

Reason with Decimal Operations

Grade 5 | NC.5.NBT.7



Place value • models • meaningful computation

Seven teaching sections | 30 multiple-choice questions
30 open/performance tasks | Worked keys
Teacher scripts, visual organizers and evidence records

Current NC standards for 2026-27 and 2027-28. The 2026-adopted revisions begin in 2028-29 and are not substituted here. Use selected tasks across several lessons; this is not a 60-item test.

Free sample | Contents

NC.5.NBT.7 | Fifth Grade mathematics

This sample contains 15 complete selected pages from the 90-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-11, 13-14, 64, 79

Representative activities

M01: sample PDF page(s) 12; original page(s) 11

M02: sample PDF page(s) 12; original page(s) 11

O01: sample PDF page(s) 13; original page(s) 13

O02: sample PDF page(s) 14; original page(s) 14

Selected teacher prompts and keys: original page(s) 64, 79

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 selected route

Start with the exact standard and learning targets, then readiness/access guidance, worked teacher models and the reusable student organizer.

Each of seven sections contains one scripted mini-lesson, choice pages and individual open-performance pages. Worked keys follow all sections; sources and classroom-use notes are last.

Session 1: warm-up and I Do, about 20 minutes. Session 2: We Do and collaborative practice, about 25-30 minutes. Session 3: independent practice and exit, about 20-25 minutes. Small-group reteach is a separate responsive 10-minute lesson.

Suggested core: M01/O01, M05/O05, M09/O09, M14/O14, M19/O19, M24/O24 and M28/O28. Select fewer when explanations need more time. The rest are a reusable bank for later practice and evidence.

Allocation per response type: warm-up 4, I Do 4, We Do 5, collaborative 5, independent 5, reteach 4, exit 3. Each item has a specific learning target in its worked key.

Print only selected student pages. Keep teacher models and worked keys separate from independent work. Use blank organizers as optional access supports; record any added mathematical hint.

TEACHER GUIDE

Exact standard and targets

Compute and solve real-world problems with multi-digit whole numbers and decimal numbers.

- Add and subtract decimals to thousandths using models, drawings or strategies based on place value.
- Multiply decimals with a product to thousandths using models, drawings, or strategies based on place value.
- Divide a whole number by a decimal and divide a decimal by a whole number, using repeated subtraction or area models. Decimals should be limited to hundredths.
- Use estimation strategies to assess reasonableness of answers.

T1 | I can add and subtract decimals through thousandths using place-value reasoning.

T2 | I can multiply decimals with products through thousandths using models or place value.

T3 | I can divide a whole number by a decimal and a decimal by a whole number using repeated subtraction or an area model, with decimals limited to hundredths.

T4 | I can estimate and use a check to judge whether real-world answers are reasonable.

Essential question: How do the units in a model explain each written step?

TEACHER GUIDE

Readiness, materials and access

Prerequisites: identify whole-number and decimal place values; exchange ten equal units for one next-place unit; recall basic multiplication/division facts; interpret equal groups. Check these orally and with drawings before increasing numerical complexity.

Materials: pencils, erasers and the supplied blank organizers. Optional large base-ten blocks or teacher-drawn place-value disks may support instruction. All tasks can be completed with drawings; no cutouts or small objects are required.

Vocabulary: factor, product, quotient, remainder, regroup, exchange, partial product, partial quotient, dividend, divisor, thousandth and reasonable. Point to a unit or region while naming it; ask learners to explain in their own language.

Access: neutral reading of directions, enlarged pages, AAC, oral/signed explanations and a scribe recording dictated steps can preserve the construct. Do not supply a calculation, regrouping decision, model partition or answer. Record such cues separately from access support.

Collect actual models, calculations and explanations across fresh tasks over time. A correct choice alone cannot establish the required model-to-method connections. Record supports and independence separately.

Reduce number complexity to isolate an error, then return to the original range. Extensions compare valid methods and justify efficiency within the standard limits; they do not require more advanced numbers.

