Answers

Chapter 1

Lesson 1.1

1.

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
○○ ○	○○○ ○○	○○○ ○○○	○○ ○○		○

a. three hundred fifty-six thousand, four hundred one
b. 356,401

2. 28,199
3. 90,038
4. 412,603
5. 800,005
6. 507,700
7. 600,600
8. Fifty thousand, six hundred eighty
9. Two hundred fifty-five thousand, four hundred thirty
10. One hundred ninety-nine thousand, three hundred three
11. Eight hundred seventy-two thousand, nine hundred
12. Three hundred five thousand, seventy-two
13. 304,678
14. 876,430
15. 304,687
16. 876,403
17. Answers vary.
Samples: 306,748; 346,780; 387,406
18.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
○○ ○○ ○○	○○		○○ ○○	○ ○○	○	○ ○○

a. six million, two hundred four thousand, three hundred thirteen
b. 6,204,313

19. 9,270,050
20. 6,084,101
21. 7,006,899
22. 4,502,015
23. 5,050,602
24. 8,400,085
25. 3,000,703
26. Eight million, eight hundred eight thousand, four hundred twenty-nine
27. Three million, two thousand, five hundred sixty-six
28. Five million, nine hundred seventy thousand, one hundred three
29. Two million, fifty thousand, sixty
30. Four million, seven hundred thousand, nine hundred
31. 1,023,596
32. Answers vary.
Samples: 3,629,501; 3,269,510; 3,029,561
33. Answers vary.
Samples: 3,902,615; 3,260,519; 3,150,269
34. Answers vary.
Samples: 6,903,512; 6,935,012; 9,052,136

Lesson 1.2

1.

900,000
20,000
5,000
0
30
8

2. ten thousands
3. 90,000
4. 90,000
5. ten thousands
6. hundreds
7. hundred thousands
8. 5,000
9. 500
10. 500,000
11. 8
12. ten thousands
13. hundred thousands
14. 60,000; ten thousands
15. 0; 0
16. 10,000
17. 700,000
18. 4,000
19. 204,891
20. 570,030
21. 306,010

22.

7,000,000
800,000
0
3,000
500
20
4

23. 6; 60,000
24. millions
25. 780
26. 728,000
27. 6,085,323
28. 2,700,508
29. 1,976,805
30. 580,249

Lesson 1.3

1. 123,087
2. 625,897
3. 4,314,356
4. 32,049
5. 785,900
6. 5,468,015
7. 197,500 283,500 1,795,000 2,385,000 2,583,000
8. 895,390 8,476,900 8,593,800 8,746,800 8,764,500
9. 5,298,053 5,296,000 2,890,670 980,576 594,287
10. 3,900,100 3,003,500 2,900,800 390,300 303,500
11. a. 1,000
    b. 1,000
    c. 1,000; 479,270
    d. 479,270
12. a. 20,000
    b. 20,000
    c. 20,000; 4,440,000
    d. 4,440,000
13. 1,005,600; 1,205,600; count on by 200,000
14. 935,800; 920,800; count back by 15,000
15. 5,391,200; 5,441,200; count on by 50,000
16. 1,158,600; 1,058,500; count back by 100,100

Lesson 1.4

1. 4,000
2. 28,000
3. 725,000
4. 300,000
5. 15,000
6. 8,000
7. 12,000
8. 2,000
9. 56,000
10. 81,000
11. 900
12. 500
13. 900
14. 600
15. 2,832 rounds to 3,000.
    1,475 rounds to 1,000.
    $3,000 + 1,000 = 4,000$
    The estimated number of tourists was 4,000.
16. $4,342 \div 7$ is about $4,200 \div 7 = 600$.
    The estimated number of visitors on Monday was 600.
17. $4 \times \$1,000 = \$4,000$
    His estimated total sales was $4,000.
18. $4 \times \$1,500 = \$6,000$
    His estimated total sales was $6,000.
19. $4 \times \$1,499 = \$5,996$
    His actual total sales was $5,996. Answers vary; Exercise 17 is easier to calculate; Exercise 18 gives an estimate that is closer to the actual total sales.

Put on Your Thinking Cap!

Thinking skill: Identifying patterns and relationships

Strategy: Look for pattern

1. 200,000
2. 9,750
3. 1,800,000
4. 1,000
5. 27,000
6. Thinking skill: Comparing
   Strategy: Use guess and check
   Solution: Estimate the number. Then guess and check your answers.
   $20 \times 20 = 400$, $30 \times 30 = 900$
   600 is between 400 and 900 so the two numbers are greater than 20 but less than 30.
   $24 \times 25 = 600$
   The page numbers are 24 and 25.
7. Thinking skill: Comparing
   Strategy: Use guess and check
   Solution: 9,805,472

8. Thinking skill: Comparing
   Strategy: Use guess and check
   Solution: 394,825 or 394,865

Chapter 2

Lesson 2.1

1. 6,541
2. 8,594
3. 6,471
4. 7,624
5. 2,538
6. 3,185
7. 13,176
8. 92,136
9. 25,192
10. 27,782
11. 75,792
12. 1,020,600
13. 908
14. 793
15. 56
16. 84
17. 436
18. 3286.5
19. Answers vary.
    Samples: $679 \times 11 \times 91 = 679{,}679$; $189 \times 11 \times 91 = 189{,}189$. The answer will be the 3-digit number repeated.

Lesson 2.2

1. 380
2. 7,460
3. 6,240
4. 8,570
5. 7,580
6. 6,800
7. 10
8. 190
9. 10
10. 10
11. 6,400
12. 80,800
13. 8; 448; 4,480
14. 4; 3,024; 30,240
15. 5; 3,400; 34,000
16. 857; 6; 5,142; 51,420
17. 1,520
18. 45,760
19. 14,700
20. 26,250
21. 4,700
22. 32,500
23. 16,800
24. 231,000
25. 192,000
26. 759,000
27. 100
28. 7,120
29. 1,000
30. 100
31. 7,910
32. 5,200
33. 6; 144; 14,400
34. 4; 432; 43,200
35. 5; 800; 80,000
36. 3; 111; 111,000
37. 8; 824; 824,000
38. 4; 1,300; 1,300,000
39. 146,300
40. 1,314,000
41. 500; 90; 45,000
42. 50; 300; 15,000
43. 4,000; 500; 2,000,000
44. 2,000; 700; 1,400,000

Lesson 2.3

1. 3,680
2. 4,770
3. 2,254
4. 3,016
5. 2,331
6. 3,055
7. 3,698
8. 8,064
9. 30,520
10. 22,200
11. 13,365
12. 47,936
13. 49,452
14. 97,278
15. 93,834
16. 74,592

Lesson 2.4

1. 720
2. 280
3. 2,300
4. 68,000
5. 232
6. 1,600
7. 10
8. 10
9. 3,980
10. 55,000
11. 10; 930; 310
12. 5; 950; 5; 190
13. 6; 12,600; 6; 2,100
14. 1,500
15. 6,200
16. 5,400
17. 3,820
18. 48
19. 357
20. 79
21. 350
22. 192
23. 275,000
24. 100
25. 1,000
26. 514,000
27. 680,000
28. 100; 135; 45
29. 5; 850; 5; 170
30. 100; 8,400; 2,100
31. 1,000; 924; 154
32. 9; 981; 9; 109
33. 1,000; 756; 108
34. 31
35. 152
36. 800; 40; 20
37. 7,000; 500; 14
38. 9,000; 300; 30
39. 4,000; 20; 200

Lesson 2.5

1. 4
2. 5 R 10
3. 3 R 1
4. 11 R 48
5. 8 R 14
6. 7 R 2
7. 21 R 15
8. 18 R 21
9. Estimated quotient = 80
   Actual quotient = 79
10. Estimated quotient = 60
    Actual quotient = 65
11. Estimated quotient = 100
    Actual quotient = 106
12. Estimated quotient = 80
    Actual quotient = 82
13. Estimated quotient = 100
    Actual quotient = 99
14. Estimated quotient = 40
    Actual quotient = 38
15. Estimated quotient = 30
    Actual quotient = 26
16. Estimated quotient = 20
    Actual quotient = 19

