

Questions, counts, and graphs



GRADE 4 | NC.4.MD.4

Seven teaching sections • 30 choice tasks • 30 open/performance tasks

Teacher scripts, original models, student workspaces, authentic performance records, worked keys and access supports.

Select tasks across several lessons. The 60-item bank is not a one-sitting test.

Current 2026-27 / 2027-28 NC standards.

Free sample | Contents

NC.4.MD.4 | Fourth Grade mathematics

This sample contains 22 complete selected pages from the 110-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-18, 47-48, 80, 95

Representative activities

M01: sample PDF page(s) 18; original page(s) 17

M02: sample PDF page(s) 19; original page(s) 18

O01: sample PDF page(s) 20; original page(s) 47

O02: sample PDF page(s) 21; original page(s) 48

Selected teacher prompts and keys: original page(s) 2, 80, 95

Using this sample

Read the preparation and access guidance before using a selected activity.
Keep teacher keys and private preparation pages separate from student copies.
Use the original resource contents to see the scope of the complete packet.

Complete paid download

The complete resource includes the full PDF task bank and teaching materials.

TEACHER GUIDE

Contents and teaching route

Teacher guide: exact standard and targets; preparation/access; worked model and anchor chart; seven section scripts; reusable organizers.

Student bank: M01-M30 choice practice, followed by O01-O30 open/performance tasks. Every task has a target and worked key in the teacher-only section. Print only selected pages.

Suggested sequence: Day 1 warm-up + I Do (20 minutes); Day 2 We Do + collaborative practice (28 minutes); Day 3 independent practice + exit (22 minutes). Add 10-minute small-group reteaching based on observed needs.

Reserve extra sessions for actual tool use or data collection. Return to all targets using fresh tasks. Supported teaching is not independent assessment.

After the bank: target coverage, instructional rubric, blank individual record, worked keys, sources and implementation notes.

Original visual models show equal units, timeline intervals, conversion segments or data frequencies. They support reasoning; they are not physical measuring instruments.

TEACHER GUIDE

The exact NC standard

NC.4.MD.4: Represent and interpret data using whole numbers.

- Collect data by asking a question that yields numerical data.
- Make a representation of data and interpret data in a frequency table, scaled bar graph, and/or line plot.
- Determine whether a survey question will yield categorical or numerical data.

Learning targets

A | Collect whole-number numerical data by asking a question.

B | Represent and interpret whole-number data in frequency tables, scaled bar graphs and line plots.

C | Distinguish categorical from numerical survey questions.

Essential question: How does a tool or representation help us justify a measurement or data conclusion?

TEACHER GUIDE

Prepare and include

Prerequisites: Count whole numbers, tally once per observation, read equal-interval axes and compare counts.

Materials: Large safe blocks, eight opaque cups or paper bags, pencils and supplied data records. Teacher prepares counts 1-6 per cup without displaying a frequency summary. No real children's personal data are collected.

Access: neutral read-aloud, enlarged print, high contrast, pointing, speech, signed/AAC response or scribing. Students may direct an adult to manipulate a tool while controlling its setup and reading.

Do not perform the mathematical skill for the learner. Name and record any answer-supplying cue separately. If an inaccessible task does not show interpretable evidence, record N/O and arrange another valid opportunity.

What to keep: Keep the question, actual raw object counts, frequency table, graph/line plot and interpretation. Observe the collection, and classify both numerical and categorical questions.

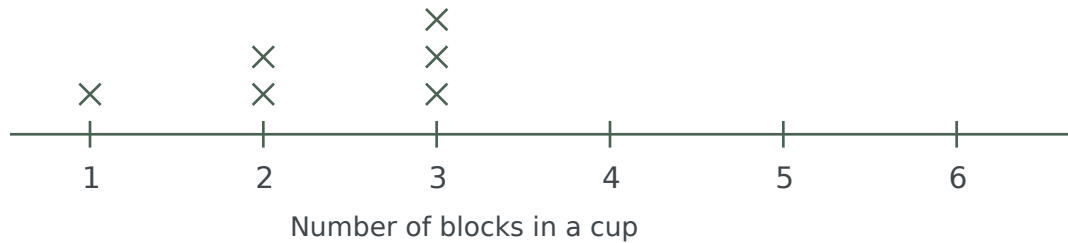
Misconception response: If frequencies are summed as data values, distinguish the number of cups from the number of blocks. If a code is treated as a quantity, ask whether arithmetic on the code has meaning.

