Mathematics Towards Foundation D

Chapter 6 — Statistics: sorting and comparing data with 2 outcomes

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Contents

Sorting and comparing data with objects and images, with 2 outcomes

This subtopic is led by the teacher. The teacher gives all the words in the student's own way of communicating — speech, sign, pictures, a communication device, or eye gaze. The student looks, listens, touches, places, and shows. The student does not need to read. The student does not need to write. The student takes part, and the taking part is the mathematics.

> *sort and compare data represented by objects and images in response to questions that have only 2 outcomes and relate to familiar situations* — VC2MFDST01, content description, quoted verbatim from `maths_AD.json`
>
> *Students sort and compare data collected in response to questions in familiar contexts.* — VC2MFDST01, achievement standard extract, quoted verbatim from `maths_AD.json`

The three elaborations below are quoted verbatim from the authority file (`maths_AD.json`). They are VCAA's illustrations of the content description, not the syllabus (TOC.md D9). The content description is the expectation; the elaboration ids (E01–E03) are the join keys for MCQ and coverage linkage.

> *participating in the sorting and display of information and data; for example, helping to create a visual display of 'yes' and 'no' responses to questions such as 'Do you have a horse?', 'Do you like the Magpies?' or 'Do you like cheese?', or choices between 2 outcomes such as 'Do you prefer orange or blue?'* — VC2MFDST01.E01
>
> *sorting and comparing the responses to questions with 2 outcomes and counting with one-to-one correspondence to quantify the result* — VC2MFDST01.E02
>
> *sorting collected responses and creating simple displays such as a picture graph or collections of representative materials and quantifying the result* — VC2MFDST01.E03

Teacher notes — what this subtopic is, and where its edges are. This is the Statistics subtopic of the book, and the only one; that is correct (TOC.md D13). The teacher and the student ask a group a question about a familiar situation. The question has **only 2 outcomes** — yes or no, or a choice between two things. The group answers. The student helps to sort the answers into two groups, count them, make a simple display, and then say or show which group has more, which has less, or whether the groups are the same. The picture answers the question about the group. That idea — that a picture can answer a question about a group — is the heart of this subtopic.

The content description's constraint is *"only 2 outcomes"*, and it is easy to breach. *Do you like cheese?* has 2 outcomes: yes, no. *Do you prefer apples or bananas?* has 2 outcomes: apples, bananas. A question with three answers is out of scope here.

This subtopic owns VC2MFDST01 and no other code. The tools come from earlier chapters and are applied here: counting with one number word per thing, and the words *more*, *less* and *same* (subtopic 1C, VC2MFDN03), and one-to-one correspondence (subtopics 1C and 2B). Here the student uses those tools on data — the answers the group gives.

What is out of scope, deliberately:

- **More than 2 outcomes.** No three-category survey, no "which of these three" question. The CD says *only 2 outcomes*.
- **Tally marks, frequency tables, and graphs with a numbered axis.** Data is represented by objects and images only. Recording with tally marks and categorical displays begins at Level 1 (`VC2M1ST01`, `VC2M1ST02`).
- **Chance, probability, "what might happen".** There is no Probability anywhere in Levels A–D (TOC.md D5).
- **The student designing or carrying out a survey alone.** The student *participates* in the collection with the teacher. Collecting as the student's own task is the Foundation book's addition (`VC2MFST01`).
- **Counts beyond 10.** The group is small, so every count sits inside this book's number range.

Materials. Two hoops, two bowls, or two mats to sort into. Counters, blocks, pegs and spoons in more than one size and texture. Picture cards and photo cards of familiar things — food, animals, colours, weather, transport, music. The

student's communication system: device, picture cards, sign list. A task that asks for placing also works with a point, a look, a reach, a sign, or a message on a communication device. A student who cannot grasp small items places large items, or looks, or presses a key. Every question in this subtopic can be answered in any of these ways; the communication load is never the mathematics.

Assessment note. Evidence for this subtopic is gathered by observation, across at least three separate occasions, and the recorded judgement is the student's best sustained response — not an average, not the most recent. Assisted and partial responses count: hand-over-hand, a partial physical prompt, co-active movement, eye gaze and aided communication are legitimate observed responses. This subtopic is practical — the student participates in the collection — so the evidence lives in the observed task at the end of this section (Checkpoint 6), not in the practice pages alone.

Theory

Ask a question with 2 outcomes

We ask a group a question. The question has only 2 answers.

Say: *Do you like cheese?*

Do: Show the two answer cards. One card says or shows **yes**. One card says or shows **no**.

Look for: Every answer is one of the two. Yes, or no. There is no third answer. That makes it a 2-outcome question.

A choice question works the same way. *Do you prefer apples or bananas?* has 2 answers: apples, or bananas.

