

North Carolina mathematics

Grade 3 | Measurement

Area: multiply and add



NC.3.MD.7

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.7 | Third Grade mathematics

This sample contains 20 complete selected pages from the 95-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-19, 76

Representative activities

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

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

O01: sample PDF page(s) 18; original page(s) 17

O02: sample PDF page(s) 20; original page(s) 19

Selected teacher prompts and keys: original page(s) 76

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

Unit-square arrays, bold rectangle partitions and labeled separate model spaces connect products and area sums.

Teacher guide

Exact standard and targets

NC.3.MD.7 | Relate area to the operations of multiplication and addition.

- Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
- Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving problems, and represent whole-number products as rectangular areas in mathematical reasoning.
- Use tiles and/or arrays to illustrate and explain that the area of a rectangle can be found by partitioning it into two smaller rectangles, and that the area of the large rectangle is the sum of the two smaller rectangles.

Observable targets

A | Connect tiling to multiplication of rectangle side lengths.

B | Use rectangular area to solve problems and represent products.

C | Partition a rectangle into two rectangles and add their areas.

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

Tile and count equal squares; interpret equal groups; work with products of side lengths up to 10. Start with countable arrays before using symbolic products.

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

side length, row, column, square unit, product, partition

Teacher-only worked model

Rows, products and parts

Build a 7-by-3 rectangle with 21 tiles. Say: "Three rows of seven squares give $7 \times 3 = 21$ square units." Split after two columns. Left area: $2 \times 3 = 6$. Right area: $5 \times 3 = 15$. Say: "The pieces cover the whole without overlap, so $6 + 15 = 21$. The split did not create more area."



One grid cell represents one unit square. No centimeter or inch scale is implied.

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 adds side lengths, ask them to mark a whole row and explain how many equal rows cover the rectangle. If parts overlap, rebuild a genuine partition before adding.

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

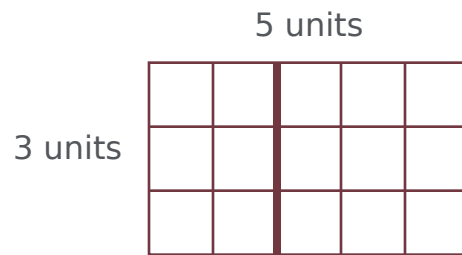
Use the exact item key. Ask: "What proves that?" If a misconception appears, use the specific repair from the model page. For independent/exit work, record the uncued attempt before teaching. Do not convert a prompted repair into independent evidence.

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

Inside is area



One grid cell represents one unit square. No centimeter or inch scale is implied.

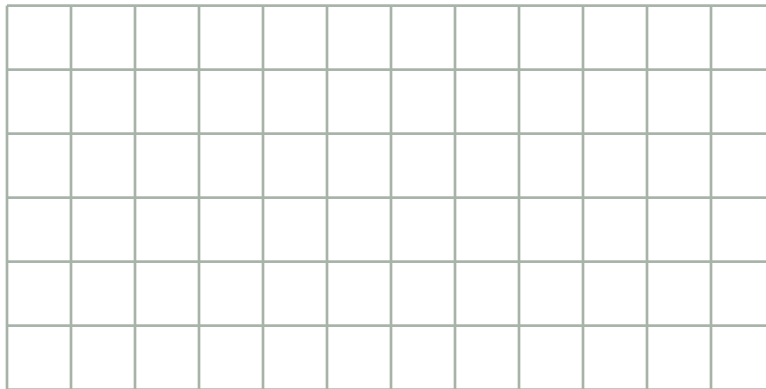
One unit square covers one square unit. Equal squares fit edge to edge. Count $5 + 5 + 5 = 15$ squares. The area is 15 square units. The border is a different measurement.

Product: $5 \times 3 = 15$. Partition: $2 \times 3 + 3 \times 3 = 6 + 9 = 15$. The two smaller rectangles have the same height and together use all five columns.

