Answer Key

GRADE 4 • MODULE 5

Fraction Equivalence, Ordering, and Operations

Lesson 1

Problem Set

1. a. Answer provided

   b. Whole: $\frac{4}{5}$, parts: $\frac{1}{5}, \frac{3}{5}; \frac{1}{5} + \frac{3}{5} = \frac{4}{5}$

   c. Whole: $\frac{3}{4}$, parts: $\frac{1}{4}, \frac{1}{4}, \frac{1}{4}; \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$

   d. Whole: $\frac{4}{6}$, parts: $\frac{2}{6}, \frac{2}{6}; \frac{2}{6} + \frac{2}{6} = \frac{4}{6}$

   e. Whole: $\frac{6}{8}$, parts: $\frac{2}{8}, \frac{2}{8}, \frac{2}{8}; \frac{2}{8} + \frac{2}{8} + \frac{2}{8} = \frac{6}{8}$

   f. Whole: $\frac{5}{4}$, parts: $\frac{3}{4}, \frac{1}{4}, \frac{1}{4}; \frac{3}{4} + \frac{1}{4} + \frac{1}{4} = \frac{5}{4}$

   g. Whole: $1\frac{2}{3}$, parts: $\frac{2}{3}, \frac{2}{3}, \frac{1}{3}; \frac{2}{3} + \frac{2}{3} + \frac{1}{3} = 1\frac{2}{3}$

   h. Whole: $1\frac{3}{8}$, parts: $\frac{2}{8}, \frac{2}{8}, \frac{2}{8}, \frac{4}{8}, \frac{1}{8}; \frac{2}{8} + \frac{2}{8} + \frac{2}{8} + \frac{4}{8} + \frac{1}{8} = 1\frac{3}{8}$

2. a. Tape diagram models number sentence.

   b. Tape diagram models number sentence.

   c. Tape diagram models number sentence.

   d. Tape diagram models number sentence.

   e. Tape diagram models number sentence.

   f. Tape diagram models number sentence.

   g. Tape diagram models number sentence.

   h. Tape diagram models number sentence.

Exit Ticket

1. Whole: 1, parts: $\frac{1}{4}, \frac{1}{4}, \frac{1}{4}, \frac{1}{4}; \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 1$

2. a. Tape diagram models number sentence.

   b. Tape diagram models number sentence.

Homework

1. a. Answer provided

   b. Whole: $\frac{2}{4}$, parts: $\frac{1}{4}, \frac{1}{4}; \frac{2}{4} = \frac{1}{4} + \frac{1}{4}$

   c. Whole: $\frac{3}{5}$, parts: $\frac{1}{5}, \frac{2}{5}; \frac{3}{5} = \frac{1}{5} + \frac{2}{5}$

   d. Whole: $\frac{5}{6}$, parts: $\frac{3}{6}, \frac{2}{6}; \frac{5}{6} = \frac{3}{6} + \frac{2}{6}$

   e. Whole: $\frac{3}{8}$, parts: $\frac{2}{8}, \frac{1}{8}; \frac{3}{8} = \frac{2}{8} + \frac{1}{8}$

   f. Whole: $1\frac{1}{5}$, parts: $\frac{5}{5}, \frac{1}{5}; 1\frac{1}{5} = \frac{5}{5} + \frac{1}{5}$

   g. Whole: $1\frac{2}{4}$, parts: $\frac{3}{4}, \frac{2}{4}, \frac{1}{4}; 1\frac{2}{4} = \frac{3}{4} + \frac{2}{4} + \frac{1}{4}$

   h. Whole: $1\frac{4}{8}$, parts: $\frac{3}{8}, \frac{2}{8}, \frac{1}{8}, \frac{3}{8}, \frac{3}{8}; 1\frac{4}{8} = \frac{3}{8} + \frac{2}{8} + \frac{1}{8} + \frac{3}{8} + \frac{3}{8}$

2. a. Tape diagram models number sentence.

   b. Tape diagram models number sentence.

   c. Tape diagram models number sentence.

   d. Tape diagram models number sentence.

   e. Tape diagram models number sentence.

   f. Tape diagram models number sentence.

Lesson 2

Problem Set

1. a. Answer provided.
   b. Tape diagram models number sentence; decompositions will vary.
   c. Tape diagram models number sentence; decompositions will vary.
2. a. Tape diagram models number sentence; decompositions will vary.
   b. Tape diagram models number sentence; decompositions will vary.
   c. Tape diagram models number sentence; decompositions will vary.
   d. Tape diagram models number sentence; decompositions will vary.

Exit Ticket

Tape diagram models number sentence; decompositions will vary.

Homework

1. a. Answer provided.
   b. Tape diagram models number sentence; decompositions will vary.
   c. Tape diagram models number sentence; decompositions will vary.
2. a. Tape diagram models number sentence; decompositions will vary.
   b. Tape diagram models number sentence; decompositions will vary.
   c. Tape diagram models number sentence; decompositions will vary.
   d. Tape diagram models number sentence; decompositions will vary.

Lesson 3

Problem Set

1. a. Answer provided.
   b. $\frac{2}{5} = \frac{1}{5} + \frac{1}{5}; \frac{2}{5} = 2 \times \frac{1}{5}$
   c. $\frac{5}{6} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}; \frac{5}{6} = 5 \times \frac{1}{6}$
   d. $\frac{6}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}; \frac{6}{8} = 6 \times \frac{1}{8}$
   e. $\frac{4}{3} = \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3}; \frac{4}{3} = 4 \times \frac{1}{3}$
2. a. $\frac{5}{3} = \left(3 \times \frac{1}{3}\right) + \left(2 \times \frac{1}{3}\right)$
   b. $\frac{6}{4} = \left(4 \times \frac{1}{4}\right) + \left(2 \times \frac{1}{4}\right)$
3. a. Tape diagram models number sentence; $\frac{4}{5} = 4 \times \frac{1}{5}$
   b. Tape diagram models number sentence; $\frac{5}{8} = 5 \times \frac{1}{8}$
   c. Tape diagram models number sentence; $\frac{7}{9} = 7 \times \frac{1}{9}$
   d. Tape diagram models number sentence; $\frac{7}{4} = 7 \times \frac{1}{4}$
   e. Tape diagram models number sentence; $\frac{7}{6} = 7 \times \frac{1}{6}$

Exit Ticket

1. a. $\frac{2}{3} = \frac{1}{3} + \frac{1}{3}; \frac{2}{3} = 2 \times \frac{1}{3}$
   b. $\frac{5}{3} = \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3}; \frac{5}{3} = 5 \times \frac{1}{3}$
2. Tape diagram models number sentence; $\frac{6}{9} = 6 \times \frac{1}{9}$

