

Metric tools and problems



GRADE 4 | NC.4.MD.1

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.1 | Fourth 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) 2, 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 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.1: Know relative sizes of measurement units. Solve problems involving metric measurement.

- Measure to solve problems involving metric units: centimeter, meter, gram, kilogram, liter, milliliter.
- Add, subtract, multiply, and divide to solve one-step word problems involving whole-number measurements of length, mass, and capacity that are given in metric units.

Learning targets

A | Choose and compare metric units for length, mass and capacity.

B | Physically measure in centimeters, meters, grams, kilograms, liters and milliliters to solve a problem.

C | Use all four operations in one-step whole-number metric measurement problems.

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

TEACHER GUIDE

Prepare and include

Prerequisites: Read whole-number scales; identify length, mass and capacity; use equal groups and the four operations.

Materials: Metric rulers and meter sticks, calibrated gram/kilogram scales, marked milliliter/liter containers, water tray, towels, light sealed objects and paper strips. Adults move heavy containers and handle cutting.

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: Observe tool selection, zero alignment or zeroed scale, eye-level container reading, unit and problem solution at all six physical stations. Retain addition, subtraction, multiplication and division evidence.

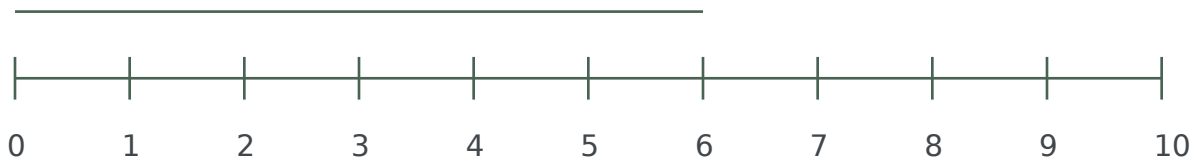
Misconception response: If a learner counts tick marks, place a finger in each interval during teaching. If units are confused, compare a meter stick with a centimeter interval, and real marked containers/scales.

TEACHER GUIDE

Worked teacher model

A ribbon is 24 cm long. Cut away 9 cm. Say: "The starting whole is 24 cm. Removing 9 cm means $24 - 9 = 15$ cm remain. I can check $15 + 9 = 24$." Then align a real strip with zero on a centimeter ruler and read its endpoint; do not count tick marks.

Illustrative ruler: labels are centimeters.



Do not measure this drawing. Read equal intervals.

Diagram reading practice: the shown segment is 6 cm because it spans six intervals. Physical measuring still requires a real ruler and object.

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

TEACHER GUIDE

Anchor chart | reasoning tools

1 m = 100 cm; 1 kg = 1,000 g; 1 L = 1,000 mL. A smaller unit means more units for the same quantity. Length uses rulers, mass uses scales, capacity uses marked containers.

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: Observe tool selection, zero alignment or zeroed scale, eye-level container reading, unit and problem solution at all six physical stations. Retain addition, subtraction, multiplication and division evidence.

Respond to a misconception: If a learner counts tick marks, place a finger in each interval during teaching. If units are confused, compare a meter stick with a centimeter interval, and real marked containers/scales.

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: Observe tool selection, zero alignment or zeroed scale, eye-level container reading, unit and problem solution at all six physical stations. Retain addition, subtraction, multiplication and division evidence.

Respond to a misconception: If a learner counts tick marks, place a finger in each interval during teaching. If units are confused, compare a meter stick with a centimeter interval, and real marked containers/scales.

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: Observe tool selection, zero alignment or zeroed scale, eye-level container reading, unit and problem solution at all six physical stations. Retain addition, subtraction, multiplication and division evidence.

Respond to a misconception: If a learner counts tick marks, place a finger in each interval during teaching. If units are confused, compare a meter stick with a centimeter interval, and real marked containers/scales.

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: Observe tool selection, zero alignment or zeroed scale, eye-level container reading, unit and problem solution at all six physical stations. Retain addition, subtraction, multiplication and division evidence.

Respond to a misconception: If a learner counts tick marks, place a finger in each interval during teaching. If units are confused, compare a meter stick with a centimeter interval, and real marked containers/scales.

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: Observe tool selection, zero alignment or zeroed scale, eye-level container reading, unit and problem solution at all six physical stations. Retain addition, subtraction, multiplication and division evidence.

Respond to a misconception: If a learner counts tick marks, place a finger in each interval during teaching. If units are confused, compare a meter stick with a centimeter interval, and real marked containers/scales.

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: Observe tool selection, zero alignment or zeroed scale, eye-level container reading, unit and problem solution at all six physical stations. Retain addition, subtraction, multiplication and division evidence.

