Problem Solving
Practice Cards
Grade 4

Contents

Didax

Correlation to the Math Standards

Standard	Card No.
Operations and Algebraic Thinking	
Interpret a multiplication equation as a comparison. (4.OA.1)	4, 12
Multiply or divide to solve word problems involving multiplicative comparison. (4.OA.2)	4, 12
Solve multi-step word problems using the four operations; interpret remainders. (4.OA.3)	2, 5, 6, 9, 10, 13, 14, 15, 16, 17
Find all factor pairs of a whole number in the range 1–100. (4.OA.4)	1, 8, 19, 20
Generate a number or shape pattern that follows a given rule. (4.OA.5)	3, 7, 11, 18, 20
Number and Operations in Base Ten	
Recognize that in a multi-digit whole number, a digit in one place repesents ten times what it represents in the place to its right. (4.NBT.1)	1, 3, 4, 6, 19
Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. (4.NBT.2)	1, 3, 6
Use place value to round whole numbers. (4.NBT.3)	2, 4, 7, 18
Fluently add and subtract multi-digit whole numbers using the standard algorithm. (4.NBT.4)	5, 10, 12, 14, 20
Multiply a whole number of up to four digits by a one-digit number; multiply two two-digit numbers. (4.NBT.5)	10, 11–14, 20
Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors. (4.NBT.6)	8, 9, 15, 16, 17
Number and Operations – Fractions	
Explain fraction equivalence using visual models. (4.NF.1)	1
Compare two fractions with different numerators and different denominators by creating common denominators. (4.NF.2)	5, 8, 18
Understand a fraction a/b as a sum of fractions $1/b$. (4.NF.3)	2, 3, 5, 6, 7, 9, 10, 12, 15, 16
Multiply a fraction by a whole number. (4.NF.4)	4, 11, 13
Express a fraction with denominator 10 as an equivalent fraction with denominator 100. (4.NF.5)	17
Use decimal notation for fraction denominators 10 or 100. (4.NF.6)	19
Compare two decimals to hundredths by reasoning about their size. (4.NF.7)	14, 20
Measurement and Data	
Know relative sizes of measurements within one system. (4.MD.1)	4, 9, 10, 12, 13, 19, 20
Solve word problems involving distances, time, liquid volumes, masses of objects, and money. (4.MD.2)	2, 3, 8–11, 13, 17, 19

Apply the area and perimeter formulas for rectangles. (4.MD.3)	1, 5, 6
Make a line plot to display a data set of measurements in fractions of a unit. (4.MD.4)	14
Understand concepts of angle measurement. (4.MD.5)	18
Measure angles in whole-number degrees using a protractor. (4.MD.6)	7, 15
Recognize angle measure as additive. (4.MD.7)	15, 16
Geometry	
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. (4.G.1)	2, 3, 8, 9, 10, 13, 14, 15, 16, 17, 18, 20
Classify two-dimensional figures. (4.G.2)	3, 4, 5, 6, 11, 12
Identify line-symmetric figures and draw lines of symmetry. (4.G.3)	1, 7, 19

Getting Started with the *Problem-Solving Practice Cards*

Congratulations on your purchase of the **Problem-Solving Practice Cards!**

Designed for rigor and carefully aligned to the Math Standards, these activity cards build student confidence in problem solving as the cards progress from strategies and procedures to a deep understanding of math concepts.

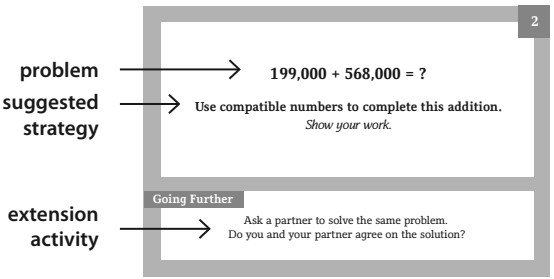
This box contains:

- 100 problem-solving cards, 20 cards for each of the five domains of the current math standards.
- This teacher guide, which includes the "Getting Started" pages and a complete answer key.