VC2MFDST01.E01 puts it this way: *helping to create a visual display of 'yes' and 'no' responses to questions such as 'Do you have a horse?', 'Do you like the Magpies?' or 'Do you like cheese?', or choices between 2 outcomes such as 'Do you prefer orange or blue?'*

Sort the answers into two groups

Each person in the group answers. Each answer goes into one of two groups.

Say: *Yes goes here. No goes there.*

Do: Give each person one thing — a counter, a peg, a picture card. Each person puts their thing in the yes group or the no group. The student helps sort. The student's own answer goes in too.

Look for: One answer goes to one group. The yes things are together. The no things are together. Nothing is left over.

The answers are the **data**. Data is what we find out when we ask.

Count each group

Now we count the answers in each group.

Say: *How many said yes? How many said no?*

Do: Touch each thing in the yes group. Say one number word for each thing: one, two, three. Then count the no group the same way.

Look for: One number word goes with one thing — this is **one-to-one correspondence**. Each answer is counted once. The last number word says how many.

VC2MFDST01.E02 puts it this way: *counting with one-to-one correspondence to quantify the result*.

Make a display

Put the answers where everyone can see them.

Say: *Let's make a picture of our answers.*

Do: Line up the yes things in one row. Line up the no things in another row. One row for each answer.

Two rows of things or pictures, one row for each answer — a display like this is called a **picture graph**. Two collections of the things work too: the yes pile and the no pile.

VC2MFDST01.E03 puts it this way: *creating simple displays such as a picture graph or collections of representative materials and quantifying the result*.

Compare — what does the picture say?

Look at the two rows. The picture now answers the question.

Three words do the comparing:

- **more** — this row has a bigger count
- **less** — this row has a smaller count
- **same** — the counts are the same

Say: *Which row is longer? Are there more yes answers, or more no answers? Or are they the same?*

Look for: The student points to, looks at, or names the row with more — or shows that the rows are the same — and then shows or tells how they know: the longer row, the leftover things, or the two counts.

Teacher script — teaching sequence

Run this as a shared activity with a small group or one other person the student knows. Deliver every line in the student's own communication modality. Model first, then hand each step to the student. Accept any response — speech, sign, placing, pointing, eye gaze, device message. Where the script says [wait], give time.

Step 1 — the question. Hold up a piece of cheese or a picture of one. Say: *We are going to ask a question. Do you like cheese?* Show the two answer cards: **yes** and **no**. Say: *Only two answers. Yes, or no.* [wait] Say: *Show me the yes card. Show me the no card.* [wait]

Step 2 — your answer. Say to the student: *Do you like cheese?* [wait] Accept any response. Give the student a counter. Say: *Put your counter here* — help the student place it by the yes card or the no card.

Step 3 — the group answers. Ask each person in the group the same question. Each person takes a counter and puts it in one of the two hoops. The student helps hand out counters or place them, with support as needed.

Step 4 — sort and count. Say: *Let's count the yes answers.* Touch each counter in the yes hoop, one at a time, together. Say one number word for each. Say: *There are ____ yes answers.* Repeat for the no hoop.

Step 5 — make the display. Say: *Let's make a picture graph.* Line up the yes counters in one row, and the no counters in a row underneath. Put the yes card at the start of the top row and the no card at the start of the bottom row.

Step 6 — compare. Say: *Which row is longer?* [wait] Say: *Are there more yes answers, or more no answers?* [wait] Say: *How do you know?* Accept the longer row, the leftover counters, or the two counts as the reason.

Step 7 — a choice question. Repeat with a choice question, such as *Do you prefer apples or bananas?* This time the two rows start with the apple card and the banana card. Sort, count, display, compare — the same steps.

Swap the context, keep the mathematics. The question can change to any familiar situation — foods, animals, weather, songs, teams, rides on the bus. The steps stay the same. Keep every question to 2 outcomes.

Worked examples

Do these with the teacher. Use real things on the table, or use what you can see here.

Worked example 1 — do you like cheese?

Six friends are asked: *Do you like cheese?* (VC2MFDST01.E01). Each friend puts a counter in the yes hoop or the no hoop. The sort is done.

Two hoops on the floor. The yes hoop has 4 counters. The no hoop has 2 counters.

Two hoops on the floor. The yes hoop has 4 counters. The no hoop has 2 counters.

Say: *How many said yes? How many said no? Which is more?*

Working	Comment
Count the yes hoop: one, two, three, four — 4.	One number word for each counter.
Count the no hoop: one, two — 2.	Each counter is counted once.
Compare the counts: 4 and 2.	4 is a bigger count than 2.

∴ 4 friends said yes, and 2 friends said no. More friends said yes. We know because 4 is a bigger count than 2.

Worked example 2 — do you have a dog?