TEACHER GUIDE

Worked teacher model

Instructional block counts are 1, 2, 2, 3, 3, 3. Ask: "How many blocks are in each cup?" This yields numerical data. Frequencies for 1, 2, 3 are 1, 2, 3. Six X marks appear in the line plot. A question about block color yields categories instead.

Each X = one cup



Say: "Show the unit, interval or group that supports each step. Then check against the original question."

TEACHER GUIDE

Anchor chart | reasoning tools

Numerical data answer how many/how much; categorical data describe groups or kinds. In a line plot, each X represents one observation. In a frequency bar graph, height counts observations, not the measured value.

1. Identify the quantity, question and unit.
2. Choose or build a representation with equal intervals or groups.
3. Keep the labels connected to their meaning.
4. Explain the calculation and check in context.

Teaching prompt: "Where do you see your reasoning in the model?" During independent assessment, do not point to the part that supplies the answer.

TEACHER GUIDE

Warm-up | teaching script

Purpose and allocation: Warm-up; M01-M04 and O01-O04. Select tasks over several lessons; do not assign the complete bank at once.

About 8 minutes: open for 2 minute(s), explore selected M01 and O01 for 3 minutes, and record/reflect for 3 minute(s). Physical collection or measurement can take a separate session.

Say: "What is being measured or counted? What does each unit or mark mean? How could you check?" Invite a learner to explain a choice; ask others to show a second representation. Partners each record their own solution.

Listen/look for: Keep the question, actual raw object counts, frequency table, graph/line plot and interpretation. Observe the collection, and classify both numerical and categorical questions.

Respond to a misconception: If frequencies are summed as data values, distinguish the number of cups from the number of blocks. If a code is treated as a quantity, ask whether arithmetic on the code has meaning.

Access: neutral read-aloud, enlarged diagrams, signed/AAC/oral responses, scribe or learner-directed tool manipulation are allowed. Record access separately from mathematical help.

Early finisher: create a new example with the same constraints, solve it and explain why your representation works.

Close: record exact words/actions, item, target, access, mathematical cues and one next teaching step. Use fresh independent evidence after reteaching.

TEACHER GUIDE

I Do | teaching script

Purpose and allocation: I Do; M05-M08 and O05-O08. Select tasks over several lessons; do not assign the complete bank at once.

About 12 minutes: open for 2 minute(s), explore selected M05 and O05 for 7 minutes, and record/reflect for 3 minute(s). Physical collection or measurement can take a separate session.

Say: "What is being measured or counted? What does each unit or mark mean? How could you check?" Demonstrate the complete worked model on the model page, saying each step aloud. Keep this supported example separate from assessment.

Listen/look for: Keep the question, actual raw object counts, frequency table, graph/line plot and interpretation. Observe the collection, and classify both numerical and categorical questions.

Respond to a misconception: If frequencies are summed as data values, distinguish the number of cups from the number of blocks. If a code is treated as a quantity, ask whether arithmetic on the code has meaning.

Access: neutral read-aloud, enlarged diagrams, signed/AAC/oral responses, scribe or learner-directed tool manipulation are allowed. Record access separately from mathematical help.

Early finisher: create a new example with the same constraints, solve it and explain why your representation works.

Close: record exact words/actions, item, target, access, mathematical cues and one next teaching step. Use fresh independent evidence after reteaching.

TEACHER GUIDE

We Do | teaching script

Purpose and allocation: We Do; M09-M13 and O09-O13. Select tasks over several lessons; do not assign the complete bank at once.

About 15 minutes: open for 2 minute(s), explore selected M09 and O09 for 10 minutes, and record/reflect for 3 minute(s). Physical collection or measurement can take a separate session.

Say: "What is being measured or counted? What does each unit or mark mean? How could you check?" Invite a learner to explain a choice; ask others to show a second representation. Partners each record their own solution.

Listen/look for: Keep the question, actual raw object counts, frequency table, graph/line plot and interpretation. Observe the collection, and classify both numerical and categorical questions.

Respond to a misconception: If frequencies are summed as data values, distinguish the number of cups from the number of blocks. If a code is treated as a quantity, ask whether arithmetic on the code has meaning.

Access: neutral read-aloud, enlarged diagrams, signed/AAC/oral responses, scribe or learner-directed tool manipulation are allowed. Record access separately from mathematical help.

Early finisher: create a new example with the same constraints, solve it and explain why your representation works.

Close: record exact words/actions, item, target, access, mathematical cues and one next teaching step. Use fresh independent evidence after reteaching.

