

North Carolina mathematics

Grade 3 | Measurement

Around the boundary



NC.3.MD.8

Teacher scripts • visual models • 30 choice checks • 30 open/performance tasks • worked keys • observation records

Current North Carolina standards for 2026-27 and 2027-28. Adopted 2026 replacements begin 2028-29. Use short sessions across days; print selected student pages.

Free sample | Contents

NC.3.MD.8 | Third Grade mathematics

This sample contains 19 complete selected pages from the 94-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-18, 75

Representative activities

M01: sample PDF page(s) 16; original page(s) 15

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

O01: sample PDF page(s) 17; original page(s) 16

O02: sample PDF page(s) 19; original page(s) 18

Selected teacher prompts and keys: original page(s) 75

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.

Contents and planning

Print a useful selection

Guide and exact standard come first, followed by seven teaching scripts, anchors, reusable masters, student bank, worked keys, evidence records and sources. Every task has a stable item ID. Select pages by ID; the bank is reusable across lessons, not a 60-item test.

Short-session sequence

Session 1, about 20 minutes: warm-up M01/O01; model with M05/O05. Session 2, about 25 minutes: shared work M09/O09, partner investigation M14/O14. Session 3, about 20 minutes: individual M19/O19 and exit M28/O28. Use M24/O24 in a later short reteach group if needed. Times are flexible and never scoring cutoffs.

Each section contains 4/4/5/5/5/4/3 choice items and the same allocation of open tasks. Other items offer fresh practice, transfer and further observation. Construction and explanation must be observed individually even after partner work.

Purposeful visual supports

Original labeled convex and concave polygons support complete boundary walks and missing-side reasoning.

Teacher guide

Exact standard and targets

NC.3.MD.8 | Solve problems involving perimeters of polygons, including finding the perimeter given the side lengths, and finding an unknown side length.

Observable targets

A | Find a polygon perimeter by adding every boundary length once.

B | Find an unknown side from perimeter and known side lengths.

C | Construct or compare boundaries and explain the result.

Collect the learner's drawing or construction, calculation when relevant, and explanation. Choice recognition alone is not evidence of the full standard. These targets are instructional, not official cut scores.

Teacher preparation

Materials and access

Prepare

Pencils, crayons, ruler/straightedge, large paper squares, supplied masters and blank paper. Adults handle cutting. Copy all matching masters at the same printer setting. One printed grid cell is a mathematical unit, not a promised centimeter or inch. Use large safe pieces; keep completed teacher models out of view during independent checks.

Prerequisites

Add and subtract whole numbers; identify a closed polygon and its side lengths. Opposite rectangle sides are equal; do not assume this for arbitrary quadrilaterals.

Neutral access

Read directions and labels exactly; allow oral, signed, AAC, drawn or child-directed construction. An adult can cut or mark exactly where the child directs. Do not count cells, select sides, provide the needed split or name a category for the child. Record access separately from mathematical cues. Do not score handwriting, spelling or reading fluency.

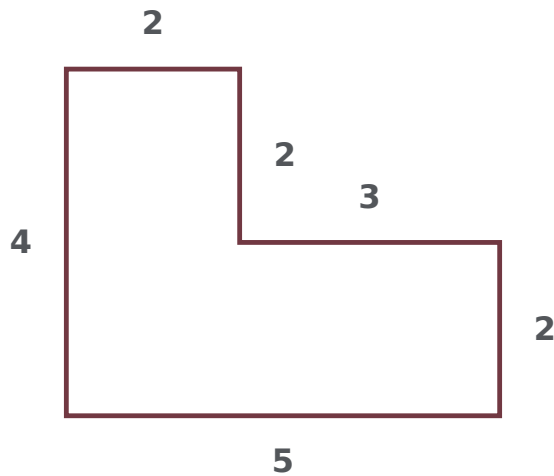
Vocabulary

polygon, boundary, side length, perimeter, unknown

Teacher-only worked model

Walk the entire outside

Trace the L-shaped boundary in order: 5, 2, 3, 2, 2, 4 cm. Say: "Perimeter measures around. I add each outside side once: $5 + 2 + 3 + 2 + 2 + 4 = 18$ cm." Hide the 3-cm label: known sides total 15; $18 - 15 = 3$ cm. Check $15 + 3 = 18$. Interior seams would not count.



All side labels are centimeters. Use labels; do not measure this scaled illustration.

Ask and check

Ask: "What in your model proves your answer?" Listen for the target-specific relationship, not just a number or shape name. Ask for a second route or counterexample only after the first model is understood. Keep this completed page for instruction.

