

Scaled graphs tell stories



GRADE 3 | NC.3.MD.3

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

Includes teacher scripts, models, student organizers, original visuals, worked keys and individual evidence records.

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

Aligned to the current 2026-27 / 2027-28 NC standards.

Free sample | Contents

NC.3.MD.3 | Third Grade mathematics

This sample contains 21 complete selected pages from the 109-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-17, 46-47, 79, 94

Representative activities

M01: sample PDF page(s) 17; original page(s) 16

M02: sample PDF page(s) 18; original page(s) 17

O01: sample PDF page(s) 19; original page(s) 46

O02: sample PDF page(s) 20; original page(s) 47

Selected teacher prompts and keys: original page(s) 79, 94

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 reference: exact standard and targets; prerequisites and access; worked model; seven section scripts; reusable organizers.

Student bank: M01-M30 are choice practice, O01-O30 are open/performance tasks. Print only selected pages. Teacher-only keys and evidence records follow.

Suggested route: Day 1 warm-up + I Do (about 20 minutes); Day 2 We Do + collaborative practice (about 28 minutes); Day 3 independent practice + exit (about 22 minutes). Use a separate 10-minute reteach after interpreting evidence.

Physical measurement and survey collection need additional sessions. Select one or two stations/opportunities at a time, returning until every required quantity or representation is observed.

Worked examples and partner-supported responses are practice. Use fresh individual items to collect independent evidence. Recognition alone cannot establish the ability to build, measure, collect or explain.

Each item names its target in the teacher key. The standard-to-evidence page describes which observations complete the coverage.

TEACHER GUIDE

The exact NC standard

NC.3.MD.3: Represent and interpret scaled picture and bar graphs:

- Collect data by asking a question that yields data in up to four categories.
- Make a representation of data and interpret data in a frequency table, scaled picture graph, and/or scaled bar graph with axes provided.
- Solve one and two-step “how many more” and “how many less” problems using information from these graphs.

Learning targets

A | Collect data by asking a question with up to four categories.

B | Represent and interpret frequency tables, scaled picture graphs and scaled bar graphs with axes provided.

C | Solve one- and two-step more/less problems from scaled graphs.

Essential question: How can a representation, tool or explanation show that an answer makes sense?

TEACHER GUIDE

Prepare, include, and notice

Prerequisites: Sort responses into categories; tally once per response; add/subtract whole numbers; skip-count by a scale factor.

Materials: Pencils, survey record and supplied axes. Real collection uses 8-16 consenting classmates/adults; names are unnecessary. All supplied club data are invented for instruction. Do not treat invented graph data as actual class preferences.

Access: read directions neutrally; offer enlarged print, high contrast, speech, pointing, signed/AAC response or a scribe. Do not supply fraction-size reasoning, read the clock hands, name the operation, choose the graph scale or perform a measurement for the learner.

Record answer-supplying cues separately. Physical access may use child-directed tool manipulation when the learner controls placement and reading. If access prevents seeing the skill, record N/O and arrange a valid alternative.

Misconception response: If a student counts symbols as votes, cover all but one symbol and read the key aloud during teaching. Rebuild the row as equal groups. For bars, trace horizontally to the axis; do not count gridlines including zero. Use a fresh graph without this cue for independent evidence.

What to keep: Keep a real raw survey record, frequency table and scaled bar representation. Collect a scaled picture graph, interpretations of each graph type, and one- and two-step more/less explanations.

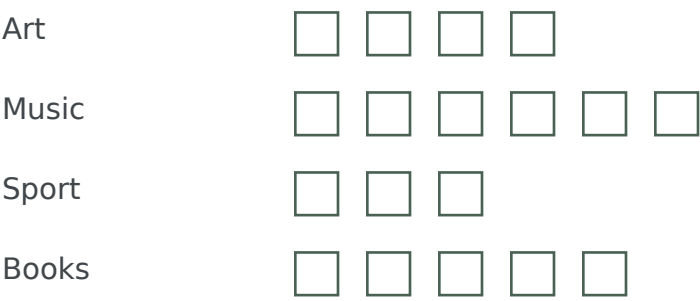
TEACHER GUIDE

Worked teacher model

Use Art 8, Music 12, Sport 6, Books 10. Say: "Each square stands for 2 votes. Art needs 4 squares, Music 6, Sport 3 and Books 5." Model a bar graph with ticks 0, 2, 4, ... 12: bars end at 8, 12, 6, 10. Then solve: Art and Music have $8 + 12 = 20$ votes; $20 - 6 = 14$ more than Sport. One symbol is not one vote when the key says 2.