Lesson 2.6

1. 110
   Step 1 $60 - 20 = 40$
   Step 2 $40 + 70 = 110$
2. 280
   Step 1 $200 \div 5 = 40$
   Step 2 $40 \times 7 = 280$
3. 82
   Step 1 $135 \div 3 = 45$
   Step 2 $100 - 45 = 55$
   Step 3 $55 + 27 = 82$
4. 200
   Step 1 $108 \div 9 = 12$
   Step 2 $12 \times 10 = 120$
   Step 3 $80 + 120 = 200$
5. 411
   Step 1 $42 \times 10 = 420$
   Step 2 $72 \div 8 = 9$
   Step 3 $420 - 9 = 411$
6. 18
   Step 1 $38 - 18 = 20$
   Step 2 $90 \times 20 = 1{,}800$
   Step 3 $1{,}800 \div 100 = 18$
7. 0
   Step 1 $80 \div 2 = 40$
   Step 2 $100 - 40 = 60$
   Step 3 $15 \times 4 = 60$
   Step 4 $60 - 60 = 0$

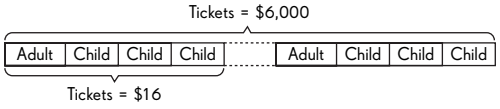
		Order
8.	$34 \times 3 \div 6 = 17$	$\times \div$
9.	$184 + 27 \times 3 = 265$	$\times +$
10.	$100 - 68 + 37 \times 4 = 180$	$\times - +$
11.	$19 \times 4 + 84 \div 6 = 90$	$\times \div +$
12.	$7 + 47 \times 8 \div 4 - 28 = 73$	$\times \div + -$
13.	$30 - (45 - 17) = 2$	$(-) -$
14.	$7 \times (14 + 26) \div 8 = 35$	$(+) \times \div$
15.	$(73 + 27) - 136 \div 4 = 66$	$(+) \div -$

Lesson 2.7 (Part 1)

1. $1{,}456 \div 56 = 26$
   $26 \times \$18 = \$468$
   He collects \$468.
2. $230 - 50 = 180$
   $180 \div 15 = 12$
   $12 \times \$20 = \$240$
   Each child collected \$240.
3. $641 + 490 = 1{,}131$
   $1{,}131 \times 8 = 9{,}048$
   $9{,}048 \div 58 = 156$
   There are 156 origami art pieces in each classroom.
4. $487 + 345 = 832$
   $832 - 40 = 792$
   $792 \div 36 = 22$
   There are 22 seashells in each box.
5. $\$4 + 3 \times \$7 = \$25$
   He paid \$25.

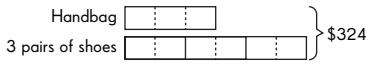
Lesson 2.7 (Part 2)

1. Cost of tickets for 1 adult and 3 children
   $= \$7 + 3 \times \$3$
   $= \$16$



$\$6{,}000 \div \$16 = 375$
$375 \times 4 = 1{,}500$
1,500 people bought tickets.

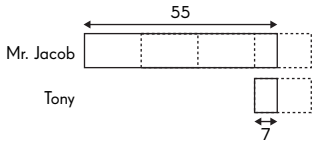
2.



9 units → $324
1 unit → $324 ÷ 9 = $36
3 units → 3 × $36 = $108

The cost of the handbag is $108.

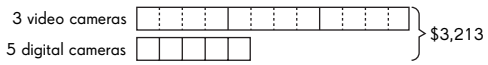
3.



(55 − 7) ÷ 3 = 16
16 − 7 = 9

In 9 years, Mr. Jacob will be 4 times as old as Tony.

4.



1 unit → $3,213 ÷ 17 = $189
5 units → 5 × $189 = $945

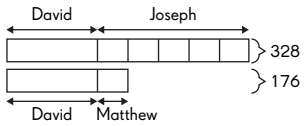
He pays $945.

5.

7 units → 1,925
1 unit → 1,925 ÷ 7 = 275
4 units → 4 × 275 = 1,100

Joel collects 1,100 cans.

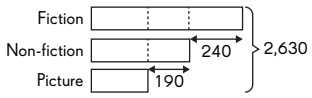
6.



4 units → 328 − 176 = 152
1 unit → 152 ÷ 4 = 38
176 − 38 = 138

David has 138 marbles.

7.

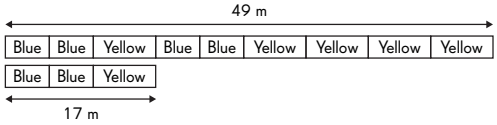


3 units → 2,630 − 240 − 190 − 190
= 2,010

1 unit → 2,010 ÷ 3 = 670
670 + 190 = 860
860 + 240 = 1,100

There are 670 picture books, 860 non-fiction books, and 1,100 fiction books.

8.



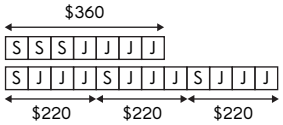
Length of 3 yellow banners
= 49 − 17 − 17 = 15 m

Length of 1 yellow banner = 15 ÷ 3
= 5 m

Length of 1 blue banner = (17 − 5) ÷ 2
= 6 m

The length of each blue banner is 6 meters.

9. S: shirt, J: jacket



Cost of 3 shirts and 9 jackets
= 3 × $220
= $660

Cost of 5 jackets = $660 − $360
= $300

Cost of 1 jacket = $300 ÷ 5
= $60

Cost of 1 shirt = $220 − ($60 × 3)
= $40

The cost of each shirt is $40.

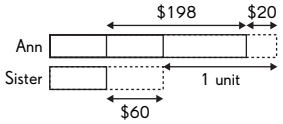
10.

Day	Amount More Than First Day (g)
1	
2	1 × 20
3	2 × 20
4	3 × 20
5	4 × 20
6	5 × 20
7	6 × 20
Total	21 × 20 = 420

(1,260 − 420) ÷ 7 = 120

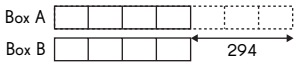
The hamsters ate 120 grams of food on the first day.

11.



1 unit → $198 + $20 − $60 = $158
$158 × 2 − $20 = $296

Ann had $296 at first.

12. 

3 units → 294
1 unit → 294 ÷ 3 = 98
7 units → 7 × 98 = 686

There were 686 marbles in Box A at first.

Put on Your Thinking Cap!

1. Strategy: Use guess and check

Solution:

No. of correct answers	No. of incorrect answers	Score
15	5	75 − 10 = 65
14	6	70 − 12 = 58
13	7	65 − 14 = 51

She has 13 correct answers.

2. Strategy: Use guess and check

Solution: Estimate the number. Then guess and check your answer.

20 × 20 = 400
30 × 30 = 900

624 is in between 400 and 900. So the two numbers are greater than 20 but less than 30.

The last digit of the product 624 is

4 → 4 × 6 = 24.
24 × 26 = 624

The greater number is 26.

3. Thinking skill: Identifying patterns and relationships

Strategy: Look for pattern

Solution: 264; 385; 792; 759; 638; 836

There is a pattern in the answers. To find the answers without using a calculator, follow these steps:

Step 1 Separate the digits of the first factor.
For example, 69 × 11 → 6 9.

Step 2 Add the digits of the first factor.
For example, 6 + 9 = 15.

Step 3 Put the ones digit of the sum from Step 2 between the digits in Step 1.
For example, 6**5**9.

Step 4 Add the tens digit of the sum from Step 2 to the hundreds digit of the number in Step 3.
For example, **7**59.

4. Thinking skill: Comparing

Strategies: Use a model, Use before-after concept

Solution:

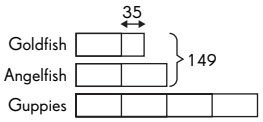
8 units → 976
1 unit → 976 ÷ 8 = 122
5 units → 5 × 122 = 610

Benga should give Aaron 610 cards.

5. Thinking skill: Comparing

Strategies: Use a model, Use before-after concept

Solution:



3 units → 149 − 35 = 114
1 unit → 114 ÷ 3 = 38
7 units → 7 × 38 = 266

266 fish are left in the aquarium.

6. Thinking skill: Comparing

Strategy: Use guess and check

Solution: Common multiples of 5 and 7 are 35, 70, 105, ...