If a learner multiplies side lengths, contrast a finger walk around with a square covering inside. If a side is missed, mark the start and trace once around.

Teacher script | Warm-up

Warm-up | teach and observe

Select M01 and O01; bank range 01-04

Purpose: Activate relevant counting or shape knowledge and find the starting point.

0-2 minutes | launch

Say: "Look at the task. Tell me what you need to find or make. Which information matters?" Read only the printed information. Ask the learner to point to the surface, boundary or shape features that matter.

2-6 minutes | act and reason

Use the selected open task. Give quiet time for the child's own construction. Say: "Show each step. How can another person check it?" In partner work, one learner builds while the other checks, then switch with a new item.

6-9 minutes | check and respond

Use the exact item key. Ask: "What proves that?" If a misconception appears, use the specific repair from the model page. For independent/exit work, record the uncued attempt before teaching. Do not convert a prompted repair into independent evidence.

9-12 minutes | transfer and record

Offer another item in this section if time and attention allow. Extend by asking for a second valid representation or a counterexample. Record item, actual action, explanation, neutral access, mathematical cues and next step. End early if the evidence is sufficient; time is not part of the score.

Teacher script | I Do

I Do | teach and observe

Select M05 and O05; bank range 05-08

Purpose: Make the representation and reasoning visible with a complete model.

0-2 minutes | launch

Say: "Look at the task. Tell me what you need to find or make. Which information matters?" Read only the printed information. Ask the learner to point to the surface, boundary or shape features that matter.

2-6 minutes | act and reason

Show the worked model above first. Think aloud using its complete calculation or construction. Then hide it and invite a fresh attempt. Say: "Show each step. How can another person check it?" In partner work, one learner builds while the other checks, then switch with a new item.

6-9 minutes | check and respond

Use the exact item key. Ask: "What proves that?" If a misconception appears, use the specific repair from the model page. For independent/exit work, record the uncued attempt before teaching. Do not convert a prompted repair into independent evidence.

9-12 minutes | transfer and record

Offer another item in this section if time and attention allow. Extend by asking for a second valid representation or a counterexample. Record item, actual action, explanation, neutral access, mathematical cues and next step. End early if the evidence is sufficient; time is not part of the score.

Teacher script | We Do

We Do | teach and observe

Select M09 and O09; bank range 09-13

Purpose: Connect learner actions to the mathematical claim together.

0-2 minutes | launch

Say: "Look at the task. Tell me what you need to find or make. Which information matters?" Read only the printed information. Ask the learner to point to the surface, boundary or shape features that matter.

2-6 minutes | act and reason

Use the selected open task. Give quiet time for the child's own construction. Say: "Show each step. How can another person check it?" In partner work, one learner builds while the other checks, then switch with a new item.

6-9 minutes | check and respond

Use the exact item key. Ask: "What proves that?" If a misconception appears, use the specific repair from the model page. For independent/exit work, record the uncued attempt before teaching. Do not convert a prompted repair into independent evidence.

9-12 minutes | transfer and record

Offer another item in this section if time and attention allow. Extend by asking for a second valid representation or a counterexample. Record item, actual action, explanation, neutral access, mathematical cues and next step. End early if the evidence is sufficient; time is not part of the score.

Teacher script | Collaborative practice

Collaborative practice | teach and observe

Select M14 and O14; bank range 14-18

Purpose: Compare constructions and require each learner to justify a decision.

0-2 minutes | launch

Say: "Look at the task. Tell me what you need to find or make. Which information matters?" Read only the printed information. Ask the learner to point to the surface, boundary or shape features that matter.

2-6 minutes | act and reason

Use the selected open task. Give quiet time for the child's own construction. Say: "Show each step. How can another person check it?" In partner work, one learner builds while the other checks, then switch with a new item.

6-9 minutes | check and respond

Use the exact item key. Ask: "What proves that?" If a misconception appears, use the specific repair from the model page. For independent/exit work, record the uncued attempt before teaching. Do not convert a prompted repair into independent evidence.

9-12 minutes | transfer and record

Offer another item in this section if time and attention allow. Extend by asking for a second valid representation or a counterexample. Record item, actual action, explanation, neutral access, mathematical cues and next step. End early if the evidence is sufficient; time is not part of the score.

Teacher script | Independent practice

Independent practice | teach and observe

Select M19 and O19; bank range 19-23

Purpose: Collect an uncued construction and explanation.

0-2 minutes | launch

Say: "Look at the task. Tell me what you need to find or make. Which information matters?" Read only the printed information. Ask the learner to point to the surface, boundary or shape features that matter.