Respond to a misconception: If a learner counts tick marks, place a finger in each interval during teaching. If units are confused, compare a meter stick with a centimeter interval, and real marked containers/scales.

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: Observe tool selection, zero alignment or zeroed scale, eye-level container reading, unit and problem solution at all six physical stations. Retain addition, subtraction, multiplication and division evidence.

Respond to a misconception: If a learner counts tick marks, place a finger in each interval during teaching. If units are confused, compare a meter stick with a centimeter interval, and real marked containers/scales.

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.

Prepare physical stations

Prepare six real stations: a paper ribbon for centimeters; safe floor rope for meters; light clay for grams; a manageable sealed grain package for kilograms; water in a marked container for liters; washable paint or colored water for milliliters.

Use calibrated tools with readable whole-unit graduations. Set quantities near whole units; avoid ambiguous halfway readings. An adult handles cutting, spills and heavy containers. Do not allow lifting heavy objects. Learners can direct the adult and read the scale.

Check zero and calibration. Privately measure each actual station with the same tool before use. Never label student objects with their answers. Record tool, actual reference, and correct rounding.

The six physical tasks require measuring first, then adding the stated whole-number amount. Do not replace them with readings from a drawing.

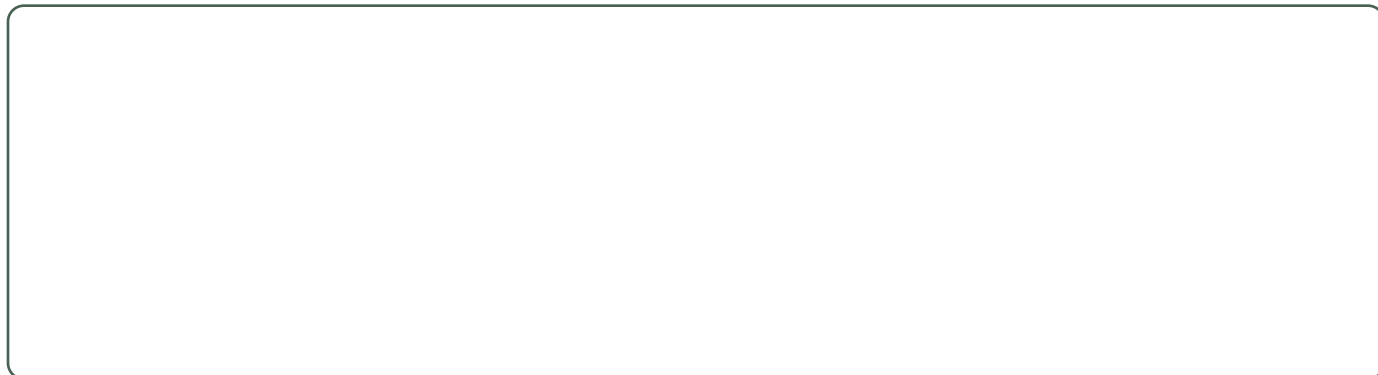
Station / tool / reference / learner reading / setup evidence:

