



PRINTABLES

PREMIUM EDUCATIONAL RESOURCES

GRADE 7 • CCSS 7.EE.B.4a • RATIONAL NUMBERS

• • •

Two-Step Equations Scavenger Hunt

Solve & Reveal

A 12-Station Self-Checking Loop
with Rational Coefficients & Constants

12

STATIONS

RATIONALS

FRACTIONS & DECIMALS

SELF-CHECKING

INSTANT FEEDBACK

Solve: $\frac{1}{2}x + 7 = 9 \rightarrow x = 4 \rightarrow$ Go to Station 4

Each answer reveals the next station!

*A Premium Mega Unit for Teachers Pay Teachers
Movement-Based Learning • Formative Assessment • Differentiated*

UM PRINTABLES

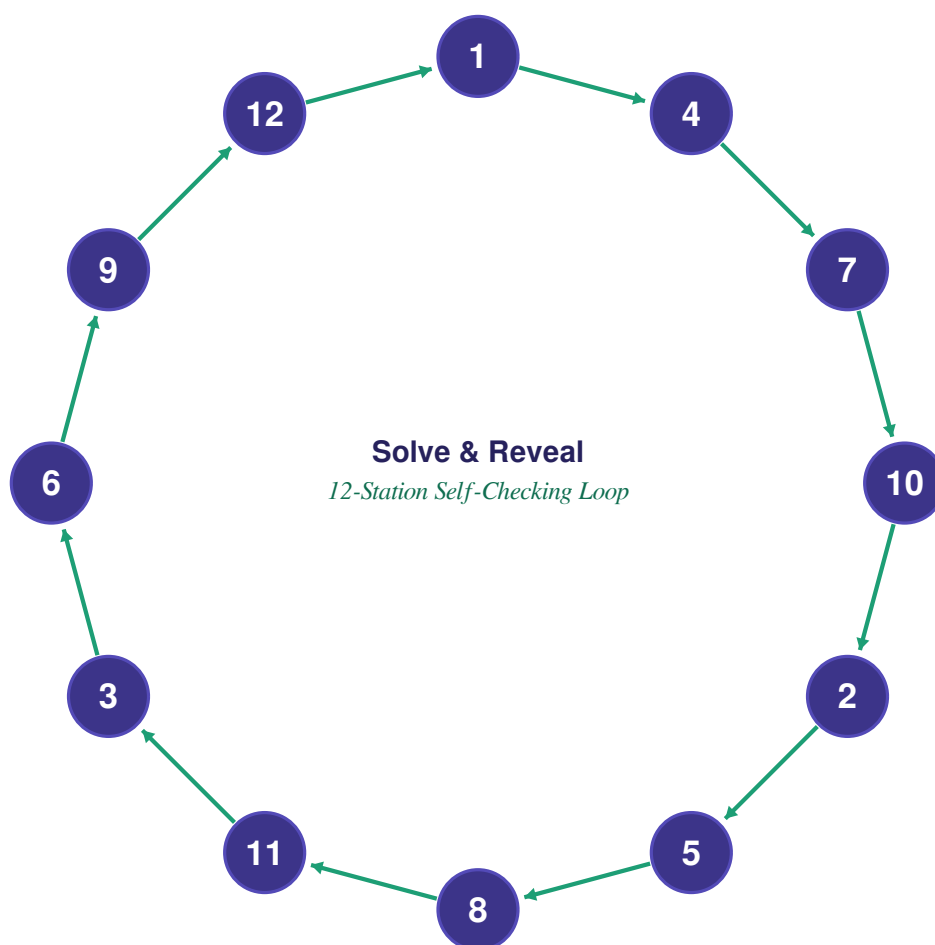
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How the Scavenger Hunt Works

The Scavenger Hunt is built on a simple but powerful idea: a closed loop of 12 stations, each containing a two-step equation with rational numbers. Students may start at *any* station. They solve the equation they find there, and the numerical answer tells them which station to visit next. If they solve all 12 equations correctly, they will visit every station exactly once and arrive back at their starting station — the loop closes. This structural property is what makes the activity self-checking: a student who makes an error will either land on a station they have already visited (signaling a wrong answer) or fail to close the loop after 12 visits.

The Station Loop at a Glance

The 12 stations are connected in the following order. A student who begins at Station 1 will travel through Stations 4, 7, 10, 2, 5, 8, 11, 3, 6, 9, 12, and then return to Station 1. A student who begins at Station 5 will travel $5 \rightarrow 8 \rightarrow 11 \rightarrow 3 \rightarrow 6 \rightarrow 9 \rightarrow 12 \rightarrow 1 \rightarrow 4 \rightarrow 7 \rightarrow 10 \rightarrow 2 \rightarrow 5$. No matter where a student starts, the loop visits every station exactly once before closing — a property mathematicians call a *Hamiltonian cycle*.