2-6 minutes | act and reason

Use the selected open task. Give quiet time for the child's own construction. Say: "Show each step. How can another person check it?" In partner work, one learner builds while the other checks, then switch with a new item.

6-9 minutes | check and respond

Use the exact item key. Ask: "What proves that?" If a misconception appears, use the specific repair from the model page. For independent/exit work, record the uncued attempt before teaching. Do not convert a prompted repair into independent evidence.

9-12 minutes | transfer and record

Offer another item in this section if time and attention allow. Extend by asking for a second valid representation or a counterexample. Record item, actual action, explanation, neutral access, mathematical cues and next step. End early if the evidence is sufficient; time is not part of the score.

Teacher script | Small-group reteach

Small-group reteach | teach and observe

Select M24 and O24; bank range 24-27

Purpose: Repair the observed misconception with a simpler model, then transfer.

0-2 minutes | launch

Say: "Look at the task. Tell me what you need to find or make. Which information matters?" Read only the printed information. Ask the learner to point to the surface, boundary or shape features that matter.

2-6 minutes | act and reason

Use the selected open task. Give quiet time for the child's own construction. Say: "Show each step. How can another person check it?" In partner work, one learner builds while the other checks, then switch with a new item.

6-9 minutes | check and respond

Use the exact item key. Ask: "What proves that?" If a misconception appears, use the specific repair from the model page. For independent/exit work, record the uncued attempt before teaching. Do not convert a prompted repair into independent evidence.

9-12 minutes | transfer and record

Offer another item in this section if time and attention allow. Extend by asking for a second valid representation or a counterexample. Record item, actual action, explanation, neutral access, mathematical cues and next step. End early if the evidence is sufficient; time is not part of the score.

Teacher script | Exit ticket

Exit ticket | teach and observe

Select M28 and O28; bank range 28-30

Purpose: Check one fresh response and identify the next useful lesson.

0-2 minutes | launch

Say: "Look at the task. Tell me what you need to find or make. Which information matters?" Read only the printed information. Ask the learner to point to the surface, boundary or shape features that matter.

2-6 minutes | act and reason

Use the selected open task. Give quiet time for the child's own construction. Say: "Show each step. How can another person check it?" In partner work, one learner builds while the other checks, then switch with a new item.

6-9 minutes | check and respond

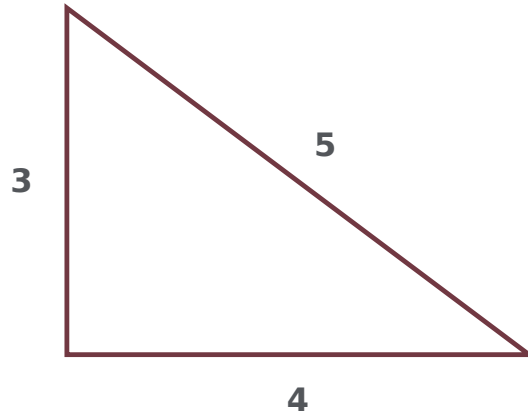
Use the exact item key. Ask: "What proves that?" If a misconception appears, use the specific repair from the model page. For independent/exit work, record the uncued attempt before teaching. Do not convert a prompted repair into independent evidence.

9-12 minutes | transfer and record

Offer another item in this section if time and attention allow. Extend by asking for a second valid representation or a counterexample. Record item, actual action, explanation, neutral access, mathematical cues and next step. End early if the evidence is sufficient; time is not part of the score.

Teacher anchor

Perimeter follows the boundary



All side labels are centimeters. Use labels; do not measure this scaled illustration.

$4 + 5 + 3 = 12$ cm. The three boundary sides are each counted once. The interior is not part of this sum.

Unknown-side model

If perimeter is 12 cm and two sides are 4 cm and 5 cm, the third is $12 - (4 + 5) = 3$ cm. Check $4 + 5 + 3 = 12$ cm.

Same area is not same perimeter

A 4-by-3 rectangle and a 6-by-2 rectangle each cover 12 square units. Their perimeters are 14 and 16 units. Covering and walking around answer different questions.

