

Signed Sums and Differences



Grade 7 | NC.7.NS.1

The Number System

Teacher scripts, original models and student organizers

30 multiple-choice + 30 open/performance tasks

Worked keys, scoring and individual evidence records

Current NC standards for 2026-27 and 2027-28. Select tasks across several sessions. This resource bank is not one test.

Free sample | Contents

NC.7.NS.1 | Seventh Grade mathematics

This sample contains 19 complete selected pages from the 92-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-15, 30-31, 60, 75

Representative activities

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

M02: sample PDF page(s) 16; original page(s) 15

O01: sample PDF page(s) 17; original page(s) 30

O02: sample PDF page(s) 18; original page(s) 31

Selected teacher prompts and keys: original page(s) 60, 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.

TEACHER GUIDE

Exact standard and scope

Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, using the properties of operations, and describing real-world contexts using sums and differences.

Domain: THE NUMBER SYSTEM

Cluster: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Current NC wording and numbering are retained. Adopted 2026 revisions beginning in 2028-29 are not substituted.

TEACHER GUIDE

Targets and evidence

Add signed rational numbers with equivalent fractions.

Evidence: M01, M04, M07, M08, M20, O06, O08, O19, O20, O26

Subtract rational numbers by adding the additive inverse.

Evidence: M09, M11, M18, M27, M30, O03, O14, O15, O16, O24

Use addition properties to choose a useful grouping.

Evidence: M16, M21, M22, M24, M28, O01, O05, O22, O25, O29

Describe a real-world sum of signed rational quantities.

Evidence: M06, M10, M14, M19, M29, O09, O10, O12, O13, O30

Interpret signed differences as changes between rational values.

Evidence: M05, M12, M17, M23, M26, O02, O07, O23, O27, O28

Determine and justify whether a signed subtraction claim is valid.

Evidence: M02, M03, M13, M15, M25, O04, O11, O17, O18, O21

MP2: connect quantities and symbols. MP3: justify claims. MP4: model a context. MP6: attend to signs, units and precision. Open tasks require actual calculations and explanations.

TEACHER GUIDE

Plan and navigation

Use four sessions of about 25-35 minutes: warm-up/model; shared/partner work; independent work; reteach/exit. Choose one M and one O item from each section first. The rest is a reusable bank for spaced practice and conferences. Do not assign all 60 items in one sitting.

Warm-up: M01-M04 and O01-O04

I Do: M05-M08 and O05-O08

We Do: M09-M13 and O09-O13

Collaborative practice: M14-M18 and O14-O18

Independent practice: M19-M23 and O19-O23

Small-group reteach: M24-M27 and O24-O27

Exit ticket: M28-M30 and O28-O30

Navigation: standard and targets; planning/access; worked model; organizer; seven scripts; choice pages; open tasks; worked keys; rubric; record; sources. Print only selected student pages. Teacher models and keys stay separate from independent work.

TEACHER GUIDE

Preparation and access

Prerequisites: equivalent fractions, decimal place value, integer direction, multiplication/division facts and operation order. Check prerequisites with a neutral example before teaching the selected target.

Materials: pencil, ruler, supplied blank lines and organizers; optional signed paper counters. Adults handle cutting. A fraction bar means numerator divided by denominator; a slash between parenthesized quantities is division. Brackets in decimal answers mark the repeating block.

Access: neutral read-aloud, enlarged print, high contrast, AAC/signing and dictated explanations. A scribe records student-directed steps exactly. Do not score handwriting, decoding or accent. Calculator exploration can follow the first unaided calculation; record tool use separately when it changes the evidence.

Answer-supplying cues include telling the learner which operation to use, changing a sign for them, supplying a reciprocal or marking the answer on the line. Preserve the first response and record any later supported response separately.

