Answer Key

GRADE 3 • MODULE 2

Place Value and Problem Solving with Units of Measure

Lesson 1

Problem Set

1. Times will vary.
2. Times will vary.
3. Times will vary.
4. Times will vary.
5. Times will vary.
6. Times will vary.

Exit Ticket

a. Jake

b. Riley and Nicholas

c. 3 seconds

Homework

1. a. Dominique
   b. Chester
   c. 5 seconds
2. Activities will vary.
3. First clock—10:15
   Second clock—2:50
   Third clock—11:00
   Fourth clock—7:05

Lesson 2

Problem Set

1. a. First and last tick marks labeled as 7:00 a.m. and 8:00 a.m.
   b. Each interval labeled by fives below the number line up to 8:00 a.m.
   c. Point D plotted and labeled above 7:10 a.m.
   d. Point E plotted and labeled above 7:35 a.m.
   e. Point T plotted and labeled above 7:40 a.m.
   f. Point L plotted and labeled above 7:45 a.m.
   g. Point W plotted and labeled above 7:55 a.m.
2. Every 5 minutes labeled below the number line
   First clock not matched to the number line
   Second clock—5:50 p.m.
   Third clock—5:15 p.m.
   Fourth clock not matched to the number line
   Fifth clock—5:40 p.m.
   Last clock—5:25 p.m.
3. First and last tick marks labeled as 5:00 p.m. and 6:00 p.m.; each interval labeled by fives below the number line up to 6:00 p.m.; 5:45 p.m. located and plotted on the number line
4. Yes; because *a.m.* means the morning and *p.m.* means the afternoon or nighttime

Exit Ticket

a. 10:10 a.m.
b. 10:20 a.m.
c. 10:50 a.m.
d. 1 hour

Homework

a. First and last tick marks labeled as 4:00 p.m. and 5:00 p.m.
b. Each interval labeled by fives below the number line up to 4:00 p.m.
c. Point W plotted and labeled above 4:05 p.m.
d. Point F plotted and labeled above 4:15 p.m.
e. Point G plotted and labeled above 4:25 p.m.
f. Point B plotted and labeled above 4:50 p.m.
g. Point P plotted and labeled above 4:55 p.m.

Lesson 3

Problem Set

1. The times shown on the clocks are plotted correctly on the number line.
   First clock—7:17 p.m.
   Second clock—7:03 p.m.
   Third clock—7:55 p.m.
   Fourth clock—7:41 p.m.
   Fifth clock—answer provided
2. Hands on the clock drawn to show 6:48 a.m.
3. Hands on the clock drawn to show 8:23 a.m.
4. 5:27 p.m.
5. a. 3:56 p.m.
   b. 3:45 p.m.

Exit Ticket

a. 8:03 a.m.
b. Hands on the clock drawn to show 8:23 a.m.
c. The first and last tick marks labeled as 8:00 a.m. and 9:00 a.m.; Point A plotted and labeled above 8:03 a.m.; Point B plotted and labeled above 8:23 a.m.

Homework

1. The times shown on the clocks are plotted correctly on the number line.
   First clock—4:34 p.m.
   Second clock—4:01 p.m.
   Third clock—4:16 p.m.
   Fourth clock—4:53 p.m.
   Fifth clock—answer provided
2. Hands on the clock drawn to show 6:07 p.m.
3. Hands on the clock drawn to show 1:32 p.m.
4. a. 2:32 p.m.
   b. 2:55 p.m.
   c. 55 p.m.
   d. First and last tick marks labeled 2:00 p.m. and 3:00 p.m.; Point B plotted and labeled above 2:32 p.m.; Point F plotted and labeled above 2:55 p.m.

Lesson 4

Problem Set

1. 26
2. 2:08
3. 31
4. 4:09
5. 9:52
6. 19 min
7. 11:58 a.m.
8. 1:17 p.m.

Exit Ticket

1. Hands on the first clock are drawn to show 1:34 p.m.
2. Hands on the second clock are drawn to show 1:56 p.m.
3. 22 min

Homework

1. 31
2. 3:22
3. 33
4. 2:11
5. 36 min
6. Times will vary.

