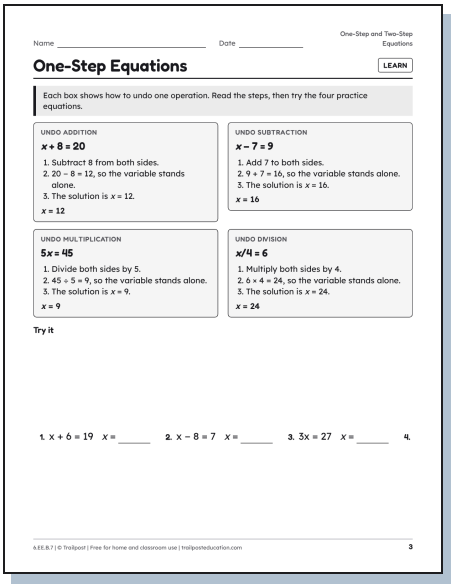
FREE TEACHER GUIDE AND INSTALL GUIDE

One-Step and Two-Step Equations

Inverse operations, checking by substitution, and writing equations from word problems

Grades 6 to 8 | **Math** | **16 student pages** | **Full answer key**



Name _____ Date _____ One-Step and Two-Step Equations

One-Step Equations LEARN

Each box shows how to undo one operation. Read the steps, then try the four practice equations.

UNDO ADDITION
$x + 8 = 20$
1. Subtract 8 from both sides.
2. 20 − 8 = 12, so the variable stands alone.
3. The solution is $x = 12$.
$x = 12$

UNDO SUBTRACTION
$x - 7 = 9$
1. Add 7 to both sides.
2. 9 + 7 = 16, so the variable stands alone.
3. The solution is $x = 16$.
$x = 16$

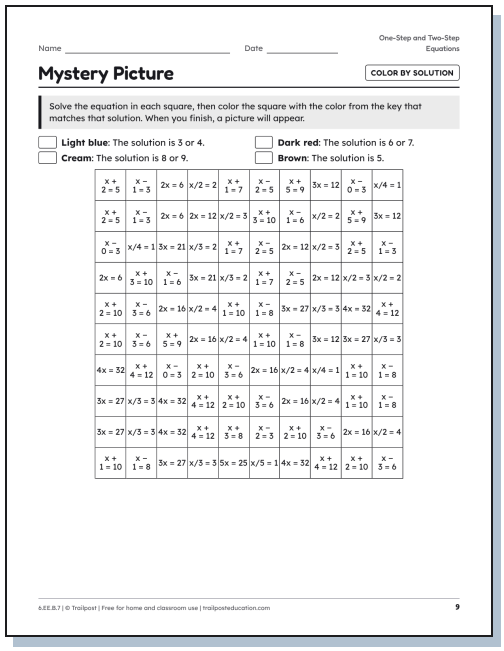
UNDO MULTIPLICATION
$5x = 45$
1. Divide both sides by 5.
2. 45 ÷ 5 = 9, so the variable stands alone.
3. The solution is $x = 9$.
$x = 9$

UNDO DIVISION
$x/4 = 6$
1. Multiply both sides by 4.
2. 6 × 4 = 24, so the variable stands alone.
3. The solution is $x = 24$.
$x = 24$

Try it

1. $x + 6 = 19$ $x =$ _____ 2. $x - 8 = 7$ $x =$ _____ 3. $3x = 27$ $x =$ _____ 4.

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Name _____ Date _____ One-Step and Two-Step Equations

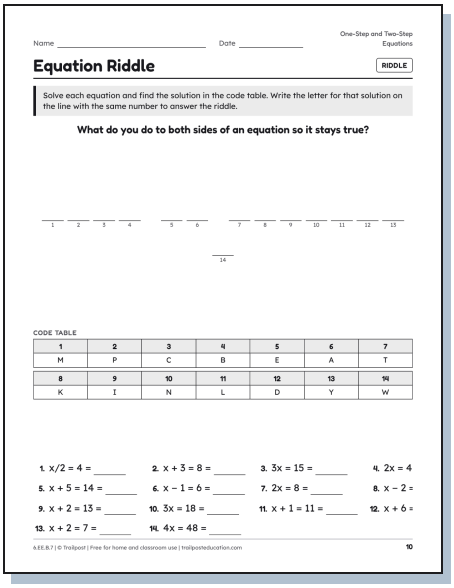
Mystery Picture COLOR BY SOLUTION

Solve the equation in each square, then color the square with the color from the key that matches that solution. When you finish, a picture will appear.

- **Light blue**: The solution is 3 or 4.
- **Cream**: The solution is 8 or 9.
- **Dark red**: The solution is 6 or 7.
- **Brown**: The solution is 5.