WORKED TEACHER MODEL

Decimal addition and subtraction

Say: “The whole has to stay the same size. A flat represents 1, a ten-cell rod represents 0.1 and one cell represents 0.01. Ten thousandths equal one hundredth.”

Example 1: $2.375 + 1.248$. Count thousandths: $2,375 + 1,248 = 3,623$ thousandths = 3.623. In the thousandths column $5 + 8 = 13$: exchange 10 thousandths for 1 hundredth. Hundredths: $7 + 4 + 1 = 12$; tenths: $3 + 2 + 1 = 6$.

Example 2: $4.002 - 1.587$. Exchange 1 whole into tenths, then hundredths, then thousandths. The top becomes 3 ones, 9 tenths, 9 hundredths and 12 thousandths. Subtract to get 2 ones, 4 tenths, 1 hundredth and 5 thousandths: 2.415. Check $2.415 + 1.587 = 4.002$.

ones	tenths	hundredths	thousandths
3	9	9	12
1	5	8	7
2	4	1	5

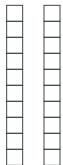
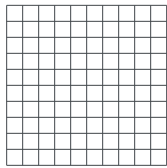
Estimate: $2 + 1$ is about 3 for the sum; $4 - 2$ is about 2 for the difference. Exact answers are nearby.

WORKED TEACHER MODEL

Decimal blocks and multiplication

Unit convention: this 10×10 flat is 1; each rod is 0.1; each small cell is 0.01. The pieces below represent 1.24.

$$1 + 0.2 + 0.04 = 1.24$$



Say: “Whole-number unit counts still work, but name the size of a unit.” For 1.24×0.3 , $124 \text{ hundredths} \times 3 \text{ tenths} = 372 \text{ thousandths} = 0.372$. The product is smaller than 1.24 because only three tenths of it is taken.

An area model can split side 1.24 into $1 + 0.2 + 0.04$ and use height 0.3. Region areas: 0.3, 0.06 and 0.012. Their sum is 0.372. Sketch and label these three regions.

Estimate $1.2 \times 0.3 = 0.36$, so 0.372 is reasonable. Counting decimal digits without explaining the units is insufficient evidence of place-value understanding.

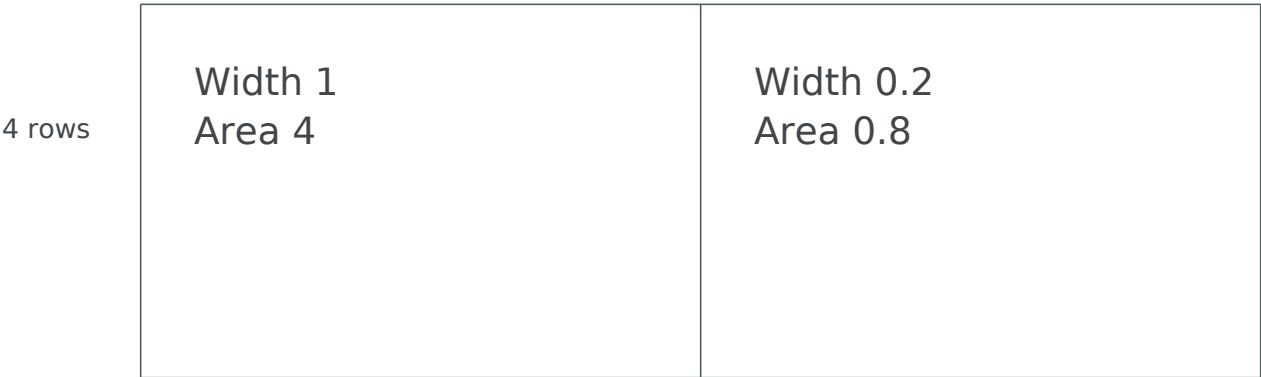
WORKED TEACHER MODEL

Two directions of decimal division

Whole number ÷ decimal: $6 \div 0.25$. Say: “How many quarter-liter groups fit into 6 liters?” Repeated subtraction removes 0.25 each time. Group 4 subtractions as 1 liter; six such groups give 24 subtractions, leaving 0. Check $24 \times 0.25 = 6$.