Votes by category

Key: one square = 2 votes



Teacher talk: Ask one clear question with no more than four categories. Record one response per person. Tally and total the table. Choose a scale; label title, categories, units and key/axis. Make symbols or bars match frequencies. For comparisons, find the relevant values, combine if needed, then subtract.

REUSABLE TEACHING REFERENCE

Anchor chart | make it make sense

Ask one clear question with no more than four categories. Record one response per person. Tally and total the table. Choose a scale; label title, categories, units and key/axis. Make symbols or bars match frequencies. For comparisons, find the relevant values, combine if needed, then subtract.

1. Name what the numbers, parts, marks or symbols represent.
2. Build or read a representation using equal units and the correct whole/scale.
3. Explain the mathematical decision, not only the final answer.
4. Check the result against the original situation.

Teaching prompt: "Show me the part of your model or tool that supports your claim." For independent evidence, ask this neutrally without pointing to the needed part.

TEACHER GUIDE

Warm-up | teaching script

Purpose: Activate the prerequisite with one familiar representation. Bank allocation: M01-M04 and O01-O04. These are choices across lessons, not a single sitting.

Selected core, about 8 minutes: first 2 minute(s) introduce the target and materials; next 3 minutes work with M01 and O01; last 3 minute(s) compare explanations and record evidence. Extend the physical measurement or survey task to a separate session when needed.

Say and do: Ask: "What does one symbol or one axis interval represent? Which categories matter? Do we combine before comparing?" Keep raw survey responses and frequencies visible during teaching. Match equal groups to picture symbols and axis heights.

Begin with a neutral reading of the directions. Wait for the learner to choose a method; ask "How do you know?" without naming the answer or operation.

Listen/look for: Keep a real raw survey record, frequency table and scaled bar representation. Collect a scaled picture graph, interpretations of each graph type, and one- and two-step more/less explanations.

If an error appears: If a student counts symbols as votes, cover all but one symbol and read the key aloud during teaching. Rebuild the row as equal groups. For bars, trace horizontally to the axis; do not count gridlines including zero. Use a fresh graph without this cue for independent evidence.

Access: allow pointing, speech, signed/AAC answers, dictation or child-directed manipulation. Record access separately from cues that name the operation, count marks, set the scale or select pieces.

Early finisher: construct a new example with the same constraints, solve it and explain why the representation is valid. Record item, actual words/actions, support and one fresh follow-up task.

TEACHER GUIDE

I Do | teaching script

Purpose: Make the reasoning visible; responses here are supported practice. Bank allocation: M05-M08 and O05-O08. These are choices across lessons, not a single sitting.

Selected core, about 12 minutes: first 2 minute(s) introduce the target and materials; next 7 minutes work with M05 and O05; last 3 minute(s) compare explanations and record evidence. Extend the physical measurement or survey task to a separate session when needed.

Say and do: Ask: "What does one symbol or one axis interval represent? Which categories matter? Do we combine before comparing?" Keep raw survey responses and frequencies visible during teaching. Match equal groups to picture symbols and axis heights.

Use the complete worked model on the model page. Think aloud, point to each representation, then invite learners to restate the reasoning. Never score this demonstration as independent evidence.

Listen/look for: Keep a real raw survey record, frequency table and scaled bar representation. Collect a scaled picture graph, interpretations of each graph type, and one- and two-step more/less explanations.

If an error appears: If a student counts symbols as votes, cover all but one symbol and read the key aloud during teaching. Rebuild the row as equal groups. For bars, trace horizontally to the axis; do not count gridlines including zero. Use a fresh graph without this cue for independent evidence.

Access: allow pointing, speech, signed/AAC answers, dictation or child-directed manipulation. Record access separately from cues that name the operation, count marks, set the scale or select pieces.

Early finisher: construct a new example with the same constraints, solve it and explain why the representation is valid. Record item, actual words/actions, support and one fresh follow-up task.