Five friends are asked: *Do you have a dog?* Each friend's answer is a card with a dog on it. The yes cards go in one group. The no cards go in the other group.

Two mats. The yes mat has 1 dog card. The no mat has 4 dog cards.

Two mats. The yes mat has 1 dog card. The no mat has 4 dog cards.

Say: *Which group has less?*

Count the yes group: one — 1. Count the no group: one, two, three, four — 4. Compare the counts: 1 and 4.

∴ 1 friend said yes, and 4 friends said no. The yes group has less. We know because 1 is a smaller count than 4.

Worked example 3 — apples or bananas?

Eight friends are asked: *Do you prefer apples or bananas?* (a choice between 2 outcomes, like VC2MFDST01.E01). Each friend puts a card in the apple row or the banana row. The rows make a picture graph.

A picture graph with two rows. The apple row has 5 apple cards. The banana row has 3 banana cards.

A picture graph with two rows. The apple row has 5 apple cards. The banana row has 3 banana cards.

Say: *Which fruit has more answers? How do you know?*

Count the apple row: one, two, three, four, five — 5. Count the banana row: one, two, three — 3. Compare the counts: 5 and 3.

∴ More friends chose apples. We know because 5 is a bigger count than 3, and the apple row is longer.

Worked example 4 — do you like rain?

Six friends are asked: *Do you like rain?* The answers are sorted and displayed in two rows.

A picture graph with two rows. The yes row has 3 raindrop cards. The no row has 3 sun cards.

A picture graph with two rows. The yes row has 3 raindrop cards. The no row has 3 sun cards.

Say: *Are the two rows the same? How do you know?*

Count the yes row: one, two, three — 3. Count the no row: one, two, three — 3. Match the rows one for each: every yes card has a partner, and nothing is left over.

∴ The two rows are the same. 3 friends said yes, and 3 friends said no. We know because both rows count to 3.

Practice tasks

The teacher says all the words in the student's own way of communicating. The student answers by placing, touching, looking, signing, speaking, or using a communication device. The teacher puts the answer down.

Q1. Sort the answers.

The teacher asks four friends: *Do you like cheese?* Two friends say yes. Two friends say no. Four counters wait on the table.

Four counters on a table. Two hoops below them, one marked yes and one marked no.

Four counters on a table. Two hoops below them, one marked yes and one marked no.

a. Put one counter in the yes hoop for each yes answer.
b. Put one counter in the no hoop for each no answer.
c. Are the two groups the same? ____

Q2. Count the picture graph.

Five friends are asked: *Do you have a dog?* The answers make this picture graph.

A picture graph with two rows. The yes row has 2 dog cards. The no row has 3 dog cards.

A picture graph with two rows. The yes row has 2 dog cards. The no row has 3 dog cards.

a. Count the yes row. There are ____
b. Count the no row. There are ____
c. Which row has more? ____

Q3. Make the picture graph.

Six friends are asked: *Do you like bananas?* Four friends say yes. Two friends say no. Six counters and two cards — yes and no — wait on the table.

a. Put the yes card down. Make a row of counters for the yes answers.
b. Put the no card down. Make a row of counters for the no answers.
c. Which row is longer? ____
d. *How do you know?* Show or tell.

Q4. Same or not the same?

Six friends are asked: *Do you like music?* The answers are sorted.

Two rows of counters. The yes row has 3 counters. The no row has 3 counters.

Two rows of counters. The yes row has 3 counters. The no row has 3 counters.

a. Count the yes row. There are ____
b. Count the no row. There are ____
c. The two rows are the ____ (same / not the same).

Q5. Is the sort right?

Five friends are asked: *Do you prefer tea or hot chocolate?* Three friends say tea. Two friends say hot chocolate. The teacher sorts the counters like this.

Two rows of counters. The tea row has 2 counters. The hot chocolate row has 3 counters.

Two rows of counters. The tea row has 2 counters. The hot chocolate row has 3 counters.

a. Is the sort right? ____
b. Put the counters in the right rows.
c. *How do you know?* Show or tell.

Q6. Your answer.

The teacher asks the student: *Do you like cheese?* The yes card and the no card are on the table.

a. Answer the question in your own way.

b. Put a counter by your answer, or look at your answer card.
c. Your answer goes in the ____ group (yes / no).

Q7. Which question has 2 outcomes?

The teacher shows two questions.

Question 1: *Do you like cheese?* — the answer cards are yes and no. Question 2: *What food do you like?* — there are many answer cards: pizza, pasta, fruit, bread, soup, and more.

Two question cards. The first card has 2 answer cards beside it: yes and no. The second card has many answer cards beside it.

Two question cards. The first card has 2 answer cards beside it: yes and no. The second card has many answer cards beside it.

a. Point to the question with only 2 answers.
b. The question with 2 outcomes is Question ____ (1 / 2).