Student master | adult cuts

Unit-square tiles

Cut on the grid lines. Use the pieces to cover the rectangle on your task page. Each tile matches one task-grid cell when copied at the same scale.



One grid cell represents one unit square. No centimeter or inch scale is implied.

Use extra copies when needed. Adults cut; keep the full collection of equal squares together.

Student organizer | copy as needed

Model, explain, verify

Task ID: _____ Name: _____

My explanation: _____

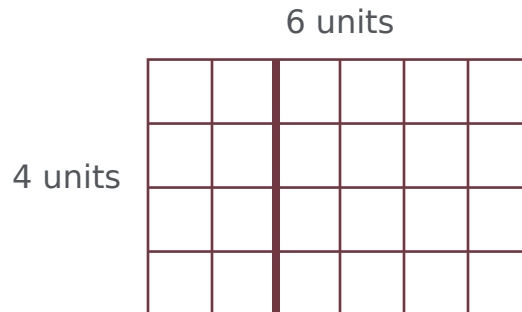
My check or revision: _____

Student | Warm-up

M01 | Choose and explain

Name: _____ Date: _____

The bold line splits the rectangle. Which equation adds the areas of its two parts?



One grid cell represents one unit square. No centimeter or inch scale is implied.

A. $24 + 24 = 48$

B. $8 + 20 = 28$

C. $8 + 16 = 24$

D. $12 + 20 = 32$

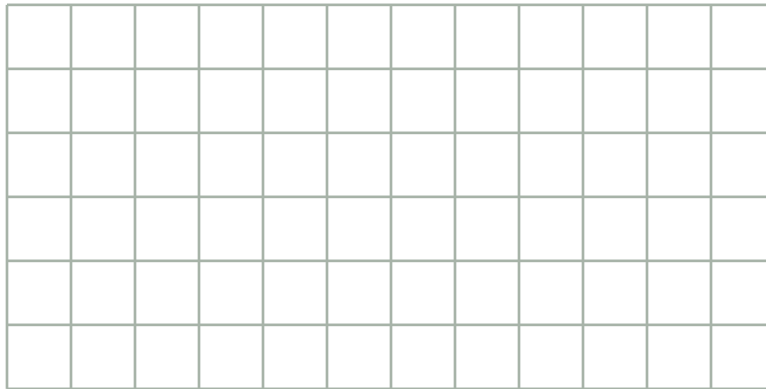
Tell or show how you know.

Student | Warm-up

001 | Make and explain

Name: _____ Date: _____

Tile a 5-unit by 3-unit rectangle. Count the squares. Write a multiplication equation and explain why it gives the same count.



One grid cell represents one unit square. No centimeter or inch scale is implied.

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

Student | Warm-up

M02 | Choose and explain

Name: _____ Date: _____

A rug is 6 feet by 4 feet. Which unit belongs with its area?

- A. feet around
- B. cubic feet
- C. square feet
- D. meters around

Tell or show how you know.

Student | Warm-up

002 | Make and explain

Name: _____ Date: _____

A classroom mat is 5 feet long and 3 feet wide. Draw a rectangular model, label lengths, and find the area. What does the answer measure?



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

Teacher-only worked keys

Items 01-02

M01 | C - $8 + 16 = 24$

Target C. Left: $2 \times 4 = 8$. Right: $4 \times 4 = 16$. No gaps or overlaps, so $8+16=24$. Distractor checks: $8 + 20 = 28$ adds an extra right-part column; $12 + 20 = 32$ counts an extra column in both parts; $24 + 24 = 48$ counts the whole rectangle twice.

O01 | Accepted evidence

Target A. 3 rows of 5 unit squares count to 15; $5 \times 3 = 15$. Every tile is in exactly one row. Observe a complete tiling.

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

M02 | C - square feet

Target B. Area is a count of two-dimensional unit squares. The side lengths are in feet, so use square feet.

O02 | Accepted evidence

Target B. Labeled 5 by 3 rectangle; $5 \times 3 = 15$ square feet covering its surface.

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