Lesson 5

Problem Set

1. 53; problem modeled on number line; 25 + 28 = 53
2. 22; problem modeled on number line; 34 – 12 = 22
3. 17; problem modeled on number line; 47 – 30 = 17
4. a. 29 minutes
   b. No; Austin will be 4 minutes late.
5. 11:13

Exit Ticket

36; problem modeled on number line; 19 + 17 = 36

Homework

1. 56; problem modeled on number line; 22 + 34 = 56
2. 9 minutes; problem modeled on number line; 56 – 47 = 9
3. 30 minutes
4. a. 47 minutes
   b. No; Marcus will be 2 minutes late.
5. 27 minutes

Lesson 6

Problem Set

1. Illustrations and descriptions will vary.
2. Illustrations and descriptions will vary.
3. Illustrations and descriptions will vary.
4. Illustrations and descriptions will vary.
5. Answers will vary; both charts grow by units of 10.

Exit Ticket

100 grams

Homework

1. a. 10
   b. 10
   c. 10
   d. They all need 10 to get to the next unit.
2. Top row, left to right: 3 kilograms; 6 kilograms; 450 grams
   Bottom row, left to right: 907 grams; 11 kilograms; 1 kilograms

Lesson 7

Problem Set

A. Objects and weights will vary.

B. Objects and weights will vary.

C. Objects and weights will vary.

D. Objects and weights will vary.

E.
1. grams
2. kilograms
3. grams
4. kilograms
5. kilograms
6. grams

F. 2 kilograms since 1 bottle of water weighs about 1 kilogram

G. Yes; 10 units of 100 grams equal 1000 grams, which is the same as 1 kilogram

Exit Ticket

1. 146 g; 12 kg

2.
a. grams
b. grams
c. kilograms
d. grams
e. kilograms

Homework

1. Water bottle—1 kilogram
   Paper clip—1 gram
   4 pennies—10 grams
   Apple—100 grams
2. Grams; because 113 kilograms is too heavy for a cell phone
3. 25 kilograms; 9 kilograms; 200 grams
   367 grams; 105 grams

Lesson 8

Problem Set

1. 464; 355
2. a. 78; problem modeled with tape diagram
   b. 8; problem modeled with tape diagram
3. Tape diagram drawn correctly; about 15 kg
4. a. About 3 kg
5. b. About 21 kg

Exit Ticket

a. 14 kg

b. 28 kg

c. 3 backpacks

Homework

1. a. C
   b. B
   c. 4
   d. 36 kg
2. 840 g
3. 430 g
4. a. 91 kg
5. b. 125 kg
6. a. 7 kg
7. b. 5 kg

Lesson 9

Problem Set

a. Estimations will vary.

b. Answers will vary.

c. Illustrations and descriptions will vary.

d. Illustrations and descriptions will vary.

e. Illustrations and descriptions will vary.

f. They both break apart into 1 thousand units. 1 liter is 1000 milliliters, and 1 kilogram is 1000 grams.

g. 1 gram; 1 liter is the same as 1 kilogram, and they break apart the same way into 1 thousand units.

Exit Ticket

1. .25
2. 100 groups; there are 10 groups of 10 milliliters in 100 milliliters, and there are 10 groups of 100 milliliters in 1 liter.

Homework

1. a. Answers will vary.
   b. Answers will vary.
2. 15 mL
3. 708 mL
4. 6 buckets
5. 5 L

Lesson 10

Problem Set

1. Vertical number line on container labeled by hundreds
   a. 500 mL; reasons will vary.
   b. Explanations will vary.
   c. 700 mL
2. 3 L; 6 L; 4 L; 0 L
3. 400 mL; 200 mL; 1000 mL; 700 mL
4. a. Capacity of each barrel plotted and labeled correctly on number line
   b. Barrel C
   c. Barrel D
   d. Barrel B; because it is closest to 70 mL
   e. Number line used to find answer; 28 more liters

Exit Ticket

1. A: 45 L
   B: 57 L
   C: 21 L
2. 24 L

Homework

1. 5 L; 2 L; 6 L; 1 L
2. 11 L
3. 5 L; 2 L; 4 L; 2 L
4. a. Capacity of each gas tank plotted and labeled on number line
   b. Large
   c. Small
   d. Medium
   e. Number line used to find answer; 32 more liters

Lesson 11

Problem Set

1. a.
   b. 445 g
2. a. 60 g
   b. 142 g
3. a. 191 g
   b. 123 g
   c. 194 g
4. Tape diagram drawn and labeled to represent the problem; 9 turkeys
5. 900 mL of milk
6. 14 L

Exit Ticket

a. 677 mL
b. 140 mL
c. 480 mL

Homework

1. 687
2. 104
3. 54 L
4. 8 beds
5. 35 mL

Lesson 12

Problem Set

1. Measurements and estimates will vary.
2. Measurements and estimates will vary.
3. Measurements and estimates will vary.
4. Measurements and estimates will vary.