CCSS Alignment Chart

This resource is built to comprehensively address Common Core State Standard **7.EE.B.4a** and a network of supporting standards from the Expressions & Equations, Number System, and Mathematical Practice domains. The table below maps each station and supplementary component to its standards, with verbatim standard language included for your lesson plan documentation.

Primary Standard

Standard	Verbatim Language
7.EE.B.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

Station-by-Station Alignment

Station	Equation Form	Rational Numbers Used	Problem Type	Standards Addressed
1	$px + q = r$	$p = 1/2, q = 7, r = 9$	Pure Algebra	7.EE.B.4a, 7.NS.A.2, MP2, MP6
2	$px + q = r$	$p = 3/4, q = 2, r = 23/4$	Word Problem (Service Charge)	7.EE.B.4a, 7.NS.A.2, 7.NS.A.3, MP1, MP4
3	$2x + 12 = 24$	$q = 12, r = 24$	Geometry (Rectangle Perimeter)	7.EE.B.4a, 7.G.A.1, MP4, MP7
4	$p(x + q) = r$	$p = 2, q = 3, r = 20$	Pure Algebra (Distributive)	7.EE.B.4a, 7.EE.A.1, MP2, MP7
5	$px + q = r$	$p = 1.2, q = 4, r = 13.6$	Word Problem (Streaming Bill)	7.EE.B.4a, 7.NS.A.3, MP1, MP4
6	$px + q = r$	$p = 2/3, q = 1, r = 7$	Pure Algebra	7.EE.B.4a, 7.NS.A.2, MP2, MP6
7	$px + q = r$	$p = 0.4, q = 6, r = 10$	Word Problem (Service Charge)	7.EE.B.4a, 7.NS.A.3, MP1, MP4
8	$p(x + q) = r$	$p = 3, q = 2.5, r = 40.5$	Pure Algebra (Distributive)	7.EE.B.4a, 7.EE.A.1, MP2, MP7



3. Worked Example 1: Integer Coefficients

Problem: Solve $3x + 5 = 17$.

Step 1: Identify the form. This is $px + q = r$ with $p = 3$, $q = 5$, $r = 17$.

Step 2: Subtract q (5) from both sides. This isolates the x -term.

$$\begin{aligned} 3x + 5 &= 17 \\ 3x &= 17 - 5 = 12 \end{aligned}$$

Step 3: Divide by p (3) to isolate x .

$$x = 12 \div 3 = 4$$

Step 4: Verify by substituting back.

Check: $3(4) + 5 = 12 + 5 = 17$ ✓ The solution $x = 4$ is correct.

KEY TAKEAWAY

For $px + q = r$, the two-step solution is always: (1) subtract q from both sides, then (2) divide by p . The order matters — if you divide first, you end up with a fractional coefficient that is harder to work with.

4. Worked Example 2: Distributive Form

Problem: Solve $4(x - 2) = 12$.

Step 1: Identify the form. This is $p(x + q) = r$ with $p = 4$, $q = -2$, $r = 12$.

Step 2: Divide both sides by p (4). This is the cleanest two-step path. (Alternatively, distribute first — both methods work.)

$$\begin{aligned} 4(x - 2) &= 12 \\ x - 2 &= 12 \div 4 = 3 \end{aligned}$$

Step 3: Add 2 to both sides (since $q = -2$, subtracting q means adding 2).

$$x = 3 + 2 = 5$$

Step 4: Verify.

Check: $4(5 - 2) = 4(3) = 12$ ✓ The solution $x = 5$ is correct.

A note on method: students sometimes prefer to distribute first, obtaining $4x - 8 = 12$, then add 8 to both sides ($4x = 20$), then divide by 4 ($x = 5$). This is mathematically correct and yields the same answer. However, dividing first (as shown above) is often faster and avoids the multiplication step. Encourage students to use whichever method they find most reliable, but to be aware that dividing first is the more efficient two-step path.



1

STATION
#1

PURE ALGEBRA • FRACTIONAL COEFFICIENT

SCENARIO

Find the value of x when one-half of x plus seven equals nine.

Solve for x :

$$\frac{1}{2}x + 7 = 9$$

YOUR SOLUTION TELLS YOU WHERE TO GO NEXT!