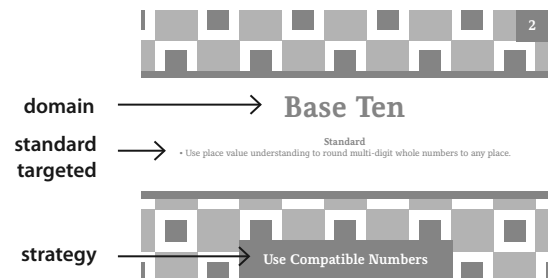
Featuring classroom-tested problems, each card suggests a specific problem-solving strategy to be used, such as:

- drawing a picture,
- using a model, or
- writing and solving an equation.

Each card includes a "Going Further" activity, which may involve work with a partner or further exploration of the concept by students working on their own.



The back of each card includes card number, domain, targeted mathematical standard, and suggested strategy for solving the problem.



The engaging problems on these cards will improve students' abilities as they learn to effectively use a variety of problem-solving strategies.

A Research-Based Approach to Problem Solving

The ability to problem solve is foundational to students' mathematical development. The first mathematical practice standard outlined in the Common Core State Standards addresses problem solving:

"Make sense of problems and persevere in solving them."

A well-designed and rigorous problem is one that asks students to:

1. Define the problem. (Make sure students understand what the question is asking.)
2. Identify what information is given and what is missing.
3. Ask questions that will lead to reasonable assumptions. (Discussion of ideas and approaches with a partner is helpful.)
4. For younger students: Use concrete objects or pictures to help conceptualize and solve the problem.
5. Identify possible solutions.
6. Evaluate possible solutions and determine the answer.
7. Check the answer using a different method. (Ask yourself: "Does this make sense?")

Finally, research emphasizes the importance of practice. Repeated practice in problem solving helps students build confidence as well as competence.

How to Use the Problem-Solving Practice Cards in Your Classroom

The Problem-Solving Practice Cards incorporate current research on the role of problem solving in mathematics learning. With 20 cards per domain and five domains per grade level, the cards give students experience in solving a wide variety of problems, either on their own or with a partner. The problems require more than just a quick answer. Students are asked to draw a picture or use a model, write and solve an equation, look for a pattern, work backwards, use direct reasoning, and more. In many cases, students are asked to justify their solution by explaining their thought processes in writing or verbally to a partner.

These problem-solving cards can be used as a unit review for the end of the week, or after the class has been given instruction on that particular topic. The cards can also be used prior to teaching a topic, as a gauge to determine how well the class understands a particular skill or skills.

The cards can be used as a whole-class, small-group, or partner activity. There is no one right way to use the

cards, but should be dictated by the needs of the class or individual students as they pertain to a particular concept or subject area.

A strategy is suggested on each card, but students should have leeway to use a different strategy if it is more natural to them. The emphasis should always be on student initiative and creative problem solving rather than rote learning.

To use the cards most effectively, it is helpful to have these materials and manipulatives on hand:

- Pencil and plain paper for drawing
- Graph paper
- Ruler
- Fraction circles and fraction strips
- Place-value disks or base-ten blocks
- Counters
- Pattern blocks
- Hundred chart
- Real money or play money

The cards are numbered and color-coded by domain for easy sorting at the end of an activity.

Answers

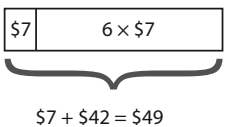
Grade 4: Operations and Algebraic Thinking

1. 30, 60; Yes, multiply 6 by the factors of 5 to find the common multiple ($6 \times 5 = 30$ and $6 \times 10 = 60$).

2. 70; $(7 \times 5) + (5 \times 7) = n$; GF: Answers will vary.

3. $n \times n$; 25, 36, 49; GF: Answers will vary.

4. \$49;



;

$n = 7 + 42 = 49$; GF: Answers may vary.

5. 5; $5 \times 4 - 15 = 5$; For each step, I used the inverse operation.