TEACHER GUIDE

We Do | teaching script

Purpose: Share the mathematical decisions, then ask each learner to explain. Bank allocation: M09-M13 and O09-O13. These are choices across lessons, not a single sitting.

Selected core, about 15 minutes: first 2 minute(s) introduce the target and materials; next 10 minutes work with M09 and O09; last 3 minute(s) compare explanations and record evidence. Extend the physical measurement or survey task to a separate session when needed.

Say and do: Ask: "What does one symbol or one axis interval represent? Which categories matter? Do we combine before comparing?" Keep raw survey responses and frequencies visible during teaching. Match equal groups to picture symbols and axis heights.

Begin with a neutral reading of the directions. Wait for the learner to choose a method; ask "How do you know?" without naming the answer or operation.

Listen/look for: Keep a real raw survey record, frequency table and scaled bar representation. Collect a scaled picture graph, interpretations of each graph type, and one- and two-step more/less explanations.

If an error appears: If a student counts symbols as votes, cover all but one symbol and read the key aloud during teaching. Rebuild the row as equal groups. For bars, trace horizontally to the axis; do not count gridlines including zero. Use a fresh graph without this cue for independent evidence.

Access: allow pointing, speech, signed/AAC answers, dictation or child-directed manipulation. Record access separately from cues that name the operation, count marks, set the scale or select pieces.

Early finisher: construct a new example with the same constraints, solve it and explain why the representation is valid. Record item, actual words/actions, support and one fresh follow-up task.

TEACHER GUIDE

Collaborative practice | teaching script

Purpose: Partners compare methods; each learner records an individual response. Bank allocation: M14-M18 and O14-O18. These are choices across lessons, not a single sitting.

Selected core, about 13 minutes: first 2 minute(s) introduce the target and materials; next 8 minutes work with M14 and O14; last 3 minute(s) compare explanations and record evidence. Extend the physical measurement or survey task to a separate session when needed.

Say and do: Ask: "What does one symbol or one axis interval represent? Which categories matter? Do we combine before comparing?" Keep raw survey responses and frequencies visible during teaching. Match equal groups to picture symbols and axis heights.

Begin with a neutral reading of the directions. Wait for the learner to choose a method; ask "How do you know?" without naming the answer or operation.

Listen/look for: Keep a real raw survey record, frequency table and scaled bar representation. Collect a scaled picture graph, interpretations of each graph type, and one- and two-step more/less explanations.

If an error appears: If a student counts symbols as votes, cover all but one symbol and read the key aloud during teaching. Rebuild the row as equal groups. For bars, trace horizontally to the axis; do not count gridlines including zero. Use a fresh graph without this cue for independent evidence.

Access: allow pointing, speech, signed/AAC answers, dictation or child-directed manipulation. Record access separately from cues that name the operation, count marks, set the scale or select pieces.

Early finisher: construct a new example with the same constraints, solve it and explain why the representation is valid. Record item, actual words/actions, support and one fresh follow-up task.

TEACHER GUIDE

Independent practice | teaching script

Purpose: Collect fresh evidence without supplying mathematical steps. Bank allocation: M19-M23 and O19-O23. These are choices across lessons, not a single sitting.

Selected core, about 17 minutes: first 2 minute(s) introduce the target and materials; next 12 minutes work with M19 and O19; last 3 minute(s) compare explanations and record evidence. Extend the physical measurement or survey task to a separate session when needed.

Say and do: Say: "Work on the selected task on your own. Show your thinking in a way that works for you." Read directions neutrally if needed. Do not point to a part, count ticks, name an operation, supply a scale or align the tool. Ask only "How do you know?" after the attempt.

Begin with a neutral reading of the directions. Wait for the learner to choose a method; ask "How do you know?" without naming the answer or operation.

Listen/look for: Keep a real raw survey record, frequency table and scaled bar representation. Collect a scaled picture graph, interpretations of each graph type, and one- and two-step more/less explanations.

If an error appears: If a student counts symbols as votes, cover all but one symbol and read the key aloud during teaching. Rebuild the row as equal groups. For bars, trace horizontally to the axis; do not count gridlines including zero. Use a fresh graph without this cue for independent evidence.

Access: allow pointing, speech, signed/AAC answers, dictation or child-directed manipulation. Record access separately from cues that name the operation, count marks, set the scale or select pieces.