No. of fruits	Cost of oranges	Cost of pears	Difference in amount
35	(35 ÷ 7) × $2 = $10	(35 ÷ 5) × $3 = $21	$11
70	(70 ÷ 7) × $2 = $20	(70 ÷ 5) × $3 = $42	$22
105	(105 ÷ 7) × $2 = $30	(105 ÷ 5) × $3 = $63	$33

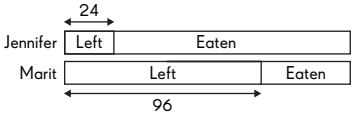
a. $30 + $63 = $93
Sophia pays $93 in all.

b. 2 × 105 = 210
She buys 210 oranges and pears altogether.

7. Thinking skill: Comparing

Strategies: Use a model, Use before-after concept

Solution:



Difference in number of crackers left
$= 96 - 24$
$= 72$

Difference in number of crackers eaten each day $= 6$

Number of days $= 72 \div 6$
$= 12$

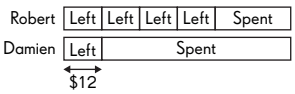
$12 \times 12 + 96 = 240$

Each of them had 240 crackers at first.

8. Thinking skill: Comparing

Strategies: Use a model, Use before-after concept

Solution:



Difference in amount left $= 3 \times \$12$
$= \$36$

Difference in spending in each day
$= \$6 - \$4$
$= \$2$

Number of days $= \$36 \div \$2$
$= 18$

$18 \times \$6 + \$12 = \$120$

Each boy had \$120 at first.

9. Thinking skill: Identifying patterns and relationships

Solution:

$80 \div (5 + 1) = 13$ R 2
$80 - 13 = 67$

The least number of highlighters is 67.

10. Thinking skill: Identifying patterns and relationships

Strategies: Work backward, Use guess and check

Solution:

a. Work backward to find the greatest factor of 54, 108 and 189.

$54 = 2 \times 27$
$108 = 4 \times 27$
$189 = 7 \times 27$

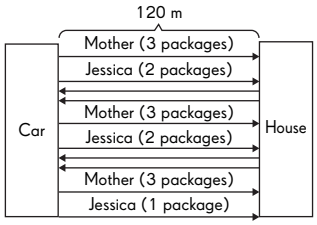
The length of each piece of cut rope is 27 centimeters.

b. $2 + 4 + 7 = 13$
Benita gets 13 pieces of cut rope.

11. Thinking skill: Analyzing parts and whole

Strategy: Use a diagram

Solution:



$10 \times 120 = 1{,}200$

The total distance covered was 1,200 meters.

12. Thinking skill: Identifying patterns and relationships

Strategy: Use guess and check

Solution:

Greatest: $542 \times 63 = 34{,}146$

Least: $356 \times 24 = 8{,}544$

Chapter 3

Lesson 3.1

1. Answers vary.
Samples: $\frac{2}{8}$; $\frac{3}{12}$

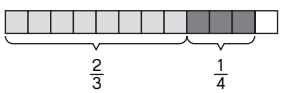
2. Answers vary.
Samples: $\frac{4}{6}$; $\frac{6}{9}$

3. Answers vary.
Samples: $\frac{8}{18}$; $\frac{12}{27}$

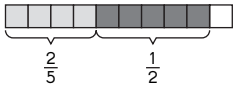
4. Answers vary.
Samples: $\frac{6}{10}$; $\frac{9}{15}$

5. Answers vary.
Samples: $\frac{12}{14}$; $\frac{18}{21}$

6. Answers vary.
Samples: $\frac{10}{16}$; $\frac{15}{24}$

7. 

$\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12}$
$= \frac{11}{12}$

8. 

$\frac{2}{5} + \frac{1}{2} = \frac{4}{10} + \frac{5}{10}$

$= \frac{9}{10}$

9. 1; $\frac{31}{40}$

10. $\frac{1}{2}$; $\frac{13}{30}$

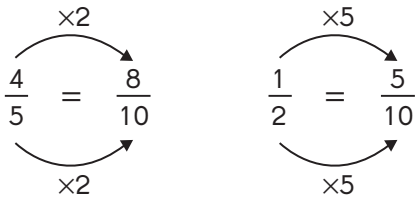
11. $1\frac{1}{2}$; $1\frac{9}{20}$

12. 2; $1\frac{7}{15}$

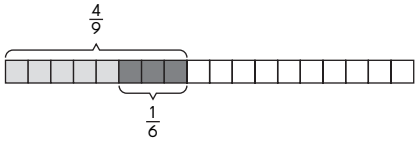
13. 1; $1\frac{1}{24}$

14. 2; $1\frac{17}{28}$

Lesson 3.2

1. 

$\frac{4}{5} - \frac{1}{2} = \frac{8}{10} - \frac{5}{10} = \frac{3}{10}$

2. 

$\frac{4}{9} - \frac{1}{6} = \frac{8}{18} - \frac{3}{18} = \frac{5}{18}$

3. $\frac{1}{2}$; $\frac{7}{15}$

4. $\frac{1}{2}$; $\frac{1}{12}$

5. 0; $\frac{1}{72}$

6. $\frac{1}{2}$; $\frac{1}{3}$

7. $\frac{1}{2}$; $\frac{11}{24}$

8. $\frac{1}{2}$; $\frac{7}{18}$

Lesson 3.3

1. $\frac{3}{5}$

2. $\frac{5}{2}$; $2\frac{1}{2}$

3. $\frac{3}{25}$

4. $\frac{2}{19}$

5. $7\frac{5}{7}$

6. $5\frac{1}{3}$

7. $4\frac{1}{2}$

8. $3\frac{1}{3}$

9. $5\frac{1}{2}$

10. $4\frac{2}{3}$

Lesson 3.4

1. 0.9
2. 0.8
3. 0.15
4. 0.36
5. 2.3
6. 2.5
7. 2.75
8. 3.6
9. 0.68
10. 3.75
11. 2.6
12. 3.875
13. 4.35
14. 5.75
15. $\$15 \div 6 = \$2.50$

She pays \$2.50 for each notebook.

Lesson 3.5

1. $5\frac{7}{8}$

2. $4\frac{5}{12}$

3. $5\frac{13}{24}$

4. $3\frac{11}{36}$

5. $7\frac{19}{24}$

6. $6\frac{11}{30}$

7. $3\frac{1}{2}$

8. $10\frac{1}{2}$

9. $3\frac{1}{2}$

10. 7

11. $6\frac{1}{2}$

12. 19

Lesson 3.6

1. $2\frac{5}{9}$

2. $1\frac{1}{4}$

3. $2\frac{7}{20}$

4. $4\frac{5}{24}$

5. $\frac{13}{21}$

6. $1\frac{7}{18}$

7. 2

8. $4\frac{1}{2}$

9. $\frac{1}{2}$

10. 2

11. 2

12. $1\frac{1}{2}$

Lesson 3.7

1. a. $28 \div 8 = 3\frac{1}{2}$

It takes $3\frac{1}{2}$ minutes to play 1 song.

b. $3\frac{1}{2} = 3.5$

It takes 3.5 minutes to play 1 song.

2. $\frac{1}{4} + \frac{1}{6} = \frac{5}{12}$

$1 - \frac{5}{12} = \frac{7}{12}$

$\frac{7}{12}$ of the participants have black hair.

3. $3\frac{7}{10} + 2\frac{3}{4} = 6\frac{9}{20}$

$6\frac{9}{20} - 4\frac{3}{5} = 1\frac{17}{20} = 1.85$

1.85 pounds of flour are left.

4. $2\frac{3}{4} - \frac{5}{8} = 2\frac{1}{8}$

$2\frac{3}{4} + 2\frac{1}{8} = 4\frac{7}{8} = 4.875$

She uses 4.875 meters of cloth in all.

5. $7 \times \frac{1}{6} = \frac{7}{6}$

$1\frac{8}{9} - \frac{7}{6} = \frac{13}{18}$

$\frac{13}{18}$ liter of apple juice is left after a week.

6. $\frac{1}{8} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{5}{8}$

$1 - \frac{5}{8} = \frac{3}{8}$

$\frac{3}{8}$ of the loaf of bread is left.

7. $\frac{2}{9} + \frac{1}{6} + \frac{2}{6} = \frac{13}{18}$

$1 - \frac{13}{18} = \frac{5}{18}$

$\frac{5}{18}$ of the book is not read.