Exit Ticket

a. 46 g
b. Rounding modeled on number line
c. 50 g
d. 46 g is more than halfway between 40 g and 50 g on the number line, so 46 g rounds up to 50 g.

Homework

1. Measurements and estimates will vary.
2. 10:30
3. 20
4. 53; 50
5. 58; 60

Lesson 13

Problem Set

1. a. 30
   b. 40; rounding modeled on number line
   c. 60; rounding modeled on number line
   d. 160; rounding modeled on number line
   e. 280; rounding modeled on number line
   f. 410; rounding modeled on number line
2. Number line drawn and labeled to model rounding; 40 g
   Number line drawn and labeled to model rounding; 50 g
   Number line drawn and labeled to model rounding; 140 g
3. a. 48 min
   b. 50 min

Exit Ticket

1. a. 30; rounding modeled on number line
   b. 280; rounding modeled on number line
2. No; 603 is less than halfway between 600 and 610, so 603 rounded to the nearest ten is 600; number line drawn and labeled to model rounding

Homework

1. a. 40
   b. 50; rounding modeled on number line
   c. 70; rounding modeled on number line
   d. 170; rounding modeled on number line
   e. 190; rounding modeled on number line
   f. 190; rounding modeled on number line
2. Number line drawn and labeled to model rounding; 50 g
   Number line is drawn and labeled to model rounding; 670 g
3. 60 g; number line drawn and labeled to model rounding

Lesson 14

Sprint

Side A

1.	5	12.	85	23.	285	34.	75
2.	15	13.	95	24.	585	35.	1,075
3.	25	14.	95	25.	585	36.	1,575
4.	75	15.	85	26.	35	37.	485
5.	75	16.	55	27.	935	38.	1,485
6.	45	17.	155	28.	65	39.	1,085
7.	45	18.	255	29.	465	40.	355
8.	35	19.	755	30.	95	41.	1,785
9.	35	20.	755	31.	895	42.	395
10.	65	21.	85	32.	995	43.	1,835
11.	65	22.	185	33.	1,005	44.	1,105

Side B

1.	15	12.	85	23.	275	34.	25
2.	25	13.	95	24.	675	35.	1,025
3.	35	14.	95	25.	675	36.	1,525
4.	65	15.	85	26.	25	37.	385
5.	65	16.	65	27.	925	38.	1,385
6.	55	17.	165	28.	55	39.	1,085
7.	55	18.	265	29.	455	40.	755
8.	45	19.	565	30.	95	41.	1,685
9.	45	20.	565	31.	895	42.	295
10.	75	21.	75	32.	995	43.	1,845
11.	75	22.	175	33.	1,005	44.	1,215

Problem Set

1. a. 100; rounding modeled on number line
   b. 300; rounding modeled on number line
   c. 300; rounding modeled on number line
   d. 1,300; rounding modeled on number line
   e. 1,600; rounding modeled on number line
   f. 1,300; rounding modeled on number line
2. a. 500 stickers
   b. 500 pages
   c. 800 mL
   d. $1,300
   e. 1,800 km
3. 550, 639, 603
4. Both are correct; explanations will vary.

Exit Ticket

1. a. 100; rounding modeled on number line
   b. 1800; rounding modeled on number line
2. 700 people

Homework

1. a. 200; rounding modeled on number line
   b. 300; rounding modeled on number line
   c. 300; rounding modeled on number line
   d. 1,300; rounding modeled on number line
   e. 1,700; rounding modeled on number line
   f. 1,800; rounding modeled on number line
2. a. 200 cards
   b. 500 people
   c. 400 milliliters
   d. 700 grams
   e. $1,300
3. 368, 420, 449
4. Both are correct; explanations will vary.

Lesson 15

Problem Set

1. a. 51 mL
   b. 71 mL
   c. 171 mL
   d. 89 cm
   e. 592 cm
   f. 627 cm
   g. 92 g
   h. 639 g
   i. 956 g
   j. 3 L 657 g
   k. 5 kg 876 g
2. 107 g
3. 475 mL + 317 mL = 792 mL; Andrea is correct; explanations will vary.
4. 47 min

Exit Ticket

1. a. 60 cm
   b. 742 m
   c. 584 km
2. a. 41 min
   b. 67 min

Homework

1. a. 82 cm
   b. 95 kg
   c. 591 mL
   d. 375 g
   e. 790 mL
   f. 480 L
2. a. 373
   b. 444
3. 119 students; tape diagram drawn and labeled to represent the problem
4. 63 cm
5. Paperback book and bar of soap; 343 g + 117 g = 460 g