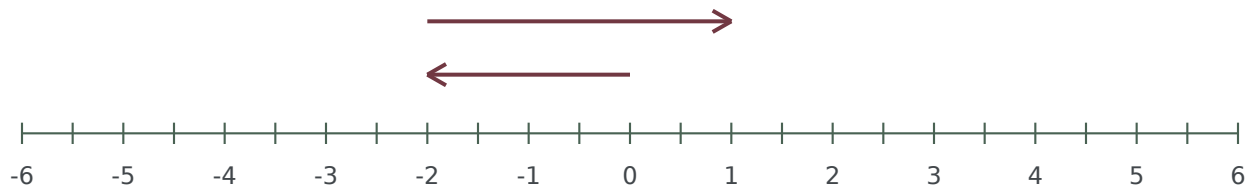
Differentiation: begin with halves/quarters and relate signs to direction; then vary denominators. Extend by comparing valid strategies, finding an input for which a shortcut fails, or creating a context for an expression. Do not replace the required performance with choice recognition.

N/O means unobserved, inaccessible or insufficient evidence. Zero is for an observed interpretable incorrect response. No invented speed cutoff or official mastery threshold is used. All contexts and numerical data are invented for instruction.

WORKED TEACHER MODEL

Think aloud and connect

Say: "For $-2 - (-3)$, subtraction adds the inverse. I rewrite $-2 + 3 = 1$. On the line, start at -2 and move 3 units right. With counters, add three positives to two negatives; remove two zero pairs and one positive remains. For rational parts the same reasoning applies: $-\frac{3}{4} - (-\frac{1}{2}) = -\frac{3}{4} + \frac{2}{4} = -\frac{1}{4}$. A change of $+\frac{1}{2}$ from $-\frac{3}{4}$ ends at $-\frac{1}{4}$." Ask why changing a subtrahend to its inverse is different from dropping a negative sign.



Model: 0 to -2 , then a $+3$ move to 1. Small ticks = 0.5.

Initial value: two negative counters



Add three positive counters



Pair two positives with the two negatives: two zero pairs. One positive remains, so $-2 + 3 = 1$.

REPRODUCIBLE STUDENT TOOL

Reasoning organizer

Name: _____ Date: _____ Item: _____

Given quantities and units / what must be found**Expression / useful representation or long division****Ordered steps / answer with units****Check / why the result makes sense**

TEACHER GUIDE

Warm-up teaching script

Select M01 and O01 first; use the remaining items through 04 later. Target: Use addition properties to choose a useful grouping.

Launch | 2-3 minutes

Say: "Read the quantities with their signs. What is being asked? Which unit or reference gives the signs meaning?" Let the learner restate the task without supplying an operation.

Model or elicit | 5-8 minutes

Say: "Write the expression before calculating. Show each equivalent step. What would let someone check your answer?" For shared work invite one step at a time; for independent/exit work do not supply steps.

Listen and probe | 3-5 minutes

Look for: Use addition properties to choose a useful grouping. Ask: "Which property or inverse makes this step valid?" If fractions are involved, check the common denominator or reciprocal explicitly. Keep signed change distinct from distance.

Respond | 3-5 minutes

Record the first attempt. For a sign error use a small signed example or zero pairs; for fraction errors use equivalent fractions; for grouping errors box the expression that must be evaluated first. Then retry a fresh item. Reteach is supported practice, not a replacement for the original evidence.

Close | 1-3 minutes

Have each learner explain one step independently. Partners compare only after both record a solution. Early finishers create and test a related expression or context, then explain which change affects the result. Record accuracy, reasoning, interpretation, access support and answer-supplying cues separately.

TEACHER GUIDE

I Do teaching script

Select M05 and O05 first; use the remaining items through 08 later. Target: Use addition properties to choose a useful grouping.

Launch | 2-3 minutes

Say: "Read the quantities with their signs. What is being asked? Which unit or reference gives the signs meaning?" Let the learner restate the task without supplying an operation.

Model or elicit | 5-8 minutes

Use the worked teacher example. Pause after every sign change and ask what justifies it. Demonstrate the calculation, model and check.

