Answer Key

GRADE 4 • MODULE 3

Multi-Digit Multiplication and Division

Lesson 1

Problem Set

1. a. 63 sq units; 32 units
   b. 54 sq units; 30 units
2. a. 22 cm; 30 sq cm
   b. 22 cm; 24 sq cm
3. a. 530 m
   b. 450 cm or 4 m 50 cm
4. a. 10 cm
   b. 7 cm
5. a. 40 cm
   b. 250 cm
6. a. 6 cm; 4 cm
   b. 12 m; 2 m

Exit Ticket

1. 16 sq cm; 20 cm
2. 892 m

Homework

1. a. 40 sq units; 26 units
   b. 35 sq units; 24 units
2. a. 20 cm; 21 sq cm
   b. 26 cm; 36 sq cm
3. a. 450 m
   b. 510 cm or 5 m 10 cm
4. a. 10 cm
   b. 5 m
5. a. 50 cm
   b. 350 m
6. a. 8 cm; 4 cm
   b. 3 m; 12 m

Lesson 2

Problem Set

1. a. Width 4 ft, length 12 ft
   b. 32 ft
2. a. Diagram drawn; width 5 in, length 30 in
   b. 70 in; 150 sq in
3. a. 6 cm
   b. Diagram drawn; width 18 cm, length 7 cm
   c. 50 cm
4. a. Diagram drawn and labeled; 18 ft
   b. Diagram drawn and labeled; 36 ft
   c. The perimeter of the second rectangle is twice the first rectangle.
   d. 80 sq ft
   e. 4
   f. When the side lengths are doubled, the perimeter will double but the area will quadruple.

Exit Ticket

1. a. Width 2 ft, length 12 ft
   b. 28 ft
2. a. Diagram drawn; width 4 ft., length 12 ft
   b. 32 ft; 48 sq ft

Homework

1. a. Width 7 ft, length 21 ft
   b. 56 ft
2. a. Diagram drawn; width 3 in, length 12 in
   b. 30 in; 36 sq in
3. a. 4 cm
   b. Diagram drawn; width 9 cm, length 12 cm
   c. 42 cm
4. a. Diagram drawn and labeled; 16 ft
   b. Diagram drawn and labeled; 32 ft
   c. The perimeter of the living room rug is double the perimeter of the bedroom rug.
   d. 60 sq ft
   e. 4
   f. When the side lengths are doubled, the perimeter will double but the area will quadruple.

Lesson 3

Sprint

Side A

1.	4	12.	49	23.	7	34.	4
2.	2	13.	64	24.	9	35.	8
3.	9	14.	8	25.	5	36.	49
4.	3	15.	100	26.	8	37.	3
5.	25	16.	10	27.	16	38.	9
6.	5	17.	9	28.	4	39.	64
7.	1	18.	81	29.	8	40.	4
8.	1	19.	5	30.	25	41.	7
9.	4	20.	9	31.	3	42.	81
10.	16	21.	4	32.	9	43.	6
11.	7	22.	4	33.	36	44.	100

Side B

1.	25	12.	36	23.	8	34.	3
2.	5	13.	81	24.	9	35.	9
3.	4	14.	9	25.	3	36.	49
4.	2	15.	100	26.	7	37.	4
5.	9	16.	10	27.	16	38.	7
6.	3	17.	7	28.	2	39.	64
7.	1	18.	49	29.	7	40.	3
8.	1	19.	4	30.	25	41.	8
9.	4	20.	8	31.	4	42.	81
10.	16	21.	4	32.	8	43.	7
11.	6	22.	5	33.	36	44.	100

Problem Set

1. 70 ft
2. 32 sq ft
3. 5 ft
4. 36 sq ft

Exit Ticket

Poster: Length 9 in, width 3 in

Banner: Length 10 in, width 2 in

Homework

1. 44 in
2. 11 sq cm
3. 3 ft
4. 288 sq in

Lesson 4

Problem Set

1. Disks drawn; 500; 500; 5 hundreds
2. Disks drawn; 5,000; 5,000; 5 thousands
3. a. 60
   b. 100
   c. 6
   d. 40
   e. 100
   f. 1,000
   g. 9,000
   h. 90
   i. 9
4. Disks drawn; 120; 12 tens
5. Disks drawn; 1,800; 1,800; 18 hundreds
6. Disks drawn; 25,000; 25,000; 25 thousands
7. 10; 10; 120
8. 2, 100; 6, 100; 600
9. 4, 4, 1,000; 16, 1,000; 16,000
10. 5, 4, 1,000; 20, 1,000; 20,000

Exit Ticket

1. a. 50
   b. 100
   c. 5
   d. 20
   e. 100
   f. 200
   g. 1,800
   h. 320
   i. 48
   j. 240
   k. 3,000
   l. 40,000

Homework

1. Disks drawn; 700, 700, 7 hundreds
2. Disks drawn; 7,000, 7,000, 7 thousands
3. a. 80
   b. 100
   c. 8
   d. 30
   e. 1,000
   f. 100
   g. 4,000
   h. 40
   i. 4
4. Disks drawn; 150, 15 tens
5. Disks drawn; 1,700, 1,700, 17 hundreds
6. Disks drawn; 36,000, 36,000, 36 thousands
7. 10, 10, 160
8. 4, 100; 8, 100; 800
9. 5, 5, 1,000; 25, 1,000; 25,000
10. 7, 6, 1,000; 42, 1,000; 42,000

Lesson 5

Problem Set

1. Disks drawn; 6; 3, 6; 6
2. Disks drawn; 60; 3, 6 tens; 60
3. Disks drawn; 600; 3 hundreds, 6 hundreds; 600
4. Disks drawn; 6,000; 2, 3 thousands, 6 thousands; 6,000
5. a. 140
   b. 180
   c. 1,200
   d. 1,600
   e. 210
   f. 360
   g. 3,000
   h. 32,000
   i. 150
   j. 300
   k. 2,000
   l. 40,000
6. 180 balloons
7. 180 cards
8. 3 fish

