Problem Solving
Practice Cards
Grade 3

Contents

Didax

Correlation to the Math Standards

Standard	Card No.
Operations and Algebraic Thinking	
Interpret products of whole numbers. (3.OA.1)	9, 14
Interpret whole-number quotients of whole numbers. (3.OA.2)	10
Use multiplication and division within 100 to solve word problems. (3.OA.3)	6
Determine the unknown whole number in a multiplication or division equation. (3.OA.4)	1, 2, 4, 18
Apply properties of operations as strategies to multiply and divide. (3.OA.5)	7, 8, 9, 12, 14
Understand division as an unknown factor problem. (3.OA.6)	6
Fluently multiply and divide within 100. (3.OA.7)	11
Solve two-step word problems using the four operations. (3.OA.8)	2, 3, 4, 5, 8, 10, 13, 20
Identify arithmetic patterns. (3.OA.9)	11, 15, 16, 17, 19
Number and Operations in Base Ten	
Round whole numbers to the nearest 10 or 100. (3.NBT.1)	1, 2, 7, 10, 12,
Fluently add and subtract within 1000. (3.NBT.2)	3–5, 8, 9, 11–15, 19–20
Multiply one-digit whole numbers by multiples of 10. (3.NBT.3)	6, 9, 11, 16–19, 20
Number and Operations – Fractions	
Understand a fraction as a quantity formed by 1 or more part when a whole is partitioned into equal parts. (3.NF.1)	1, 3, 4, 5, 6, 8, 9, 10, 13, 20
Understand a fraction as a number on a number line. (3.NF.2)	2, 12, 14
Explain equivalence of fractions. (3.NF.3)	1, 3, 4, 5, 7, 8, 10, 11, 15–20
Measurement and Data	
Tell and write time to the nearest minute and measure time intervals in minutes. (3.MD.1)	1, 2, 3, 4, 8, 13
Measure and estimate liquid volumes and masses of objects. (3.MD.2)	5, 10
Draw scaled picture and bar graphs to represent a data set with several categories. (3.MD.3)	6, 12, 16
Measure with rules marked with halves and fourths. (3.MD.4)	18
Understand concepts of area measurement. (3.MD.5)	7, 9, 15, 17
Measure area by counting unit squares. (3.MD.6)	7, 9, 17
Relate area to multiplication and division. (3.MD.7)	7, 9, 15
Solve problems involving perimeters of polygons. (3.MD.8)	14, 19, 20
Geometry	
Understand that shapes in different categories may share attributes. (3.G.1)	5–8, 10, 11, 12, 14–16
Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. (3.G.2)	1, 2, 3, 4, 9, 13, 17–20

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.

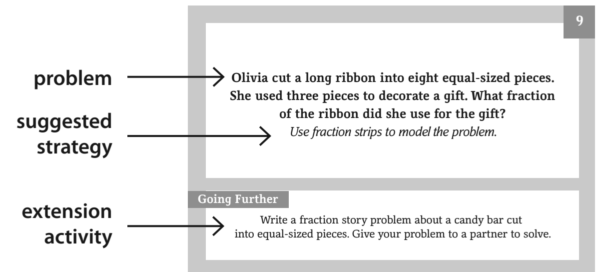
This box contains:

- 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.

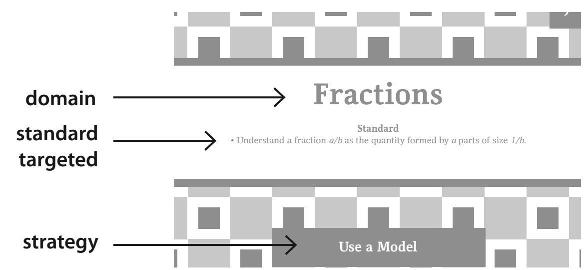
Featuring classroom-tested problems, each card suggests a specific problem-solving strategy to be used, such as:

- 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.

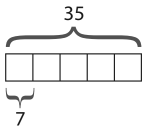
To use the cards most effectively, it is helpful to have these materials and manipulatives on hand:

- 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

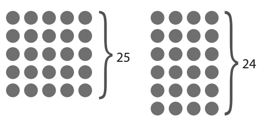
Grade 3: Operations and Algebraic Thinking

1. 7; 

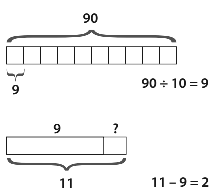
; $5 \times n = 35$; $n = 7$; GF: Answers will vary.