8. a. $1\frac{2}{3} + \frac{7}{8} = 2\frac{13}{24}$

Jamal spent $2\frac{13}{24}$ hours watching television and helping with housework.

b. $1\frac{4}{5} - \frac{7}{8} = \frac{37}{40}$

Jamal spent $\frac{37}{40}$ hour more on the nap.

9. $2\frac{3}{5} + \frac{3}{4} = 3\frac{7}{20}$

$3\frac{7}{20} + 2\frac{3}{5} = 5\frac{19}{20}$

They buy $5\frac{19}{20}$ pounds of meat altogether.

10. $1\frac{7}{10} - \frac{1}{4} = 1\frac{9}{20}$

$1\frac{7}{10} + 1\frac{9}{20} = 3\frac{3}{20}$

The total weight of the two boxes is $3\frac{3}{20}$ pounds.

11. $4\frac{3}{5} - \frac{3}{4} = 3\frac{17}{20}$

$4\frac{3}{5} + 4\frac{3}{5} + 3\frac{17}{20} + 3\frac{17}{20} = 16\frac{9}{10}$

The perimeter of the storeroom is $16\frac{9}{10}$ meters.

12. $4\frac{1}{5} + 3\frac{2}{5} = 7\frac{3}{5}$

$7\frac{3}{5} - 2\frac{1}{2} = 5\frac{1}{10}$

There were $5\frac{1}{10}$ liters of water in the tank at first.

Put on Your Thinking Cap!

1. Thinking skill: Comparing

Solution:

Length of each piece of rope P

$= 2 \div 3 = \frac{2}{3}$ m

Length of each piece of rope Q

$= \frac{2}{3} + \frac{2}{5}$

$= 1\frac{1}{15}$ m

Length of rope Q $= 1\frac{1}{15} + 1\frac{1}{15} + 1\frac{1}{15}$

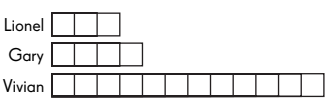
$= 3\frac{1}{5}$

The length of rope Q is $3\frac{1}{5}$ meters.

2. Thinking skill: Comparing

Strategy: Use a model

Solution:



Vivian has 12 units of money and Lionel has 3 units.

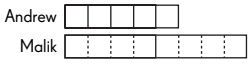
$12 \div 3 = 4$

Vivian's amount of money is 4 times Lionel's amount of money.

3. Thinking skill: Comparing

Strategy: Use a model

Solution:



Andrew's savings is $\frac{5}{8}$ of Malik's savings.

4. Thinking skill: Identifying patterns and relationships

Strategy: Look for pattern

Solution:

$$\frac{1}{100}+\frac{2}{100}+\cdots+\frac{49}{100}+\frac{50}{100}+\frac{51}{100}+\cdots+\frac{98}{100}+\frac{99}{100}$$

$$\underbrace{\quad\quad}_{1}\quad\underbrace{\quad\quad\quad\quad\quad\quad}_{1}\quad\underbrace{\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad}_{1}$$

The sum of each pair of fractions is 1.

Number of such pairs of fractions

$= 98 \div 2$

$= 49$

Value $= 49 + \frac{50}{100}$

$= 49\frac{1}{2}$

5. Thinking skill: Identifying patterns and relationships

Strategy: Look for pattern

Solution:

Look for pairs of numbers that give a sum of 11.

$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10$

$= 5 \times 11$

$= 55$

Value

$= \frac{1}{99} \times 55$

$= \frac{5}{9}$

6. Thinking skill: Identifying patterns and relationships

Strategy: Look for pattern

Solution:

$$\frac{1}{1\times 2}+\frac{1}{2\times 3}=\frac{2}{3}$$

$$\frac{1}{1\times 2}+\frac{1}{2\times 3}+\frac{1}{3\times 4}=\frac{3}{4}$$

$$\frac{1}{1\times 2}+\frac{1}{2\times 3}+\frac{1}{3\times 4}+\frac{1}{4\times 5}=\frac{4}{5}$$

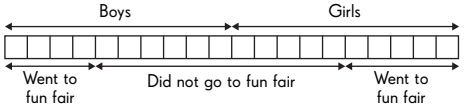
$$\frac{1}{1\times 2}+\frac{1}{2\times 3}+\frac{1}{3\times 4}+\cdots\cdots+\frac{1}{28\times 29}+\frac{1}{29\times 30}=\frac{29}{30}$$

7. Thinking skill: Comparing

Strategy: Use a model

Solution:

$\frac{2}{5} = \frac{4}{10}$; $\frac{1}{2} = \frac{5}{10}$

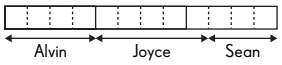


$\frac{11}{20}$ of the students in the class did not go to the fun fair.

8. Thinking skill: Comparing

Strategy: Use a model

Solution:



$\frac{3}{12} = \frac{1}{4}$

Sean gets $\frac{1}{4}$ of the marbles.

Chapter 4

Lesson 4.1

1. $\frac{1}{2}$; $\frac{3}{5}$; $\frac{3}{10}$
2. $\frac{3}{4}$; $\frac{5}{7}$; $\frac{15}{28}$
3. $\frac{15}{22}$
4. $\frac{7}{18}$
5. $\frac{5}{8}$
6. $\frac{4}{5}$
7. $\frac{1}{5}$
8. $\frac{1}{2}$

Lesson 4.2

1. $\frac{2}{7} \times \frac{3}{4} = \frac{3}{14}$

   $\frac{3}{14} \times 56 = 12$

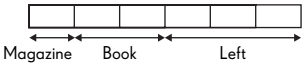
   Rahul gets 12 paper clips.

2. $1 - \frac{2}{3} = \frac{1}{3}$

   $\frac{1}{3} \times \frac{9}{10} = \frac{3}{10}$

   $\frac{3}{10}$ hour is left.

3. **Method 1**



$\frac{3}{6} = \frac{1}{2}$

$\frac{1}{2}$ of his savings are left.

Method 2

$1 - \frac{1}{6} = \frac{5}{6}$

$\frac{2}{5} \times \frac{5}{6} = \frac{1}{3}$

$1 - \frac{1}{6} - \frac{1}{3} = \frac{1}{2}$

$\frac{1}{2}$ of his savings are left.

4. Fraction of caps that are not red or blue

$= 1 - \frac{1}{6} - \frac{1}{3}$

$= \frac{1}{2}$

Fraction of caps that are green

$= \frac{3}{7} \times \frac{1}{2}$

$= \frac{3}{14}$

3 units → 27
1 unit → $27 \div 3 = 9$
14 units → $14 \times 9 = 126$

There are 126 caps altogether.

5. $1 - \frac{1}{5} = \frac{4}{5}$

$\frac{7}{8} \times \frac{4}{5} = \frac{7}{10}$

$\frac{7}{10} \times 30 = 21$

She receives 21 text messages.

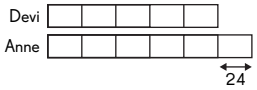
6. $1 - \frac{2}{5} = \frac{3}{5}$

$\frac{4}{9} \times \frac{3}{5} = \frac{4}{15}$

$\frac{3}{5} - \frac{4}{15} = \frac{5}{15} = \frac{1}{3}$

1 unit → 15
3 units → $3 \times 15 = 45$

Sam makes 45 bread rolls.

7. 

$6 \times 24 = 144$

Anne has 144 cards.

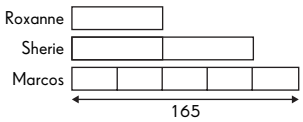
8. **Method 1**

$\frac{4}{5} \times 165 = 132$

$132 \div 2 = 66$
$165 - 66 = 99$

Marcos has 99 more beads than Roxanne.

Method 2



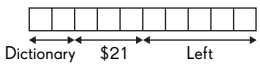
5 units → 165
1 unit → $165 \div 5 = 33$
3 units → $3 \times 33 = 99$

Marcos has 99 more beads than Roxanne.

9. $\frac{1}{5} = \frac{2}{10}$

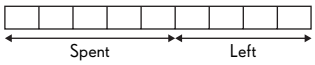
$\frac{1}{2} = \frac{5}{10}$

$1 - \frac{1}{5} - \frac{1}{2} = \frac{3}{10}$



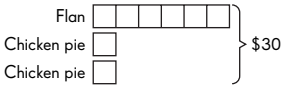
3 units → $21
1 unit → $21 \div 3 = \$7$
5 units → $5 \times \$7 = \$35$

Ken has $35 left.