Lesson 16

Problem Set

1. a. 120 mL
   b. 420 mL
   c. 820 mL
   d. 150 cm
   e. 600 cm
   f. 900 cm
   g. 835 g
   h. 942 g
   i. 983 g
   j. 4 L 800 mL
   k. 6 kg 851 g
2. Tape diagram drawn and labeled; 1,000 g
3. 144 muffins
4. 741 mL

Exit Ticket

1. a. 107 g
   b. 617 kg
   c. 802 L
2. 104 L

Homework

1. a. 55 m
   b. 85 m
   c. 530 m
   d. 72 mL
   e. 542 mL
   f. 642 mL
   g. 631 kg
   h. 801 kg
   i. 902 kg
   j. 6 L 556 mL
   k. 8 kg 622 g
2. Tape diagram drawn and labeled; 101 minutes
3. 324
4. 802

Lesson 17

Sprint

Side A

1.	20	12.	50	23.	80	34.	640
2.	30	13.	80	24.	90	35.	670
3.	40	14.	70	25.	100	36.	970
4.	80	15.	70	26.	110	37.	980
5.	60	16.	60	27.	120	38.	990
6.	50	17.	30	28.	150	39.	1,000
7.	40	18.	40	29.	310	40.	1,110
8.	20	19.	50	30.	410	41.	1,120
9.	40	20.	80	31.	520	42.	3,230
10.	30	21.	90	32.	620	43.	5,490
11.	60	22.	20	33.	630	44.	7,890

Side B

1.	10	12.	40	23.	80	34.	540
2.	20	13.	90	24.	90	35.	570
3.	30	14.	80	25.	100	36.	970
4.	70	15.	80	26.	110	37.	980
5.	70	16.	70	27.	120	38.	990
6.	60	17.	20	28.	160	39.	1,000
7.	50	18.	30	29.	210	40.	1,110
8.	20	19.	40	30.	310	41.	1,120
9.	30	20.	80	31.	420	42.	2,340
10.	20	21.	90	32.	520	43.	4,580
11.	50	22.	50	33.	530	44.	8,790

Problem Set

1. a. A: 704; 500, 300, 800
   700; 500, 200, 700
   697; 400, 200, 600
   B: 517; 400, 200, 600
   504; 400, 100, 500
   496; 300, 100, 400
   C: 810; 700, 200, 900
   805; 600, 200, 800
   793; 600, 100, 700
   b. Explanations will vary; both addends are close to the halfway point, so they balance each other out.

2. a. Estimates will vary.
   b. 245 min
   c. Explanations will vary; a different way of rounding is shown and compared.

3. a. Estimates will vary.
   b. 256 kilograms; a tape diagram is drawn and labeled to represent the problem.

Exit Ticket

a. 420 minutes
b. 400 minutes
c. Explanations will vary; both addends are close to the halfway point, so rounding to the nearest 10 minutes and 100 minutes give estimates that are close to each other.

Homework

1. a. 40 kg
   b. 39 kg
   c. 70 min
   d. 61 min
   e. A close estimate can help us see if our actual sum is reasonable.

2. a. Estimates will vary.
   b. Estimates will vary.
   c. 573 min; explanations will vary.

Lesson 18

Problem Set

1. a. 36 mL
   b. 336 mL
   c. 136 mL
   d. 497 cm
   e. 361 cm
   f. 498 cm
   g. 177 g
   h. 73 g
   i. 75 g
   j. 1 km 315 m
   k. 2 kg 31 g
2. 172 g; tape diagram drawn and labeled to model problem
3. a. 95 min
   b. 50 min
4. 34 cm

Exit Ticket

1. a. 235 mL
   b. 304 m
   c. 125 kg
2. 221 cm

Homework

1. a. 24 L
   b. 324 L
   c. 224 L
   d. 575 cm
   e. 334 cm
   f. 365 cm
   g. 681 g
   h. 261 g
   i. 306 km
   j. 192 km

2. 174 g; tape diagram drawn and labeled to model problem

3. a. 158 min
   b. 19 min

Lesson 19

Problem Set

1. a. 280 cm
   b. 80 cm
   c. 365 g
   d. 254 g
   e. 648 mL
   f. 248 mL
   g. 4 km 233 m
   h. 2 L 51 mL
2. 149 km
3. 8 kg
4. 235 L