6. 7; $n + (n + 3) + (n - 3) = 21$; $n + n + n + 0 = 21$; $3n = 21$; $n = 7$; GF: Answers may vary.

7. 21; $2n + 1$;

In	Out
1	3
2	5
3	7
4	9
10	21

; GF: 41

8. 8 and 13; $8 \times 13 = 104$; GF: 1 and 96, 8 and 12

9. 48 crates; 400 ÷ 25 = 16; 16 × 3 = 48; GF: Answers will vary.

10. 13 buses; 463 ÷ 38 = 12 R 7; GF: No: he will only order 12 buses.

11. 3*n* + 1; 22, 25, 28; GF: Answers will vary.

12. $23; *n* = (2 × 10) + 3; *n* = 20 + 3 = 23; GF: $53; 10 + (2 × 10) + (2 × 10) + 3 = 10 + 20 + 23 = 53

13. 2 ounces; division; 30 ÷ 4 = 7 R 2; GF: Answers will vary.

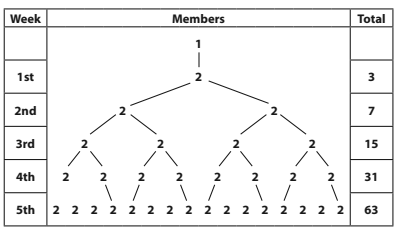
14. Yes; (2 × $1) + (4 × $2) + $2 = $2 + $8 + $2 = $12; The actual cost is $14.00, so my estimate is $2 off; GF: No; If I round up more than I round down, the estimate may be greater than the exact sum.

15. 2,124 seedlings; 236 trays and 9 seedlings per large tray; multiplication: 236 × 9 = 2,124; GF: 2,580 seedlings (430 × 6 = 2,580)

16. 162 seats; 18 × 26 = 468 seats; 468 – (247 + 59) = 468 – 306 = 162 seats left; GF: 20 rows × 25 seats per row = about 500 seats; 250 adults + 60 children = about 310 seats taken; 500 – 310 = about 190 seats left. Yes, it's reasonable.

17. 160 beads; 6 × 42 = 252 total beads; 252 – 92 = 160 beads left; GF: Answers may vary.

18. 63 members; GF: Answers may vary.



19. 26 chickens and 12 goats;

Chickens		Goats		Totals	
Heads	Feet	Heads	Feet	Heads	Feet
26	52	12	48	38	100

; GF: 15 goats and 30 chickens (45 heads, 120 feet)

20. 16 = 2 × 2 × 2 × 2; 32 = 2 × 2 × 2 × 2 × 2; 64 = 2 × 2 × 2 × 2 × 2 × 2; Yes; Each one has one more factor of 2; GF: 2 = 2; 4 = 2 × 2; 8 = 2 × 2 × 2

Grade 4: Number and Operations in Base Ten

1. 753; seven hundred fifty-three; GF: 492; four hundred ninety-two

2. 199,000 + 1,000 + 568,000 – 1,000 = 767,000; GF: Answers will vary.

3. 853; I know that the ones digit is 3, so I should work from there. Since the tens digit is 2 more than the ones digit, it is 3 + 2 = 5. Since the hundreds digit is 3 more than the tens digit, it is 5 + 3 = 8. So the number is 853; GF: Answers will vary.

4. 20,000 is 100 times greater than 200; GF: 40 is 1,000 times less than 40,000.

5. $1000; $n - 365 + 250 = 885$; $n - 115 = 885$; $n = 1000$; GF: $115 ($885 + n = 1000$)

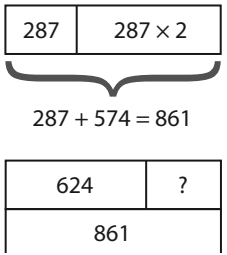
6. 602,000; $600 \times 1{,}000 = 600{,}000$; $20 \times 100 = 2{,}000$; $600{,}000 + 2{,}000 = 602{,}000$; GF: Answers will vary.