Q8. Apples or bananas.

Seven friends are asked: *Do you prefer apples or bananas?* Four friends choose apples. Three friends choose bananas. Apple cards and banana cards wait on the table.

a. Make two rows: one apple row and one banana row.
b. Count the apple row. There are ____
c. Count the banana row. There are ____
d. Which fruit has more answers? ____

Q9. Answer the question from the picture.

Eight friends are asked: *Do you like hot days?* The picture graph shows the answers.

A picture graph with two rows. The yes row has 6 sun cards. The no row has 2 cloud cards.

A picture graph with two rows. The yes row has 6 sun cards. The no row has 2 cloud cards.

a. Count the yes row. There are ____
b. Count the no row. There are ____
c. Are there more yes answers, or more no answers? ____

Q10. Which group has less?

The dog question again. Six friends answer. One friend says yes. Five friends say no.

Two mats. The yes mat has 1 dog card. The no mat has 5 dog cards.

Two mats. The yes mat has 1 dog card. The no mat has 5 dog cards.

a. Count each group.
b. Which group has less? ____
c. *How do you know?* Show or tell.

Q11. Finish the display.

The teacher has counted the answers to *Do you like the Magpies?* (VC2MFDST01.E01). Four friends said yes. Three friends said no. The yes row is started.

A picture graph started. The yes row has 4 black-and-white counters. The no row is empty. The no card sits at its start.

A picture graph started. The yes row has 4 black-and-white counters. The no row is empty. The no card sits at its start.

a. Put 3 counters in the no row.
b. Which row is longer? ____
c. Are there more yes answers, or more no answers? ____

Q12. Ask and find out.

The student and the teacher ask five people at the table: *Do you prefer orange or blue?* (VC2MFDST01.E01). Each person takes an orange card or a blue card.

a. Help sort the cards into two rows.
b. Count the orange row and the blue row. Orange: ____ Blue: ____
c. Which colour has more? ____

Answers

Q1. c. same — both groups count to 2.

Q2. a. 2 b. 3 c. the no row.

Q3. c. the yes row d. the yes row has 4 counters and the no row has 2; 4 is a bigger count than 2.

Q4. a. 3 b. 3 c. same.

Q5. a. no b. the tea row gets 3 counters and the hot chocolate row gets 2 c. three friends said tea, so the tea row needs 3 counters.

Q6. c. the group for the student's own answer — yes or no. Both are right; the answer is the student's.

Q7. b. 1.

Q8. b. 4 c. 3 d. apples.

Q9. a. 6 b. 2 c. more yes answers.

Q10. b. the yes group c. 1 is a smaller count than 5.

Q11. b. the yes row c. more yes answers.

Q12. b., c. counts depend on the five answers; the colour with the bigger count has more. If both count the same, they are the same.

Fully-worked solutions

Q1.

Four counters on a table. Two hoops below them, one marked yes and one marked no.

Four counters on a table. Two hoops below them, one marked yes and one marked no.

Two friends said yes, so 2 counters go in the yes hoop. Two friends said no, so 2 counters go in the no hoop. Count each group: 2 and 2.

∴ The two groups are the same — both count to 2.

Q2.

A picture graph with two rows. The yes row has 2 dog cards. The no row has 3 dog cards.

A picture graph with two rows. The yes row has 2 dog cards. The no row has 3 dog cards.

Count the yes row: one, two — 2. Count the no row: one, two, three — 3. Compare the counts: 3 is a bigger count than 2.

∴ The no row has more.

Q3.

Four friends said yes, so the yes row gets 4 counters. Two friends said no, so the no row gets 2 counters. Line them up, one row under the other.

∴ The yes row is longer. We know because the yes row has 4 counters, the no row has 2, and 4 is a bigger count than 2.

Q4.

Two rows of counters. The yes row has 3 counters. The no row has 3 counters.

Two rows of counters. The yes row has 3 counters. The no row has 3 counters.

Count the yes row: one, two, three — 3. Count the no row: one, two, three — 3. Match the rows one for each: nothing is left over.

∴ The two rows are the same. Both count to 3.

Q5.

Two rows of counters. The tea row has 2 counters. The hot chocolate row has 3 counters.

Two rows of counters. The tea row has 2 counters. The hot chocolate row has 3 counters.

Three friends said tea, so the tea row needs 3 counters. Two friends said hot chocolate, so that row needs 2 counters. The picture shows 2 in the tea row and 3 in the hot chocolate row — one counter is in the wrong row.

∴ No, the sort is not right. The tea row gets 3 counters and the hot chocolate row gets 2. We know by counting the answers again, one for each friend.

Q6.

The student answers *Do you like cheese?* in their own way — a word, a sign, a look, a placed card, a device message. The counter goes by the student's answer.