10. a. 

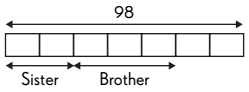
4 units → $24
1 unit → $24 \div 4 = \$6$
5 units → $5 \times \$6 = \$30$

She spends $30.

b. 

8 units → $30
1 unit → $30 \div 8 = \$3.75$
6 units → $6 \times \$3.75 = \$22.50$

The flan costs $22.50.

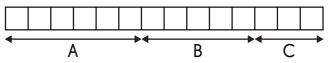
11. 

7 units → 98
1 unit → $98 \div 7 = 14$
5 units → $5 \times 14 = 70$ (gave away)
$98 + 70 = 168$
Melody must buy 168 more stickers.

12. $1 - \frac{3}{7} = \frac{4}{7}$

Fraction of biscuits in container B
$= \frac{5}{8} \times \frac{4}{7}$
$= \frac{5}{14}$

Fraction of biscuits in container C
$= 1 - \frac{3}{7} - \frac{5}{14}$
$= \frac{3}{14}$



Container A has 3 more units than container C.
3 units → 21
1 unit → $21 \div 3 = 7$
14 units → $14 \times 7 = 98$
Jacky bakes 98 biscuits.

Lesson 4.3

1. $1\frac{1}{8}$
2. $1\frac{1}{5}$
3. $1\frac{1}{3}$
4. $1\frac{1}{14}$
5. $\frac{9}{14}$
6. $\frac{9}{10}$
7. 6
8. $3\frac{3}{16}$
9. $5\frac{3}{5}$
10. $2\frac{2}{3}$
11. $2\frac{2}{9}$
12. $2\frac{7}{16}$

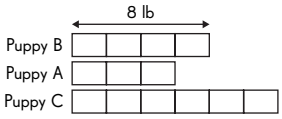
Lesson 4.4

1. $7\frac{3}{5}$
2. 22
3. $8\frac{2}{3}$
4. 39
5. 105
6. $20\frac{2}{3}$
7. $62\frac{1}{3}$
8. $38\frac{6}{7}$
9. $30\frac{2}{3}$
10. $33\frac{3}{4}$
11. $46\frac{1}{5}$
12. $25\frac{1}{2}$

Lesson 4.5

1. $1\frac{4}{5} \times 7 = 12\frac{3}{5}$
$12\frac{3}{5}$ liters are about 13 liters.
$13 \div 2 = 6\frac{1}{2}$
Mrs. Smith needs to buy 7 bottles every week.

2. $1\frac{3}{4} \times 9 = 15\frac{3}{4}$
$15\frac{3}{4}$ meters are about 16 meters.
Lily needs 16 meters of ribbon.

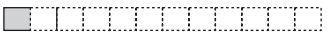
3. 

4 units → 8 lb
1 unit → 2 lb
6 units → 12 lb
The weight of puppy C is 12 pounds.

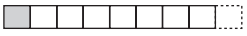
4. Area of flowerbed $= 3\frac{3}{4} \times 2$
$= 7\frac{1}{2}$ m^2
Area of flowerbed with border
$= (3\frac{3}{4} + \frac{1}{2} + \frac{1}{2}) \times (2 + \frac{1}{2} + \frac{1}{2})$
$= 4\frac{3}{4} \times 3$
$= 14\frac{1}{4}$ m^2
Area of border $= 14\frac{1}{4} - 7\frac{1}{2}$
$= 6\frac{3}{4}$ m^2
Cost $= 6\frac{3}{4} \times \$20$
$= \$135$
Uncle James has to pay $135.

Lesson 4.6

1. $\frac{1}{6}$; $\frac{1}{6}$

2. 

   $\frac{1}{12}$

3. 

   $\frac{1}{9}$

4. $\frac{2}{15}$

5. $\frac{1}{24}$

6. $\frac{3}{10}$

7. $\frac{1}{18}$

8. $\frac{5}{12} \div 5 = \frac{1}{12}$

   There is $\frac{1}{12}$ liter of paint in each pot.

9. $\frac{1}{2} \div 5 = \frac{1}{10}$

   Each girl has $\frac{1}{10}$ of the loaf of bread.

10. $\frac{9}{10} \div 6 = \frac{3}{20}$

    $\frac{3}{20} + \frac{3}{20} = \frac{3}{10}$

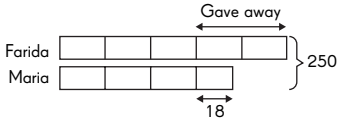
    The total length of 2 of the pieces is $\frac{3}{10}$ meter.

11. $1 - \frac{1}{5} = \frac{4}{5}$

    $\frac{4}{5} \div 3 = \frac{4}{15}$

    Each friend got $\frac{4}{15}$ of the bag of nuts.

Lesson 4.7

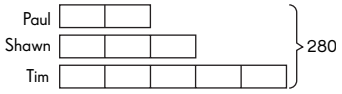
1. 

Method 1

8 units → 250 − 18 = 232
1 unit → 232 ÷ 8 = 29
3 × 29 + 18 = 105
Maria had 105 beads at first.

Method 2

250 − 18 = 232
$\frac{3}{8} \times 232 = 87$
87 + 18 = 105
Maria had 105 beads at first.

2. 

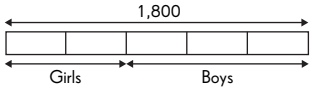
10 units → 280
1 unit → 280 ÷ 10 = 28
3 units → 3 × 28 = 84
Tim has 84 more postcards than Paul.

3. $1 - \frac{5}{9} = \frac{4}{9}$

Number of boys who do not take part in sports activities

$= \frac{4}{9} \times 540$

$= 240$



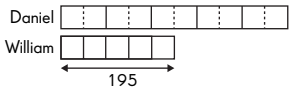
Number of boys in school

$= \frac{3}{5} \times 1{,}800$

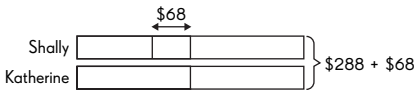
$= 1{,}080$

Number of boys who take part in sports activities
$= 1{,}080 - 240$
$= 840$

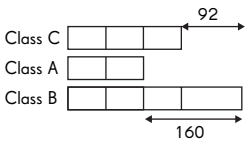
840 boys take part in sports activities.

4. 

5 units → 195
10 units → 195 × 2 = 390
Daniel has 390 marbles.

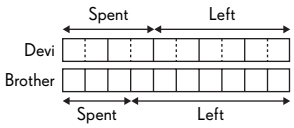
5. 

4 units → $288 + $68 = $356
1 unit → $356 ÷ 4 = $89
$89 − $68 = $21
Shally had $21 at first.

6. 

1 unit → 160 − 92 = 68
2 units → 2 × 68 = 136
136 + 160 = 296
Class B folds 296 paper cranes.

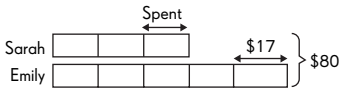
7.



$6 + 7 = 13$
13 units → \$78
1 unit → \$78 ÷ 13 = \$6
7 units → 7 × \$6 = \$42

They spent \$42 altogether.

8.



7 units → \$80 − \$17 = \$63
1 unit → \$63 ÷ 7 = \$9
\$9 + \$17 = \$26

Emily had \$26 more than Sarah at first.

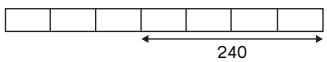
9. Number of girls $= \frac{3}{8} \times 40$
$= 15$

Number of boys = 40 − 15
= 25

$(15 \times 2) + (25 \times 1) = 55$
55 units → 220
1 unit → 220 ÷ 55 = 4
$(15 \times 2) - 25 = 5$
5 units → 5 × 4 = 20

All the girls receive 20 more balloons than all the boys.

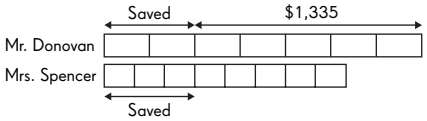
10. Number of nickels = 1,200 ÷ 5
= 240



4 units → 240
1 unit → 240 ÷ 4 = 60
7 units → 7 × 60 = 420

There are 420 coins in the piggy bank.

