC2M5ST02.E01).
b (1)	Gives one reason for the choice, tied to what the display does.	“A column graph shows which is the most common.” “A line graph shows how the counts changed across our visits.” A reason that only names the display (“because I like graphs”) does not.
c (1)	Builds the display in the spreadsheet, with a title saying what was investigated and who — or where.	“Favourite sport of 24 students in our class”, “Insects in our square across three visits”.
d (1)	Labels both axes, with the count scale starting at 0.	For a column graph: categories along the bottom, number of answers up the side, scale from 0

Mark	What you can see the student do	Accept
e (1)	Checks the display against the validated data.	(VC2M5ST02.E01 axis conventions). For a line graph: time along the bottom. For a table: choices and counts lined up in columns, with a total row. Every category and every count in the display matches the spreadsheet table. 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 question posed in Part A.	The statement answers the student's own question, not a different one (VC2M5ST03.E02).
b (1)	States the mode with its count, and as "n out of N" (or a fraction).	"The mode is soccer: 10 students, 10 out of 24." For a line graph, the highest point is the mode of the visits. If two categories tie for tallest, accept both named — the mode may be non-unique (VC2M5ST01.E02).
c (1)	Describes the shape of the data.	Column graph: where it is tall, where it is short, any gaps — "tallest at soccer, shortest at tag, nobody chose swimming". Line graph: how the counts changed over time — "up at lunch, then down" (VC2M5ST02.E02).
d (1)	Keeps the findings inside the investigation: names who or what was investigated, and claims nothing beyond it.	"In our class ...", "In our square ...". A claim about "all students" or "every playground" does not earn the mark.
e (1)	States one true thing the data cannot tell.	"It cannot tell us about other classes." "One square might not be like the whole playground." "We only visited for one day." Any true limit of the student's own data (VC2M5ST03.E02 — does the data give the information needed to answer the question?).

How the marks map to the curriculum

Curriculum words	Marks
Posing questions or identifying a problem (VC2M5ST03)	A a, A b
Collecting relevant data (VC2M5ST03), by survey or by observation (VC2M5ST03.E01, VC2M5ST03.E03)	A c, A d, A e, B a, B b

Curriculum words	Marks
Acquiring and validating data using software including spreadsheets (VC2M5ST01, VC2M5ST01.E05)	B c, B d, B e
Choosing appropriate displays and justifying the choice (VC2M5ST03, VC2M5ST01.E03)	C a, C b
Representing data with a spreadsheet (VC2M5ST01)	C c, C d, C e
Interpreting the data — highest frequency (mode) and shape (VC2M5ST01.E02; VC2M5ST02.E02 for change over time)	D b, D c
Communicating findings within the context of the investigation (VC2M5ST03, VC2M5ST03.E02)	D a, D d, D e

Teacher recording sheet

Part	Criterion	Marks	Action notes
A	Posing the question and planning the collection	/5	
B	Collecting and validating the data	/5	
C	Choosing and constructing an appropriate display	/5	
D	Communicating findings within the context	/5	
		/20	

What the marks say

The marks use the words VCAA carries on VC2M5ST03: *pose ... collect ... choose appropriate displays and interpret ... communicate findings within the context*. A student who scores across all four criteria has run the whole investigation cycle of 7C with their own question — and has done the two things a timed written item cannot show: conducting the investigation and communicating its findings. A mark not scored here is a gap to teach next; VC2M5ST03 is also assessed in written form in Test T7.

Record the total: ☐ out of 20

Task I2 — Model and cost a class event

Task I2 assesses code VC2M5N09 (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 5; authority file `maths_5.json`): “use mathematical modelling to solve practical problems involving additive and multiplicative situations, including simple financial planning contexts; formulate the problems, choosing operations and efficient mental and written calculation strategies, and using digital tools where appropriate; interpret and communicate solutions in terms of the situation”. This task draws on VC2M5N09.E01, .E02 and .E03. Elaboration .E04 is not covered here; see the front-of-book note on Aboriginal and Torres Strait Islander content. Supporting work: **3B** (the modelling cycle and budgets), **1B** (multiplying larger numbers), **1C** (reading remainders) and **3A** (estimating and checking).

Achievement standard (Level 5, extract): “Students use mathematical modelling to solve financial and other practical problems, formulating and solving problems, choosing arithmetic operations and interpreting results in terms of the situation.”

Marks	20 — four parts, 5 marks each (see the Marking guide)
Time	About two lessons. This is a classroom task, not a test — there is no time limit.
Equipment	This task sheet, pencil and paper; a calculator if you want one; a computer or tablet with spreadsheet software where your class uses them (3B)
Digital tools	Allowed — a spreadsheet is a good tool for a budget (3B). You are also marked for showing at least one mental or written strategy, because choosing the strategy is part of the skill (1B).
Working	You may work in pairs, but each student hands in their own working and their own advice.