$x + 2 = 5$	$x - 1 = 3$	$2x = 6$	$x/2 = 2$	$x + 1 = 7$	$x - 2 = 5$	$x + 5 = 9$	$3x = 12$	$x - 0 = 3$	$x/4 = 1$
$x + 2 = 5$	$x - 1 = 3$	$2x = 6$	$2x = 12$	$x/2 = 3$	$x + 3 = 10$	$x - 1 = 6$	$x/2 = 2$	$x + 5 = 9$	$3x = 12$
$x - 0 = 3$	$x/4 = 1$	$3x = 21$	$x/3 = 2$	$x + 1 = 7$	$x - 2 = 5$	$2x = 12$	$x/2 = 3$	$x + 2 = 5$	$x - 1 = 3$
$2x = 6$	$x + 3 = 10$	$x - 1 = 6$	$3x = 21$	$x/3 = 2$	$x + 1 = 7$	$x - 2 = 5$	$2x = 12$	$x/2 = 3$	$x/2 = 2$
$x + 2 = 10$	$x - 3 = 6$	$2x = 16$	$x/2 = 4$	$x + 1 = 10$	$x - 1 = 8$	$3x = 27$	$x/3 = 3$	$4x = 32$	$x + 4 = 12$
$x + 2 = 10$	$x - 3 = 6$	$x + 5 = 9$	$2x = 16$	$x/2 = 4$	$x + 1 = 10$	$x - 1 = 8$	$3x = 12$	$3x = 27$	$x/3 = 3$
$4x = 32$	$x + 4 = 12$	$x - 0 = 3$	$x + 2 = 10$	$x - 3 = 6$	$2x = 16$	$x/2 = 4$	$x/4 = 1$	$x + 1 = 10$	$x - 1 = 8$
$3x = 27$	$x/3 = 3$	$4x = 32$	$x + 4 = 12$	$x + 2 = 10$	$x - 3 = 6$	$2x = 16$	$x/2 = 4$	$x + 1 = 10$	$x - 1 = 8$
$3x = 27$	$x/3 = 3$	$4x = 32$	$x + 4 = 12$	$x + 3 = 8$	$x - 2 = 3$	$x + 2 = 10$	$x - 3 = 6$	$2x = 16$	$x/2 = 4$
$x + 1 = 10$	$x - 1 = 8$	$3x = 27$	$x/3 = 3$	$5x = 25$	$x/5 = 1$	$4x = 32$	$x + 4 = 12$	$x + 2 = 10$	$x - 3 = 6$

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Name _____ Date _____ One-Step and Two-Step Equations

Equation Riddle RIDDLE

Solve each equation and find the solution in the code table. Write the letter for that solution on the line with the same number to answer the riddle.

What do you do to both sides of an equation so it stays true?

_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____
1 2 3 4 5 6 7 8 9 10 11 12 13 14

CODE TABLE

1	2	3	4	5	6	7
M	P	C	B	E	A	T
8	9	10	11	12	13	14
K	I	N	L	D	Y	W

1. $x/2 = 4$ = _____ 2. $x + 3 = 8$ = _____ 3. $3x = 15$ = _____ 4. $2x = 4$
5. $x + 5 = 14$ = _____ 6. $x - 1 = 6$ = _____ 7. $2x = 8$ = _____ 8. $x - 2 =$
9. $x + 2 = 13$ = _____ 10. $3x = 18$ = _____ 11. $x + 1 = 11$ = _____ 12. $x + 6 =$
13. $x + 2 = 7$ = _____ 14. $4x = 48$ = _____

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STUDENTS WILL LEARN TO

- ✓ Solve a one-step equation using an inverse operation
- ✓ Solve a two-step equation and check the solution
- ✓ Write an equation that matches a word problem
- ✓ Explain inverse operations in your own words

A free resource from Trailpost

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Getting started

What is in your download

File	What it is
Student-Pages.pdf	The 16-page student packet, starting with a cover page that has a name line and a table of contents.
Answer-Key.pdf	The same pages with every answer filled in, so you can check work quickly or project a page to go over it together.
Teacher-Guide.pdf	This guide, which explains how to print the packet, how to pace it, and which standards it covers.

How to open the files

1. On a Chromebook, open the Files app, double-click the zip folder, and drag the three PDFs into Google Drive or onto the desktop.
2. On a Windows computer, right-click the zip folder and choose Extract All, then open the new folder that appears.
3. On a Mac, double-click the zip folder and a regular folder with the three PDFs will open next to it.
4. Open each PDF in your browser or in any PDF reader, and you are ready to print.

How to print

- Set the print scale to Actual Size or 100 percent so the boxes and lines stay the right size for student handwriting.
- Black and white printing works well, because every page uses black lines and light gray shading.
- Print pages 7 and 15 on one side only, because students cut those pages apart.
- The exit ticket page holds two copies of the same ticket, so one printed page covers two students.

One star and two stars

Pages marked with one star (5) give steady practice with friendly numbers and extra support. Pages marked with two stars (6, 12) ask for more steps and more explaining. Students who finish the one-star page with few mistakes can move straight to the two-star page, and students who need more time can do the one-star page twice with a partner.