Decimal ÷ whole number: $4.8 \div 4$. Say: “The rectangle has area 4.8 and height 4. First give each row 1, using area 4; split the remaining 0.8 equally among four rows as 0.2 each.” Width $1 + 0.2 = 1.2$, so $4 \times 1.2 = 4.8$.

Decimals in these division tasks are limited to hundredths. Dividing a decimal by a decimal is not a required task type in this packet. Estimate $4.8 \div 4$ using $4 \div 4 = 1$; 1.2 is nearby.



Schematic area model, not drawn to scale. Both regions have the same height; the labels state their quantities.

STUDENT RESOURCE

Reusable student organizer

Name: _____ Date: _____ Problem: _____

Estimate / name the units

ones	tenths	hundredths	thousandths

Draw a model / explain a step

Check and interpret

TEACHER GUIDE

Evidence and responsive scoring

Collect individual work during partner tasks, then a fresh unaided performance later. A choice response is recognition evidence; it cannot establish algorithm fluency or model construction.

Score computation, method/model, explanation and reasonableness separately where requested. 3: accurate, independent and connected evidence; 2: mostly accurate with a minor error or incomplete connection; 1: relevant partial evidence with major gaps; 0: interpretable observed incorrect work. N/O: unobserved, inaccessible or insufficient evidence.

Record date/item, learner’s exact strategy, independence, consistency, access supports, answer-supplying cues and next step. Do not score handwriting or reading difficulty as mathematics. These instructional descriptors are not official mastery cutoffs.

Look for accurate model construction, value-preserving steps and a check connected to the original quantities. Collect fresh evidence after reteaching and compare the learner’s reasoning over time.

Learner / date / item	Evidence / dimension scores	Support / next step

TEACHER GUIDE

Warm-up: teaching moves

Selected core: M01 and O01. Bank: M01-M04 and O01-O04. Target: Divide a whole number by a decimal and a decimal by a whole number using repeated subtraction or an area model, with decimals limited to hundredths. Estimate and use a check to judge whether real-world answers are reasonable.

0-2 minutes | Say: “What does each number measure or count? What size answer would make sense?” Listen before suggesting a procedure.

2-5 minutes | Retrieve facts and place values before computing. Ask learners to explain the value of one digit and predict a reasonable magnitude.

5-8 minutes | Say: “Show why each written step preserves the quantity. Point to the matching unit, group or region.” Listen for aligned units, correctly named product units, or the meaning of equal groups in division.

Close | Ask: “How does your check rule out a misplaced digit or an extra group?” Record the computation and explanation separately.

Misconception response: If decimal placement is guessed, name the unit of each operand and product. In division ask what one group means before calculating.

Early finisher: compare a second valid strategy and explain which is more efficient for these numbers. Record any mathematical hint separately and reassess with a fresh item.

STUDENT TASKS

Warm-up: choose a result

M01 A rectangular garden is 3.1 meters long and 8.8 meter wide. What is its area in square meters?

A. 27.28

B. 17.28

C. 26.28

D. 27.38

Scratch work

M02 A tank holds 36.811 liters. Use 7.045 liters. How many liters remain?

A. 29.766

B. 29.666

C. 28.766

D. 29.765

Scratch work

STUDENT PERFORMANCE

Warm-up: show your method

001 5.04 meters of ribbon is shared equally among 8 students. How many meters does each student receive? Estimate to check reasonableness. Use repeated subtraction or an area model. Label quantities and connect the model to an equation.

Draw and label your model; choose your own partitions

Written work / explanation

Check / estimate / interpretation

STUDENT PERFORMANCE

Warm-up: show your method

002 A container holds 20 liters. Each bottle holds 0.8 liter. How many full bottles can be filled? Estimate to check reasonableness. Use repeated subtraction or an area model. Label quantities and connect the model to an equation.