The situation

Class 5F is running a **games afternoon** to raise money for the Year 5 camp. The class asks you to be the planner. Here is what the class knows:

- Three classes are coming, and each class has 27 students.
- Every student buys a ticket. Tickets are **\$2** each.
- Every student gets a drink, so every student needs a cup. Cups come in **packs of 8**, and one pack costs **\$3**.
- The class also pays for: snacks **\$28**, equipment hire **\$35**, and medals **\$21**.
- The goal is to raise **\$60** for camp.

The prices on this sheet are planning numbers for this task, not shop prices.

Your job is to cost the afternoon, check that the numbers make sense, and tell Class 5F whether the goal is reached — and what the class could do if it is not.

What to do

The four parts below match the four parts of the Marking guide.

Lesson 1 — formulate and plan

1. **Formulate** — turn the situation into maths (3B). List the things you must work out: how many students are coming, the ticket money coming in, the cups to buy, the money going out, and the money raised. Write a number sentence for each, with $\square$ for the unknown.
2. Say **why** each operation fits — “*equal groups, so I multiply*” — because giving the reason is part of formulating the problem.

3. Set up a **budget** like the one in 3B — a table or a spreadsheet with the money-in lines, the money-out lines, and a line for the money raised. A budget is a plan, made before the event, of the money coming in (**income**) and the money going out (**expenses**).

Lesson 2 — solve, check, interpret and communicate

4. **Estimate first** (3A): about how many students? About how much money in, money out, and money raised? Write your estimates down before you solve.
5. **Solve** each number sentence. Show at least one mental or written strategy (1B). For the cups, work out how many packs, and say what you do with the leftover and why (1C).
6. **Check**: are your exact answers close to your estimates? If not, find what slipped.
7. **Interpret and communicate** — say the answers in words that fit the situation (3B): how much money the afternoon raises, how that reads against the \$60 goal, and how many packs of cups the class should buy and why.
8. **What if?** Choose one change and run your model again:
 - **Option A** — tickets are \$3 each instead of \$2;
 - **Option B** — a fourth class of 27 students comes. Work out the new money raised, and read it against the \$60 goal.
9. **Advice for Class 5F** — write two or three sentences telling the class what to do, using your numbers. You may be asked to share your advice with the class; the words you say count for the same marks as the words you write.

Equipment

- this task sheet, including the situation above
- pencil and paper for the working and the advice
- a calculator if you want one — allowed
- a ruler if you draw bar models (optional)
- one computer or tablet with spreadsheet software per pair (optional) — a paper budget table like the one in 3B works too

Safety

- This task is planning only — no cooking, no food handling and no equipment set-up happen during the task lessons.
 - If Class 5F later runs a real games afternoon: the event needs the teacher's approval; check food allergies before any food is chosen; everyone washes hands before touching food; only adults use any heating equipment.
 - In the classroom: keep bags and device cables out of the way, and walk when moving around to share work.
-

Marking guide

This is a classroom task, not an exam. Marks are given for actions you can see in the student's work — in the written working, the budget table or spreadsheet, and the spoken or written advice. The four parts follow the modelling cycle of 3B: formulate, choose, solve, interpret and communicate. Each part is marked 0–5, for a total of **20 marks**.

Give the mark for a row whenever the action appears, however the working is laid out, and accept any correct strategy, not just the one in the sample response. Where a later row builds on an earlier number, mark it from the student's own number (carry-through), so that one slip does not cost the whole task.

Part 1 — Formulating the situation (5 marks)

Look for	Marks
A number sentence for the students coming: $3 \times 27 = \square$ (or $27 + 27 + 27 = \square$)	1
A number sentence for the ticket money: $\square \times \$2 = \square$, or $81 \times \$2 = \square$	1
A number sentence for the cups: $81 \div 8 = \square$ (or $\square \div 8 = \square$ if the student count is not worked out yet)	1
Number sentences for the money going out and the money raised: the four costs added ($\$33 + \$28 + \$35 + \$21 = \square$, in any order), and money in – money out = $\square$	1
A model set up before solving — a budget table, a spreadsheet, or a bar model or table of the situation	1

The unknowns are shown as $\square$ (or $\triangle$ or a blank) before solving — that is the formulate step at this level.

Part 2 — Choosing operations and strategies, and saying why (5 marks)

Look for	Marks
A reason tied to the situation for each operation — for example “ <i>equal groups of 27, so multiply</i> ”, “ <i>fitting students into packs of 8, so divide</i> ”, “ <i>putting the costs together, so add</i> ”, “ <i>comparing money in with money out, so subtract</i> ”. Award for at least three of the four situations.	2
Chooses and names a calculation strategy for at least one multiplication — mental doubling, splitting into tens and ones, or a written method — and says why it fits	1
Decides which answers must be exact and which can be estimates, and says why — the money totals must be exact; the estimate is the check	1
Chooses a tool — spreadsheet, calculator or paper table — and says why it fits	1

Part 3 — Solving, with a reasonableness check (5 marks)

Look for	Marks
Estimates written down before solving — for example about 90 students, money in about	1