Homework

1. a. Answer provided.
   b. $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$; $\frac{3}{4} = 3 \times \frac{1}{4}$
   c. $\frac{4}{5} = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$; $\frac{4}{5} = 4 \times \frac{1}{5}$
   d. $\frac{5}{6} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$; $\frac{5}{6} = 5 \times \frac{1}{6}$
2. a. $\frac{4}{3} = \left(3 \times \frac{1}{3}\right) + \left(1 \times \frac{1}{3}\right)$
   b. $\frac{8}{6} = \left(6 \times \frac{1}{6}\right) + \left(2 \times \frac{1}{6}\right)$
3. a. Tape diagram models number sentence; $\frac{3}{5} = 3 \times \frac{1}{5}$
   b. Tape diagram models number sentence; $\frac{3}{8} = 3 \times \frac{1}{8}$
   c. Tape diagram models number sentence; $\frac{5}{9} = 5 \times \frac{1}{9}$
   d. Tape diagram models number sentence $\frac{8}{5} = 8 \times \frac{1}{5}$
   e. Tape diagram models number sentence; $\frac{12}{4} = 12 \times \frac{1}{4}$

Lesson 4

Problem Set

1. a. Answer provided.
   b. $\frac{1}{3} = \frac{1}{6} + \frac{1}{6}; \frac{1}{3} = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12}$
   c. Answers will vary.
   d. Answers will vary.
2. a. Answers will vary.
   b. Answers will vary.
3. a. Answer provided.
   b. Tape diagram models number sentence.
   c. Tape diagram models number sentence.
   d. Tape diagram models number sentence.
4. Tape diagram models number sentence.
5. Tape diagram models number sentence.
6. Tape diagram models number sentence.

Exit Ticket

1. Answers will vary.
2. Tape diagram models number sentence.

Homework

1. a. Answer provided.

   b. $\frac{1}{4} = \frac{1}{8} + \frac{1}{8}$; $\frac{1}{4} = \frac{1}{16} + \frac{1}{16} + \frac{1}{16} + \frac{1}{16}$

2. a. Answers will vary.

   b. Answers will vary.

   c. Answers will vary.

3. a. Answer provided.

   b. Tape diagram models number sentence.

   c. Tape diagram models number sentence.

   d. Tape diagram models number sentence.

4. Tape diagram models number sentence.

5. Tape diagram models number sentence.

6. Tape diagram models number sentence.

Lesson 5

Problem Set

1. a. 8, $\frac{1}{8}, \frac{2}{8}, \frac{1}{8}, \frac{2}{8}$

   b. 2 rows drawn; $\frac{1}{5} = \frac{2}{10}, \frac{1}{5} = \frac{1}{10} + \frac{1}{10} = \frac{2}{10}, \frac{1}{5} = 2 \times \frac{1}{10} = \frac{2}{10}$

   c. 4 rows drawn; $\frac{1}{3} = \frac{4}{12}, \frac{1}{3} = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} = \frac{4}{12}, \frac{1}{3} = 4 \times \frac{1}{12} = \frac{4}{12}$

2. a. Area model shows $\frac{1}{2} = \frac{3}{6}$; $\frac{1}{2} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6}, \frac{1}{2} = 3 \times \frac{1}{6} = \frac{3}{6}$

   b. Area model shows $\frac{1}{2} = \frac{4}{8}$; $\frac{1}{2} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{4}{8}, \frac{1}{2} = 4 \times \frac{1}{8} = \frac{4}{8}$

   c. Area model shows $\frac{1}{2} = \frac{5}{10}$; $\frac{1}{2} = \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} = \frac{5}{10}, \frac{1}{2} = 5 \times \frac{1}{10} = \frac{5}{10}$

   d. Area model shows $\frac{1}{3} = \frac{2}{6}$; $\frac{1}{3} = \frac{1}{6} + \frac{1}{6} = \frac{2}{6}, \frac{1}{3} = 2 \times \frac{1}{6} = \frac{2}{6}$

   e. Area model shows $\frac{1}{3} = \frac{4}{12}$; $\frac{1}{3} = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} = \frac{4}{12}, \frac{1}{3} = 4 \times \frac{1}{12} = \frac{4}{12}$

   f. Area model shows $\frac{1}{4} = \frac{3}{12}$; $\frac{1}{4} = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} = \frac{3}{12}, \frac{1}{4} = 3 \times \frac{1}{12} = \frac{3}{12}$

3. Explanations will vary.

Exit Ticket

1. a. 2 rows drawn; $\frac{1}{4} = \frac{1}{8} + \frac{1}{8} = \frac{2}{8}, \frac{1}{4} = 2 \times \frac{1}{8} = \frac{2}{8}$

   b. 3 rows drawn; $\frac{1}{4} = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} = \frac{3}{12}, \frac{1}{4} = 3 \times \frac{1}{12} = \frac{3}{12}$

2. Area model shows $\frac{3}{5} = \frac{6}{10}$; $\frac{3}{5} = \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} = \frac{6}{10}, \frac{3}{5} = 6 \times \frac{1}{10} = \frac{6}{10}$

Homework

1. a. $6, \frac{1}{6}, \frac{1}{6}, \frac{1}{6}$

   b. 2 rows drawn; $\frac{1}{4} = \frac{2}{8}, \frac{1}{4} = \frac{1}{8} + \frac{1}{8} = \frac{2}{8}$, $\frac{1}{4} = 2 \times \frac{1}{8} = \frac{2}{8}$

   c. 4 rows drawn; $\frac{1}{4} = \frac{4}{16}, \frac{1}{4} = \frac{1}{16} + \frac{1}{16} + \frac{1}{16} + \frac{1}{16} = \frac{4}{16}$, $\frac{1}{4} = 4 \times \frac{1}{16} = \frac{4}{16}$