The value of x is your next station number.
If x is between 1 and 12, you're on the right track.

9

STATION
#9

WORD PROBLEM • BAKING (FRACTIONAL)

SCENARIO

A baker starts with 7 cups of flour in her bowl. She then adds one-quarter cup of flour for each additional loaf of bread she wants to bake. If she uses 10 cups of flour in all, how many additional loaves did she bake?

Solve for x:

$$\frac{1}{4}x + 7 = 10$$

YOUR SOLUTION TELLS YOU WHERE TO GO NEXT!

The value of x is your next station number.
If x is between 1 and 12, you're on the right track.

Student Recording Sheet

Student Name: _____ Class Period: _____ Date: _____

Starting Station: _____ Ending Station (should match starting): _____

DIRECTIONS

Solve the equation at each station. Show all your work in the workspace provided. Write your final answer for x and the number of the next station you will visit. If you solve all 12 stations correctly, your ending station will match your starting station. If it does not, revisit the stations where you might have made an error.

1

STATION 1

Pure Algebra • Fractional Coefficient
Recording Sheet

Find the value of x when one-half of x plus seven equals nine.

SHOW YOUR WORK:

$x =$ _____ **→ Next Station:** _____

- ☐ Verified by substitution
- ☐ Loop continues correctly

STATION 1

Pure Algebra • Fractional Coefficient

 Answer: $x = 4 \rightarrow$ Next: Station 4

Scenario: Find the value of x when one-half of x plus seven equals nine.

Equation:

$$\frac{1}{2}x + 7 = 9$$

Step-by-Step Solution:

Step 1. Start with the equation.

$$\frac{1}{2}x + 7 = 9$$

Step 2. Subtract 7 from both sides to isolate the x -term.

$$\frac{1}{2}x = 9 - 7 = 2$$

Step 3. Multiply both sides by 2 (the reciprocal of $1/2$).