7. about $2009; Rounding to the nearest dollar means rounding in the ones place. Since 0.51 is more than 0.5, I round up from 8 to 9; GF: $2008.50

8. 4, 4, 4; The quotient is 4 in each equation, because 8 divided by 2 is 4 and the number of zeros is the same in the divisor and dividend; GF: Answers may vary.

9. 3 jellybeans; $1{,}259 \div 4 = 314$ R 3; GF: $1{,}260 \div 4 = 315$; It is reasonable.

10. 237 cakes;



;

$287 \times 3 = 861$; $861 - 624 = 237$ cakes; GF: Answers will vary.

11. 180 pies; array showing 15 groups of 12 or area model:

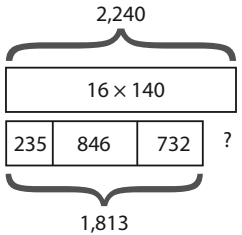
×	10	5
10	100	50
2	20	10

100
20
50
10
180

;

GF: Yes; I can add 15 groups of 12 pies or multiply 15×12.

12. 427 brownies;



;

$16 \times 140 = 2{,}240$; $2{,}240 - 1{,}813 = 427$; GF: Answers will vary.

13. 2,600 lbs per year; 25 lbs × 2 per week × 52 weeks = 2,600 lbs. per year; GF: The cost of each carton ($57) and the number of boxes of fish per carton (6) were not needed to solve the problem.

14. 1,170 can travel on the train and 846 can sit;

×	10	8
60	600	480
5	50	40

600
50
480
40
1,170

;

×	10	8	
40	400	320	400 + 320
7	70	56	70 + 56
			846

;

18 × 65 = 1,170, 18 × 47 = 846; GF: 324 people are standing; 1,170 – 846 = 324

15. 83; division; 742 ÷ 9 = 82 R 4; 82 trays will be filled completely. The 83rd tray will have 4 peaches.

16. About 970 tons per month; 6,790 ÷ 7 = 970; GF: Answers will vary.

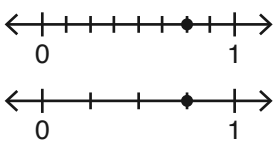
17. 700,000; GF: Answers will vary.

18. 900; the difference is 3; 420 + 290 + 190 = 900; 417 + 289 + 191 = 897; GF: 400 + 300 + 200 = 900; In this case they are the same, because the amounts that I rounded up and down the first time (up 3, up 1, down 1) even out to the same difference (up 3) as the amounts that I rounded up and down the second time (down 17, up 11, up 9) do.

19. 600; I know that dividing by 10 means moving one place value to the right. When I move the 6 one place to the right from 6,000, I get 600; GF: 5,000 ÷ 50 = 100.

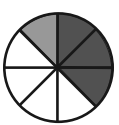
20. 9,678 more people; 75,320 – 65,642 = 9,678; GF: 37,900 people; 4 × 9,475 = 37,900

Grade 4: Number and Operations – Fractions

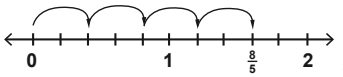


1. 3; ;
GF: Answers will vary.

2. 4/5; 1/5 + 1/5 + 2/5 = 4/5; GF: Answers will vary.

3. 4/8;  ; 1/8 + 3/8 = 4/8; GF: 1/2

4. 8/5 or 1 3/5;



;
GF: 1/5 × 8

5. 5/12; 1/6 + 3/12 = 2/12 + 3/12 = 5/12; GF: I had to find a common denominator: 1/6 = 2/12. Then I could add the two fractions together: 2/12 + 3/12 = 5/12.

6. 7/10; 2/10 + 1/10 + 3/10 + 1/10 = 7/10; GF: 10/10

7. Answers will vary. Sample answers: 6/8 + 1/8; 5/8 + 2/8; 4/8 + 3/8; GF: Answers will vary.

8. No; sample answers: 2/6 and 3/12 are not located on the same point on the number line; When I multiply 2/6 by 1 (2/2) to get a denominator of 12, I get a numerator of 4, so 2/6 is equivalent to 4/12, not 3/12; GF: Answers will vary.