2. 40; GF: $8 \times 6 = 48$; $48 - 8 = 40$

3. 30; GF: $(3 \times 5) + (3 \times 5) = 3(5 + 5)$; $3(5 + 5) = 30$

4. 49; 

; $(5 \times 5) + (6 \times 4) = 25 + 24 = 49$; GF: Answers may vary.

5. Alberto; 

; GF: $11 > 9$

6. 7; GF: $9 \times n = 63$; $n = 7$; $63 \div 9 = 7$; multiplication or division

7. 40; GF: $4(3) + 4(7) = 4(3 + 7) = 4(10) = 40$

8. 50; $5(6) + 5(4) = 5(6 + 4) = 5(10) = 50$

9. 45; $5 \times 8 = 40$; $40 + 5 = 45$; GF: Answers may vary.

10. 4; $38 \times 2 = 76$; $80 - 76 = 4$; GF: Answers may vary.

11. 80; 5; 75; GF: Answers may vary.

12. 56 square yards; two arrays showing 6×7 and 2×7; $42 + 14 = 56$; GF: Sample answer: Yes; $7(6 + 2) = 7(8) = 56$

13. 3 brownies; array showing 8 rows and 4 columns; subtraction; GF: $8 \times 4 = 32$; $32 - 29 = 3$

14. 72; 4 groups of 9 is 36; doubling 36 makes 8 groups of 9, or 72; $2 \times 4 \times 9 = 72$; GF: Answers may vary.

15. The product is always an even number; GF: Sample answer: Even numbers can always be represented as groups of two. No matter how many groups of an even number you have, there will always be an even total.

16. The product always ends in 5 or 0; GF: Sample answer: Multiplying by 11 yields 11, 22, 33, and so on. It creates a diagonal pattern on the hundred board.

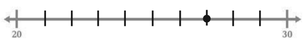
17. Any three of 18, 27, 36, 45; $1 + 8 = 9$; $2 + 7 = 9$; $3 + 6 = 9$; $4 + 5 = 9$; The sum is always 9; GF: Yes; 54: $5 + 4 = 9$; 63: $6 + 3 = 9$; 72: $7 + 2 = 9$; 81: $8 + 1 = 9$; 90: $9 + 0 = 9$; 99: $9 + 9 = 18$, $1 + 8 = 9$.

18. 44; 78 – n = 34; n = 44; GF: Answers will vary.

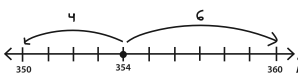
19. No; You will only get an odd number when you multiply 3 by an odd number—otherwise the product is even; GF: Yes; odd × odd = odd and odd × even = even.

20. 12; 24 – 14 = 10; 10 + 2 = 12

Grade 3: Number and Operations in Base Ten

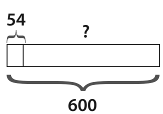
1. 30; 

;
GF: Sample answer: 53; 50

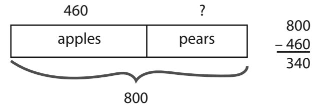
2. 350; 

;
GF: 100; 260; 740; 920

3. 433; 397 + 79 = 476; 476 – 43 = 433; GF: 400 + 80 = 480; 480 – 40 = 440; It's 7 people too many; GF: Answers may vary.

4. 546; 

;
GF: 600 – 54 = 546

5. 340;


;
GF: 460 + n = 800; n = 340

6. True; array showing 6 groups of 10; 6 × 10 = 60; 10 + 10 + 10 +10 +10 + 10 = 60; GF: Answers will vary.

7. 60; On the number line, 60 is 10 more than 50, and 10 less than 70; GF: Answers will vary.

8. 217; 482 + n = 699; n = 217; 699 – 482 = 217; GF: Answers will vary.

9. $178; GF: 17 × 10 = 170, 170 + 8 = 178

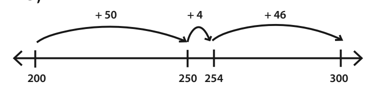
10. 200 + 140 = 340; GF: 200 + 100 = 300; Rounding to the nearest 10 results in the closer estimate.

11. 236; GF: 100 + 130 + 6 = 236

12. 130 + 90 = 220; "about"; GF: 128 + 89 = 217; It's 3 less than the estimate.

13. 24; Sample strategy: Use easier numbers: 52 – 30 = 22 and 22 + 2 = 24; GF: Answers will vary.