Exit Ticket

1. Disks drawn; 800; 2 hundreds, 8 hundreds; 800
2. Disks drawn; 8,000; 4, 2 thousands, 8 thousands; 8,000
3. a. 90
   b. 160
   c. 2,400
   d. 1,800
   e. 640
   f. 120
   g. 3,000
   h. 40,000
4. 210 hours

Homework

1. Disks drawn; 10; 2,10; 10
2. Disks drawn; 100; 2, 10 tens; 100
3. Disks drawn; 1,000; 2 hundreds, 10 hundreds; 1,000
4. Disks drawn; 10,000; 5, 2 thousands, 10 thousands; 10,000
5. a. 180
   b. 420
   c. 4,900
   d. 2,700
   e. 810
   f. 280
   g. 3,600
   h. 48,000
   i. 350
   j. 400
   k. 1,000
   l. 30,000
6. 1,800 chicken nuggets
7. 240 stickers
8. 3 flowers

Lesson 6

Problem Set

1. Disks drawn; 800; 800; 800
2. Area model drawn; 8 hundreds
3. Area model drawn; 12 hundreds; 1,200
4. Area model drawn; 10 hundreds; 1,000
5. 400; 4
6. 1,200; tens; 12
7. 1,400; 7; 2, hundreds
8. 2,100; 7 tens, 3 tens, 21
9. 3,600 seats
10. $4,000

Exit Ticket

1. Disks drawn; 600; 600; 600
2. Area model drawn; 6 hundreds
3. 1,200 pages

Homework

1. Disks drawn; 1,800; 1,800; 1,800
2. Area model drawn; 18 hundreds
3. Area model drawn; 4 hundreds; 400
4. Area model drawn; 24 hundreds; 2,400
5. 1,000, 10
6. 1,500; tens; 15
7. 1,200; 6; 2; hundreds
8. 2,800; 4 tens; 7 tens; 28
9. 3,600 seconds
10. 2,000 pieces of paper

Lesson 7

Sprint

Side A

1.	6	12.	900	23.	35	34.	54,000
2.	60	13.	9,000	24.	3,500	35.	8,100
3.	600	14.	12,000	25.	24	36.	64,000
4.	6,000	15.	1,200	26.	240	37.	490
5.	6,000	16.	120	27.	36	38.	3,600
6.	8	17.	15	28.	36,000	39.	5,600
7.	80	18.	1,500	29.	42	40.	63,000
8.	800	19.	14	30.	4,200	41.	1,000
9.	8,000	20.	140	31.	72	42.	300
10.	9	21.	16	32.	720	43.	20,000
11.	90	22.	16,000	33.	54	44.	4,000

Side B

1.	8	12.	600	23.	45	34.	54,000
2.	80	13.	6,000	24.	4,500	35.	6,400
3.	800	14.	12,000	25.	32	36.	81,000
4.	8,000	15.	1,200	26.	320	37.	4,900
5.	8,000	16.	120	27.	27	38.	360
6.	9	17.	15	28.	27,000	39.	5,600
7.	90	18.	150	29.	42	40.	63,000
8.	900	19.	12	30.	4,200	41.	100
9.	9,000	20.	120	31.	56	42.	3,000
10.	6	21.	16	32.	560	43.	2,000
11.	60	22.	1,600	33.	54	44.	40,000

Problem Set

1. Disks drawn and partial products recorded
   a. Answer provided
   b. 2 × 4 tens + 2 × 3 ones; 86
   c. 3 × 4 tens + 3 × 3 ones; 129
   d. 4 × 4 tens + 4 × 3 ones; 172
2. Disks drawn and partial products recorded
   a. 72
   b. 183
   c. 336

Exit Ticket

1. Disks drawn and partial products recorded; 246
2. Disks drawn and partial products recorded; 217

Homework

1. Disks drawn and partial products recorded
   a. 3 × 2 tens + 3 × 4 ones; 72
   b. 3 × 4 tens + 3 × 2 ones; 126
   c. 4 × 3 tens + 4 × 4 ones; 136
2. Disks drawn and partial products recorded
   a. 108
   b. 210
3. No; explanations will vary.

Lesson 8

Problem Set

1. Disks drawn and partial products recorded
   a. 2, 1, 3; 213
   b. 2 × 2 hundreds + 2 × 1 ten + 2 × 3 ones; 426
   c. 3 × 2 hundreds + 3 × 1 ten + 3 × 4 ones; 642
   d. 3 × 1 thousand + 3 × 2 hundreds + 3 × 5 tens + 3 × 4 ones; 3,762
2. Disks drawn and partial products recorded
   a. 636
   b. 8,072
   c. 7,638
   d. 4,221
3. 720 bagels

Exit Ticket

1. Disks drawn and partial products recorded; 2,052
2. Disks drawn and partial products recorded; 3,162

Homework

1. Disks drawn and partial products recorded
   a. 4 hundreds, 2 tens, 4; 848
   b. 3 × 4 hundreds + 3 × 2 tens + 3 × 4 ones; 1,272
   c. 4 × 1 thousand + 4 × 4 hundreds + 4 × 2 tens + 4 × 4 ones; 5,696
2. Disks drawn and partial products recorded
   a. 1,234
   b. 3,210
   c. 9,102
3. a. 966 m
   b. 2,898 m

Lesson 9

Problem Set

1. a. 136; 136
   b. 672; 672
2. a. 753
   b. 810
   c. 2,736
   d. 1,620
   e. 1,580
   f. 2,352
3. 602
4. 4,113
5. 90 cm
6. $952
7. 1,008 g