TEACHER GUIDE

Collaborative practice | teaching script

Purpose and allocation: Collaborative practice; M14-M18 and O14-O18. Select tasks over several lessons; do not assign the complete bank at once.

About 13 minutes: open for 2 minute(s), explore selected M14 and O14 for 8 minutes, and record/reflect for 3 minute(s). Physical collection or measurement can take a separate session.

Say: "What is being measured or counted? What does each unit or mark mean? How could you check?" Invite a learner to explain a choice; ask others to show a second representation. Partners each record their own solution.

Listen/look for: Keep the question, actual raw object counts, frequency table, graph/line plot and interpretation. Observe the collection, and classify both numerical and categorical questions.

Respond to a misconception: If frequencies are summed as data values, distinguish the number of cups from the number of blocks. If a code is treated as a quantity, ask whether arithmetic on the code has meaning.

Access: neutral read-aloud, enlarged diagrams, signed/AAC/oral responses, scribe or learner-directed tool manipulation are allowed. Record access separately from mathematical help.

Early finisher: create a new example with the same constraints, solve it and explain why your representation works.

Close: record exact words/actions, item, target, access, mathematical cues and one next teaching step. Use fresh independent evidence after reteaching.

TEACHER GUIDE

Independent practice | teaching script

Purpose and allocation: Independent practice; M19-M23 and O19-O23. Select tasks over several lessons; do not assign the complete bank at once.

About 17 minutes: open for 2 minute(s), explore selected M19 and O19 for 12 minutes, and record/reflect for 3 minute(s). Physical collection or measurement can take a separate session.

Say: "Show what you know. Choose your own method and explain how you checked." Read words neutrally. Do not name an operation, point to a graph value, align a tool, or supply a unit relationship.

Listen/look for: Keep the question, actual raw object counts, frequency table, graph/line plot and interpretation. Observe the collection, and classify both numerical and categorical questions.

Respond to a misconception: If frequencies are summed as data values, distinguish the number of cups from the number of blocks. If a code is treated as a quantity, ask whether arithmetic on the code has meaning.

Access: neutral read-aloud, enlarged diagrams, signed/AAC/oral responses, scribe or learner-directed tool manipulation are allowed. Record access separately from mathematical help.

Early finisher: create a new example with the same constraints, solve it and explain why your representation works.

Close: record exact words/actions, item, target, access, mathematical cues and one next teaching step. Use fresh independent evidence after reteaching.

TEACHER GUIDE

Small-group reteach | teaching script

Purpose and allocation: Small-group reteach; M24-M27 and O24-O27. Select tasks over several lessons; do not assign the complete bank at once.

About 10 minutes: open for 2 minute(s), explore selected M24 and O24 for 5 minutes, and record/reflect for 3 minute(s). Physical collection or measurement can take a separate session.

Say: "What is being measured or counted? What does each unit or mark mean? How could you check?" Invite a learner to explain a choice; ask others to show a second representation. Partners each record their own solution.

Listen/look for: Keep the question, actual raw object counts, frequency table, graph/line plot and interpretation. Observe the collection, and classify both numerical and categorical questions.

Respond to a misconception: If frequencies are summed as data values, distinguish the number of cups from the number of blocks. If a code is treated as a quantity, ask whether arithmetic on the code has meaning.

Access: neutral read-aloud, enlarged diagrams, signed/AAC/oral responses, scribe or learner-directed tool manipulation are allowed. Record access separately from mathematical help.

Early finisher: create a new example with the same constraints, solve it and explain why your representation works.

Close: record exact words/actions, item, target, access, mathematical cues and one next teaching step. Use fresh independent evidence after reteaching.

TEACHER GUIDE

Exit ticket | teaching script

Purpose and allocation: Exit ticket; M28-M30 and O28-O30. Select tasks over several lessons; do not assign the complete bank at once.

About 5 minutes: open for 1 minute(s), explore selected M28 and O28 for 3 minutes, and record/reflect for 1 minute(s). Physical collection or measurement can take a separate session.

Say: "Show what you know. Choose your own method and explain how you checked." Read words neutrally. Do not name an operation, point to a graph value, align a tool, or supply a unit relationship.

Listen/look for: Keep the question, actual raw object counts, frequency table, graph/line plot and interpretation. Observe the collection, and classify both numerical and categorical questions.

Respond to a misconception: If frequencies are summed as data values, distinguish the number of cups from the number of blocks. If a code is treated as a quantity, ask whether arithmetic on the code has meaning.