2. a. Area model shows $\frac{1}{3} = \frac{2}{6}; \frac{1}{3} = \frac{1}{6} + \frac{1}{6} = \frac{2}{6}, \frac{1}{3} = 2 \times \frac{1}{6} = \frac{2}{6}$

   b. Area model shows $\frac{1}{3} = \frac{3}{9}$; $\frac{1}{3} = \frac{1}{9} + \frac{1}{9} + \frac{1}{9} = \frac{3}{9}$, $\frac{1}{3} = 3 \times \frac{1}{9} = \frac{3}{9}$

   c. Area model shows $\frac{1}{3} = \frac{4}{12}; \frac{1}{3} = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} = \frac{4}{12}$, $\frac{1}{3} = 4 \times \frac{1}{12} = \frac{4}{12}$

   d. Area model shows $\frac{1}{3} = \frac{5}{15}; \frac{1}{3} = \frac{1}{15} + \frac{1}{15} + \frac{1}{15} + \frac{1}{15} + \frac{1}{15} = \frac{5}{15}$, $\frac{1}{3} = 5 \times \frac{1}{15} = \frac{5}{15}$

   e. Area model shows $\frac{1}{5} = \frac{2}{10}; \frac{1}{5} = \frac{1}{10} + \frac{1}{10} = \frac{2}{10}$, $\frac{1}{5} = 2 \times \frac{1}{10} = \frac{2}{10}$

   f. Area model shows $\frac{1}{5} = \frac{3}{15}; \frac{1}{5} = \frac{1}{15} + \frac{1}{15} + \frac{1}{15} = \frac{3}{15}$, $\frac{1}{5} = 3 \times \frac{1}{15} = \frac{3}{15}$

3. Explanations will vary.

Lesson 6

Sprint

Side A

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

Side B

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

Problem Set

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

   b. Decomposed horizontally to show tenths; $\frac{1}{5}+\frac{1}{5}=\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)=\frac{4}{10}$; $\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)=\left(2\times\frac{1}{10}\right)+\left(2\times\frac{1}{10}\right)$, $\frac{2}{5}=4\times\frac{1}{10}=\frac{4}{10}$

   c. Decomposed horizontally to show twelfths; $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=\left(\frac{1}{12}+\frac{1}{12}+\frac{1}{12}\right)+\left(\frac{1}{12}+\frac{1}{12}+\frac{1}{12}\right)+\left(\frac{1}{12}+\frac{1}{12}+\frac{1}{12}\right)=\frac{9}{12}$; $\left(\frac{1}{12}+\frac{1}{12}+\frac{1}{12}\right)+\left(\frac{1}{12}+\frac{1}{12}+\frac{1}{12}\right)+\left(\frac{1}{12}+\frac{1}{12}+\frac{1}{12}\right)=\left(3\times\frac{1}{12}\right)+\left(3\times\frac{1}{12}\right)+\left(3\times\frac{1}{12}\right)=\frac{9}{12}$, $\frac{3}{4}=9\times\frac{1}{12}=\frac{9}{12}$

2. a. Area model shows $\frac{3}{5}=\frac{6}{10}$; $\frac{3}{5}=\frac{1}{5}+\frac{1}{5}+\frac{1}{5}=\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)=\frac{6}{10}$, $\frac{3}{5}=\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)=\left(2\times\frac{1}{10}\right)+\left(2\times\frac{1}{10}\right)+\left(2\times\frac{1}{10}\right)=\frac{6}{10}$, $\frac{3}{5}=6\times\frac{1}{10}=\frac{6}{10}$

   b. Area model shows $\frac{3}{4}=\frac{6}{8}$; $\frac{3}{4}=\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=\left(\frac{1}{8}+\frac{1}{8}\right)+\left(\frac{1}{8}+\frac{1}{8}\right)+\left(\frac{1}{8}+\frac{1}{8}\right)=\frac{6}{8}$, $\left(2\times\frac{1}{8}\right)+\left(2\times\frac{1}{8}\right)+\left(2\times\frac{1}{8}\right)=\frac{6}{8}$, $\frac{3}{4}=6\times\frac{1}{8}=\frac{6}{8}$

3. Answers will vary.

Exit Ticket

1. Decomposed horizontally to show eighths; $\frac{3}{4}=\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=\left(\frac{1}{8}+\frac{1}{8}\right)+\left(\frac{1}{8}+\frac{1}{8}\right)+\left(\frac{1}{8}+\frac{1}{8}\right)=\frac{6}{8}$, $\left(2\times\frac{1}{8}\right)+\left(2\times\frac{1}{8}\right)+\left(2\times\frac{1}{8}\right)=\frac{6}{8}$, $\frac{3}{4}=6\times\frac{1}{8}=\frac{6}{8}$

2. Area model shows $\frac{4}{5}=\frac{8}{10}$

Homework

1. a. 4, 10, 1, 1, 10 , $\frac{1}{10}$, $\frac{1}{10}$, 10, $\frac{1}{10}$, 10

   b. Decomposed horizontally to show eighths; $\frac{1}{4}+\frac{1}{4}=\left(\frac{1}{8}+\frac{1}{8}\right)+\left(\frac{1}{8}+\frac{1}{8}\right)=\frac{4}{8},\left(\frac{1}{8}+\frac{1}{8}\right)+\left(\frac{1}{8}+\frac{1}{8}\right)=$
   $\left(2\times\frac{1}{8}\right)+\left(2\times\frac{1}{8}\right)=\frac{4}{8},\frac{2}{4}=4\times\frac{1}{8}=\frac{4}{8}$

   c. Decomposed horizontally to show fifteenths; $\frac{1}{5}+\frac{1}{5}+\frac{1}{5}+\frac{1}{5}=\left(\frac{1}{15}+\frac{1}{15}+\frac{1}{15}\right)+\left(\frac{1}{15}+\frac{1}{15}+\frac{1}{15}\right)+$
   $\left(\frac{1}{15}+\frac{1}{15}+\frac{1}{15}\right)+\left(\frac{1}{15}+\frac{1}{15}+\frac{1}{15}\right)=\frac{12}{15};\left(\frac{1}{15}+\frac{1}{15}+\frac{1}{15}\right)+\left(\frac{1}{15}+\frac{1}{15}+\frac{1}{15}\right)+\left(\frac{1}{15}+\frac{1}{15}+\frac{1}{15}\right)+$
   $\left(\frac{1}{15}+\frac{1}{15}+\frac{1}{15}\right)=\left(3\times\frac{1}{15}\right)+\left(3\times\frac{1}{15}\right)+\left(3\times\frac{1}{15}\right)+\left(3\times\frac{1}{15}\right)=\frac{12}{15},\frac{4}{5}=12\times\frac{1}{15}=\frac{12}{15}$