∴ The student's answer goes in the yes group or the no group. Both answers are right — the question asks the student.

Q7.

Two question cards. The first card has 2 answer cards beside it: yes and no. The second card has many answer cards beside it.

Two question cards. The first card has 2 answer cards beside it: yes and no. The second card has many answer cards beside it.

Question 1 has only 2 answer cards: yes and no. Question 2 has many answer cards. A question for this subtopic has only 2 outcomes.

∴ Question 1 has 2 outcomes.

Q8.

Four friends chose apples, so the apple row gets 4 cards. Three friends chose bananas, so the banana row gets 3 cards. Count: 4 and 3. Compare: 4 is a bigger count than 3.

∴ Apples have more answers.

Q9.

A picture graph with two rows. The yes row has 6 sun cards. The no row has 2 cloud cards.

A picture graph with two rows. The yes row has 6 sun cards. The no row has 2 cloud cards.

Count the yes row: one, two, three, four, five, six — 6. Count the no row: one, two — 2. Compare the counts: 6 is a bigger count than 2.

∴ There are more yes answers.

Q10.

Two mats. The yes mat has 1 dog card. The no mat has 5 dog cards.

Two mats. The yes mat has 1 dog card. The no mat has 5 dog cards.

Count the yes group: one — 1. Count the no group: one, two, three, four, five — 5. Compare the counts: 1 is a smaller count than 5.

∴ The yes group has less. We know because 1 is a smaller count than 5.

Q11.

A picture graph with two rows. The yes row has 4 black-and-white counters. The no row has 3 black-and-white counters.

A picture graph with two rows. The yes row has 4 black-and-white counters. The no row has 3 black-and-white counters.

Four friends said yes, so the yes row keeps its 4 counters. Three friends said no, so 3 counters go in the no row. Count the rows: 4 and 3. Compare: 4 is a bigger count than 3.

∴ The yes row is longer. There are more yes answers.

Q12.

Each of the five people takes an orange card or a blue card. Sort the cards into two rows. Count each row, one card for each number word. Compare the two counts.

∴ The colour with the bigger count has more. If both rows count the same, they are the same. The answers come from the people asked, so the counts change each time — the steps stay the same.

Observation for assessment — this subtopic's part of Checkpoint 6

Checkpoint 6 assesses subtopic 6A, one-to-one or in a small group the student knows, with objects, picture cards and two sorting containers on the table. VC2MFDST01 is the only CD in Chapter 6, and Checkpoint 6 carries **6 marks** for it (TOC.md §7: 4 marks per owned CD, with a floor of 6 marks per chapter). It is an observed task with materials on the table, not a written task and not a timed task. The digital MCQ layer keyed to VC2MFDST01 is separate and is not this assessment.

Administration — binding for every item

- Observe on **at least 3 separate occasions**. A single observation is not evidence. The recorded judgement is the student's **best sustained** response, not an average and not the most recent.
- Assisted and partial responses are scored, not zeroed: hand-over-hand, partial physical prompt, co-active movement, eye-gaze and aided communication (device, picture exchange, sign) are legitimate observed responses.
- Deliver every instruction in the student's own modality. No task depends on the student reading anything.
- Vary the question and the materials across occasions — cheese one day, dogs another day, colours a third day — so the judgement is about the mathematics, not one familiar set of objects.
- Guidance: about 10 minutes per occasion, spread across the week. This is for a teacher planning the week, not a limit on the student.

Script.

Materials: counters or picture cards, two hoops or mats, yes/no cards (or two choice cards, such as apple and banana).

1. Choose a 2-outcome question with the student, such as *Do you like cheese?* Show the two answer cards. *Say: We will ask our group. Yes or no.*
2. Ask the group. Each person answers and puts a counter in one of the two hoops. *Say to the student: Help sort the answers.* [The student places, points, gazes, or directs, with or without assistance.]
3. *Say: How many said yes? How many said no?* [Count each group together, one number word per counter.]
4. *Say: Let's make a picture.* Line the counters up in two rows.
5. *Say: Which has more? Or are they the same?* [Wait for the answer in any modality.]
6. *Say: How do you know?* [Wait for the reason — the longer row, the leftover counters, or the two counts.]

Rubric — 6 marks, in the language of the achievement standard.

The achievement standard extract for `VC2MFDST01`: *"Students sort and compare data collected in response to questions in familiar contexts."* Sorting (marks 1–4) and comparing (marks 5–6) are scored as separate observations, as TOC.md §7 requires.