Exit Ticket

1. a. 5,472
   b. 4,018
2. 92 years old

Homework

1. a. 92; 92
   b. 1,260; 1,260
2. a. 928
   b. 852
   c. 2,198
   d. 1,320
   e. 4,056
   f. 3,456
3. 432
4. 1,050 points
5. $477
6. $1,316
7. 512 pages

Lesson 10

Problem Set

1. a. 126
   b. 252
   c. 2,586
   d. 1,293
   e. 18,636
   f. 9,318
   g. 17,236
   h. 34,472
2. 1,095 days
3. 1,848 m
4. 42,240 ft

Exit Ticket

1. a. 14,088
   b. 11,753
2. 4,820 sunflowers

Homework

1. a. 123
   b. 369
   c. 1,001
   d. 2,002
   e. 8,192
   f. 16,384
   g. 32,768
   h. 32,768
2. 768 oz
3. 2,748 days
4. 8,192 megabytes

Lesson 11

Problem Set

1. Standard algorithm, partial products method and area model used
   a. 1,700; 400, 20, 5
   b. 3,738; 500, 30, 4; 7, 500, 7, 30, 7, 4
   c. 1,672; 8, 200, 9; 8, 200, 8, 9
2. 774; partial products method used
3. 1,868; tape diagram drawn
4. 35,917
5. 8,415
6. 23,850 pounds

Exit Ticket

1. 11,236
2. 6,075 pages

Homework

1. Standard algorithm, partial products method and area model used
   a. 2,416; 300, 2
   b. 1,080; 200, 10, 6; 5, 200, 5, 10, 5, 6
   c. 5,337; 9, 500, 90, 3; 9, 500, 9, 90, 9, 3
2. 1,900 people; partial products method used
3. 2,304; tape diagram drawn
4. 18,759
5. 21,511
6. 18,744 pounds

Lesson 12

Problem Set

1. 657¢ or $6.57
2. 11,508 L
3. 589 marbles
4. a. Equations will vary
   b. Word problems will vary; 3,262 g

Exit Ticket

872 beads

Homework

1. 644 stickers
2. 12,236 copies
3. 285 bars
4. a. Equations will vary
   b. Word problems will vary; 3,142 m

Lesson 13

Sprint

Side A

1.	4	12.	115	23.	63	34.	6,339
2.	40	13.	9	24.	363	35.	6,393
3.	44	14.	120	25.	84	36.	6,933
4.	2	15.	129	26.	284	37.	96
5.	40	16.	8	27.	484	38.	175
6.	42	17.	140	28.	684	39.	162
7.	6	18.	148	29.	884	40.	378
8.	90	19.	6	30.	9	41.	500
9.	96	20.	180	31.	39	42.	642
10.	15	21.	186	32.	639	43.	10,426
11.	100	22.	189	33.	3,639	44.	8,540

Side B

1.	6	12.	125	23.	84	34.	4,226
2.	60	13.	16	24.	484	35.	4,262
3.	66	14.	120	25.	48	36.	4,622
4.	2	15.	136	26.	248	37.	92
5.	60	16.	8	27.	448	38.	265
6.	62	17.	180	28.	648	39.	135
7.	9	18.	188	29.	848	40.	216
8.	60	19.	6	30.	6	41.	645
9.	69	20.	120	31.	26	42.	500
10.	25	21.	126	32.	426	43.	10,624
11.	100	22.	129	33.	2,426	44.	4,940

Problem Set

1. $748
2. 216 lb
3. 1,362 lb
4. 7,183 pages

Exit Ticket

1. $1,512
2. $1,920
3. David; $408

Homework

1. $534
2. $245
3. 1,972 seats
4. 5,191 reams of paper

Lesson 14

Problem Set

1. 9 pairs; yes; 1 sock
2. 4 bows; yes; 4 in
3. 5 chairs; yes; 2 chairs
4. 5 days
5. 72 apples; 4 apples
6. 7 vans

Exit Ticket

8 groups; 9 chaperones

Homework

1. 8 booklets; yes; 1 sheet
2. 8 booklets; yes; 2 in
3. 4 groups; 5 students
4. 8 days; Day 9
5. 8 rows; 3 soldiers
6. 9 groups; 6 students

Lesson 15

Problem Set

Array and area model drawn for each solution.

1. 3, 0; yes
2. 3, 1; no, one small square outside of the larger rectangle
3. Quotient 9, R2
4. Quotient 4, R2
5. Quotient 10, R3
6. Quotient 8, R3

Exit Ticket

Array and area model drawn for each solution.

1. Quotient 5, R2
2. Quotient 5, R2

Homework

Array and area model drawn for each solution.

1. 6, 0; yes
2. 6, 1; no, one small square outside of the larger rectangle
3. Quotient 6, R2
4. Quotient 5, R4
5. Quotient 6, R1
6. Quotient 5, R6

Lesson 16

Problem Set

1. Disks drawn; 3; 1; 6; 7
2. Disks drawn; 13; 1; 13 × 6 = 26, 26 + 1 = 27
3. Disks drawn; 2; 2; 2 × 3 = 6, 6 + 2 = 8
4. Disks drawn; 12; 2; 12 × 3 = 36, 36 + 2 = 38
5. Disks drawn; 1; 2; 4 × 1 = 4, 4 + 2 = 6
6. Disks drawn; 21; 2; 4 × 21 = 84, 84 + 2 = 86

Exit Ticket

1. Disks drawn; 1; 2; 1 × 3 = 3, 3 + 2 = 5
2. Disks drawn; 21; 2; 3 × 21 = 63, 63 + 2 = 65

Homework

1. Disks drawn; 2; 1; 6, 6 + 1 = 7
2. Disks drawn; 22; 1; 22 × 3 = 66, 66 + 1 = 67
3. Disks drawn; 2; 1; 2 × 2 = 4, 4 + 1 = 5
4. Disks drawn; 42; 1; 42 × 2 = 84, 84 + 1 = 85
5. Disks drawn; 1; 1; 1 × 4 = 4, 4 + 1 = 5
6. Disks drawn; 21; 1; 4 × 21 = 84, 84 + 1 = 85