9. 3/8; 8/8 – 5/8 = 3/8; GF: Answers will vary.

10. 1 5/6 pieces of cloth;

6/6 + 5/6 = 1 5/6; GF: Answers may vary.

11. 4 2/4 or 4 1/2 yards; 6 × 3/4 = 18/4 = 4 2/4; GF: Answers will vary.

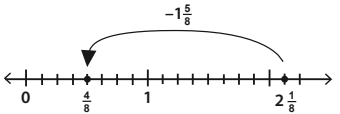
12. 1 5/6 of the two pizzas; 12/6 – 1/6 = 11/6 or 1 5/6; GF: 1/3/6 or 1 1/2 of the two pizzas

13. 1 1/4 miles; 5 × 1/4 = 5/4 = 1 1/4; GF: 1/4 + 1/4 + 1/4 + 1/4 + 1/4 = 5/4 = 1 1/4; I notice that multiplying is the same as repeated addition.

14. 0.09, 4/10, 0.49, 0.6, 0.75; GF: Sample answer: I changed each fraction or decimal to a fraction with denominator 100: 0.6 = 60/100, 3/4 = 75/100, 0.49 = 49/100, 0.09 = 9/100, and 4/10 = 40/100.

15. 1 2/4 or 1 1/2 more laps; 6 3/4 – 5 1/4 = 1 2/4; GF: Answers may vary.

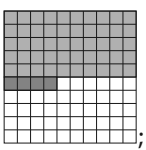
16. 4/8 or 1/2 more miles;



GF: Answers may vary.

17. 40; GF: Answers will vary.

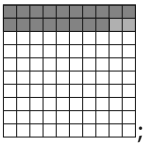
18. Greater than 1/2;



GF: 0.54

19. 7/10; 0.7; The number line is divided into tenths from 0 to 1, and the point is located at the 7th mark after 0, so it equivalent to 7/10. The decimal equivalent of 7/10 is 0.7. GF: Answers will vary.

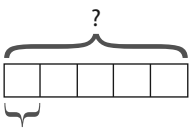
20. quarter;



GF: 0.2 > 0.18

Grade 4: Measurement and Data

1. 70 yards; $A = l \times w$; $700 = l \times 10$; l = 70; GF: 160 yards; $P = 2l + 2w = 2(70) + 2(10) = 140 + 20 = 160$



2. $50; $10 $10 × 5 = $50 ; GF: $72

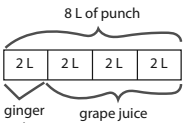
3. 2650 mL; 3 L × 1000 mL per L = 3000 mL; 3000 mL – 350 mL = 2650 mL; GF: 3 L > 350 mL

4. 50; 200; 300; 350; 500; 0.5 × 100 = 50; 2 × 100 = 200; 3 × 100 = 300; 3.5 × 100 = 350; 5 × 100 = 500; GF: Answers will vary.

5. 25 feet; $A = l \times w$; $750 = 30 \times w$; $w = 25$; GF: division: 750/30 = 25

6. 6 feet; $2w + 2(w + 3) = 30$; $4w + 6 = 30$; $4w = 24$; $w = 6$; GF: Answers may vary.

7. D; GF: 120°

8. 6 L; 

; GF: 8 L

9. Lila has more; 5 oz more; 1 1/4 lb × 16 oz per lb = 20 oz; GF: 3000 g

10. 6000 g; 6 kg × 1000 g per kg = 6000 g; GF: Answers will vary.

11. 4157 seconds; 1 hour × 3600 seconds per hour = 3600 sec; 9 min × 60 sec per min = 540 sec; 3600 + 540 + 17 = 4157 seconds to run the race; GF: Answers may vary.

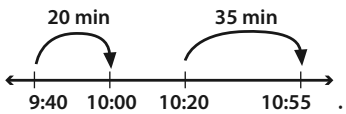
12. 2 ft ≠ 30 in.; 2 ft = 24 in.; GF: Answers may vary.