Access: neutral read-aloud, enlarged diagrams, signed/AAC/oral responses, scribe or learner-directed tool manipulation are allowed. Record access separately from mathematical help.

Early finisher: create a new example with the same constraints, solve it and explain why your representation works.

Close: record exact words/actions, item, target, access, mathematical cues and one next teaching step. Use fresh independent evidence after reteaching.

TEACHER ONLY | OBJECTS, NOT PERSONAL DATA

Prepare collection and records

Prepare eight cups with 1-6 large safe blocks in each. Vary counts between collection tasks. Ask learners to pose the supplied how-many question to a partner and collect answers by jointly counting each cup. Never collect real children's names, ages, addresses, health information, preferences or other personal facts.

Record only cup numbers and block counts. The question yields numerical data because the response is a count. Contrast with a question about object colors or kinds; no personal survey is needed.

Privately retain the actual counts. Verify the table total is eight cups and that all marks/bars match the collected data. Learners may choose a bar scale of 1 or 2 cups; odd frequencies on a scale of 2 end halfway between gridlines.

The supplied task displays are invented instructional data. Actual collection tasks produce variable data; assess the evidence against what was actually counted.

STUDENT RESOURCE

Raw collection record

Question: How many blocks are in each prepared cup?

Cup number	Block count
1	
2	
3	
4	
5	
6	
7	
8	

Frequency table: block count / number of cups

1 / ____ 2 / ____ 3 / ____

4 / ____ 5 / ____ 6 / ____

Check: frequency sum = ____ cups

My interpretation and check:

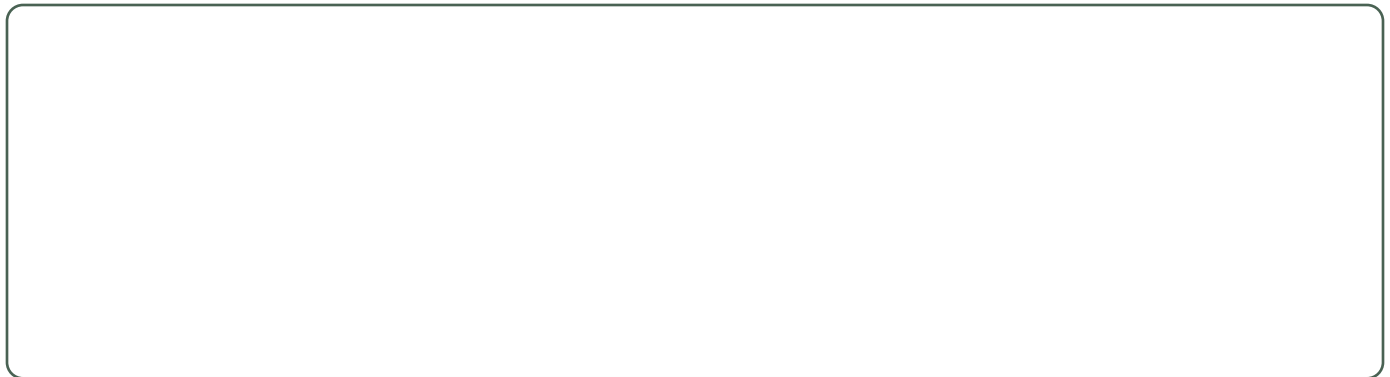
STUDENT RESOURCE

Reusable representation organizer

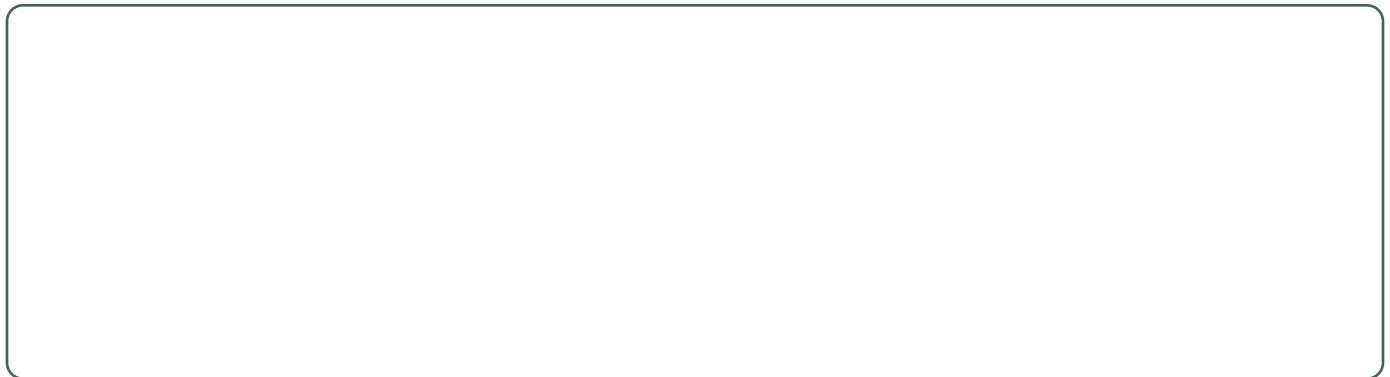
Question and raw object data



Table / graph / line plot with labels



Interpretation and check

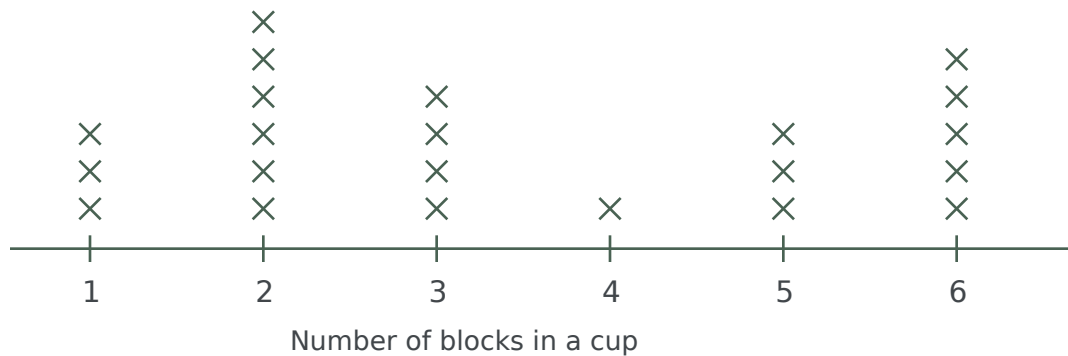


STUDENT CHOICE PRACTICE

M01 | Warm-up

The display records instructional cup data. How many cups contain exactly 2 blocks?

Each X = one cup



A. 3 cups

B. 6 cups

C. 9 cups

D. 8 cups

Explain or show how you decided.

STUDENT CHOICE PRACTICE

M02 | Warm-up

What type of data does this question yield? "What kind of toy vehicle is shown?"

- A. No data can be collected
- B. Categorical data
- C. Numerical data
- D. Both types in every response

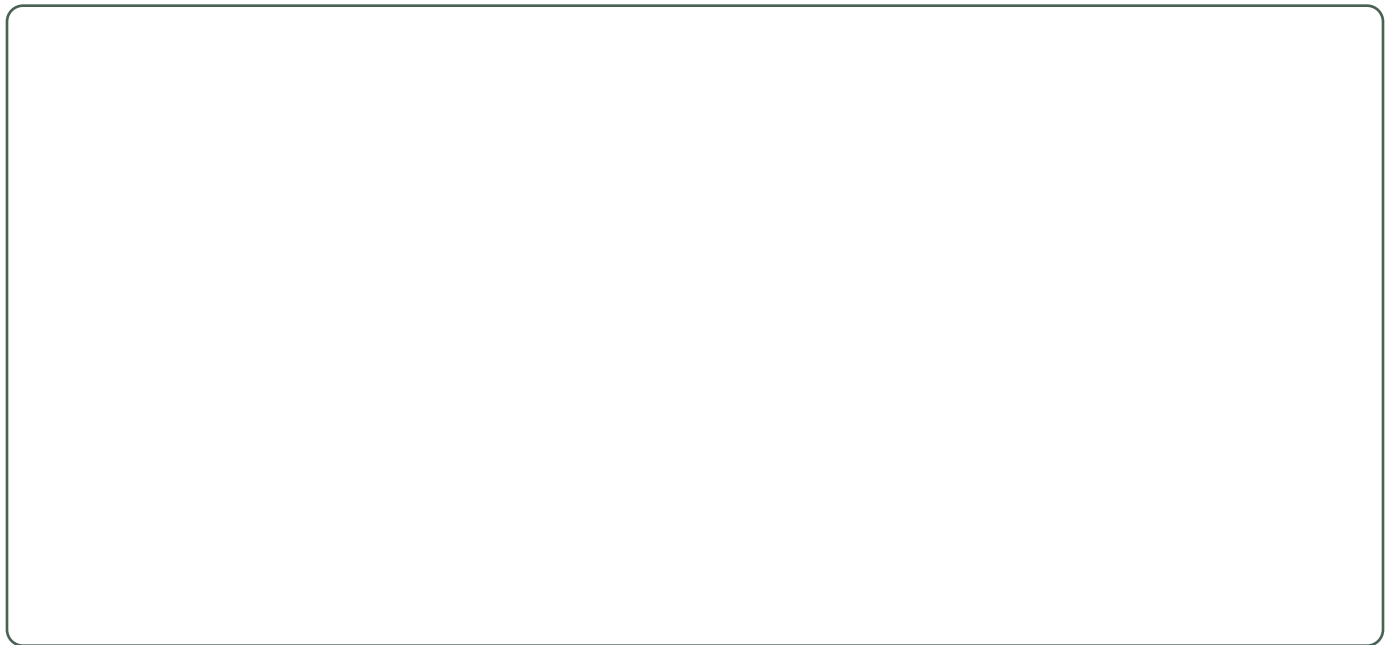
Explain or show how you decided.