Draw and label your model; choose your own partitions

Written work / explanation

Check / estimate / interpretation

TEACHER KEY

Worked keys and learning targets

M01 | Warm-up | Answer: A 27.28

Multiply decimals with products through thousandths using models or place value. Estimate and use a check to judge whether real-world answers are reasonable.

$3.1 = 31/10$; $8.8 = 88/10$. Multiply unit counts: $31 \times 88 = 2728$. The product unit is $1/100$, so $2728/100 = 27.28$. A labeled area model has sides 3.1 and 8.8 and this area. Use nearby easy factors: $3 \times 9 = 27$. Thus $3.1 \times 8.8 \approx 27$. Compare exact 27.28 with this estimate; use unit counts to confirm the decimal place. Context answer: 27.28 square meters.

Distractor 26.28: This differs from the correct value by 1. Compare the place-value units and each operation in the worked solution; the choice alone does not identify the learner's error.

Distractor 17.28: This differs from the correct value by 10. Compare the place-value units and each operation in the worked solution; the choice alone does not identify the learner's error.

Distractor 27.38: This differs from the correct value by 0.1. Compare the place-value units and each operation in the worked solution; the choice alone does not identify the learner's error.

M02 | Warm-up | Answer: A 29.766

Add and subtract decimals through thousandths using place-value reasoning. Estimate and use a check to judge whether real-world answers are reasonable.

Express both quantities in thousandths: $36811 - 7045 = 29766$ thousandths = 29.766. Align equal place values; exchange ten smaller units for one larger unit, or the reverse for subtraction. Round operands to whole numbers: $37 - 7 = 30$. Exact 29.766 should be near 30; rounding each operand can change this estimate by up to 1 in total. Context answer: 29.766 liters.

Distractor 29.666: This differs from the correct value by 0.1. Compare the place-value units and each operation in the worked solution; the choice alone does not identify the learner's error.

Distractor 28.766: This differs from the correct value by 1. Compare the place-value units and each operation in the worked solution; the choice alone does not identify the learner's error.

Distractor 29.765: This differs from the correct value by 0.001. Compare the place-value units and each operation in the worked solution; the choice alone does not identify the learner's error.

TEACHER KEY

Worked keys and learning targets

001 | Warm-up | Answer: 0.63

Divide a whole number by a decimal and a decimal by a whole number using repeated subtraction or an area model, with decimals limited to hundredths. Estimate and use a check to judge whether real-world answers are reasonable.

Use an area model with total area 5.04 and height 8. Split width as $0.6 + 0.03 = 0.63$. Region areas are $8 \times 0.6 = 4.8$ and $8 \times 0.03 = 0.24$; together they give 5.04. Each equal row has area 0.63; $8 \times 0.63 = 5.04$. Choose a nearby dividend from multiples of 0.8: $4.8 \div 8 = 0.6$. This estimates the quotient to tenths; exact 0.63 is nearby. Multiplication confirms the exact quotient. Context answer: 0.63 meters per student.

Evidence: require the requested model or strategy, named units, explanation and check. Accept mathematically equivalent model partitions and explanations.

002 | Warm-up | Answer: 25

Divide a whole number by a decimal and a decimal by a whole number using repeated subtraction or an area model, with decimals limited to hundredths. Estimate and use a check to judge whether real-world answers are reasonable.

Repeatedly subtract groups of 0.8 from 20. Group the subtractions: $25 \times 0.8 = 20$, leaving 0. The group count is 25. Draw a rectangle of height 0.8, total area 20 and unknown width; its width is 25. Use benchmark group size 1: $20 \div 1 = 20$. Compare exact 25 with this estimate; a smaller actual group size requires more groups. Multiplication confirms the exact count. Context answer: 25 bottles.

Evidence: require the requested model or strategy, named units, explanation and check. Accept mathematically equivalent model partitions and explanations.