$$x = 2 \times 2 = 4$$

Step 4. Verify: $(1/2)(4) + 7 = 2 + 7 = 9 \checkmark$

Solution: $x = 4 \rightarrow$ Go to Station 4

FINAL ANSWER: $x = 4$

$\rightarrow$ Go to Station 4



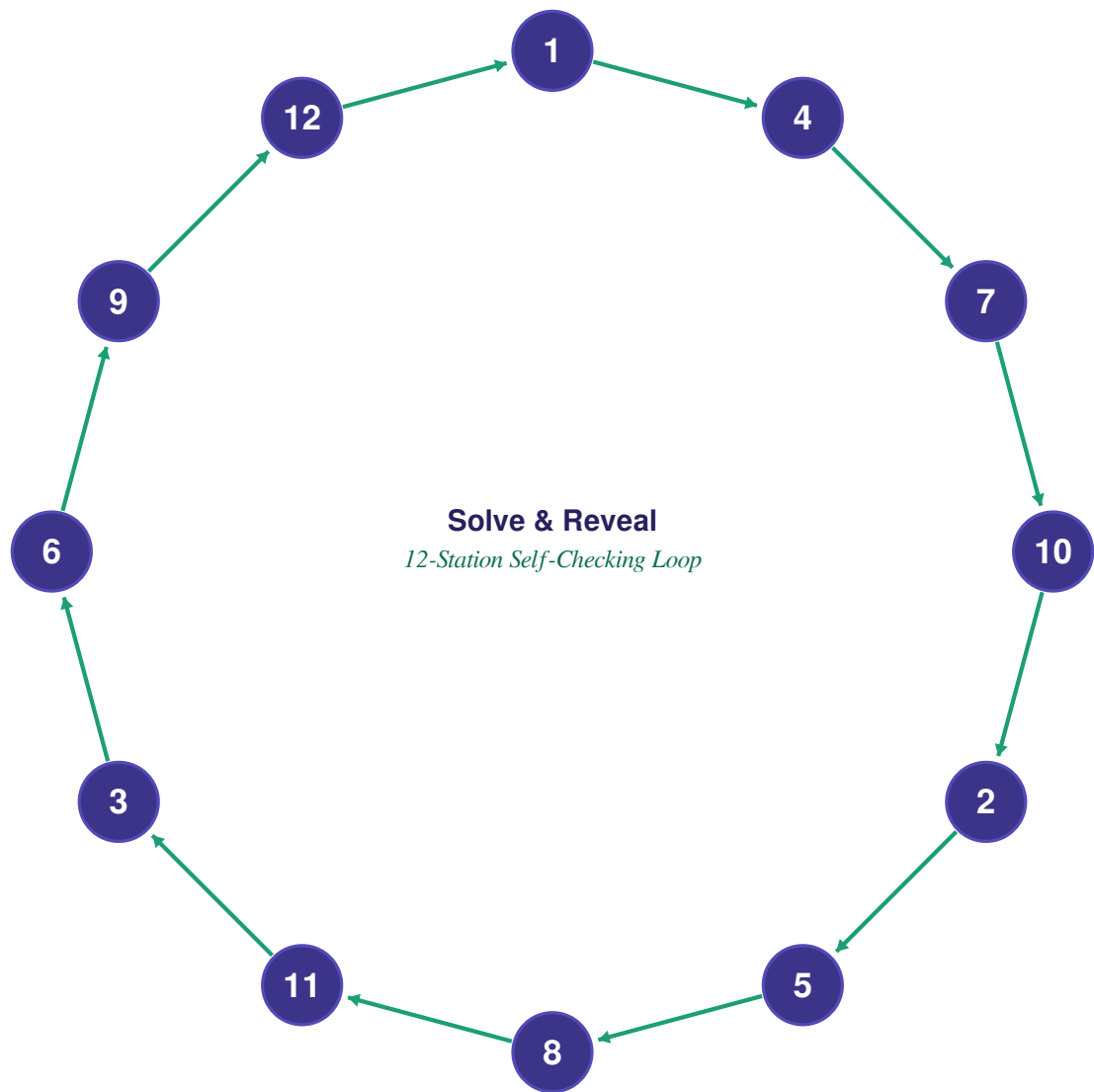


Figure 6. The 12-station loop. Starting from any station and following the teal arrows, students visit every station exactly once before returning to their starting point.

Path Examples

Because the loop is a closed cycle, students can start at any station and will visit every other station exactly once before returning. Here are the paths for a few common starting stations:

Starting Station	Path (12 visits, then back to start)
1	1 → 4 → 7 → 10 → 2 → 5 → 8 → 11 → 3 → 6 → 9 → 12 → 1
4	4 → 7 → 10 → 2 → 5 → 8 → 11 → 3 → 6 → 9 → 12 → 1 → 4

Exit Ticket

Student Name: _____ Class Period: _____ Date: _____

DIRECTIONS

Solve each equation below. Show all your work in the space provided. Write your final answer on the line. Turn in this exit ticket as you leave class.

Problem 1. Solve: $2.5x + 1 = 11$

SHOW YOUR WORK

$x =$ _____

Problem 2. Solve: $(1/3)(x - 4) = 2$

SHOW YOUR WORK

$x =$ _____

Problem 3. A fruit stand sells apples for \$0.75 each. The stand also charges a \$1.50 bagging fee for any order. If Elena paid \$6.00 total, how many apples did she buy? Write an equation and solve.





PRINTABLES

PREMIUM EDUCATIONAL RESOURCES

WHAT'S INSIDE THIS RESOURCE

Two-Step Equations Scavenger Hunt — Solve & Reveal

Grade 7 • 12-Station Loop with Rationals • CCSS 7.EE.B.4a • 86 Pages

TEACHER SUPPORT

2 pp	Teacher Welcome & Resource Overview
3 pp	How the Scavenger Hunt Works
3 pp	CCSS Alignment Chart
3 pp	Materials & Setup Instructions
4 pp	30- & 45-Minute Pacing Guides
3 pp	Differentiation Strategies

CORE & STUDENT MATERIALS

8 pp	Mini-Lesson Refresher • 5 worked examples
2 pp	Vocabulary Glossary
12	Full-Color Station Cards
7 pp	Student Recording Sheet
2 pp	Exit Ticket + Self-Assessment

ANSWERING & EXTENSIONS

13 pp	Detailed Station Answer Key • 12 station solutions + verification
2 pp	Station Loop Verification Map
4 pp	Exit Ticket Answer Key + Scoring Rubric
2 pp	Challenge Stations • 4 extension problems
3 pp	Write Your Own Equation + Peer Rubric
3 pp	Error Analysis • 3 worked error cases

REFLECTION & FOLLOW-UP

2 pp	Student Reflection & Self-Assessment
2 pp	Family Connection Letter + Home Practice
2 pp	Teacher Reflection & Implementation Notes
1 p	Review Request Page

THE LEARNING EXPERIENCE

12-STATION LOOP

Students solve each equation and use x to identify the next station.

RATIONAL NUMBERS

Fractions and decimals appear alongside integer examples.

SELF-CHECKING

A closed loop lets students notice when a solution sends them off track.