Lesson 17

Problem Set

1. Disks drawn; 2; 1; 4, 2 × 2 = 4, 4 + 1 = 5
2. Disks drawn; 25; 0; 2 × 25 = 50
3. Disks drawn; 2; 1; 3 × 2 = 6, 6 + 1 = 7
4. Disks drawn; 25; 0; 3 × 25 = 75
5. Disks drawn; 2; 1; 4 × 2 = 8, 8 + 1 = 9
6. Disks drawn; 23; 0; 23 × 4 = 92

Exit Ticket

1. Disks drawn; 1; 1; 4 × 1 = 4, 4 + 1 = 5
2. Disks drawn; 14; 0; 14 × 4 = 56

Homework

1. Disks drawn; 3; 1; 3 × 2 = 6, 6 + 1 = 7
2. Disks drawn; 36; 1; 2 × 36 = 72, 72 + 1 = 73
3. Disks drawn; 1; 2; 1 × 4 = 4, 4 + 2 = 6
4. Disks drawn; 15; 2; 4 × 15 = 60, 60 + 2 = 62
5. Disks drawn; 2; 2; 3 × 2 = 6, 6 + 2 = 8
6. Disks drawn; 28; 0; 3 × 28 = 84

Lesson 18

Problem Set

1. 23; 23 × 2 = 46
2. 32; 32 × 3 = 96
3. 17; 17 × 5 = 85
4. 13; 13 × 4 = 52
5. 17 R2; 17 × 3 = 51, 51 + 2 = 53
6. 23 R3; 23 × 4 = 92, 92 + 3 = 95
7. 14 R5; 14 × 6 = 84, 84 + 5 = 89
8. 16; 16 × 6 = 96
9. 20; 20 × 3 = 60
10. 15; 15 × 4 = 60
11. 11 R7; 11 × 8 = 88, 88 + 7 = 95
12. 13 R4; 13 × 7 = 91, 91 + 4 = 95

Exit Ticket

1. 13 R2; 13 × 7 = 91, 91 + 2 = 93
2. 12 R3; 12 × 8 = 96, 96 + 3 = 99

Homework

1. 42; 42 × 2 = 84
2. 21; 21 × 4 = 84
3. 16; 16 × 3 = 48
4. 16; 16 × 5 = 80
5. 15 R4; 15 × 5 = 75, 75 + 4 = 79
6. 22 R3; 22 × 4 = 88, 88 + 3 = 91
7. 15 R1; 15 × 6 = 90, 90 + 1 = 91
8. 13; 13 × 7 = 91
9. 29; 29 × 3 = 87
10. 14 R3; 14 × 6 = 84, 84 + 3 = 87
11. 11 R6; 11 × 8 = 88, 88 + 6 = 94
12. 15 R4; 15 × 6 = 90, 90 + 4 = 94

Lesson 19

Sprint

Side A

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

Side B

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

Problem Set

1. Equation accurately modeled; remainder circled
2. Remainder is greater than divisor; explanations will vary.
3. Equation accurately modeled; 1 remaining ten is decomposed into 10 ones
4. a. Picture accurately models division; yes
   b. Explanations will vary.
5. Answers will vary.

Exit Ticket

1. Disks drawn; 16; yes; 1
2. No; she can fill 11 pages completely; explanations may vary.

Homework

1. Equation accurately modeled; remainder circled
2. Remainder is greater than divisor; explanations will vary.
3. Equation accurately modeled; 2 remaining tens are decomposed into 20 ones
4. a. Picture accurately models division; yes
   b. Explanations will vary.
5. Answers will vary.

Lesson 20

Problem Set

1. a. 72 ÷ 4 = 18
   b. Whole: 72; parts: 40 and 32; 40, 4, 32, 4, 10, 8, 18
2. 15; whole: 45; parts: 30 and 15; (30 ÷ 3) + (15 ÷ 3) = 10 + 5 = 15; area model and number bond drawn
3. 16; whole: 64; parts: 40 and 24; area model and number bond drawn; solved with distributive property or standard algorithm
4. 23; solved with area model; explanations may vary.
5. 12; solved with area model and standard algorithm

Exit Ticket

1. 72 ÷3 = 24
2. 14; solved with area model, number bond, and written method

Homework

1. a. 54 ÷ 3 = 18
   b. Whole: 54; parts: 30 and 24; 30, 3, 24, 3, 10, 8, 18
2. 14; whole: 42; parts: 30 and 12; (30 ÷ 3) + (12 ÷ 3) = 10 + 4 = 14; area model and number bond drawn
3. 15; whole: 60; part: 40; part: 20; area model and number bond drawn; solved with distributive property or standard algorithm
4. 18; solved with area model; explanations may vary.
5. 16; solved with area model and standard algorithm

Lesson 21

Sprint

Side A

1.	4	12.	1 R1	23.	3	34.	1 R4
2.	4 R1	13.	2 R1	24.	3 R1	35.	1
3.	1	14.	2 R2	25.	1	36.	1
4.	1 R1	15.	3	26.	1 R1	37.	3 R1
5.	1 R2	16.	1 R2	27.	1 R2	38.	3 R3
6.	1 R3	17.	1 R3	28.	1 R3	39.	3 R3
7.	1 R2	18.	1	29.	1	40.	3 R3
8.	2	19.	1 R1	30.	1 R1	41.	3 R5
9.	2	20.	1	31.	2	42.	7 R1
10.	2 R1	21.	1 R1	32.	2 R1	43.	8 R5
11.	1	22.	1	33.	3	44.	9 R1