2. a. Area model shows $\frac{2}{3}=\frac{4}{6};\frac{1}{3}+\frac{1}{3}=\left(\frac{1}{6}+\frac{1}{6}\right)+\left(\frac{1}{6}+\frac{1}{6}\right)=\frac{4}{6},\left(\frac{1}{6}+\frac{1}{6}\right)+\left(\frac{1}{6}+\frac{1}{6}\right)=\left(2\times\frac{1}{6}\right)+$

   b. $\left(2\times\frac{1}{6}\right)=\frac{4}{6},\frac{2}{3}=4\times\frac{1}{6}=\frac{4}{6}$

   c. Area model shows $\frac{4}{5}=\frac{8}{10};\ \frac{1}{5}+\frac{1}{5}+\frac{1}{5}+\frac{1}{5}=\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)=\frac{8}{10},$

   d. $\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)+\left(\frac{1}{10}+\frac{1}{10}\right)=\left(2\times\frac{1}{10}\right)+\left(2\times\frac{1}{10}\right)+\left(2\times\frac{1}{10}\right)+$

   e. $\left(2\times\frac{1}{10}\right)=\frac{8}{10},\frac{4}{5}=6\times\frac{1}{10}=\frac{6}{10}$

3. Answers will vary.

Lesson 7

Problem Set

1. a. Answer provided
   b. $\frac{1}{2} = \frac{1 \times 3}{2 \times 3} = \frac{3}{6}$
   c. $\frac{1}{2} = \frac{1 \times 4}{2 \times 4} = \frac{4}{8}$
   d. $\frac{1}{2} = \frac{1 \times 5}{2 \times 5} = \frac{5}{10}$
2. a. Answers will vary.
   b. Answers will vary.
   c. Answers will vary.
   d. Answers will vary.
   e. The size of the fractional units decreased.
   f. The number of total units increased.
3. a. Area model represents $\frac{1}{3}$ and is decomposed horizontally into sixths; $\frac{1}{3} = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$
   b. Area model represents $\frac{1}{3}$ and is decomposed horizontally into ninths; $\frac{1}{3} = \frac{1 \times 3}{3 \times 3} = \frac{3}{9}$
   c. Area model represents $\frac{1}{3}$ and is decomposed horizontally into twelfths; $\frac{1}{3} = \frac{1 \times 4}{3 \times 4} = \frac{4}{12}$

Exit Ticket

a. Area model represents $\frac{1}{4}$; $\frac{1}{4} = \frac{1 \times 2}{4 \times 2} = \frac{2}{8}$
b. Area model represents $\frac{1}{4}$; $\frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$

Homework

1. a. Answer provided
   b. $\frac{1}{2} = \frac{1 \times 4}{2 \times 4} = \frac{4}{8}$
   c. $\frac{1}{2} = \frac{1 \times 6}{2 \times 6} = \frac{6}{12}$
   d. $\frac{1}{2} = \frac{1 \times 7}{2 \times 7} = \frac{7}{14}$
2. a. Answers will vary.
   b. Answers will vary.
   c. Answers will vary.
   d. Answers will vary.
3. a. Area model shows $\frac{1}{4}$ and is decomposed horizontally into eighths; $\frac{1}{4} = \frac{1 \times 2}{4 \times 2} = \frac{2}{8}$
   b. Area model shows $\frac{1}{4}$ and is decomposed horizontally into twelfths; $\frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$
   c. Area model shows $\frac{1}{4}$ and is decomposed horizontally into sixteenths; $\frac{1}{4} = \frac{1 \times 4}{4 \times 4} = \frac{4}{16}$

Lesson 8

Problem Set

1. a. Answer provided
   b. $\frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12}$
   c. $\frac{4}{5} = \frac{4 \times 2}{5 \times 2} = \frac{8}{10}$
   d. $\frac{5}{6} = \frac{5 \times 2}{6 \times 2} = \frac{10}{12}$
2. a. Area model shows $\frac{3}{5} = \frac{3 \times 2}{5 \times 2} = \frac{6}{10}$
   b. Area model shows $\frac{3}{5} = \frac{3 \times 3}{5 \times 3} = \frac{9}{15}$
3. a. Area model proves $\frac{2}{5} = \frac{4}{10}$
   b. Area model proves $\frac{2}{3} = \frac{8}{12}$
   c. Area model proves $\frac{3}{6} = \frac{6}{12}$
   d. Area model proves $\frac{4}{6} = \frac{8}{12}$
4. a. Answers will vary.
   b. Answers will vary.
   c. Answers will vary.
   d. Answers will vary.
5. a. False; answers will vary.
   b. True
   c. False; answers will vary.
   d. True

Exit Ticket

1. Answers will vary.
2. False; answers will vary.

Homework

1. a. Answer provided
   b. $\frac{3}{4} = \frac{3 \times 2}{4 \times 2} = \frac{6}{8}$
   c. $\frac{4}{5} = \frac{4 \times 3}{5 \times 3} = \frac{12}{15}$
   d. $\frac{7}{8} = \frac{7 \times 2}{8 \times 2} = \frac{14}{16}$
2. a. $\frac{3}{6} = \frac{3 \times 2}{6 \times 2} = \frac{6}{12}$
   b. $\frac{2}{4} = \frac{2 \times 3}{4 \times 3} = \frac{6}{12}$
3. a. Area model proves $\frac{1}{3} = \frac{2}{6}$
   b. Area model proves $\frac{2}{5} = \frac{4}{10}$
   c. Area model proves $\frac{5}{7} = \frac{10}{14}$
   d. Area model proves $\frac{3}{6} = \frac{9}{18}$
4. a. Answers will vary.
   b. Answers will vary.
   c. Answers will vary.
   d. Answers will vary.
5. a. False; answers will vary.
   b. True
   c. False; answers will vary.
   d. True

Lesson 9

Problem Set

1. a. Answer provided

   b. Model shows $\frac{3}{6} = \frac{3 \div 3}{6 \div 3} = \frac{1}{2}$

   c. Model shows $\frac{5}{10} = \frac{5 \div 5}{10 \div 5} = \frac{1}{2}$

   d. Model shows $\frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$ or $\frac{4}{8} = \frac{4 \div 2}{8 \div 2} = \frac{2}{4}$

2. a. Model shows $\frac{2}{6} = \frac{2 \div 2}{6 \div 2} = \frac{1}{3}$

   b. Model shows $\frac{2}{8} = \frac{2 \div 2}{8 \div 2} = \frac{1}{4}$

   c. Model shows $\frac{2}{10} = \frac{2 \div 2}{10 \div 2} = \frac{1}{5}$

   d. Model shows $\frac{2}{12} = \frac{2 \div 2}{12 \div 2} = \frac{1}{6}$

   e. The size of the fractional units increased.

   f. The number of total units decreased.