Listen and probe | 3-5 minutes

Look for: Use addition properties to choose a useful grouping. Ask: "Which property or inverse makes this step valid?" If fractions are involved, check the common denominator or reciprocal explicitly. Keep signed change distinct from distance.

Respond | 3-5 minutes

Record the first attempt. For a sign error use a small signed example or zero pairs; for fraction errors use equivalent fractions; for grouping errors box the expression that must be evaluated first. Then retry a fresh item. Reteach is supported practice, not a replacement for the original evidence.

Close | 1-3 minutes

Have each learner explain one step independently. Partners compare only after both record a solution. Early finishers create and test a related expression or context, then explain which change affects the result. Record accuracy, reasoning, interpretation, access support and answer-supplying cues separately.

TEACHER GUIDE

We Do teaching script

Select M09 and O09 first; use the remaining items through 13 later. Target: Describe a real-world sum of signed rational quantities.

Launch | 2-3 minutes

Say: "Read the quantities with their signs. What is being asked? Which unit or reference gives the signs meaning?" Let the learner restate the task without supplying an operation.

Model or elicit | 5-8 minutes

Say: "Write the expression before calculating. Show each equivalent step. What would let someone check your answer?" For shared work invite one step at a time; for independent/exit work do not supply steps.

Listen and probe | 3-5 minutes

Look for: Describe a real-world sum of signed rational quantities. Ask: "Which property or inverse makes this step valid?" If fractions are involved, check the common denominator or reciprocal explicitly. Keep signed change distinct from distance.

Respond | 3-5 minutes

Record the first attempt. For a sign error use a small signed example or zero pairs; for fraction errors use equivalent fractions; for grouping errors box the expression that must be evaluated first. Then retry a fresh item. Reteach is supported practice, not a replacement for the original evidence.

Close | 1-3 minutes

Have each learner explain one step independently. Partners compare only after both record a solution. Early finishers create and test a related expression or context, then explain which change affects the result. Record accuracy, reasoning, interpretation, access support and answer-supplying cues separately.

TEACHER GUIDE

Collaborative practice teaching script

Select M14 and O14 first; use the remaining items through 18 later. Target: Subtract rational numbers by adding the additive inverse.

Launch | 2-3 minutes

Say: "Read the quantities with their signs. What is being asked? Which unit or reference gives the signs meaning?" Let the learner restate the task without supplying an operation.

Model or elicit | 5-8 minutes

Say: "Write the expression before calculating. Show each equivalent step. What would let someone check your answer?" For shared work invite one step at a time; for independent/exit work do not supply steps.

Listen and probe | 3-5 minutes

Look for: Subtract rational numbers by adding the additive inverse. Ask: "Which property or inverse makes this step valid?" If fractions are involved, check the common denominator or reciprocal explicitly. Keep signed change distinct from distance.

Respond | 3-5 minutes

Record the first attempt. For a sign error use a small signed example or zero pairs; for fraction errors use equivalent fractions; for grouping errors box the expression that must be evaluated first. Then retry a fresh item. Reteach is supported practice, not a replacement for the original evidence.

Close | 1-3 minutes

Have each learner explain one step independently. Partners compare only after both record a solution. Early finishers create and test a related expression or context, then explain which change affects the result. Record accuracy, reasoning, interpretation, access support and answer-supplying cues separately.

TEACHER GUIDE

Independent practice teaching script

Select M19 and O19 first; use the remaining items through 23 later. Target: Add signed rational numbers with equivalent fractions.

Launch | 2-3 minutes

Say: "Read the quantities with their signs. What is being asked? Which unit or reference gives the signs meaning?" Let the learner restate the task without supplying an operation.

Model or elicit | 5-8 minutes

Say: "Write the expression before calculating. Show each equivalent step. What would let someone check your answer?" For shared work invite one step at a time; for independent/exit work do not supply steps.