Side B

1.	1 R1	12.	1 R1	23.	2	34.	4 R1
2.	1	13.	1	24.	2 R1	35.	4
3.	1 R3	14.	1 R1	25.	2	36.	4 R5
4.	1 R2	15.	1 R1	26.	2 R1	37.	5 R5
5.	1	16.	1 R2	27.	3	38.	2 R5
6.	1 R1	17.	1	28.	2 R2	39.	6 R6
7.	1 R3	18.	1 R1	29.	1 R4	40.	6 R3
8.	1 R2	19.	3	30.	1	41.	7 R5
9.	1 R2	20.	3 R1	31.	1 R1	42.	8 R5
10.	2	21.	1 R3	32.	1	43.	7 R5
11.	1	22.	1 R2	33.	1	44.	7 R7

Problem Set

1. 18 R1; answer includes area model, long division, and distributive property
2. 25 R1; answer includes area model, long division, and distributive property
3. a. 53 ÷ 4 = 13 R1
   b. (40 ÷ 4) + (12 ÷ 4) = 10 + 3 = 13
4. 16; answer includes area model and long division or distributive property
5. 16 R1; answer includes area model and long division or distributive property
6. 14; answer includes area model and long division or distributive property
7. 14 R2; answer includes area model and long division or distributive property
8. 13 R1; answer includes area model and long division or distributive property
9. 26 R1; answer includes area model and long division or distributive property
10. 12 groups; 1 student

Exit Ticket

1. 59 ÷ 2 = 29 R1
2. 23 R1; answer includes area model, long division, and distributive property

Homework

1. 17 R1; answer includes area model, long division, and distributive property
2. 26 R1; answer includes area model, long division, and distributive property
3. a. 98 ÷ 4 = 24 R2
   b. (40 ÷ 4) + (40 ÷ 4) + (16 ÷ 4) = 10 + 10 + 4 = 24
4. 14; answer includes area model and long division or distributive property
5. 14 R1; answer includes area model and long division or distributive property
6. 13; answer includes area model and long division or distributive property
7. 13 R2; answer includes area model and long division or distributive property
8. 12 R1; answer includes area model and long division or distributive property
9. 24 R1; answer includes area model and long division or distributive property
10. 24 lunch trays; 1 lunch tray

Lesson 22

Problem Set

1. a. Answer provided
   b. $1 \times 6 = 6$, $2 \times 3 = 6$; 1, 2, 3, 6; C
   c. $1 \times 7 = 7$; 1, 7; P
   d. $1 \times 9 = 9$, $3 \times 3 = 9$; 1, 3, 9; C
   e. $1 \times 12 = 12$, $2 \times 6 = 12$; $3 \times 4 = 12$; 1, 2, 3, 4, 6, 12; C
   f. $1 \times 13 = 13$; 1, 13; P
   g. $1 \times 15 = 15$, $3 \times 5 = 15$; 1, 3, 5, 15; C
   h. $1 \times 16 = 16$, $2 \times 8 = 16$, $4 \times 4 = 16$; 1, 2, 4, 8, 16; C
   i. $1 \times 18 = 18$, $2 \times 9 = 18$, $3 \times 6 = 18$; 1, 2, 3, 6, 9, 18; C
   j. $1 \times 19 = 19$; 1, 19; P
   k. $1 \times 21 = 21$; $3 \times 7 = 21$; 1, 3, 7, 21; C
   l. $1 \times 24 = 24$, $2 \times 12 = 24$, $3 \times 8 = 24$, $4 \times 6 = 24$; 1, 2, 3, 4, 6, 8, 12, 24; C
2. For 25: (1, 25); (5, 5); composite; more than 2 factors
   For 28: (1, 28); (2, 14); (4, 7); composite; more than 2 factors
   For 29: (1, 29); prime; only 2 factors
3. a. 2, 3, 5, 7, 11, 13, 17, 19
   b. 2 is a prime and even number
4. Incorrect; 3 is not a factor of 28

Exit Ticket

a. $1 \times 9 = 9$, $3 \times 3 = 9$; 1, 3, 9; C

b. $1 \times 12 = 12$, $2 \times 6 = 12$; $3 \times 4 = 12$; 1, 2, 3, 4, 6, 12; C

c. $1 \times 19 = 19$; 1, 19; P

Homework

1. a. Answer provided
   b. $1 \times 10 = 10$, $2 \times 5 = 10$; 1,2, 5, 10; C
   c. $1 \times 11 = 11$; 1, 11; P
   d. $1 \times 14 = 14$, $2 \times 7 = 14$; 1, 2, 7, 14; C
   e. $1 \times 17 = 17$; 1, 17; P
   f. $1 \times 20 = 20$, $2 \times 10 = 20$, $4 \times 5 = 20$; 1, 2, 4, 5, 10, 20; C
   g. $1 \times 22 = 22$, $2 \times 11 = 22$; 1, 2, 11, 22; C
   h. $1 \times 23 = 23$; 1, 23; P
   i. $1 \times 25 = 25$, $5 \times 5 = 25$; 1, 5, 25; C
   j. $1 \times 26 = 26$; $2 \times 13 = 26$; 1, 2, 13, 26; C
   k. $1 \times 27 = 27$, $3 \times 9 = 27$; 1, 3, 9, 27; C
   l. $1 \times 28 = 28$, $2 \times 14 = 28$, $4 \times 7 = 28$; 1, 2, 4, 7, 14, 28; C
2. For 19: (1, 19); prime; only 2 factors
   For 21: (1, 21); (3, 7); composite; more than 2 factors
   For 24: (1, 24); (2, 12); (3, 8); (4, 6); composite; more than 2 factors
3. a. 1, 3, 5, 7, 9, 11, 13, 15, 17, 19
   b. 9 and 15 are odd and composite
4. Correct; 3 is a factor of 27

Lesson 23

Problem Set

1. Explanations may vary.
   a. Yes
   b. No
   c. Yes
   d. Yes
   e. Yes
   f. Yes
   g. No
   h. No
2. a. 4; 4; 4; 24
   b. 9; 3; 3; 3; 3; 36
3. $(4 \times 2) \times 7 = 4 \times (2 \times 7) = 4 \times 14 = 56$
   $(4 \times 2) \times 9 = 4 \times (2 \times 9) = 4 \times 18 = 72$
   $(4 \times 2) \times 10 = 4 \times (2 \times 10) = 4 \times 20 = 80$
4. Explanations may vary.