3. a. Area models prove $\frac{2}{6} = \frac{1}{3}$ and $\frac{3}{9} = \frac{1}{3}$

   b. $\frac{2}{6} = \frac{2 \div 2}{6 \div 2} = \frac{1}{3}$, $\frac{3}{9} = \frac{3 \div 3}{9 \div 3} = \frac{1}{3}$

4. a. Area models prove $\frac{2}{8} = \frac{1}{4}$ and $\frac{3}{12} = \frac{1}{4}$

   b. $\frac{2}{8} = \frac{2 \div 2}{8 \div 2} = \frac{1}{4}$, $\frac{3}{12} = \frac{3 \div 3}{12 \div 3} = \frac{1}{4}$

Exit Ticket

a. Area models prove $\frac{2}{6} = \frac{1}{3}$ and $\frac{4}{12} = \frac{1}{3}$

b. $\frac{2}{6} = \frac{2 \div 2}{6 \div 2} = \frac{1}{3}$, $\frac{4}{12} = \frac{4 \div 4}{12 \div 4} = \frac{1}{3}$

Homework

1. a. Answer provided

   b. Model shows $\frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$ or $\frac{4}{8} = \frac{4 \div 2}{8 \div 2} = \frac{2}{4}$

   c. Model shows $\frac{6}{12} = \frac{6 \div 6}{12 \div 6} = \frac{1}{2}$ or $\frac{6}{12} = \frac{6 \div 3}{12 \div 3} = \frac{2}{4}$ or $\frac{6}{12} = \frac{6 \div 2}{12 \div 2} = \frac{3}{6}$

   d. Model shows $\frac{7}{14} = \frac{7 \div 7}{14 \div 7} = \frac{1}{2}$

2. a. Model shows $\frac{2}{12} = \frac{2 \div 2}{12 \div 2} = \frac{1}{6}$

   b. Model shows $\frac{2}{10} = \frac{2 \div 2}{10 \div 2} = \frac{1}{5}$

   c. Model shows $\frac{2}{8} = \frac{2 \div 2}{8 \div 2} = \frac{1}{4}$

   d. Model shows $\frac{2}{6} = \frac{2 \div 2}{6 \div 2} = \frac{1}{3}$

   e. The size of the fractional units increased.

   f. The number of total units decreased.

3. a. Area models prove $\frac{4}{8} = \frac{1}{2}$ and $\frac{6}{12} = \frac{1}{2}$

   b. $\frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$, $\frac{6}{12} = \frac{6 \div 6}{12 \div 6} = \frac{1}{2}$

4. a. Area models prove $\frac{4}{8} = \frac{1}{2}$ and $\frac{8}{16} = \frac{1}{2}$

   b. $\frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$, $\frac{8}{16} = \frac{8 \div 8}{16 \div 8} = \frac{1}{2}$

Lesson 10

Problem Set

1. a. Answer provided

   b. Area model shows composed fractions; $\frac{9}{12} = \frac{9 \div 3}{12 \div 3} = \frac{3}{4}$

   c. Area model shows composed fractions; $\frac{6}{10} = \frac{6 \div 2}{10 \div 2} = \frac{3}{5}$

   d. Area model shows composed fractions; $\frac{6}{8} = \frac{6 \div 2}{8 \div 2} = \frac{3}{4}$

2. a. Area model shows composed fractions; $\frac{4}{6} = \frac{4 \div 2}{6 \div 2} = \frac{2}{3}$

   b. Area model shows composed fractions; $\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$ or $\frac{8}{12} = \frac{8 \div 2}{12 \div 2} = \frac{4}{6}$

3. a. Area model shows $\frac{4}{10}$ composed as $\frac{2}{5}$

   b. Area model shows $\frac{6}{9}$ composed as $\frac{2}{3}$

4. a. $\frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$

   b. $\frac{12}{16} = \frac{12 \div 4}{16 \div 4} = \frac{3}{4}$

   c. $\frac{12}{20} = \frac{12 \div 4}{20 \div 4} = \frac{3}{5}$

   d. $\frac{16}{20} = \frac{16 \div 4}{20 \div 4} = \frac{4}{5}$

Exit Ticket

Area model proves $\frac{4}{10} = \frac{2}{5}$; $\frac{4}{10} = \frac{4 \div 2}{10 \div 2} = \frac{2}{5}$

Homework

1. a. Answer provided

   b. Area model shows composed fractions; $\frac{4}{10} = \frac{4 \div 2}{10 \div 2} = \frac{2}{5}$

   c. Area model shows composed fractions; $\frac{6}{9} = \frac{6 \div 3}{9 \div 3} = \frac{2}{3}$

   d. Area model shows composed fractions; $\frac{9}{15} = \frac{9 \div 3}{15 \div 3} = \frac{3}{5}$

2. a. Area model shows composed fractions; $\frac{6}{8} = \frac{6 \div 2}{8 \div 2} = \frac{3}{4}$

   b. Area model shows composed fractions; $\frac{12}{16} = \frac{12 \div 4}{16 \div 4} = \frac{3}{4}$ or $\frac{12}{16} = \frac{12 \div 2}{16 \div 2} = \frac{6}{8}$

3. a. Area model shows $\frac{6}{15}$ composed as $\frac{2}{5}$

   b. Area model shows $\frac{6}{18}$ composed as $\frac{2}{6}$

4. a. $\frac{8}{10} = \frac{8 \div 2}{10 \div 2} = \frac{4}{5}$

   b. $\frac{9}{12} = \frac{9 \div 3}{12 \div 3} = \frac{3}{4}$

   c. $\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$

   d. $\frac{12}{18} = \frac{12 \div 6}{18 \div 6} = \frac{2}{3}$

Lesson 11

Problem Set

1. a. $\frac{0}{4}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}; \frac{1}{4}$ circled
   b. $\frac{0}{8}, \frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}; \frac{2}{8}$ circled
   c. $\frac{0}{12}, \frac{1}{12}, \frac{2}{12}, \frac{3}{12}, \frac{4}{12}, \frac{5}{12}, \frac{6}{12}, \frac{7}{12}, \frac{8}{12}, \frac{9}{12}, \frac{10}{12}, \frac{11}{12}, \frac{12}{12}; \frac{3}{12}$ circled
2. a. $\frac{1}{4} = \frac{1 \times 2}{4 \times 2} = \frac{2}{8}$
   b. $\frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$
3. a. Number line drawn for $\frac{0}{3}, \frac{1}{3}, \frac{2}{3}, \frac{3}{3}; \frac{2}{3}$ circled
   b. Number line drawn for $\frac{0}{6}, \frac{1}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}, \frac{6}{6}; \frac{4}{6}$ circled
   c. Number line drawn for $\frac{0}{12}, \frac{1}{12}, \frac{2}{12}, \frac{3}{12}, \frac{4}{12}, \frac{5}{12}, \frac{6}{12}, \frac{7}{12}, \frac{8}{12}, \frac{9}{12}, \frac{10}{12}, \frac{11}{12}, \frac{12}{12}; \frac{8}{12}$ circled
4. a. $\frac{4}{6} = \frac{4 \div 2}{6 \div 2} = \frac{2}{3}$
   b. $\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$
5. a. Number line drawn appropriately
   b. $\frac{2}{5} = \frac{2 \times 2}{5 \times 2} = \frac{4}{10}$
   c. $\frac{4}{10} = \frac{4 \div 2}{10 \div 2} = \frac{2}{5}$