Mark	Look for	Source of the language
1	The student participates in collecting responses to a question in a familiar context — answers for themselves, or helps gather the group's answers. The question has only 2 outcomes.	*"participating in the sorting and display of information and data"* — VC2MFDST01.E01; *"questions that have only 2 outcomes and relate to familiar situations"* — VC2MFDST01
2	The student sorts the objects or images into two groups, one group for each outcome, with one item placed per response.	*"Students sort … data collected in response to questions in familiar contexts."* — achievement standard extract carried on VC2MFDST01
3	The student helps make a simple display of the sorted responses — two rows, or two collections.	*"creating simple displays such as a picture graph or collections of representative materials"* — VC2MFDST01.E03
4	The student counts the responses in	*"counting with one-to-one*

Mark	Look for	Source of the language
	each group with one number word per item to say how many in each.	*correspondence to quantify the result"* — VC2MFDST01.E02
5	The student compares the two groups — says or shows which has more, which has less, or that they are the same.	*"Students … compare data collected in response to questions in familiar contexts."* — achievement standard extract carried on VC2MFDST01
6	The student answers a question from the display — *Which has more?* — and shows or tells how they know: the longer row, the leftovers, or the two counts.	*"in response to questions"* — VC2MFDST01; Checkpoint 6 format, TOC.md §7

Scoring notes.

- The counts themselves are small — no more than 10 responses — so the number work stays inside this book's range.
- The question may be yes/no or a choice between two things. Both are 2-outcome questions; either satisfies the CD.
- A student who participates with hand-over-hand support on occasion 1 and sorts independently on occasion 3 is scored on the best sustained response across the three occasions.
- Nothing here requires speech. A student who communicates by eye gaze alone can deliver every mark.

Teacher note — handoff. This subtopic hands forward to the Foundation book's `VC2MFST01` (collect, sort and compare data, 2 outcomes). The next step is collecting: at Foundation the student collects the data themselves. At Level D they participate, sort and compare.

Where this subtopic sits

- **Before it, in this book:** 1C counting and comparing collections to 10 — the words *more*, *less* and *same*, and one-to-one correspondence; 2B matching one for each. 6A takes those tools and uses them on data.
- **After it, in this book:** this is the last chapter. The end-of-level review revisits this CD with no new content.
- **Beyond this book:** the Foundation book's `VC2MFST01` adds collecting to the sort-and-compare delivered here. Tally marks, frequency tables and numbered axes begin at Level 1 (`VC2M1ST01`, `VC2M1ST02`), and probability much later, at Level 3 (`VC2M3P01`). None of that is taught here.

Checkpoint 6 (CP6) — Chapter 6: Statistics — sorting and comparing data with 2 outcomes

Mathematics Towards Foundation D · ClassBasics workbook · Level D

Observation checkpoint — the student participates in a two-outcome collection, sorts it, and answers a question from it. The teacher reads, signs or presents everything on these pages in the student's own communication way. The student reads nothing and is never required to speak or write.

Instrument information

Instrument	Checkpoint 6 (CP6) — Chapter 6 assessment
Book and band	ClassBasics *Mathematics Towards Foundation D* (book code `BK_MathsADD`) — Foundation Level D, the exit level of the Towards Foundation continuum. Level D is a progression level, not a year level; no age is implied anywhere in this instrument.
Chapter coverage	Chapter 6 — Statistics: sorting and comparing data with objects and images, with 2 outcomes (section 6A)
Content descriptions assessed	`VC2MFDST01` (6A) — one owned content description, scored on a 6-mark analytic rubric
Marks	**6** — marks 1–4 score sorting, marks 5–6 score comparing; sorting and comparing are scored as separate observations (TOC §7). Chapter 6 holds one content description; the 6-mark chapter floor gives the single CD enough separately scored observation to be readable.
Structure	One observed task, run with a small group or one other person the student knows, scored on six separately scored marks
Format	Observed: the student participates in a two-outcome collection, sorts it and answers a question from it
Timing	**Untimed.** A guidance duration for planning is about 10 minutes per occasion, spread across the week. This is never a limit on the student.
Occasions	Evidence is gathered across **at least three separate occasions**. The recorded mark is the student's **best sustained** response — not an average and not the most recent occasion.
Permitted materials	The materials list below, and the student's own communication system. No worksheets, no written responses, no calculator. There are no multiple-choice items in this instrument; the MCQ bank keyed to this content description belongs to the digital question layer.
Recording	Record every occasion on the CP6 recording sheet: `_MathsADD_CP6_Rubric.md`. The recording space for this checkpoint is that sheet.

Conditions

- **All instructions are delivered in the student's own communication modality** — spoken language, sign, AAC device, picture exchange, eye-gaze, or a combination. No task depends on the student reading anything.
- **No task requires speech.** Every response channel is accepted: a look, a gaze, a reach, a point, a placed counter or card, a vocalisation, a sign, a picture, or a word on the device. Where the student directs and the

adult places, record it as the student's response. Nothing here requires speech — a student who communicates by eye-gaze alone can deliver every mark.