STUDENT INDIVIDUAL PERFORMANCE

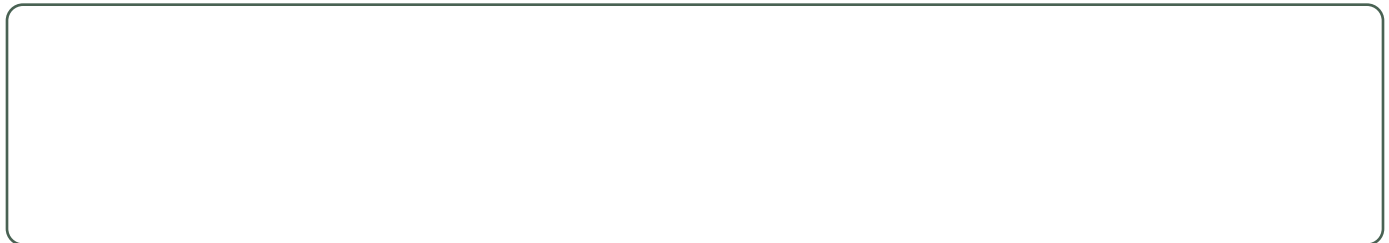
001 | Warm-up

Ask a partner, "How many blocks are in each prepared cup?" Count the blocks in eight cups together, recording one whole-number answer per cup. Use only the objects, no personal facts. Make a frequency table and line plot. Interpret the most frequent block count and explain how you checked the display.

Use the raw collection record, then draw your display here.



Interpretation and check:



STUDENT INDIVIDUAL PERFORMANCE

002 | Warm-up

The display records instructional cup data. How many cups were observed in all? Make a different representation of the same data in your work area. Label it and explain your answer.

Blocks in a cup	Number of cups
1	3
2	4
3	5
4	2
5	5
6	1

My model / table / equation / answer

My reasoning and check

TEACHER ONLY | KEEP SEPARATE FROM STUDENT PAGES

M01-M02 | worked keys

M01 | B. 6 cups

The frequency at 2 blocks is 6; 6 cups contain that amount.

Distractor checks: A (3 cups): Uses 3 unit(s) too few. C (9 cups): Uses 3 unit(s) too many. D (8 cups): Uses 2 unit(s) too many.

Target B: Represent and interpret whole-number data in frequency tables, scaled bar graphs and line plots.

M02 | B. Categorical data

Categorical data. The responses name kinds or groups, not measured quantities.

Distractor checks: A (No data can be collected): The question can be answered using the given objects. C (Numerical data): Confuses quantity with category. D (Both types in every response): The requested response has one type, not both.

Target C: Distinguish categorical from numerical survey questions.

TEACHER ONLY | KEEP SEPARATE FROM STUDENT PAGES

001-002 | worked keys

001 | Expected performance

Variable real object data. Retain eight raw counts, each 1-6. Frequencies for values 1-6 must sum to 8. Each X represents one cup in a line plot; in a bar graph use an equal labeled scale from zero and bars matching all six frequencies. State every most-frequent value if tied. Observe asking the numerical question and collecting counts, not merely copying invented data.

Target A: Collect whole-number numerical data by asking a question.

002 | Expected performance

$3 + 4 + 5 + 2 + 5 + 1 = 20$ cups. Add frequencies, counting each cup once. The new display must preserve frequencies 3, 4, 5, 2, 5, 1 for block counts 1-6, with a title, labels and appropriate scale/key.

Target B: Represent and interpret whole-number data in frequency tables, scaled bar graphs and line plots.