Exit Ticket

1. Explanations may vary.
   a. Yes
   b. No
   c. Yes
   d. Yes
2. Explanations may vary.

Homework

1. Explanations may vary.
   a. Yes
   b. No
   c. Yes
   d. Yes
   e. Yes
   f. Yes
   g. No
   h. No
2. a. 3; 3; 3; 4; 12
   b. 6; 2; 2; 2; 30
3. $(5 \times 2) \times 7 = 5 \times (2 \times 7) = 5 \times 14 = 70$
   $(5 \times 2) \times 8 = 5 \times (2 \times 8) = 5 \times 16 = 80$
   $(5 \times 2) \times 9 = 5 \times (2 \times 9) = 5 \times 18 = 90$
4. Explanations may vary.

Lesson 24

Problem Set

1. a. 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210
   b. 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108, 112, 116, 120, etc.
   c. 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120, 126, 132, 138, 144, 150, 156, 162, 168, 174, 180
2. 1, 2, 3, 4, 6, 8, 12, 24
3. a. Yes; yes
   b. No; no
   c. Yes; yes
4. Yes; explanations will vary.
5. a. Multiples of 2 circled red; 0, 2, 4, 6, 8
   b. Multiples of 3 shaded green; answers will Vary; sums are multiples of 3 or divisible by 3
   c. Multiples of 5 circled blue; 0, 5
   d. Multiples of 10 crossed out; zero in the ones place

Exit Ticket

1. 55; 66; 77; 88; 99
2. 21, 35, 42, 49, 56, 63, 70
3. a. 1, 2, 3, 6, 9, 18
   b. 1, 2, 3, 6, 9, 18
   c. Yes; explanations will vary.

Homework

1. a. 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, etc.
   b. 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, etc.
   c. 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120, 126, 132, 138, 144, 150, etc.
2. 1, 2, 3, 5, 6, 10, 30
3. a. Yes; yes
   b. Yes; no
   c. No; no
4. No; explanations will vary.
5. a. Multiples of 6 underlined; 0, 2, 4, 6, 8
   b. Multiples of 4 identified; 2, 6
   c. 0, 4, 8; answers will vary.
   d. Multiples of 9 circled; sum is 9.

Lesson 25

Problem Set

1. Chart completed per directions
2. a. 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97
   b. Not multiples of any numbers except themselves
   c. Composite numbers
   d. Prime numbers

Exit Ticket

1. 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30 crossed off
2. 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31 circled
3. 1

Homework

1. Answers will vary.
2. Composite
3. Prime
4. 1; neither prime nor composite

Lesson 26

Problem Set

1. a. Disks accurately drawn.
   b. 3; 3
   c. 30; 3 tens
   d. 300; 6 hundreds, 3 hundreds
2. 3,000; 6 thousands, 3 thousands
   a. Disks accurately drawn
   b. 4; 4
   c. 40; 12 tens, 4 tens
   400; 12 hundreds, 4 hundreds
3. a. Answer provided
   b. 300; 6 hundreds ÷ 2 = 3 hundreds
   c. 200; 8 hundreds ÷ 4 = 2 hundreds
   d. 300; 9 hundreds ÷ 3 = 3 hundreds
   e. 50; 5
   f. 60; 24 tens ÷ 4 = 6 tens
   g. 90; 45 tens ÷ 5 = 9 tens
   h. 40; 20 tens ÷ 5 = 4 tens
   i. 900; 9
   j. 600; 24 hundreds ÷ 4 = 6 hundreds
   k. 800; 24 hundreds ÷ 3 = 8 hundreds
   l. 800; 40 hundreds ÷ 5 = 8 hundreds
4. 700 kg
5. 70 stickers
6. $400

Exit Ticket

1. a. 2
   b. 200; 12 hundreds ÷ 6 = 2 hundreds
   c. 300; 21 hundreds ÷ 7 = 3 hundreds
   d. 400; 32 hundreds ÷ 8 = 4 hundreds
2. 40 pennies

Homework

1. Disks accurately drawn.
   a. 2; 2
   b. 20; 2 tens
   c. 200; 6 hundreds, 2 hundreds
   d. 2,000; 6 thousands, 2 thousands
2. Disks accurately drawn.
   a. 3; 3
   b. 30; 12 tens, 3 tens
   c. 300; 12 hundreds, 3 hundreds
3. a. Answer provided
   b. 300; 9 hundreds ÷ 3 = 3 hundreds
   c. 200; 4 hundreds ÷ 2 = 2 hundreds
   d. 100; 3 hundreds ÷ 3 = 1 hundred
   e. 50; 5
   f. 80; 16 tens ÷ 2 = 8 tens
   g. 80; 40 tens ÷ 5 = 8 tens
   h. 60; 30 tens ÷ 5 = 6 tens
   i. 400; 4
   j. 400; 16 hundreds ÷ 4 = 4 hundreds
   k. 600; 24 hundreds ÷ 4 = 6 hundreds
   l. 600; 30 hundreds ÷ 5 = 6 hundreds
4. 4,000 L
5. 70 mL
6. $600