11.



Mr. Donovan:

5 units → \$1,335
1 unit → \$1,335 ÷ 5 = \$267
2 units → 2 × \$267 = \$534

Mrs. Spencer:
3 units → \$534
1 unit → \$534 ÷ 3 = \$178
8 units → 8 × \$178 = \$1,424

Mrs. Spencer's paycheck is \$1,424.

12.

40 units → \$12
5 units → \$12 ÷ 8 = \$1.50

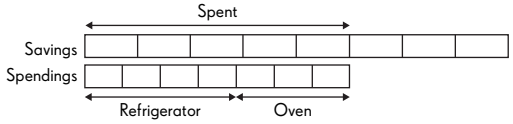
The cost of 1 kilogram of sugar was \$1.50.

Put on Your Thinking Cap!

1. Thinking skill: Comparing

Strategy: Use a model

Solution:



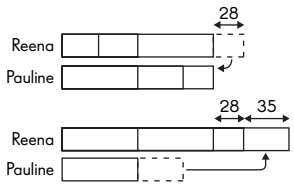
1 unit → \$280
7 units → 7 × \$280 = \$1,960
5 units → \$1,960
1 unit → \$1,960 ÷ 5 = \$392
8 units → 8 × \$392 = \$3,136

Mrs. Tan's savings was \$3,136 at first.

2. Thinking skill: Comparing

Strategy: Use a model

Solution:



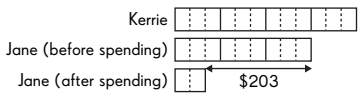
1 unit → 28 + 35 = 63
3 units → 3 × 63 = 189
189 − 35 = 154

Reena has 154 bookmarks.

3. Thinking skill: Comparing

Strategies: Use a model, Use before-after concept

Solution:



$\frac{3}{4} = \frac{9}{12}$, $\frac{1}{6} = \frac{2}{12}$

7 units → \$203
1 unit → \$203 ÷ 7 = \$29
12 units → 12 × \$29 = \$348

Kerrie had \$348.

4. Strategy: Use a model, Use before-after concept

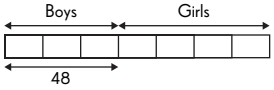
Solution:

Before:

Number of girls = $\frac{3}{5} \times 120 = 72$

Number of boys = 120 − 72 = 48

After:



3 units → 48
1 unit → 48 ÷ 3 = 16
4 units → 4 × 16 = 64
72 − 64 = 8

8 girls left the library.

5. Thinking skill: Comparing

Strategy: Use before-after concept

Solution:

Before:

Adults → 3 units
Children → 5 units
} Difference = 2 units

After:

Adults → 2 units × 2 = 4 units
Children → 3 units × 2 = 6 units
} Difference = 2 units

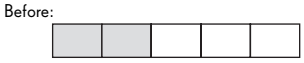
4 units − 3 units = 1 unit
1 unit → 6
8 units → 8 × 6 = 48

48 people were on the bus at first.

6. Strategies: Use a model, Use before-after concept

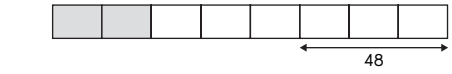
Solution:

Before:



After:

$\frac{3}{4} = \frac{6}{8}$



3 units → 48
1 unit → 48 ÷ 3 = 16
5 units → 5 × 16 = 80

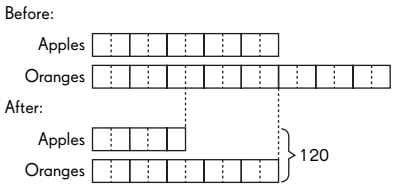
There were 80 counters in the box at first.

7. Thinking skill: Comparing

Strategies: Use a model, Use before-after concept

Solution:

Before:



15 units → 120
1 unit → 120 ÷ 15 = 8
26 units → 26 × 8 = 208

There were 208 apples and oranges at the stand at first.

8. Thinking skill: Comparing

Strategy: Use before-after concept

Solution:

After:

In puzzle → 13 units
Not in puzzle → 7 units
} Total = 20 units

Before:

In puzzle → 2 units × 4 = 8 units
Not in puzzle → 3 units × 4 = 12 units
} Total = 20 units

12 units − 7 units = 5 units
5 units → 300
1 unit → 300 ÷ 5 = 60
20 units → 20 × 60 = 1,200

The jigsaw puzzle consists of 1,200 pieces.

9. Thinking skill: Analyzing parts and whole

Strategy: Work backward

Solution:

720 ÷ 2 = 360
Each had 360 stamps in the end.

	Samuel	Pat
Finally	360	360 ($\frac{2}{3}$ left)
Pat to Samuel	360 − 180 = 180 ($\frac{3}{4}$ left)	360 ÷ 2 = 180 360 + 180 = 540
Samuel to Pat	180 ÷ 3 = 60 180 + 60 = 240	540 − 60 = 480

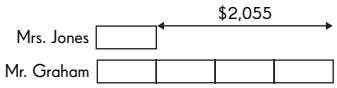
Samuel had 240 stamps at first.

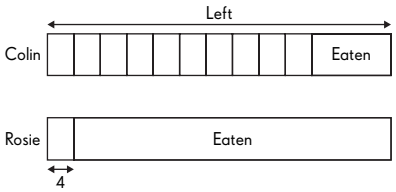
10. Thinking skill: Analyzing parts and whole
Strategy: Work backward
Solution:

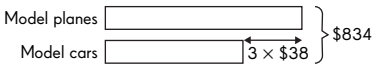
Stage	Work	A	B	C
Finally		18 gal	18 gal	18 gal
C to A	Pail C: $18 \div 3 \times 4 = 24$ Pail A: $18 - 6 = 12$	12 gal	18 gal	24 gal
B to C	Pail B: $18 \div 3 \times 4 = 24$ Pail C: $24 - 6 = 18$	12 gal	24 gal	18 gal
A to B	Pail A: $12 \div 3 \times 4 = 16$ Pail B: $24 - 4 = 20$	16 gal	20 gal	18 gal

Pail A had 16 gallons of water,
pail B had 20 gallons of water and
pail C had 18 gallons of water at first.

Test Prep for Chapters 1 to 4

1. C 2. C 3. A 4. C
5. D 6. B 7. D 8. B
9. A 10. C
11. 2,467,058 12. 710,000
13. 203,485
14. 3,190,500 3,090,500 2,090,500 319,500 290,500
15. 16 16. 424
17. $4\frac{7}{12}$ 18. 144
19. 5.925 20. $\frac{21}{40}$
21. 

3 units → \$2,055
1 unit → $\$2{,}055 \div 3 = \$685$
4 units → $4 \times \$685 = \$2{,}740$
Mr. Graham had \$2,740.
22. 

Difference in quantity left $= 4 \times 9$
$= 36$
Difference in quantity eaten each day
$= 8 - 5$
$= 3$
Number of days $= 36 \div 3$
$= 12$
Number of cashews $= 12 \times 8 + 4$
$= 100$
Each child had 100 cashews at first.
23. 

Cost of 1 model plane $= \$52 - \$14$
$= \$38$
Cost of 1 model car and 1 model plane
$= \$52 + \$38$
$= \$90$
$\$834 - 3 \times \$38 = \$720$
Number of model cars $= \$720 \div \$90$
$= 8$
Number of model planes $= 8 + 3$
$= 11$
He buys 11 model planes.

Chapter 5

Lesson 5.1

1. $w + 8$ 2. $a - 10$
3. $p + \frac{3}{4}$ 4. $5 - 6y$
5. $6g$ 6. $\frac{3k}{2}$
7. $4h$ 8. $5s - 12$
9. $7b + 8$ 10. $\frac{5d}{4}$
11. 7 12. 13
13. 31 14. 60
15. 14 16. 37
17. 7 18. 5
19. 10 20. 9
21. Mrs. Smith pays $5x$ dollars.
22. Alyssa has $(6p - 15)$ dollars more than her brother.
23. $2 \times 7 = 14$
$(5m - 14)$ liter of milk is left.
24. Each of them has $\frac{(3y + 8)}{2}$ comics.