Student organizer | copy as needed

Model, explain, verify

Task ID: _____ Name: _____

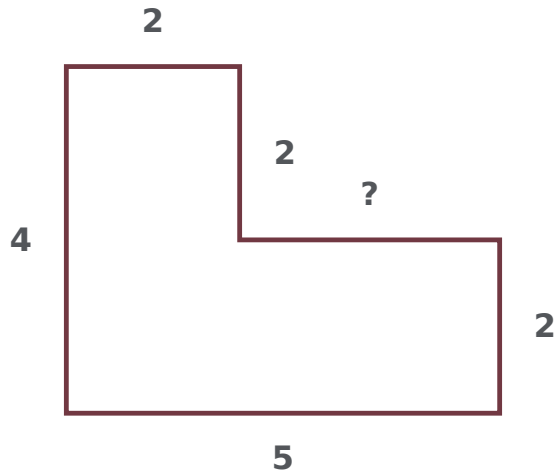
My explanation: _____

My check or revision: _____

Student | Warm-up

M01 | Choose and explain

Name: _____ Date: _____

The perimeter is 18 cm. Find the side marked ?.

All side labels are centimeters. Use labels; do not measure this scaled illustration.

- A. 4
- B. 8
- C. 3
- D. 18

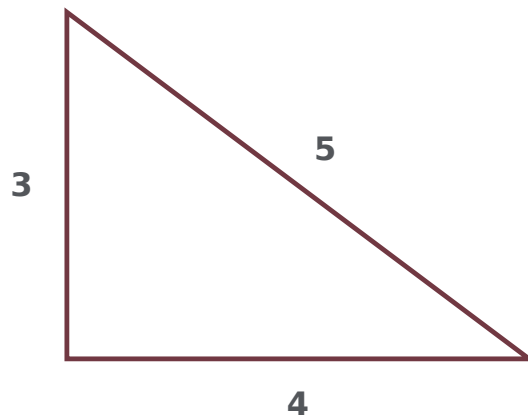
Tell or show how you know.

Student | Warm-up

O01 | Make and explain

Name: _____ Date: _____

Trace the outside boundary with your finger. Find the perimeter, write the addition, and explain why each side is counted once.



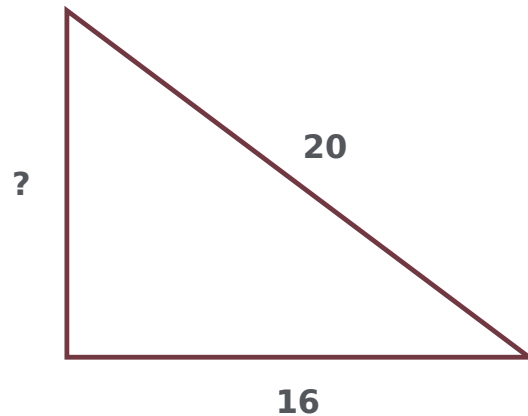
All side labels are centimeters. Use labels; do not measure this scaled illustration.

Explain your model and check. You may tell an adult.

Student | Warm-up

M02 | Choose and explain

Name: _____ Date: _____

The perimeter is 48 cm. Find the side marked ?.

All side labels are centimeters. Use labels; do not measure this scaled illustration.

- A. 28
- B. 12
- C. 16
- D. 48

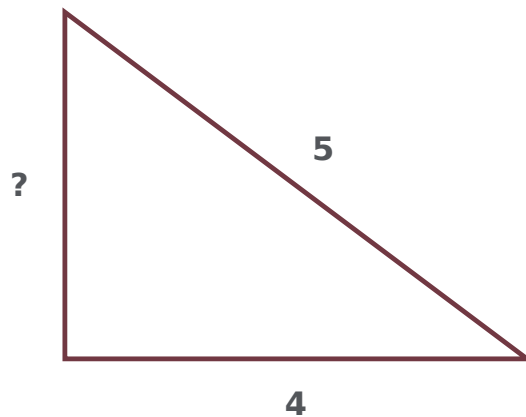
Tell or show how you know.

Student | Warm-up

002 | Make and explain

Name: _____ Date: _____

This polygon has perimeter 12 cm. Find the missing side. Write a subtraction equation and check by adding all side lengths.



All side labels are centimeters. Use labels; do not measure this scaled illustration.

Explain your model and check. You may tell an adult.

Teacher-only worked keys

Items 01-02

M01 | C - 3

Target B. Known sides total 15 cm. $18 - 15 = 3$ cm. Check: $15 + 3 = 18$.

001 | Accepted evidence

Target A. Boundary traversal uses 3 sides: $4 + 5 + 3 = 12$ cm. Start and finish at the same vertex; do not add interior distances.

Accept equivalent correct reasoning. Record the actual action and any supplied mathematical cue.

M02 | B - 12

Target B. Known sides total 36 cm. $48 - 36 = 12$ cm. Check: $36 + 12 = 48$.

002 | Accepted evidence

Target B. $12 - (4 + 5) = 3$ cm. Check all sides sum to 12 cm.

Accept equivalent correct reasoning. Record the actual action and any supplied mathematical cue.