- **Assisted and partial responses are scored, never zeroed.** Hand-over-hand, partial physical prompt, co-active movement, eye-gaze and aided communication are legitimate observed responses at Level D. A student who participates with hand-over-hand support on occasion 1 and sorts independently on occasion 3 is scored on the best sustained response across the three occasions.
- **The student's communication system is to hand and in reach** on every occasion. If it is not, note that on the recording sheet — it is part of the evidence, not a detail.
- **This is a school-designed assessment instrument.** It is written by the school for its own students against the Victorian Curriculum F–10 Mathematics Version 2.0 content description named above. It is not a VCAA instrument and has not been reviewed or endorsed by VCAA.
- Whole pages may be removed from the printed booklet for distribution, provided only whole pages are removed.

Teacher guidance — before you begin

CP6 gathers the evidence Chapter 6 has been building: sorting and comparing data represented by objects and images, in response to questions that have **only 2 outcomes** and relate to familiar situations (6A, `VC2MFDST01`). The teacher and the student ask a group a question; the group answers; the student helps to sort the answers into two groups, count them, make a simple display, and then say or show which group has more, which has less, or whether the groups are the same. That a picture can answer a question about a group is the heart of this checkpoint.

The 2-outcome constraint is the CD's own and is easy to breach. *Do you like cheese?* has 2 outcomes: yes, no. *Do you prefer apples or bananas?* has 2 outcomes: apples, bananas. A question with three answers is out of scope here. Either form — yes/no or a choice between two — satisfies the CD.

Sorting and comparing are scored as separate observations (TOC §7): marks 1–4 score sorting (participating in the collection, sorting into two groups, making the display, counting with one number word per item); marks 5–6 score comparing (which has more, less, or the same; answering the question from the display with a reason).

What CP6 never asks. No question with more than 2 outcomes. No tally marks, frequency tables or graphs with a numbered axis — data is represented by objects and images only. No chance, no probability, no "what might happen". The student does not design or carry out a survey alone — the student participates in the collection with the teacher. The counts are small: no more than 10 responses, inside this book's number range.

Vary the question and the materials across occasions — cheese one day, dogs another day, colours a third day — so the judgement is about the mathematics, not one familiar set of objects.

The observed task — script in 6 steps

Materials: counters or picture cards, two hoops or mats, yes/no cards (or two choice cards, such as apple and banana), and the student's communication system.

1. Choose a 2-outcome question with the student, such as *Do you like cheese?* Show the two answer cards. Say: "We will ask our group. Yes or no."
2. Ask the group. Each person answers and puts a counter in one of the two hoops. Say to the student: "Help sort the answers." The student places, points, gazes, or directs, with or without assistance.
3. Say: "How many said yes? How many said no?" Count each group together, one number word per counter.
4. Say: "Let's make a picture." Line the counters up in two rows, one row under the other, with the answer card at the start of each row.
5. Say: "Which has more? Or are they the same?" Wait for the answer in any modality.
6. Say: "How do you know?" Wait for the reason — the longer row, the leftover counters, or the two counts.

The six marks

Rubric wording in full on `_MathsADD_CP6_Rubric.md`, in the language of the achievement standard extract carried on `VC2MFDST01`: *"Students sort and compare data collected in response to questions in familiar contexts."*

Mark	Idea scored	Look for
1	sorting	participates in collecting responses to a question in a familiar context — answers for themselves, or helps gather the group's answers; the question has only 2 outcomes
2	sorting	sorts the objects or images into two groups, one group for each outcome, with one item placed per response
3	sorting	helps make a simple display of the sorted responses — two rows, or two collections
4	sorting	counts the responses in each group with one number word per item to say how many in each
5	comparing	compares the two groups — says or shows which has more, which has less, or that they are the same
6	comparing	answers a question from the display — *Which has more?* — and shows or tells how they know: the longer row, the leftovers, or the two counts

Award each mark where the observation is met on the student's best sustained response across at least three occasions, with any level of assistance. Award 0 only where no observable response is seen across the occasions.

Response set — how the student can answer

- **Object action:** place a counter or card in a hoop or row; answer the question by placing their own counter; line the counters up to make the display; touch each counter while counting.
- **Gesture, eye-gaze, switch or AAC:** direct the sorting by gaze or switch with the adult placing; point to or gaze at the row with more; choose *more*, *less*, *same*, *yes* or *no* on the device.
- **Speech or sign:** say or sign their answer, the counts, and *more*, *less* or *same* with the reason.