14. Subtraction; 650 – 346 = 304; GF: More than 300; 650 – 350 = 300, so since I am subtracting less than 350, I will have more than 300 left.

15. 46;


16. 9; GF: Answers will vary.

17. 200; picture showing 4 groups of 5 tens; 4 × 50 = 200; GF: Answers will vary.

18. 300 pennies; 60 × 5 = 300; GF: 30 times

19. $153; number line showing 367 + 153 = 520; GF: 367 + n = 520; n = 153

20. 99 sheep; GF: 10 × 9 = 90, 90 + 9 = 99;

Grade 3: Number and Operations – Fractions

1. 2/8; sample answer: picture of 8 apples with 2 circled; GF: 1/4

2. 2/6; The number line is divided into 6 equal parts. One part is equal to 1/6, so two parts is equal to 2/6; GF: 1/3

3. 1/4; 3/4; GF: 4/4

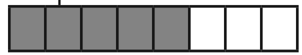
4. 3/6; I can see that 3 of the circles are shaded and there are 6 circles in all, so the fraction is 3/6; GF 1/2; I can see that half of the circles are shaded, so the equivalent unit fraction is 1/2.

5. 4/6; sample answer: There are 6 small rectangles inside the large rectangle. That means each small rectangle is 1/6 of the large rectangle, so the 4 shaded rectangles are 4/6 of the whole; GF: 2/3

6. 3/4; GF: Answers will vary.

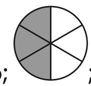
7. 4/4; GF: 6/6

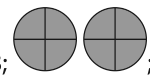
8. Sample answer:



; I divided the rectangle into 8 parts and shaded 5 of them; GF: No

9. 3/8; GF: Answers will vary.

10. 3/6;  ; GF: 1/2

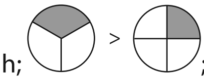
11. 8;  ; GF: 1; 2

12. 3/4; 6/8; Yes; The two fractions are located at the same point on the number line; GF: 1/4, 2/8; 2/4, 4/8

13. 2/8; 1/4; There are 8 cups in all, and 2 are lying on their sides, so 2/8 of the cups are lying on their sides; GF: 7/8

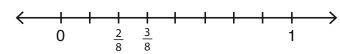
14. 2/6; The two fractions are located at the same point on the number line; GF: 2/3, 4/6

15. No; The two fractions do not refer to the same-sized whole; GF: <

16. Noah; 

; 1/3 > 1/4 or 1/4 < 1/3; GF: True; Answers will vary.

17. Luke;



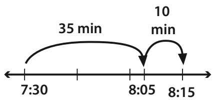
3/8 > 2/8; GF: "One whole" means one mile in this problem.

18. The two boys ate the same amount; 4/8 = 2/4; GF: the same amount

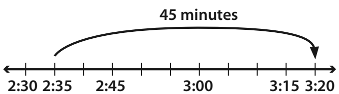
19. B: 1/4 = 2/8; Both fractions represent the same amount of the circle; GF: Answers may vary.

20. C: 3/4 > 3/8; GF: The denominator is the number of parts the whole is divided into. The bigger the denominator, the smaller each part is. For same-sized wholes, a denominator of 4 means 4 parts and a denominator of 8 means 8 parts, so 3/4 is greater than 3/8.

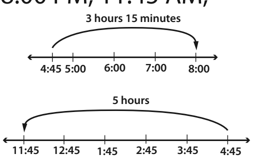
Grade 3: Measurement and Data

1. 10 minutes; 

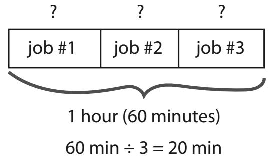
;
GF: Answers will vary.

2. 45 minutes; 2:35 PM; 3:20 PM;


;
GF: Answers will vary.

3. 8:00 PM; 11:45 AM;


; GF: Answers will vary.

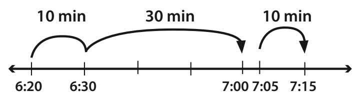
4. 20 minutes;


;
GF: 10 minutes

5. can of soup; 21 grams more; subtraction; 30 – 9 = 21; GF: Answers will vary.

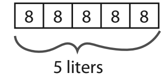
6. 1 more student; 5 – 4 = 1; GF: 5 more students

7. 20 square units; 5 + 5 + 5 + 5 = 20; 4 × 5 = 20; GF: No

8. 50 minutes;


;
GF: Answers will vary.