Using the answer key

The answer key matches the student packet page for page, so page 6 of the key answers page 6 of the student packet. Written answers in the key are sample answers, and any answer that gives the same idea with good reasoning should earn credit.

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What is inside

Students learn what an equation is, undo operations to solve one-step and two-step equations, and check solutions by substitution. The packet moves from guided pages to two levels of practice, puzzles, word problems, error analysis, a writing page, a review, exit tickets, and a self-check.

Page	Title	What students do
1	**Cover**	Students write their name and see a list of every page in the packet.
2	**What an Equation Is** Learn | 6.EE.B.5	Students learn that an equation is a balance, and they learn the words variable, solution, and inverse operation.
3	**One-Step Equations** Learn | 6.EE.B.7	Students see one-step equations for all four operations and learn to undo each one.
4	**Two-Step Equations** Guided Practice | 7.EE.B.4a	Students undo addition or subtraction first, then undo multiplication or division, and they check by substitution.
5	**One-Step Practice** Practice ★ | 6.EE.B.7	Students solve twenty-four one-step equations with all four operations, including a few with fractions.
6	**Two-Step Practice** Practice ★★ | 7.EE.B.4a	Students solve two-step equations, including negatives and a few with fractions, then compare solutions.
7	**Sort the Equations** Cut and Paste | 6.EE.B.7	Students solve twelve equations and glue each card under the column for its solution.
8	**Match the Story to the Equation** Match | 7.EE.B.4a	Students match eight word problems to the equations that model them, then write an equation of their own.
9	**Mystery Picture** Color by Solution | 6.EE.B.7	Students solve the equation in each square and color it to reveal a house.
10	**Equation Riddle** Riddle | 6.EE.B.7	Students solve sixteen equations and use a code table to turn each solution into a letter that answers a riddle.
11	**Equation Word Problems** Apply | 7.EE.B.4a	Students write and solve equations for four word problems, and the last two take two steps.
12	**Find the Mistake** Error Analysis ★★ | 7.EE.B.4a	Students study two pieces of student work, explain each mistake, and solve a new equation with the right steps.
13	**Explain Inverse Operations** Write About Math | 6.EE.B.7	Students explain inverse operations in writing, show the steps for a two-step equation, and tell how to check.
14	**Mixed Review** Review | 6.EE.B.7, 7.EE.B.4a	Students review one-step and two-step equations, a comparison, and two word problems.
15	**Exit Tickets** Check | 6.EE.B.7, 7.EE.B.4a	Two copies of a short exit ticket on each page so you can check understanding in about five minutes.
16	**How Did I Do?** Self-Check | 6.EE, 7.EE	Students rate their own progress on each skill and set one goal for practice.

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Pacing and standards

A suggested plan

Day	Pages	What to do
Day 1	2 to 4	Read the two Learn pages together and talk through each inverse operation, then have partners finish the guided page while you check in.
Day 2	5 to 6	Students start with the one-star page and move to the two-star page when they finish with few mistakes.
Day 3	7 to 10	Use the sort, the match, the mystery picture, and the riddle as centers or as a fun Friday set.
Day 4	11 to 13	Students solve the word problems, find the mistakes on the error page, and explain inverse operations in writing.
Day 5	14 to 16	Give the review page as a quiz, use the exit ticket the next morning, and finish with the self-check.

Standards

Code	Standard
6.EE.B.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true?
6.EE.B.7	Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.
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.
8.EE.C.7	Solve linear equations in one variable.

Teaching tips

- Have students write the inverse operation next to each step, so they can see why they add when an equation subtracts.
- The mystery picture and the riddle check themselves, because a wrong solution gives a color or a letter that looks wrong.
- Ask students to substitute their solution back into the original equation before they raise a hand, because checking catches most arithmetic slips.

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Thank you for downloading this packet

I made this packet for families and teachers who need solid practice pages that are ready to print tonight, and I hope it saves you some planning time this week.

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These packets are also free on the Trailpost website, and each one comes with an answer key and a teacher guide like this one.

- **Addition and Subtraction Within 20** | Math, grades 1 to 2
- **Claim, Evidence, Reasoning with Data** | Science, grades 6 to 9
- **CVC Words and Short Vowels** | ELA, grades K to 1
- **Ecosystems and Food Webs** | Science, grades 4 to 6
- **Figurative Language** | ELA, grades 4 to 6
- **Equivalent Fractions and Number Lines** | Math, grades 3 to 5
- **Main Idea and Key Details** | ELA, grades 3 to 5
- **Map Skills** | Social Studies, grades 3 to 5
- **Multiplication Fact Strategies** | Math, grades 3 to 4
- **Citing Text Evidence** | ELA, grades 5 to 8
- **Telling Time and Counting Money** | Math, grades 2 to 3

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