25. k bottles of pasta sauce cost
$k \times \$4 = \$4k$.
He received $\$(10 - 4k)$ change.

26. The cost of 3 such books is $\frac{3y}{8}$ dollars.

27. John has $(y - 20)$ stickers for his sisters.
Each sister gets $\left(\frac{y - 20}{2}\right)$ stickers.

28. Kenny has $(m + 10)$ fish.
He buys another $(20 + 30) = 50$ fish.
Kenny has $(m + 60)$ fish now.

29. The shorter piece is $\left(\frac{g - 10}{2}\right)$ inches long.

Lesson 5.2

1.	$3g$	2.	$10w$
3.	$5a$	4.	$8b$
5.	$7h$	6.	$6k$
7.	$11d$	8.	$15n$
9.	$12x - 4$	10.	$6 + 10g$
11.	$4n + 5$	12.	$6d - 5$
13.	$12 + 3k$	14.	$7w + 3$
15.	$4 + 13h$	16.	$5 + 3m$
17.	$5 + 3s$	18.	$4n + 13$

Lesson 5.3

1.	$<$	2.	$=$	3.	$>$	4.	$>$
5.	$>$	6.	$<$	7.	$>$	8.	$=$
9.	7	10.	4	11.	6	12.	7
13.	8	14.	9				

Lesson 5.4

1. a. Joan's brother is $(4y - 28)$ years old.
b. $4 \times 12 - 28 = 20$
Her brother is 20 years old.

2. a. The cost of renting the car is $\$(120 + 18n)$.
b. $\$(120 + 18 \times 8) = \$264$
The cost of renting the car is \$264.

3. a. $\$5 = 500$ cents
He spends $7g$ cents in one week.
He has $(500 - 7g)$ cents left.
b. $7g$ cents $= \frac{7g}{100}$ dollars
He has $\left(5 - \frac{7g}{100}\right)$ dollars left.

4. a. $10w - 2w = 8w$
$8w \div 2 = 4w$
Cindy's age is $4w$ years.
b. If $w = 4$,
$4w = 4 \times 4 = 16$
Cindy is 16 years old.

5. a. Patrick paid $3p$ dollars.
b. $3p = 36$
$p = 12$
When $p = 12$, Patrick and Amanda pay the same amount of money for the model planes.

6. a. $4k + 6 = 4 \times 5 + 6 = 26$
$6k - 2 = 6 \times 5 - 2 = 28$
$26 < 28$
Nancy has a shorter ribbon.
b. $6k - 2 = 4k + 6$
$2k = 8$
$k = 4$
When $k = 4$, they will have the same length of ribbon.

7. $50b - 28b = 22b$
$28b > 22b$
No, he does not save more than he spends.

8. Benny has $3p$ game cards.
Together Anne and Benny have
$(p + 3p) = 4p$ game cards.
If $4p > 30$, then p must be 8, 9, 10, ...
The least value of p is 8 so that Anne and Benny together have more game cards than Colin.

Put on Your Thinking Cap!

1. Thinking skill: Analyzing parts and whole
Strategy: Solve part of the problem
Solution:
$5 \times p = 5p$
$200 \text{ g} \times 5 = 1{,}000 \text{ g} = 1 \text{ kg}$
The total mass of the crackers in 5 boxes is $(5p - 1)$ kilograms.

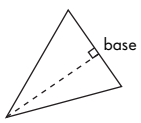
2. Thinking skill: Analyzing parts and whole
Strategy: Solve part of the problem
Solution:
a. Mr. Johnson will pay $\$(2x + 30)$.
b. $2 \times 200 + 30 = 430$
He will have to pay \$430.

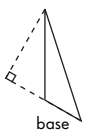
3. Thinking skill: Analyzing parts and whole
Strategy: Solve part of the problem
Solution:
a. The remaining stickers are shared by 3 people.
She gives each brother $\frac{(80 - 5m)}{3}$ stickers.
b. If $m = 4$,
$\frac{(80 - 5 \times 4)}{3} = 20$
Each brother gets 20 stickers.

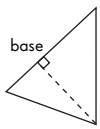
4. Thinking skill: Analyzing parts and whole
Strategy: Solve part of the problem
Solution:
a. Jerry's allowance $= 3k$ dollars
Danny's allowance $= (3k + 20)$ dollars
$k + 3k + 3k + 20 = 7k + 20$
Their total monthly allowance is $(7k + 20)$ dollars.
b. $7 \times \$18 + \$20 = \$146$
Their total monthly allowance is \$146.

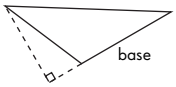
Chapter 6

Lesson 6.1

1. *AD*
2. *BE*
3. *CF*
4. *QR*
5. *PR*
6. *PQ*
7. 

8. 

9. 

10. 

11. Base $= KL$, Height $= LM$ or
Base $= LM$, Height $= KL$
12. Base $= KL$, Height $= VM$ or
Base $= LM$, Height $= UK$

Lesson 6.2

1. 324 in.^{2}
2. 1,350 cm^2
3. $346\frac{1}{2}$ ft^2
4. $962\frac{1}{2}$ m^2
5. 891 cm^2
6. 900 in.^{2}
7. 1,058 cm^2
8. 1,944 ft^2

Put on Your Thinking Cap!

1. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
Area of $ABC = \frac{1}{2} \times 72 \times 96$
$= 3{,}456$ in.^{2}
Area of $ADC = \frac{1}{2} \times 72 \times 48$
$= 1{,}728$ in.^{2}
Shaded area $= 3{,}456 - 1{,}728$
$= 1{,}728$ in.^{2}

2. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
Area of $ABCD = 60 \times 60$
$= 3{,}600$ cm^2
Area of $ABC = \frac{1}{2} \times 60 \times 18$
$= 540$ cm^2
Shaded area $= 3{,}600 - 2 \times 540$
$= 2{,}520$ cm^2

3. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:

Method 1

Base of 1 triangle $= 60 \div 5$
$= 12$ cm
Height of 1 triangle $= 30 \div 2$
$= 15$ cm
Area of 5 triangles $= 5 \times \frac{1}{2} \times 12 \times 15$
$= 450$ cm^2
Area of remaining paper
$= 60 \times 30 - 450$
$= 1{,}350$ cm^2

Method 2

Since the cut triangles make up a quarter of the paper,
area of the remaining paper
$= \frac{3}{4} \times 60 \times 30$
$= 1{,}350$ cm^2

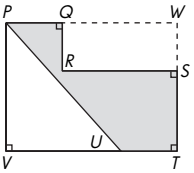
4. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:

$$\text{Area of } BCD = \frac{1}{2} \times 24 \times 10 = 120 \text{ cm}^2$$

$$\text{Area of } BDE = \frac{1}{2} \times 26 \times 6 = 78 \text{ cm}^2$$

$$\text{Shaded area} = 120 - 78 = 42 \text{ cm}^2$$

5. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:



$$\text{Area of } PWTV = 36 \times 28 = 1{,}008 \text{ ft}^2$$

$$\text{Area of } PVU = \frac{1}{2} \times 24 \times 28 = 336 \text{ ft}^2$$

$$\text{Area of } QWSR = 24 \times 10 = 240 \text{ ft}^2$$

$$\text{Shaded area} = 1{,}008 - 336 - 240 = 432 \text{ ft}^2$$

6. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:

$$CD = 2 \times 16 = 32 \text{ cm}$$

$$AB = (42 \div 2) \times 3 = 63 \text{ cm}$$

$$\text{Area of } ABC = \frac{1}{2} \times 63 \times 32 = 1{,}008 \text{ cm}^2$$

$$\text{Area of } BEG = \frac{1}{2} \times 42 \times 16 = 336 \text{ cm}^2$$

$$\text{Shaded area} = 1{,}008 - 336 = 672 \text{ cm}^2$$

7. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:

$$\text{Shaded area} = \frac{1}{2} \times 12 \times 12 = 72 \text{ cm}^2$$

8. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:

$$\text{Area of 2 triangles} = 2 \times \frac{1}{2} \times 24 \times 24 = 576 \text{ in.}^2$$

$$\text{Area of square} = 10 \times 10 = 100 \text{ in.}^2$$

$$\text{Unshaded area} = 576 - 100 - 100 = 376 \text{ in.}^2$$

Chapter 7

Lesson 7.1

1. 60 grams
2. 23 : 10; 11 : 60; 60 : 23; 39 : 10; 60 : 10 (or 6 : 1)
3. a. 4 : 3 b. 5 : 12
4. a. 7 : 20 b. 8 : 5
5. 14 : 15

Lesson 7.2

1. 12
2. 54
3. 56
4. 42
5. 72
6. 7
7. 9
8. 8
9. 2 : 3
10. 5 : 2
11. 7 : 4
12. 3 : 5
13. 8 : 5
14. 11 : 13
15. 2 : 3
16. 4 : 1

Lesson 7.3

1. a. 4 : 5 = 60 : 75
   He uses 75 blue tiles.
   b. 9 : 4 = 540 : 240
   He uses 240 gray tiles.
2. a. 5 : 3 = 30 : 18
   The building is 30 meters tall.
   b. 5 : 3 = 45 : 27
   The shadow will be 27 meters long.