Lesson 27

Sprint

Side A

1.	3	12.	11	23.	41	34.	71
2.	3	13.	13	24.	43	35.	73
3.	3	14.	17	25.	47	36.	79
4.	5	15.	19	26.	53	37.	83
5.	5	16.	23	27.	59	38.	2
6.	5	17.	19	28.	97	39.	17
7.	7	18.	29	29.	91	40.	5
8.	11	19.	31	30.	97	41.	59
9.	11	20.	37	31.	89	42.	31
10.	17	21.	2	32.	61	43.	2
11.	19	22.	2	33.	67	44.	43

Side B

1.	5	12.	13	23.	41	34.	71
2.	5	13.	11	24.	43	35.	73
3.	5	14.	17	25.	47	36.	67
4.	7	15.	19	26.	53	37.	59
5.	7	16.	23	27.	59	38.	2
6.	7	17.	19	28.	97	39.	19
7.	3	18.	29	29.	91	40.	5
8.	11	19.	31	30.	97	41.	59
9.	11	20.	37	31.	89	42.	41
10.	17	21.	2	32.	67	43.	2
11.	19	22.	2	33.	61	44.	67

Problem Set

1. Disks accurately drawn
   a. 162
   b. 172
   c. 161
   d. 183
2. Disks accurately drawn; algorithm accurately recorded
   a. 131
   b. 242
   c. 172

Exit Ticket

1. 141; Disks accurately drawn; algorithm accurately recorded
2. 141; Disks accurately drawn; algorithm accurately recorded

Homework

1. Disks accurately drawn
   a. 173
   b. 264
   c. 172
   d. 243
2. Disks accurately drawn; algorithm accurately recorded
   a. 162
   b. 151
   c. 241

Lesson 28

Problem Set

1. a. 287
   b. 287
   c. 177
   d. 118
   e. 218 R1
   f. 118 R1
   g. 91 R2
   h. 91 R4
   i. 169 R2
   j. 238 R3
2. 145 bottles; yes; 1 bottle

Exit Ticket

1. a. 388
   b. 198 R2
2. 32 servings

Homework

1. a. 189
   b. 265
   c. 128
   d. 123
   e. 179 R2
   f. 172 R2
   g. 166
   h. 156 R3
   i. 155 R1
   j. 132 R3
2. 233 m

Lesson 29

Problem Set

1. a. 418
   b. 394 R2
   c. 3474
   d. 2,237 R1
   e. 3,784 R1
   f. 2,523
   g. 1,591
   h. 1,514 R4
   i. 2,489 R2
   j. 2,489
2. 93 goats

Exit Ticket

1. a. 591
   b. 1,694 R2
2. 446 stamps

Homework

1. a. 616
   b. 616
   c. 3,142
   d. 3,293 R1
   e. 1,815
   f. 2,712 R1
   g. 2,822 R1
   h. 2,818 R2
   i. 1,234 R1
   j. 1,234 R3
2. 1,296 apples

Lesson 30

Problem Set

1. 51
2. 234 R2
3. 209
4. 203 R1
5. 190
6. 1,280
7. 614
8. 1,341 R1
9. 2,078 R1
10. 3,002 R2
11. a. 1,043 R2
    b. Answers will vary.

Exit Ticket

1. 95
2. 2,346 R2

Homework

1. 81 R4
2. 251 R1
3. 207 R3
4. 200 R2
5. 240
6. 1,250
7. 412
8. 4,515 R1
9. 1,554 R2
10. 2,000

Lesson 31

Sprint

Side A

1.	3	12.	300	23.	60	34.	40
2.	30	13.	500	24.	600	35.	80
3.	300	14.	700	25.	4	36.	800
4.	3,000	15.	900	26.	40	37.	80
5.	3	16.	90	27.	3	38.	700
6.	30	17.	2	28.	300	39.	80
7.	300	18.	3	29.	4	40.	900
8.	3,000	19.	30	30.	40	41.	90
9.	2	20.	300	31.	6	42.	80
10.	3	21.	5	32.	600	43.	900
11.	30	22.	6	33.	700	44.	800

Side B

1.	2	12.	50	23.	40	34.	60
2.	20	13.	70	24.	400	35.	70
3.	200	14.	700	25.	3	36.	700
4.	2,000	15.	900	26.	30	37.	70
5.	2	16.	90	27.	3	38.	600
6.	20	17.	3	28.	300	39.	800
7.	200	18.	4	29.	3	40.	70
8.	2,000	19.	40	30.	30	41.	800
9.	2	20.	400	31.	6	42.	90
10.	3	21.	5	32.	600	43.	800
11.	30	22.	4	33.	700	44.	80

Problem Set

1. 78 tables; number of groups unknown
2. 473 books; group size unknown
3. 501 sacks; number of groups unknown
4. 1,920 cookies; group size unknown
5. 603 miles; group size unknown

Exit Ticket

1. 143 cars; group size unknown
2. 178 sacks; number of groups unknown

Homework

1. 125 mL; group size unknown
2. 206 baggies; number of groups unknown
3. 70 miles; groups size unknown
4. 219 strips; number of groups unknown
5. 1,164 Groblarx fruits; group size is unknown

Lesson 32

Problem Set

1. 31 seats
2. 8 bagels
3. 87 bags; 5 pieces of candy
4. 150 teams; 4 children
5. 1,014 kg; 5 kg

Exit Ticket

1. 121 students
2. 59 crayons

Homework

1. 48 guests
2. 500 pencils
3. 251 sacks
4. 36 muffins
5. 1,287 m

Lesson 33

Problem Set

1. a. $892 \div 4 = 223$
   b. Whole: 892; parts: 400, 400, 80, 12
   $(400 \div 4)+(400 \div 4)+(80 \div 4)+(12 \div 4)= 100 + 100 + 20 + 3 = 223$
2. a. 240; area model accurately drawn
   b. Answers will vary.
3. a. 258; area model accurately drawn
   b. Answers will vary.
   c. Algorithm accurately recorded
4. a. 792; area model accurately drawn
   b. Answers will vary.
   c. Algorithm accurately recorded