Early finisher: construct a new example with the same constraints, solve it and explain why the representation is valid. Record item, actual words/actions, support and one fresh follow-up task.

TEACHER GUIDE

Small-group reteach | teaching script

Purpose: Use the diagnosed misconception to rebuild the concept. Bank allocation: M24-M27 and O24-O27. These are choices across lessons, not a single sitting.

Selected core, about 10 minutes: first 2 minute(s) introduce the target and materials; next 5 minutes work with M24 and O24; last 3 minute(s) compare explanations and record evidence. Extend the physical measurement or survey task to a separate session when needed.

Say and do: Ask: "What does one symbol or one axis interval represent? Which categories matter? Do we combine before comparing?" Keep raw survey responses and frequencies visible during teaching. Match equal groups to picture symbols and axis heights.

Begin with a neutral reading of the directions. Wait for the learner to choose a method; ask "How do you know?" without naming the answer or operation.

Listen/look for: Keep a real raw survey record, frequency table and scaled bar representation. Collect a scaled picture graph, interpretations of each graph type, and one- and two-step more/less explanations.

If an error appears: If a student counts symbols as votes, cover all but one symbol and read the key aloud during teaching. Rebuild the row as equal groups. For bars, trace horizontally to the axis; do not count gridlines including zero. Use a fresh graph without this cue for independent evidence.

Access: allow pointing, speech, signed/AAC answers, dictation or child-directed manipulation. Record access separately from cues that name the operation, count marks, set the scale or select pieces.

Early finisher: construct a new example with the same constraints, solve it and explain why the representation is valid. Record item, actual words/actions, support and one fresh follow-up task.

TEACHER GUIDE

Exit ticket | teaching script

Purpose: Collect one brief fresh performance and select a next teaching step. Bank allocation: M28-M30 and O28-O30. These are choices across lessons, not a single sitting.

Selected core, about 5 minutes: first 1 minute(s) introduce the target and materials; next 3 minutes work with M28 and O28; last 1 minute(s) compare explanations and record evidence. Extend the physical measurement or survey task to a separate session when needed.

Say and do: Say: "Work on the selected task on your own. Show your thinking in a way that works for you." Read directions neutrally if needed. Do not point to a part, count ticks, name an operation, supply a scale or align the tool. Ask only "How do you know?" after the attempt.

Begin with a neutral reading of the directions. Wait for the learner to choose a method; ask "How do you know?" without naming the answer or operation.

Listen/look for: Keep a real raw survey record, frequency table and scaled bar representation. Collect a scaled picture graph, interpretations of each graph type, and one- and two-step more/less explanations.

If an error appears: If a student counts symbols as votes, cover all but one symbol and read the key aloud during teaching. Rebuild the row as equal groups. For bars, trace horizontally to the axis; do not count gridlines including zero. Use a fresh graph without this cue for independent evidence.

Access: allow pointing, speech, signed/AAC answers, dictation or child-directed manipulation. Record access separately from cues that name the operation, count marks, set the scale or select pieces.

Early finisher: construct a new example with the same constraints, solve it and explain why the representation is valid. Record item, actual words/actions, support and one fresh follow-up task.

STUDENT RESOURCE | ONE RESPONSE PER PERSON

Survey record

Write the question from your selected survey task:

Question: _____

Record one category per respondent; no names needed.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

16. _____

Frequency table (category / count):

____ / ____ ____ / ____

____ / ____ ____ / ____

Total responses ____ Check: frequency sum ____

STUDENT RESOURCE

My reusable work organizer

Question / raw data or given frequencies

A large, empty rectangular box with rounded corners, intended for the student to write their question or raw data.

Graph with labels, title and scale

A large, empty rectangular box with rounded corners, intended for the student to draw a graph with labels, title, and scale.