3. $16 - 4 = 12$
$18 + 3 = 21$
$21 : 12 = 7 : 4$
The ratio of the number of boys to the number of girls is 7 : 4.

4. 2 units → 16 in.
1 unit → $16 \div 2 = 8$ in.
Length $= 5 \times 8$
$= 40$ in.
Width $= 3 \times 8$
$= 24$ in.
Area of rectangle $= 40 \times 24$
$= 960$ in.^{2}

Lesson 7.4

1. 8 : 5
2. $\frac{8}{5}$
3. $\frac{5}{8}$
4. $\frac{8}{13}$
5. $1\frac{3}{5}$ times
6. 3 : 8
7. $\frac{3}{8}$
8. $2\frac{2}{3}$ times
9. 77 fish

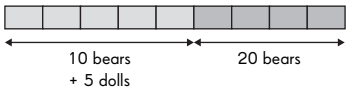
Lesson 7.5

1. 35; 20
2. 9; 18
3. 28; 36
4. 35; 63
5. 3 : 2 : 5
6. 6 : 3 : 5
7. 3 : 5 : 8
8. 4 : 7 : 8

Lesson 7.6

1. Keisha's age this year $= 12 + 3$
$= 15$ years
Sarah's age : Keisha's age $= 4 : 5 = 12 : 15$
Ratio in 9 years $= (12 + 9) : (15 + 9)$
$= 21 : 24$
$= 7 : 8$
The ratio of Sarah's age to Keisha's age in 9 years is 7 : 8.

2. Distance dog runs : Distance cat runs
$= 7 : 4$
$7 - 4 = 3$
$12 \div 3 = 4$ times
$4 \times 7 = 28$
The dog has to run 28 meters.

3. 

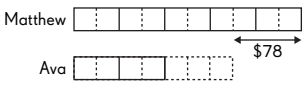
4 units → 20 bears
2 units → 10 bears
1 unit → 5 bears
3 units → 5 dolls
The ratio was 3 : 1.

4. Area of P : Area of Q $= 3 : 2 = 12 : 8$
Number of units for the figure
$= 12 + 8 - 5$
$= 15$
Number of units for the unshaded part
$= 15 - 5$
$= 10$
$10 : 15 = 2 : 3$
The ratio is 2 : 3.

Put on Your Thinking Cap!

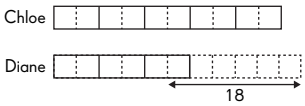
1. Thinking skill: Analyzing parts and whole
Strategy: Use a model
Solution:


3 units → 162
1 unit → $162 \div 3 = 54$
7 units → $7 \times 54 = 378$
2 units → 378
1 unit → $378 \div 2 = 189$
3 units → $3 \times 189 = 567$
There are 567 ribbons in the basket.

2. Thinking skill: Analyzing parts and whole
Strategy: Use a model
Solution:


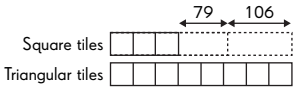
3 units → \$78
1 unit → $\$78 \div 3 = \$26$
14 units → $14 \times \$26 = \$364$
They have \$364 altogether.

3. Thinking skill: Analyzing parts and whole
Strategy: Use a model
Solution:



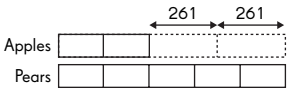
6 units → 18
1 unit → 18 ÷ 6 = 3
16 units → 16 × 3 = 48
They have 48 books altogether.

4. Thinking skill: Analyzing parts and whole
Strategy: Use a model
Solution:



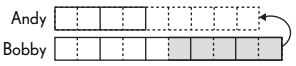
5 units → 79 + 106 = 185
1 unit → 185 ÷ 5 = 37
11 units → 11 × 37 = 407
There were 407 tiles in the box at first.

5. Thinking skill: Analyzing parts and whole
Strategy: Use a model
Solution:



3 units → 261 + 261 = 522
1 unit → 522 ÷ 3 = 174
2 units → 2 × 174 = 348
He had 348 apples at first.

6. Thinking skill: Analyzing parts and whole
Strategy: Use a model
Solution:
a. **Method 1**



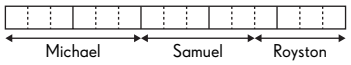
The new ratio was 9 : 5.

Method 2

Andy's collection : Bobby's collection
= 2 : 5
= 4 : 10
(4 + 5) : (10 − 5) = 9 : 5
The new ratio was 9 : 5.

b. 4 units → 108
1 unit → 108 ÷ 4 = 27
10 units → 10 × 27 = 270
Bobby had 270 antique coins at first.

7. Thinking skill: Analyzing parts and whole
Strategy: Use a model
Solution:

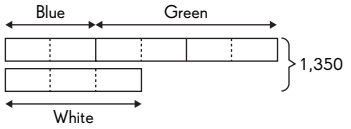


2 units → 118
1 unit → 118 ÷ 2 = 59
15 units → 15 × 59 = 885
There were 885 marbles in the box.

Mid-Year Test

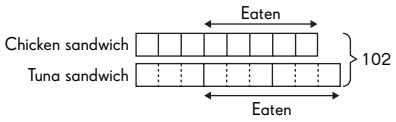
1. B	2. B	3. C	4. C
5. D	6. A	7. C	8. B
9. D	10. D	11. C	12. C
13. A	14. B	15. A	16. D
17. D	18. D	19. C	20. B

21. 899,300
22. 6,000
23. 84
24. 5
25. 180
26. 160
27. 78
28. $\frac{3}{4}$
29. 8
30. $\frac{2}{9}$
31. 3 : 2
32. 7
33. 13
34. 8
35. 19
36. 455
37. 540
38. 680
39. 112.5
40. Mr. Johnson drives 2 miles farther.
41.



9 units → 1,350
1 unit → 1,350 ÷ 9 = 150
4 units → 4 × 150 = 600
600 green beads are used.

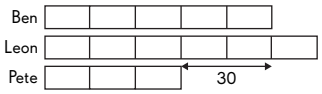
42. Area of triangle $BDC = \frac{1}{2} \times 12 \times 12$
$= 72 \text{ cm}^2$
Area of square $GEFC = 6 \times 6$
$= 36 \text{ cm}^2$
Area of triangle $EDF = \frac{1}{2} \times (12 + 6) \times 6$
$= 54 \text{ cm}^2$
Shaded area $= BDC + GEFC - EDF$
$= 72 + 36 - 54$
$= 54 \text{ cm}^2$

43.


17 units → 102
1 unit → $102 \div 17 = 6$
8 units → $8 \times 6 = 48$
9 units → $9 \times 6 = 54$
She made 48 chicken sandwiches and 54 tuna sandwiches.

44. a. Number of red balls $= 48 \div 3$
$= 16$
Number of white balls $= 30 \div 5$
$= 6$
Total number of balls $= 16 + 6 + 30 + 48$
$= 100$
There are 100 balls altogether.

b. $1 - \frac{7}{10} = \frac{3}{10}$
$\frac{3}{10} \times 100 = 30$
30 balls will be left.

45.


a. 2 units → 30
1 unit → $30 \div 2 = 15$
14 units → $14 \times 15 = 210$
They have 210 marbles altogether.

b. $210 \div 3 = 70$
3 units → $3 \times 15 = 45$
$70 - 45 = 25$
25 more marbles must be given to Pete.