Listen and probe | 3-5 minutes

Look for: Add signed rational numbers with equivalent fractions. Ask: "Which property or inverse makes this step valid?" If fractions are involved, check the common denominator or reciprocal explicitly. Keep signed change distinct from distance.

Respond | 3-5 minutes

Record the first attempt. For a sign error use a small signed example or zero pairs; for fraction errors use equivalent fractions; for grouping errors box the expression that must be evaluated first. Then retry a fresh item. Reteach is supported practice, not a replacement for the original evidence.

Close | 1-3 minutes

Have each learner explain one step independently. Partners compare only after both record a solution. Early finishers create and test a related expression or context, then explain which change affects the result. Record accuracy, reasoning, interpretation, access support and answer-supplying cues separately.

TEACHER GUIDE

Small-group reteach teaching script

Select M24 and O24 first; use the remaining items through 27 later. Target: Subtract rational numbers by adding the additive inverse.

Launch | 2-3 minutes

Say: "Read the quantities with their signs. What is being asked? Which unit or reference gives the signs meaning?" Let the learner restate the task without supplying an operation.

Model or elicit | 5-8 minutes

Say: "Write the expression before calculating. Show each equivalent step. What would let someone check your answer?" For shared work invite one step at a time; for independent/exit work do not supply steps.

Listen and probe | 3-5 minutes

Look for: Subtract rational numbers by adding the additive inverse. Ask: "Which property or inverse makes this step valid?" If fractions are involved, check the common denominator or reciprocal explicitly. Keep signed change distinct from distance.

Respond | 3-5 minutes

Record the first attempt. For a sign error use a small signed example or zero pairs; for fraction errors use equivalent fractions; for grouping errors box the expression that must be evaluated first. Then retry a fresh item. Reteach is supported practice, not a replacement for the original evidence.

Close | 1-3 minutes

Have each learner explain one step independently. Partners compare only after both record a solution. Early finishers create and test a related expression or context, then explain which change affects the result. Record accuracy, reasoning, interpretation, access support and answer-supplying cues separately.

TEACHER GUIDE

Exit ticket teaching script

Select M28 and O28 first; use the remaining items through 30 later. Target: Interpret signed differences as changes between rational values.

Launch | 2-3 minutes

Say: "Read the quantities with their signs. What is being asked? Which unit or reference gives the signs meaning?" Let the learner restate the task without supplying an operation.

Model or elicit | 5-8 minutes

Say: "Write the expression before calculating. Show each equivalent step. What would let someone check your answer?" For shared work invite one step at a time; for independent/exit work do not supply steps.

Listen and probe | 3-5 minutes

Look for: Interpret signed differences as changes between rational values. Ask: "Which property or inverse makes this step valid?" If fractions are involved, check the common denominator or reciprocal explicitly. Keep signed change distinct from distance.

Respond | 3-5 minutes

Record the first attempt. For a sign error use a small signed example or zero pairs; for fraction errors use equivalent fractions; for grouping errors box the expression that must be evaluated first. Then retry a fresh item. Reteach is supported practice, not a replacement for the original evidence.

Close | 1-3 minutes

Have each learner explain one step independently. Partners compare only after both record a solution. Early finishers create and test a related expression or context, then explain which change affects the result. Record accuracy, reasoning, interpretation, access support and answer-supplying cues separately.

STUDENT CHOICE

Choice practice 1-2

M01 | Find $(7/2) + (5/2)$.

- A. $25/4$
- B. 6
- C. 7
- D. 3

Reasoning notes: _____

M02 | Lee claims $(2/3) - (4/3) = 1/3$. What value should the expression have?

- A. $-2/3$
- B. $-7/6$
- C. $-14/3$
- D. $-5/12$

Reasoning notes: _____

STUDENT PERFORMANCE

001 | Warm-up

Target: Use addition properties to choose a useful grouping.