Interpretation and equation(s)

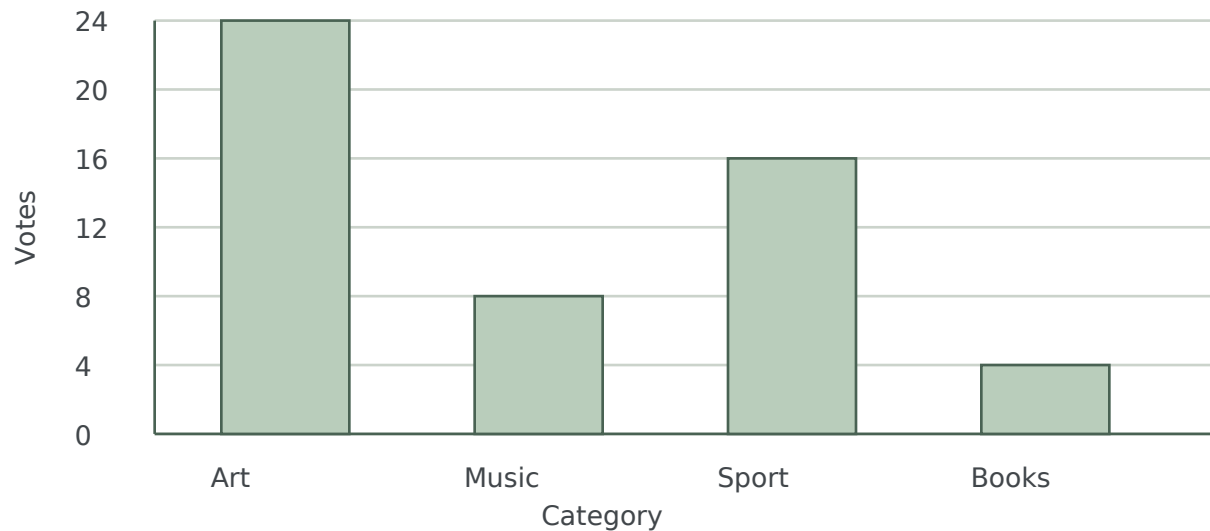
A large, empty rectangular box with rounded corners, intended for the student to provide their interpretation and equation(s).

STUDENT CHOICE PRACTICE

M01 | Warm-up

How many votes does Music have?

Club-choice votes (practice data)



A. 2 votes

B. 8 votes

C. 0 votes

D. 4 votes

Show or explain how you decided.

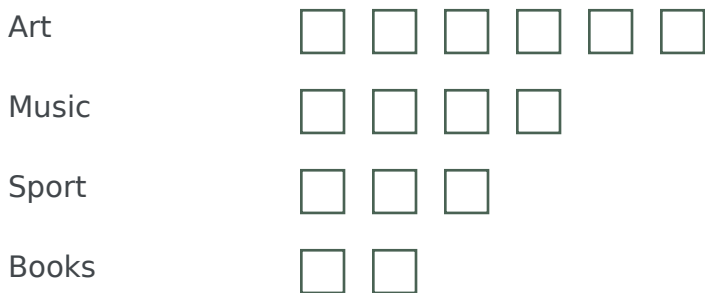
STUDENT CHOICE PRACTICE

M02 | Warm-up

How many more votes does Art have than Books?

Club-choice votes (practice data)

Key: one square = 4 votes



A. 16 votes

B. 4 votes

C. 28 votes

D. 24 votes

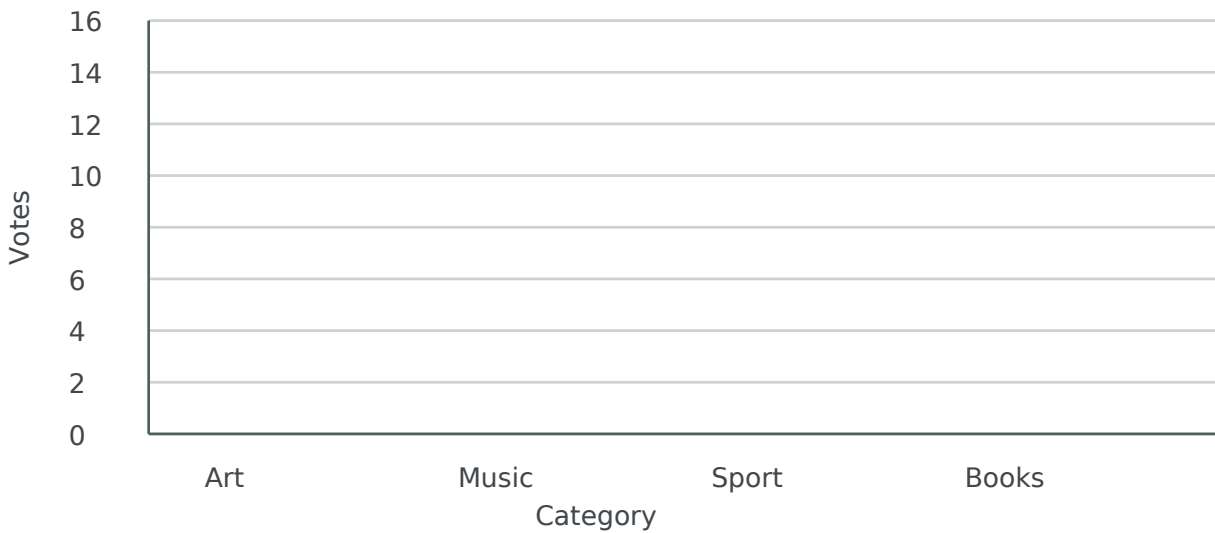
Show or explain how you decided.