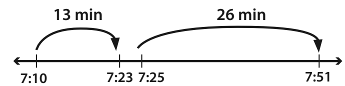
9. C; Adding the lengths of the sides would give the perimeter, not the area; GF: 35 square units

10. 40 glasses; 

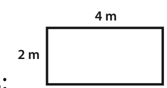
;
5 × 8 = 40; GF: Answers may vary.

11. B; multiplication; GF: Sample answers: 3 ft by 15 ft; 4 ft by 14 ft; 2 ft by 16 ft

12. 15 more apples; 40 – 25 = 15; GF: Answers will vary.

13. 39 minutes;


;
GF: Answers may vary.

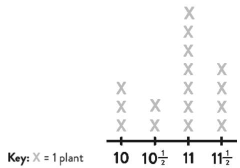
14. 4 meters; 

; GF: Answers may vary.

15. 240 square feet; finding the area of the dining room; The area of the dining room is 10 ft × 8 ft = 80 sq ft. The area of the living room is 2 ft × 80 ft = 160 sq ft. So the area of the new room is

80 + 160 = 240 sq ft; GF: 10 × 8 = 80; 2 × 80 = 160; 80 + 160 = 240

16. 11 plants;



;

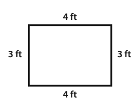
GF: 5 plants

17. 42 square units; multiply the side lengths; 6 × 7 = 42; GF: Answers will vary.

18. Answers will vary.

19. 16 units; sample answers: "I counted the units all the way around the figure," or "I added the lengths of all the sides"; GF: Answers will vary.

20. 3 ft and 4 ft;



;

3 × 4 = 12; 3 + 4 + 3 + 4 = 14; GF: Sample answer: 16 ft (4 + 4 + 4 + 4)

Grade 3: Geometry

1. 1/2; 3 parts out of 6 are shaded, so the shaded part is 3/6 or 1/2 of the rectangle; GF: Answers will vary.

2. 1/4; 1 part out of 4 is shaded, so the shaded part is 1/4 of the rectangle; GF: 3/4

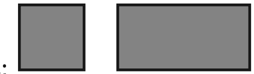
3. 1/4; There are four parts that are equal in size, so each one is 1/4 of the whole; GF: 4/4

4. 1/2; GF: Answers will vary.

5. No; B, C, and D all have 4 sides, so they are quadrilaterals, but A has 6 sides, so it is not; GF: Answers will vary.

6. True, both shapes have 4 sides so they are quadrilaterals; False, squares have four right angles. The shape on the right does not; GF: Yes, both shapes have opposite sides parallel, so they are parallelograms.

7. Yes;



;

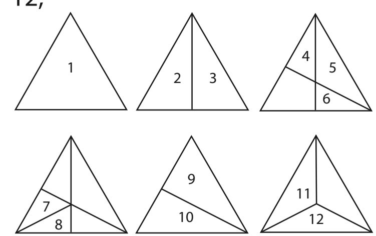
GF: A rectangle must have two pairs of opposite sides with equal length, but it doesn't have to have adjacent sides of equal length like a square does.

8. 9; GF: Answers may vary.

9. No; Three of the 8 equal parts are shaded, so the shaded part is 3/8; GF: Answers will vary.

10. No; It has 5 sides, and quadrilaterals must have 4; GF: pentagon

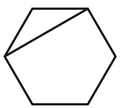
11. 12;

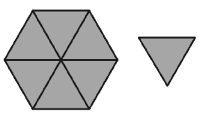


12. C; trapezoid; A rhombus, rectangle, and square have opposite sides parallel, but shape C has a pair of opposite sides that are not parallel. Since the other pair of opposite sides are parallel, it is a trapezoid; GF: Answers will vary.

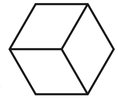
13. True; Since rectangles 1 and 2 are the same size, B (which is half of rectangle 1) and D (which is half of rectangle 2) also have the same area; GF: No

14. Rhombus; trapezoid; GF: parallelogram or large triangle

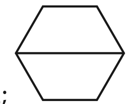
15.  ; Answers will vary; GF: 6 triangles, 3 rhombuses, 2 trapezoids

16. 1/6;  ; GF: 6; 12

17. 2/6 or 1/3; GF: 1/2

18. 1/3;  ; GF: 4/6 or 2/3

19. C; Since the angles at the corners of the large shape are not right angles, it is not a rectangle; GF: Answers may vary.

20. 3/6 or 1/2;  ; GF: 1/4