Look for	Marks
\$180, money out about \$115, money raised about \$65. Accept any sensible rounding; the point is the habit of estimating first (3A).	
Students coming: $3 \times 27 = 81$	1
Ticket money: $81 \times \$2 = \162	1
Cups, money out and money raised: $81 \div 8 = 10$ remainder 1, so 11 packs; $11 \times \$3 = \33 ; money out $\$33 + \$28 + \$35 + \$21 = \$117$; money raised $\$162 - \$117 = \$45$	1
Compares the exact answers with the estimates and says they are reasonable — or finds and fixes a slip	1

Part 4 — Interpreting and communicating in terms of the situation (5 marks)

Look for	Marks
States the money raised in words — “ <i>the afternoon raises \$45</i> ”	1
Reads the result against the goal — “ $\$60 - \$45 = \$15$, so the plan is \$15 short of the goal”	1
Interprets the cup remainder: 10 packs cover 80 students, and the 1 left over still needs a cup, so the class buys 11 packs — rounded up, with the reason said (1C)	1
Runs one what-if change and states the new result in words. Option A: $81 \times \$3 = \243 in, money raised $\$243 - \$117 = \$126$, which is \$66 over the goal. Option B: 108 students, money in $108 \times \$2 = \216 , cups $108 \div 8 = 13$ remainder 4 so 14 packs at \$42, money out \$126, money raised \$90, which is \$30 over the goal.	1
Gives advice to Class 5F in two or three sentences that use the numbers	1

Mark total: 20 (Part 1: 5, Part 2: 5, Part 3: 5, Part 4: 5).

Fully worked sample response

Formulate (Part 1).

Situation	Number sentence	Why this operation
Students coming	$3 \times 27 = \square$	Three equal groups of 27 → multiply
Ticket money	$81 \times \$2 = \square$	81 equal groups of \$2 → multiply
Cups	$81 \div 8 = \square$	Fitting students into packs of 8 → divide
Money going out	$\$33 + \$28 + \$35 + \$21 = \square$	Putting the costs together → add
Money raised	$\$162 - \$117 = \square$	Comparing money in with money out → subtract

Plan (Part 1). A budget table — a spreadsheet could hold the same lines:

Line	Number	Price	Total
Tickets	81	\$2	\$162
Total money in			\$162
Cups	11 packs	\$3	\$33
Snacks	1	\$28	\$28
Equipment hire	1	\$35	\$35
Medals	1	\$21	\$21
Total money out			\$117
Money raised			\$45

Estimate, then solve (Parts 2 and 3).

Estimate first (3A): 27 is about 30, so about $3 \times 30 = 90$ students; money in about $90 \times \$2 = \180 ; cups about $90 \div 8 \approx 11$ packs, about \$33, so about \$30; money out about $\$30 + \$30 + \$35 + \$20 = \$115$; money raised about $\$180 - \$115 = \$65$.

Working	Comment
Students: 3×27 . Think $3 \times 20 = 60$ and $3 \times 7 = 21$, so $60 + 21 = 81$.	Equal groups $\rightarrow$ multiply. Split into tens and ones (1B).
Ticket money: $81 \times \$2 = \162 . Think $80 + 80 = 160$ and $1 + 1 = 2$, so \$162.	Mental strategy — doubling (1B).
Cups: $81 \div 8 = 10$ remainder 1. Count in eights: 8, 16, 24, ..., 80.	Fitting into packs $\rightarrow$ divide (1C).
10 packs cover 80 students; the 1 left over still needs a cup, so buy 11 packs: $11 \times \$3 = \33 .	Round up — the leftover still counts (1C).
Money out: $\$33 + \$28 + \$35 + \$21 = \$117$.	Putting the costs together $\rightarrow$ add.
Money raised: $\$162 - \$117 = \$45$.	Money in – money out.
Check: the estimate was about \$65 and the exact answer is \$45 — both are near the goal but short of it, so the answer is reasonable.	The estimate checks the exact answer (3A).

Interpret and communicate (Part 4).

- The games afternoon raises **\$45**.
- The goal is \$60, and $\$60 - \$45 = \$15$, so the plan is **\$15 short** of the goal.
- The class buys **11 packs** of cups — 10 packs would leave 1 student without a cup.

What if — Option A. Tickets at \$3: money in becomes $81 \times \$3 = \243 ; money out stays \$117; money raised becomes $\$243 - \$117 = \$126$. Read against the goal: $\$126 - \$60 = \$66$, so the goal is reached with **\$66 over**.

What if — Option B. A fourth class comes: students become $4 \times 27 = 108$; money in becomes $108 \times \$2 = \216 ; cups become $108 \div 8 = 13$ remainder 4, so 14 packs, and $14 \times \$3 = \42 ; money out becomes $\$42 + \$28 + \$35 + \$21 = \$126$; money raised becomes $\$216 - \$126 = \$90$. Read against the goal: $\$90 - \$60 = \$30$, so the goal is reached with **\$30 over**.

(Each student chooses one option; either earns the Part 4 mark.)

Advice for Class 5F (sample). “Raise the ticket price to \$3. The afternoon then raises \$126, which is \$66 more than the \$60 goal — enough for camp even if a few students are away. Inviting a fourth class also works (\$90 raised, \$30 over), but only if another class can come.”