Exit Ticket

1. a. $747 \div 3 = 249$
   b. Whole: 747; parts: 600, 120, 27
   $(600 \div 3) + (120 \div 3) + (27 \div 3) = 200 + 40 + 9 = 249$
2. a. 684; area model accurately drawn
   b. Answers will vary.
   c. Algorithm accurately recorded

Homework

1. a. 1,828 ÷ 4 = 457
   b. Whole: 1,828; parts: 1,600, 200, 28
   (1,600 ÷ 4) + (200 ÷ 4) + (28 ÷ 4) = 400 + 50 + 7 = 457
2. a. 204; area model accurately drawn
   b. Answers will vary.
3. a. 183; area model accurately drawn
   b. Answers will vary.
   c. Algorithm accurately recorded
4. a. 1,381; area model accurately drawn
   b. Answers will vary.
   c. Algorithm accurately recorded

Lesson 34

Problem Set

1. Disks drawn accurately
   a. 3; 3; 720
   b. 43; 43; 1,720
   c. 10, 37; 37; 1,110
2. Disks drawn accurately
   a. 540
   b. 1,240
3. a. 1,360
   b. 2,150
4. a. 1,360
   b. 1,500

Exit Ticket

1. 2, 10, 41, 820
2. 1,920

Homework

1. Disks drawn accurately
   a. 2; 2; 680
   b. 34; 34; 1,020
   c. 10, 42; 42; 1,260
2. Disks drawn accurately
   a. 320
   b. 1,280
3. a. 630
   b. 2,520
4. a. 1,720
   b. 1,610

Lesson 35

Problem Set

1. 40; 400; 440
2. 50; 2,000; 2,050
3. 180; 4,200; 4,380
4. 2,560
5. 3,780
6. 2,040
7. 2,040
8. 2,200
9. 4,400

Exit Ticket

1. 90; 2,700; 2,790
2. 240; 2,800; 3,040

Homework

1. 210; 300; 510;
2. 320; 2,000; 2,320
3. 400; 1,500; 1,900
4. 1,140
5. 880
6. 1,760
7. 2,640
8. 3,290
9. 5,200

Lesson 36

Problem Set

1. a. 4×2 , 4×10, 10×2, 10×10
   b. 2, 10, 2, 10
2. 308; area model and partial products accurately recorded
3. 800; area model and partial products accurately recorded
4. 1,470; area model and partial products accurately recorded
5. 462; partial products accurately recorded
6. 506; partial products accurately recorded

Exit Ticket

1. 1,118; area model and partial products accurately recorded
2. 935; area model and partial products accurately recorded

Homework

1. a. 3×2, 3×10, 10×2, 10×10
   b. 2, 10, 2, 10
2. 578; area model and partial products accurately recorded
3. 810; area model and partial products accurately recorded
4. 855; area model and partial products accurately recorded
5. 564; partial products accurately recorded
6. 2,139; partial products accurately recorded
7. 253; partial products accurately recorded
8. 506; partial products accurately recorded

Lesson 37

Problem Set

1. 4 × 2, 4 × 10, 10 × 2, 10 × 10; 8, 40, 20, 100, 168; 4 × 12, 10 × 12; 48, 120, 168
2. 2 × 3, 2 × 40, 30 × 3, 30 × 40; 6, 80, 90, 1,200, 1,376; 2 × 43, 30 × 43; 86, 1,290, 1,376
3. 7 × 15, 50 × 15; 105, 750, 855
4. a. 150, 6, 25; 1,000, 40, 25; 1,150
   b. 36, 2, 18; 1,080, 60, 18; 1,116
   c. 234, 1,560, 1,794
   d. 234, 1,560, 1,794

Exit Ticket

1. 3 × 2, 3 × 20, 40 × 2, 40 × 20; 6, 60, 80, 800, 946; 3 × 22, 40 × 22; 66, 880, 946
2. 5 × 64, 10 × 64; 320, 640, 960

Homework

1. 6 × 4, 6 × 30, 20 × 4, 20 × 30; 24, 180, 80, 600, 884; 6 × 34, 20 × 34; 204, 680, 884
2. 2 × 1, 2 × 40, 80 × 1, 80 × 40; 2, 80, 80, 3,200, 3,362; 2 × 41, 80 × 41; 82, 3,280, 3,362
3. 2 × 26, 50 × 26; 52, 1,300, 1,352
4. a. 204, 3, 68; 1,360, 20, 68; 1,564
   b. 147, 3, 49; 1,470, 30, 49; 1,617
   c. 80, 320, 400
   d. 54, 3,780, 3,834

Lesson 38

Problem Set

1. 3 × 54, 20 × 54; 3, 20; 162, 54; 1,080, 54; 1,242
2. 6 × 54, 40 × 54; 6, 40; 324, 6, 54; 2,160, 40, 54; 2,484
3. 5 × 47, 50 × 47; 5, 47, 50, 47; 235, 5, 47; 2,350, 50, 47; 2,585
4. 290, 5, 58; 2,320, 40, 58; 2,610
5. 410, 5, 82; 4,100, 50, 82; 4,510
6. 3,339
7. 6,132

Exit Ticket

1. 216, 3, 72; 2,880, 40, 72; 3,096
2. 1,855

Homework

1. 6 × 43, 20 × 43; 6, 20; 258, 43; 860, 43; 1,118
2. 7 × 63, 40 × 63; 7, 40; 441, 7, 63; 2,520, 40, 63; 2,961
3. 4 × 67, 50 × 67; 4, 67, 50, 67; 268, 4, 67; 3,350, 50, 67; 3,618
4. 208, 4, 52; 1,560, 30, 52; 1,768
5. 516, 6, 86; 4,300, 50, 86; 4,816
6. 2,808
7. 3,344
8. 3,969
9. 5,372