cm _____
m _____
g _____
kg _____
L _____
mL _____

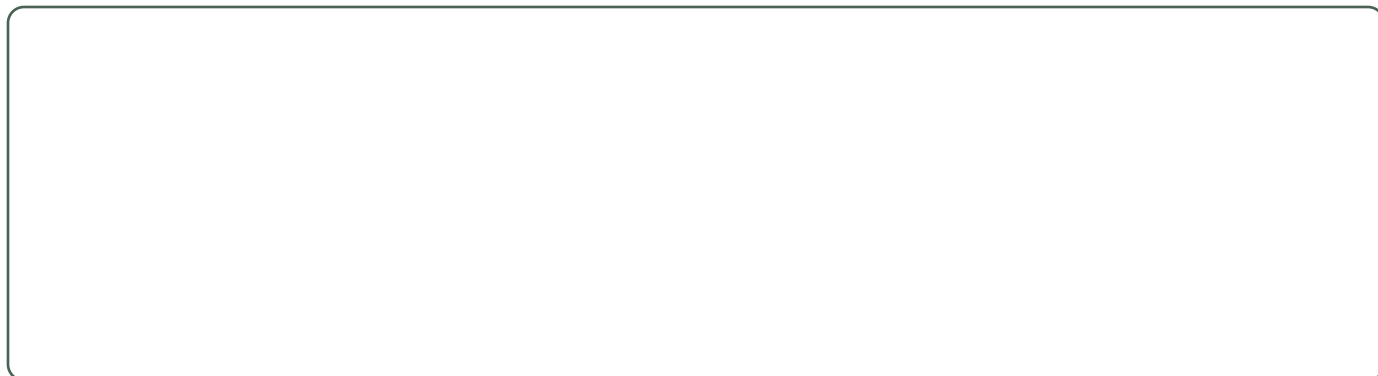
STUDENT RESOURCE

Reusable representation organizer

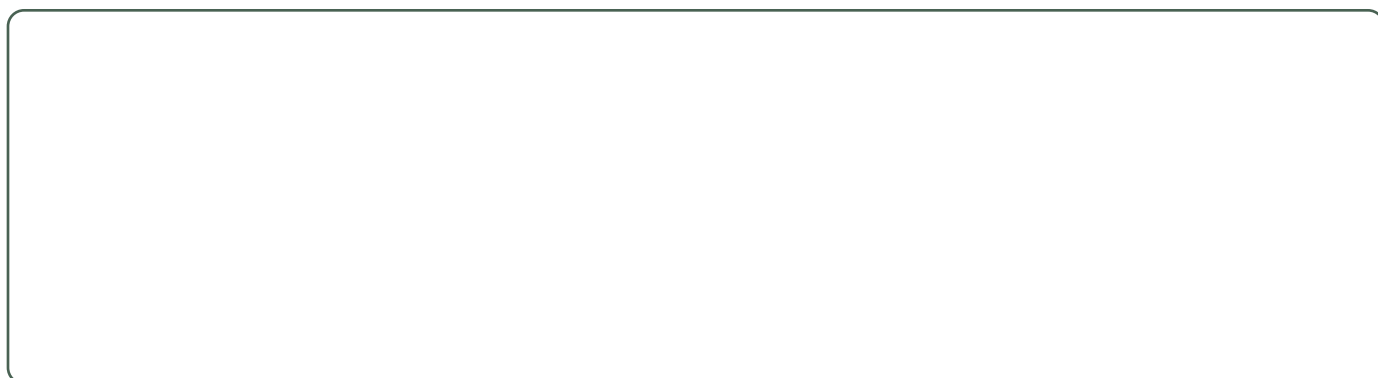
Measured quantity / tool / unit



Equation or model



Answer and check



STUDENT CHOICE PRACTICE

M01 | Warm-up

A total of 78 cm of ribbon is shared equally into 3 portions. How much is in each portion?

- A. 28 cm
- B. 26 cm
- C. 27 cm
- D. 29 cm

Explain or show how you decided.

STUDENT CHOICE PRACTICE

M02 | Warm-up

There are 24 m of rope. A worker removes 5 m. How much remains?

- A. 16 m
- B. 20 m
- C. 19 m
- D. 21 m

Explain or show how you decided.

STUDENT INDIVIDUAL PERFORMANCE

001 | Warm-up

Use the prepared ribbon station. Choose a tool and measure the quantity in cm to the nearest whole cm. Record how you set up and read the tool. If 3 cm more were added, what would the total be? Show your calculation.

Tool setup, measured value and unit

Equation and problem answer

Explanation and check

STUDENT INDIVIDUAL PERFORMANCE

002 | Warm-up

A container holds 35 m of rope. Another 4 m is added. What is the total measurement? Draw a model or write an equation; explain the operation and check.

My model / table / equation / answer

My reasoning and check

TEACHER ONLY | KEEP SEPARATE FROM STUDENT PAGES

M01-M02 | worked keys

M01 | B. 26 cm

$78 \div 3 = 26$. Answer: 26 cm. Share the total into equal groups; check by multiplication.

Distractor checks: A (28 cm): Uses 2 unit(s) too many. C (27 cm): Uses 1 unit(s) too many. D (29 cm): Uses 3 unit(s) too many.

Target C: Use all four operations in one-step whole-number metric measurement problems.

M02 | C. 19 m

$24 - 5 = 19$. Answer: 19 m. Remove the used part.

Distractor checks: A (16 m): Uses 3 unit(s) too few. B (20 m): Uses 1 unit(s) too many. D (21 m): Uses 2 unit(s) too many.

Target C: Use all four operations in one-step whole-number metric measurement problems.

TEACHER ONLY | KEEP SEPARATE FROM STUDENT PAGES

001-002 | worked keys

001 | Expected performance

Variable result: actual measured amount q cm; total $(q + 3)$ cm. Observe the learner choosing the correct metric tool, zeroing/aligning it, reading to the nearest whole unit and adding 3. Privately measure the same object beforehand with the same tool; accept correct whole-unit rounding. The result must agree with this reference, not a made-up fixed answer.

Target B: Physically measure in centimeters, meters, grams, kilograms, liters and milliliters to solve a problem.

002 | Expected performance

$35 + 4 = 39$. Answer: 39 m. Join the two amounts.

Target C: Use all four operations in one-step whole-number metric measurement problems.