Exit Ticket

1. Number line drawn appropriately
2. $\frac{2}{6} = \frac{2 \times 2}{6 \times 2} = \frac{4}{12}$
3. $\frac{4}{12} = \frac{4 \div 2}{12 \div 2} = \frac{2}{6}$

Homework

1. a. $\frac{0}{3}, \frac{1}{3}, \frac{2}{3}, \frac{3}{3}; \frac{1}{3}$ circled
   b. $\frac{0}{6}, \frac{1}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}, \frac{6}{6}; \frac{2}{6}$ circled
   c. $\frac{0}{12}, \frac{1}{12}, \frac{2}{12}, \frac{3}{12}, \frac{4}{12}, \frac{5}{12}, \frac{6}{12}, \frac{7}{12}, \frac{8}{12}, \frac{9}{12}, \frac{10}{12}, \frac{11}{12}, \frac{12}{12}; \frac{4}{12}$ circled
2. a. $\frac{1}{3} = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$
   b. $\frac{1}{3} = \frac{1 \times 4}{3 \times 4} = \frac{4}{12}$
3. a. Number line drawn for $\frac{0}{4}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}; \frac{2}{4}$ circled
   b. Number line drawn for $\frac{0}{8}, \frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}; \frac{4}{8}$ circled
   c. Number line drawn for $\frac{0}{10}, \frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, \frac{10}{10}; \frac{5}{10}$ circled
4. $\frac{4}{8} = \frac{4 \div 2}{8 \div 2} = \frac{2}{4}$
5. a. Number line drawn appropriately
   b. $\frac{3}{4} = \frac{3 \times 2}{4 \times 2} = \frac{6}{8}$
   c. $\frac{6}{8} = \frac{6 \div 2}{8 \div 2} = \frac{3}{4}$

Lesson 12

Problem Set

1. a. Points plotted appropriately for $\frac{1}{3}, \frac{5}{6}, \frac{7}{12}$
   b. i. $>$
      ii. $<$
2. a. Points plotted appropriately for $\frac{11}{12}, \frac{1}{4}, \frac{3}{8}$
   b. Answers will vary.
   c. Explanations will vary.
3. a. $<$; explanations will vary.
   b. $<$; explanations will vary.
   c. $>$; explanations will vary.
   d. $>$; explanations will vary.
   e. $<$; explanations will vary.
   f. $<$; explanations will vary.
   g. $>$; explanations will vary.
   h. $>$; explanations will vary.
   i. $<$; explanations will vary.
   j. $<$; explanations will vary.

Exit Ticket

1. Points plotted appropriately for $\frac{8}{10}, \frac{3}{5}, \frac{1}{4}$
2. a. $<$
   b. $>$
   c. $<$
   d. $<$

Homework

1. a. Points plotted appropriately for $\frac{2}{3}, \frac{1}{6}, \frac{4}{10}$
   b. i. $>$
      ii. $>$
2. a. Points plotted appropriately for $\frac{5}{12}, \frac{3}{4}, \frac{2}{6}$
   b. Answers will vary.
   c. Explanations will vary.
3. a. $>$; explanations will vary.
   b. $>$; explanations will vary.
   c. $>$; explanations will vary.
   d. $<$; explanations will vary.
   e. $>$; explanations will vary.
   f. $>$; explanations will vary.
   g. $<$; explanations will vary.
   h. $>$; explanations will vary.
   i. $>$; explanations will vary.
   j. $>$; explanations will vary.

Lesson 13

Problem Set

1. Points plotted appropriately for $\frac{4}{3}, \frac{11}{6}, \frac{17}{12}$
2. a. $>$
   b. $<$
3. Points plotted appropriately for $\frac{11}{8}, \frac{7}{4}, \frac{15}{12}$
4. Explanations will vary.
5. a. $<$; explanations will vary.
   b. $<$; explanations will vary.
   c. $>$; explanations will vary.
   d. $>$; explanations will vary.
   e. $>$; explanations will vary.
   f. $>$; explanations will vary.
   g. $>$; explanations will vary.
   h. $<$; explanations will vary.
   i. $<$; explanations will vary.
   j. $<$; explanations will vary.

Exit Ticket

1. Points plotted appropriately for $\frac{5}{4}, \frac{10}{7}, \frac{16}{9}$
2. a. $<$
   b. $<$
   c. $>$

Homework

1. Points plotted appropriately for $\frac{3}{2}, \frac{9}{5}, \frac{14}{10}$
2. a. $<$
   b. $<$
3. Points plotted appropriately for $\frac{12}{9}, \frac{6}{5}, \frac{18}{15}$
4. Explanations will vary.
5. a. $<$; explanations will vary.
   b. $<$; explanations will vary.
   c. $>$; explanations will vary.
   d. $<$; explanations will vary
   e. $<$; explanations will vary.
   f. $<$; explanations will vary.
   g. $<$; explanations will vary.
   h. $<$; explanations will vary.
   i. $<$; explanations will vary.
   j. $>$; explanations will vary.

Lesson 14

Problem Set

1. a. $>$
   b. $>$
   c. $>$
   d. $>$
2. a. $<$; explanations will vary.
   b. Answer provided.
   c. $>$; explanations will vary.
   d. $>$; explanations will vary.
3. a. Tape diagrams model $\frac{2}{3} < \frac{5}{6}$
   b. Tape diagrams model $\frac{3}{4} < \frac{7}{8}$
   c. Tape diagrams model $1\frac{3}{4} > 1\frac{7}{12}$
4. a. Number line models fractions; $<$
   b. Number line models fractions; $>$
   c. Number line models fractions; $<$
   d. Number line models fractions; $>$
5. a. $>$
   b. $>$
   c. $>$
   d. $<$
   e. $<$
   f. $>$
   g. $>$
   h. $>$
6. Evan; picture supports answer.