After the third occasion

Transfer each mark from the recording sheet to the summary there: sorting /4, comparing /2 — checkpoint total /6. The rubric wording and the occasion record are on `_MathsADD_CP6_Rubric.md`. `VC2MFDST01` appears again in the end-of-level review (REV), worth 2 marks, before reporting against the Level D achievement standard. This chapter hands forward to the Foundation book's `VC2MFST01`, where the student collects the data themselves; at Level D they participate, sort and compare.

Checkpoint 6 (CP6) — Rubric and recording sheet

Mathematics Towards Foundation D · ClassBasics workbook · Level D

Chapter 6 — Statistics: sorting and comparing data with 2 outcomes. This sheet is for the teacher to fill in. The student reads nothing and writes nothing here. Whole pages may be removed from the printed booklet for distribution, provided only whole pages are removed.

Instrument	Checkpoint 6 (CP6) — scoring rubric and observation record
Book and band	ClassBasics *Mathematics Towards Foundation D* (`BK_MathsADD`) — Foundation Level D, Towards Foundation. A progression level, not a year level; no age implied.
Content descriptions assessed	`VC2MFDST01` — scored on a 6-mark analytic rubric; sorting (marks 1–4) and comparing (marks 5–6) scored as separate observations (TOC §7)
Marks	6
Conditions	Observed participation in a two-outcome collection, untimed; evidence across at least three separate occasions; the recorded marks are the student's best sustained response. School-designed assessment instrument, not a VCAA instrument; not reviewed or endorsed by VCAA.

Student: _____ Communication system used: _____

The scoring model — the whole of the mark scheme

`VC2MFDST01` is the only content description in Chapter 6 and carries **6 marks** (TOC §7: 4 marks per owned CD, with a floor of 6 marks per chapter), scored on one analytic rubric. Sorting (marks 1–4) and comparing (marks 5–6) are scored as **separate observations**, as TOC §7 requires. Every mark is awarded or not awarded on the student's **best sustained** response across **at least three separate occasions**:

- **1 mark** — the observation described for that mark is seen, in any modality, **with any level of assistance**. Assisted and partial responses score: hand-over-hand, partial physical prompt, co-active movement, eye-gaze and aided communication (AAC device, picture exchange, sign) are legitimate observed responses at Level D. A rubric that scores only independent performance has failed the achievement standard.
- **0 marks** — no observable response yet, across the occasions. This is not a failure. Record what was offered, keep teaching, then observe again.

Rules that bind the judgement:

- A single observation is not evidence at Level D. Response varies with fatigue, seizure activity, medication, sensory load, pain, and whether the student's communication system is to hand.
- The recorded judgement is the student's **best sustained** response — not an average, and not the most recent occasion.
- Nothing is timed; nothing is written. Vary the question and the materials across occasions so the judgement is about the mathematics, not one familiar set of objects.
- The question always has only 2 outcomes — yes/no or a choice between two. The counts are small: no more than 10 responses.

Record A — `VC2MFDST01` · sorting and comparing data with 2 outcomes · 6 marks

Content description (quoted verbatim from `maths_AD.json`): *"sort and compare data represented by objects and images in response to questions that have only 2 outcomes and relate to familiar situations."*

Achievement standard extract carried on this CD (quoted verbatim): *"Students sort and compare data collected in response to questions in familiar contexts."*

Sorting — marks 1–4

Mark	Look for	Occasion 1	Occasion 2	Occasion 3	Further	Best sustained
1	The student participates in collecting responses to a question in a familiar context — answers for themselves, or helps gather the group's answers. The question has only 2 outcomes.					/1
2	The student sorts the objects or images into two groups, one group for each outcome, with one item placed per response.					/1
3	The student helps make a simple display of the sorted responses — two rows, or two collections.					/1
4	The student counts the responses in each group with one number word per item to say how many in each.					/1

Comparing — marks 5–6

Mark	Look for	Occasion 1	Occasion 2	Occasion 3	Further	Best sustained
5	The student compares the two groups — says or shows which has more, which has less, or that they are the same.					/1
6	The student answers a question from the display — *Which has more?* — and shows or tells how they know: the longer row, the leftovers, or the two counts.					/1

Occasion record

For each occasion, record: the question asked and its two outcomes, the size of the group, the two counts, the display made, the comparison words (*more*, *less*, *same*) in the student's own modality, the reason the student showed, and the support given.

Occasion	Date	Question and outcomes	Group size	Counts	What the student did	Modality and support
1						
2						
3						
Further						

Checkpoint 6 summary

Idea scored	Marks	Best sustained mark
Sorting — participate, sort into two groups, make the display, count one number word per item	4	___ / 4
Comparing — which has more, less, or the same; answer the question with a reason	2	___ / 2
Checkpoint 6 total		**___ / 6**

VC2MFDST01 is assessed again, worth 2 marks, in the end-of-level review (REV) before reporting against the Level D achievement standard.

Recorded by: _____ **Date:** _____