What is the value of $(2/3) + (3/4) + (-2/3)$? Show two groupings and name the properties that preserve the sum.

Expression and calculations / long division if requested

Answer / explanation / check

STUDENT PERFORMANCE

002 | Warm-up

Target: Interpret signed differences as changes between rational values.

A sensor reading changes from $-3/4$ meters to $3/4$ meters relative to a reference. What is final minus initial, the signed change? Show your calculations and explain why the signs and operations fit. Use the blank line as a model; choose and label a suitable scale, zero, start, moves and endpoint.



Choose a scale. Label equal intervals, zero and all needed values.

Expression / calculation / labeled model details

Answer / explanation / check

TEACHER ONLY

M worked keys 1-2

M01: B. 6

Target: Add signed rational numbers with equivalent fractions.

Use denominator 2: $\frac{7}{2} + \frac{5}{2} = 6$. Sample line: start at $\frac{7}{2}$, move $\frac{5}{2}$ units right, end at 6. Mark zero and use equal intervals.

Option checks: $\frac{25}{4}$: This option differs from the exact result by $\frac{1}{4}$. Ask the learner to locate the first changed sign, operation or arithmetic step; the choice alone does not identify a unique misconception. 7: This option differs from the exact result by 1. Ask the learner to locate the first changed sign, operation or arithmetic step; the choice alone does not identify a unique misconception. 3: This option differs from the exact result by -3. Ask the learner to locate the first changed sign, operation or arithmetic step; the choice alone does not identify a unique misconception.

M02: A. -2/3

Target: Determine and justify whether a signed subtraction claim is valid.

$(\frac{2}{3}) - (\frac{4}{3}) = (\frac{2}{3}) + (-\frac{4}{3}) = -\frac{2}{3}$. The claim is incorrect; its value differs from the correct result by 1. Sample line: start at $\frac{2}{3}$, move $\frac{4}{3}$ units left, end at $-\frac{2}{3}$. Mark zero and use equal intervals.

Option checks: $-\frac{7}{6}$: This option differs from the exact result by $-\frac{1}{2}$. Ask the learner to locate the first changed sign, operation or arithmetic step; the choice alone does not identify a unique misconception. $-\frac{14}{3}$: This option differs from the exact result by -4. Ask the learner to locate the first changed sign, operation or arithmetic step; the choice alone does not identify a unique misconception. $-\frac{5}{12}$: This option differs from the exact result by $\frac{1}{4}$. Ask the learner to locate the first changed sign, operation or arithmetic step; the choice alone does not identify a unique misconception.

TEACHER ONLY

O worked keys 1-2

001: $\frac{3}{4}$

Target: Use addition properties to choose a useful grouping.

Commutativity and associativity allow $(\frac{2}{3} + (-\frac{2}{3})) + (\frac{3}{4}) = 0 + (\frac{3}{4}) = \frac{3}{4}$. The additive-inverse and identity properties finish the calculation. A second grouping is $(\frac{2}{3} + (\frac{3}{4})) + (-\frac{2}{3}) = \frac{17}{12} + (-\frac{2}{3}) = \frac{3}{4}$.

Accept equivalent exact fractions, decimals or mixed numbers, with requested units and explanation. Check the requested performance as well as the final value; a number alone is incomplete evidence.

002: $\frac{3}{2}$ meters

Target: Interpret signed differences as changes between rational values.

Final - initial = $(\frac{3}{4}) - (-\frac{3}{4}) = (\frac{3}{4}) + (\frac{3}{4}) = \frac{3}{2}$ meters. The reading rises. Sample line: start at $\frac{3}{4}$, move $\frac{3}{4}$ units right, end at $\frac{3}{2}$. Mark zero and use equal intervals.

Accept equivalent exact fractions, decimals or mixed numbers, with requested units and explanation. The line must have equal intervals and labeled zero; arrows must show the starting value and signed moves in the expression. Check the requested performance as well as the final value; a number alone is incomplete evidence.