Exit Ticket

1. Tape diagrams model $\frac{2}{5} > \frac{3}{10}$
2. $\frac{4}{3} > \frac{7}{6}$; number line labeled and plotted accurately

Homework

1. a. $>$
   b. $>$
   c. $>$
   d. $>$
2. a. $>$; explanations will vary.
   b. Answer provided.
   c. $>$; explanations will vary.
   d. $<$; explanations will vary.
3. a. Tape diagrams model $\frac{3}{4} > \frac{7}{12}$
   b. Tape diagrams model $\frac{2}{4} > \frac{1}{8}$
   c. Tape diagrams model $1\frac{4}{10} < 1\frac{3}{5}$
4. a. Number line models fractions; $>$
   b. Number line models fractions; $>$
   c. Number line models fractions; $>$
   d. Number line models fractions; $>$
5. a. $<$
   b. $<$
   c. $>$
   d. $>$
   e. $=$
   f. $<$
   g. $>$
   h. $>$
6. Simon; picture supports answer

Lesson 15

Problem Set

1. a. Area models prove $\frac{1}{2} < \frac{2}{3}$
   b. Area models prove $\frac{4}{5} > \frac{3}{4}$
   c. Area models prove $\frac{3}{5} > \frac{4}{7}$
   d. Area models prove $\frac{3}{7} > \frac{2}{6}$
   e. Area models prove $\frac{5}{8} < \frac{6}{9}$
   f. Area models prove $\frac{2}{3} < \frac{3}{4}$
2. a. $<$
   b. $<$
   c. $>$
   d. $>$
3. a. $<$
   b. $>$
   c. $>$
   d. $>$
4. Explanations will vary.

Exit Ticket

1. Area models prove $\frac{3}{4} < \frac{4}{5}$
2. Area models prove $\frac{2}{6} < \frac{3}{5}$

Homework

1. a. Area models prove $\frac{1}{2} < \frac{3}{5}$
   b. Area models prove $\frac{2}{3} < \frac{3}{4}$
   c. Area models prove $\frac{4}{6} > \frac{5}{8}$
   d. Area models prove $\frac{2}{7} < \frac{3}{5}$
   e. Area models prove $\frac{4}{6} = \frac{6}{9}$
   f. Area models prove $\frac{4}{5} < \frac{10}{12}$
2. a. $>$
   b. $>$
   c. $>$
   d. $>$
3. a. $>$
   b. $<$
   c. $=$
   d. $<$
4. Explanations will vary.

Lesson 16

Problem Set

1. a. 2 fifths
   b. 2 fifths
   c. 1 half
   d. 3 fourths
2. a. $\frac{2}{6}$
   b. $\frac{2}{8}$
   c. $\frac{0}{10}$
   d. $\frac{1}{5}$
   e. $\frac{1}{4}$
   f. $\frac{2}{4}$
3. a. Answer provided
   b. Number bond shows $\frac{7}{6}$ is $\frac{6}{6}$ and $\frac{1}{6}$; $1\frac{1}{6}$
   c. Number bond shows $\frac{6}{5}$ is $\frac{5}{5}$ and $\frac{1}{5}$; $1\frac{1}{5}$
   d. Number bond shows $\frac{11}{8}$ is $\frac{8}{8}$ and $\frac{3}{8}$; $1\frac{3}{8}$
   e. Number bond shows $\frac{6}{4}$ is $\frac{4}{4}$ and $\frac{2}{4}$; $1\frac{2}{4}$
   f. Number bond shows $\frac{12}{10}$ is $\frac{10}{10}$ and $\frac{2}{10}$; $1\frac{2}{10}$
4. a. 3 fourths
   b. 7 fifths
5. a. $\frac{7}{8}$
   b. $\frac{9}{12}$
6. a. Answer provided
   b. Number bond shows $\frac{7}{4}$ is $\frac{4}{4}$ and $\frac{3}{4}$; $1\frac{3}{4}$
   c. Number bond shows $\frac{12}{9}$ is $\frac{9}{9}$ and $\frac{3}{9}$; $1\frac{3}{9}$
   d. Number bond shows $\frac{13}{10}$ is $\frac{10}{10}$ and $\frac{3}{10}$; $1\frac{3}{10}$
   e. Number bond shows $\frac{12}{6}$ is $\frac{6}{6}$ and $\frac{6}{6}$; 2
   f. Number bond shows $\frac{14}{8}$ is $\frac{8}{8}$ and $\frac{6}{8}$; $1\frac{6}{8}$
7. a. Number line models $\frac{7}{4} - \frac{5}{4} = \frac{2}{4}$
   b. Number line models $\frac{5}{4} + \frac{2}{4} = \frac{7}{4}$

Exit Ticket

1. Number bond shows $\frac{11}{9}$ is $\frac{9}{9}$ and $\frac{2}{9}$; $1\frac{2}{9}$
2. Number bond shows $\frac{15}{12}$ is $\frac{12}{12}$ and $\frac{3}{12}$; $1\frac{3}{12}$

Homework

1. a. 1 sixth
   b. 2 tenths
   c. 1 fourth
   d. 3 thirds

2. a. $\frac{1}{5}$
   b. $\frac{4}{9}$
   c. $\frac{4}{12}$
   d. $\frac{2}{6}$
   e. $\frac{3}{3}$
   f. $\frac{2}{4}$

3. a. Answer provided
   b. Number bond shows $\frac{11}{8}$ is $\frac{8}{8}$ and $\frac{3}{8}$; $1\frac{3}{8}$
   c. Number bond shows $\frac{6}{5}$ is $\frac{5}{5}$ and $\frac{1}{5}$; $1\frac{1}{5}$
   d. Number bond shows $\frac{5}{4}$ is $\frac{4}{4}$ and $\frac{1}{4}$; $1\frac{1}{4}$
   e. Number bond shows $\frac{8}{7}$ is $\frac{7}{7}$ and $\frac{1}{7}$; $1\frac{1}{7}$
   f. Number bond shows $\frac{12}{10}$ is $\frac{10}{10}$ and $\frac{2}{10}$; $1\frac{2}{10}$