STUDENT INDIVIDUAL PERFORMANCE

001 | Warm-up

Ask 8-16 classmates or adults: "Which activity would you choose?" Give these choices: Art, Music, Sport, Books. Each person chooses one. Record each response and make a frequency table. Use the provided axes to draw a scaled bar graph; label the scale and title. Explain which categories have more or fewer votes.

Votes by category



Use the survey record for responses and table.

My comparison statement and check

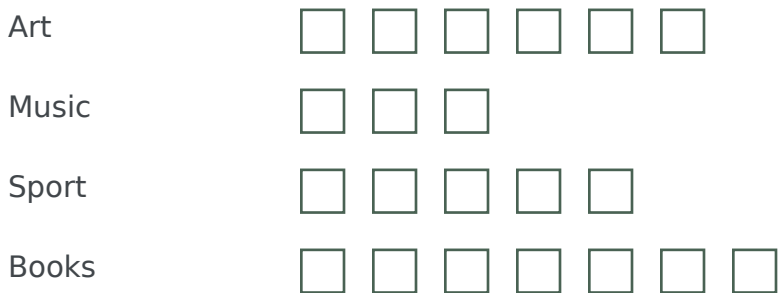
STUDENT INDIVIDUAL PERFORMANCE

002 | Warm-up

How many more votes does Books have than Music? Show the needed values and equation(s). Explain your comparison.

Club-choice votes (practice data)

Key: one square = 3 votes



My representation / equation / answer

My explanation and check

TEACHER ONLY | DO NOT GIVE WITH TASKS

M01-M02 | worked keys

M01 | B. 8 votes

2 scale intervals $\times$ 4 = 8 votes. Read the graph key or vertical scale before calculating. The answer counts votes, not drawn symbols.

Other choices: A (2 votes): counts symbols/scale intervals rather than votes. Recheck the representation and original question. C (0 votes): two scale intervals too low. Recheck the representation and original question. D (4 votes): one scale interval too low. Recheck the representation and original question.

Target B: Represent and interpret frequency tables, scaled picture graphs and scaled bar graphs with axes provided.

M02 | A. 16 votes

$24 - 8 = 16$ votes. Read the graph key or vertical scale before calculating. The answer counts votes, not drawn symbols.

Other choices: B (4 votes): counts symbols/scale intervals rather than votes. Recheck the representation and original question. C (28 votes): three scale intervals too high. Recheck the representation and original question. D (24 votes): two scale intervals too high. Recheck the representation and original question.

Target C: Solve one- and two-step more/less problems from scaled graphs.

TEACHER ONLY | DO NOT GIVE WITH TASKS

001-002 | worked keys

001 | expected performance

Variable real survey data. A valid collection asks the stated question, records exactly one category per respondent and has four or fewer categories. Tally each response once; frequencies must total the respondent count (8-16). The provided axis uses intervals of 2 votes; an odd count ends halfway between adjacent gridlines. Bars must match the table, begin at zero and have equal widths. Label the title and categories. Verify every interpretation against the collected frequencies. Keep the raw record as evidence.

Target A: Collect data by asking a question with up to four categories.

002 | expected performance

$21 - 9 = 12$ votes. Read the graph key or vertical scale before calculating. The answer counts votes, not drawn symbols.

Target C: Solve one- and two-step more/less problems from scaled graphs.