13. 1696 meters; 1450 m + 246 m = 1696 m; GF: Answers will vary.

14. 10 3/4 inches; 2(1/8) + 5(1/4) + 4(1/2) + 3(3/4) + 5(1) = 1/4 + 5/4 + 2 + 9/4 + 5 = 15/4 + 7 = 3 3/4 + 7 = 10 3/4; GF: Answers may vary.

15. 10°; 70 ÷ 7 = 10; GF: 7°; 70 ÷ 10 = 7

16. 20°; 35 + *x* + 35 = 90; 70 + *x* = 90; *x* = 20; GF: perpendicular; Perpendicular lines (or rays) form right (90°) angles, so the measure of angle *ABC* is 90°.

17. 55 minutes;


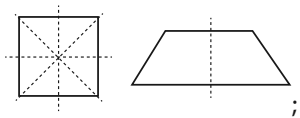
;
GF: Answers may vary.

18. 40°; 9*x* = 360; *x* = 40; or 360 ÷ 9 = 40; GF: 60°

19. $6.00; GF: Answers will vary.

20. 7000 mL; 4000 + 3000 = 7000; GF: Answers may vary.

Grade 4: Geometry

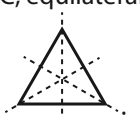
1. 4; 1; 
;
GF: Answers will vary.

2. A, D; GF: 6

3. C; GF: No; A trapezoid has exactly one pair of parallel sides, while a parallelogram has two sets of parallel sides, so they are not the same.

4. A, B, E, F; A, E; GF: parallelogram or rhombus

5. equilateral triangle; 
;
GF: trapezoid

6. C; equilateral triangle;

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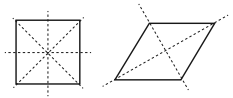
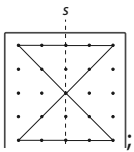
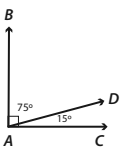
GF: 

7. 

; GF: Answers will vary.

8. 

15°; ; GF: Answers will vary.

9. 81; $6 \times 3 = 18$; $18 \div 2 = 9$; $9 \times 9 = 81$; GF: Answers will vary.

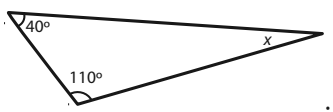
10. 72 minutes; $360 \div 5 = 72$; GF: 60°

11. True; a rectangle has 4 right angles. An obtuse angle measures more than 90º. GF: Answers will vary.

12. Equilateral, isosceles, scalene; 
; False, scalene triangles have no lines of symmetry; GF: Answers may vary.

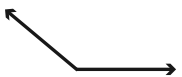
13. 30°; $35 + x + 25 = 90$; $60 + x = 90$; $x = 30$; GF: Answers will vary.

14. True; sketch of rectangle with all 4 angles labeled 90°; GF: Since two of the sides form a right angle, those two line segments are perpendicular.

15. 30°; 

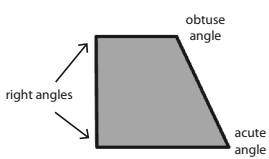
; $x + 40 + 110 = 180$; $x + 150 = 180$; $x = 30$; GF: If I know two angle measures of a triangle, I can add them together and subtract the sum from 180°. The result will be the missing angle measure.

16. 35°; $55 + x = 90$; $x = 35$; GF: Answers will vary.

17. 1 ray, 1 line, 2 right angles; A ray is the part of a line that has a start point but no endpoint; A line is straight and extends without end in both directions; A right angle is an angle that measures 90°; GF: Sample answer: 

18. 30°; $x + 4x = 150$; $5x = 150$; $x = 30$; GF: the angle on the left

19. 3, 4, 6, 8; Each one has the same number of lines of symmetry as its number of sides; GF: 12

20. 1 acute angle; 1 obtuse angle; 2 right angles; 

; GF: Answers may vary.