Exit Ticket

1. a. 159 m
   b. 108 kg
2. 78 kg

Homework

1. a. 190 g
   b. 166 g
   c. 287 cm
   d. 321 cm
   e. 842 g
   f. 542 g
   g. 2 L 20 mL
   h. 4 L 452 mL
2. 75 kg; tape diagram drawn and labeled to model problem
3. 188 kg
4. 415 L

Lesson 20

Sprint

Side A

1.	200	12.	900	23.	400	34.	1,000
2.	300	13.	1,900	24.	1,400	35.	1,000
3.	400	14.	2,900	25.	500	36.	1,000
4.	800	15.	3,900	26.	5,500	37.	10,000
5.	1,800	16.	7,900	27.	900	38.	7,000
6.	2,800	17.	500	28.	6,900	39.	4,100
7.	3,800	18.	2,500	29.	600	40.	8,400
8.	7,800	19.	400	30.	700	41.	3,600
9.	300	20.	3,400	31.	700	42.	9,800
10.	400	21.	700	32.	800	43.	2,900
11.	500	22.	4,700	33.	900	44.	10,000

Side B

1.	100	12.	800	23.	300	34.	1,000
2.	200	13.	1,800	24.	1,300	35.	1,000
3.	300	14.	2,800	25.	400	36.	1,000
4.	700	15.	3,800	26.	5,400	37.	10,000
5.	1,700	16.	8,800	27.	800	38.	4,000
6.	2,700	17.	400	28.	6,800	39.	2,100
7.	3,700	18.	2,400	29.	600	40.	7,400
8.	8,700	19.	500	30.	700	41.	4,600
9.	200	20.	3,500	31.	700	42.	8,800
10.	300	21.	900	32.	800	43.	3,900
11.	400	22.	4,900	33.	900	44.	10,000

Problem Set

1. a. A: 295; 400, 200, 200
   298; 500, 200, 300
   299; 400, 100, 300
   302; 500, 100, 400
   B: 486; 700, 300, 400
   495; 800, 300, 500
   498; 700, 200, 500
   508; 800, 200, 600
   b. Explanations will vary; in the differences that gave the most precise estimates both numbers either rounded down or both numbers rounded up.
2. a. Estimates will vary.
   b. 188 L; tape diagram drawn and labeled to model problem
3. a. Estimates and explanations will vary.
   b. 128 g; tape diagram drawn and labeled to model problem

Exit Ticket

a. Estimates will vary.
b. Estimates will vary.
c. 53 g
d. Estimates and explanations will vary.

Homework

1. a. 30 km
   b. 28 km
   c. Yes; it is a reasonable answer because our estimate is very close to our actual answer. A close estimate can help us see if our actual sum is reasonable.
2. a. Estimates will vary.
   b. 209 centimeters; explanations will vary.
3. a. Estimates will vary.
   b. 648 g
4. a. Estimates will vary.
   b. Estimates will vary.
   c. 254 liters of water; estimates and explanations will vary.

Lesson 21

Problem Set

1. a. 91 g, 58 g, 90 g, 60 g, 150 g;
   91 g, 58 g, 149 g
   b. 91g, 58 g, 90 g, 60 g, 30 g;
   91 g, 58 g, 33 g
   c. Because both estimates are close to the actual answers
2. Yarn A: 64; 60
   Yarn B: 88; 90
   Yarn C: 38; 40
   a. Estimate: 100 cm; actual: 102 cm
   b. Estimate: 10 cm; actual: 14 cm;
   tape diagram is drawn and labeled
3. Capacity of the 3 containers plotted and labeled on number lines
   Container D: 212 mL ≈ 210 mL
   Container E: 238 mL ≈ 240 mL
   Container F: 195 mL ≈ 200 mL
   a. Estimate: 650 mL; actual: 645 mL
   b. Estimate: 30 mL; actual: 26 mL;
   tape diagram drawn and labeled
4. a. 21 min
   b. Estimate will vary; actual: 94 min
   c. Because the estimate is close to the actual answer

Exit Ticket

a. Estimations will vary; 714 mL
b. Estimations will vary; 123 mL

Homework

1. a. Estimations will vary; 612 mL
   b. Estimations will vary; 306 mL
   c. Answers and explanations will vary.
2. a. Estimations will vary; 886 L
   b. Estimations will vary; 148 L
3. a. 26 min
   b. Estimations will vary; 11 min
4. a. Estimations will vary; 769 cm
   b. Estimations will vary; 312 cm;
   tape diagram drawn and labeled