4. a. 6 fifths
   b. 7 eighths

5. a. $\frac{9}{11}$
   b. $\frac{9}{10}$

6. a. Number bond shows $\frac{6}{4}$ is $\frac{4}{4}$ and $\frac{2}{4}$; $1\frac{2}{4}$
   b. Number bond shows $\frac{14}{12}$ is $\frac{12}{12}$ and $\frac{2}{12}$; $1\frac{2}{12}$
   c. Number bond shows $\frac{12}{8}$ is $\frac{8}{8}$ and $\frac{4}{8}$; $1\frac{4}{8}$
   d. Number bond shows $\frac{13}{10}$ is $\frac{10}{10}$ and $\frac{3}{10}$; $1\frac{3}{10}$
   e. Number bond shows $\frac{9}{5}$ is $\frac{5}{5}$ and $\frac{4}{5}$; $1\frac{4}{5}$
   f. Number bond shows $\frac{6}{3}$ is $\frac{3}{3}$ and $\frac{3}{3}$; 2

7. a. Number line accurately models $\frac{11}{9} - \frac{5}{9} = \frac{6}{9}$
   b. Number line accurately models $\frac{13}{12} + \frac{4}{12} = \frac{17}{12}$

Lesson 17

Problem Set

1. a. $\frac{8}{5}+\frac{2}{5}=\frac{10}{5}$, $\frac{2}{5}+\frac{8}{5}=\frac{10}{5}$, $\frac{10}{5}-\frac{2}{5}=\frac{8}{5}$, $\frac{10}{5}-\frac{8}{5}=\frac{2}{5}$

   b. $\frac{7}{8}+\frac{8}{8}=\frac{15}{8}$, $\frac{8}{8}+\frac{7}{8}=\frac{15}{8}$, $\frac{15}{8}-\frac{8}{8}=\frac{7}{8}$, $\frac{15}{8}-\frac{7}{8}=\frac{8}{8}$

2. a. Answer provided

   b. $\frac{2}{10}$; number line models solution; solved by counting up and subtracting

   c. $\frac{2}{5}$; number line models solution; solved by counting up and subtracting

   d. $\frac{3}{8}$; number line models solution; solved by counting up and subtracting

   e. $\frac{5}{10}$; number line models solution; solved by counting up and subtracting

   f. $\frac{3}{5}$; number line models solution; solved by counting up and subtracting

3. a. Answer provided.

   b. $\frac{6}{6}+\frac{3}{6}=\frac{9}{6}$, $\frac{9}{6}-\frac{4}{6}=\frac{5}{6}$; $\frac{6}{6}-\frac{4}{6}=\frac{2}{6}$, $\frac{2}{6}+\frac{3}{6}=\frac{5}{6}$; number bond shows $1\frac{3}{6}$ is $\frac{6}{6}$ and $\frac{3}{6}$

   c. $\frac{8}{8}+\frac{6}{8}=\frac{14}{8}$, $\frac{14}{8}-\frac{7}{8}=\frac{7}{8}$; $\frac{8}{8}-\frac{7}{8}=\frac{1}{8}$, $\frac{1}{8}+\frac{6}{8}=\frac{7}{8}$; number bond shows $1\frac{6}{8}$ is $\frac{8}{8}$ and $\frac{6}{8}$

   d. $\frac{10}{10}+\frac{1}{10}=\frac{11}{10}$, $\frac{11}{10}-\frac{7}{10}=\frac{4}{10}$; $\frac{10}{10}-\frac{7}{10}=\frac{3}{10}$, $\frac{3}{10}+\frac{1}{10}=\frac{4}{10}$; number bond shows $1\frac{1}{10}$ is $\frac{10}{10}$ and $\frac{1}{10}$

   e. $\frac{12}{12}+\frac{3}{12}=\frac{15}{12}$, $\frac{15}{12}-\frac{6}{12}=\frac{9}{12}$; $\frac{12}{12}-\frac{6}{12}=\frac{6}{12}$, $\frac{6}{12}+\frac{3}{12}=\frac{9}{12}$; number bond shows $1\frac{3}{12}$ is $\frac{12}{12}$ and $\frac{3}{12}$

Exit Ticket

1. $\frac{3}{5}$; number line models solution; solved by counting up and subtracting

2. $\frac{7}{7}+\frac{2}{7}=\frac{9}{7}$, $\frac{9}{7}-\frac{5}{7}=\frac{4}{7}$; $\frac{7}{7}-\frac{5}{7}=\frac{2}{7}$, $\frac{2}{7}+\frac{2}{7}=\frac{4}{7}$; number bond shows $1\frac{2}{7}$ is $\frac{7}{7}$ and $\frac{2}{7}$

Homework

1. a. $\frac{5}{6}+\frac{4}{6}=\frac{9}{6}$, $\frac{4}{6}+\frac{5}{6}=\frac{9}{6}$, $\frac{9}{6}-\frac{5}{6}=\frac{4}{6}$, $\frac{9}{6}-\frac{4}{6}=\frac{5}{6}$

   b. $\frac{5}{9}+\frac{8}{9}=\frac{13}{9}$, $\frac{8}{9}+\frac{5}{9}=\frac{13}{9}$, $\frac{13}{9}-\frac{5}{9}=\frac{8}{9}$, $\frac{13}{9}-\frac{8}{9}=\frac{5}{9}$

2. a. $\frac{3}{8}$; number line models solution; solved by counting up and subtracting

   b. $\frac{3}{5}$; number line models solution; solved by counting up and subtracting

   c. $\frac{4}{6}$; number line models solution; solved by counting up and subtracting

   d. $\frac{3}{4}$; number line models solution; solved by counting up and subtracting

   e. $\frac{2}{3}$; number line models solution; solved by counting up and subtracting

   f. $\frac{4}{5}$; Number line models solution; solved by counting up and subtracting

3. a. Answer provided

   b. $\frac{8}{8}+\frac{3}{8}=\frac{11}{8}$, $\frac{11}{8}-\frac{7}{8}=\frac{4}{8}$; $\frac{8}{8}-\frac{7}{8}=\frac{1}{8}$, $\frac{1}{8}+\frac{3}{8}=\frac{4}{8}$; number bond shows $1\frac{3}{8}$ is $\frac{8}{8}$ and $\frac{3}{8}$

   c. $\frac{4}{4}+\frac{1}{4}=\frac{5}{4}$, $\frac{5}{4}-\frac{3}{4}=\frac{2}{4}$; $\frac{4}{4}-\frac{3}{4}=\frac{1}{4}$, $\frac{1}{4}+\frac{1}{4}=\frac{2}{4}$; number bond shows $1\frac{1}{4}$ is $\frac{4}{4}$ and $\frac{1}{4}$

   d. $\frac{7}{7}+\frac{2}{7}=\frac{9}{7}$, $\frac{9}{7}-\frac{5}{7}=\frac{4}{7}$; $\frac{7}{7}-\frac{5}{7}=\frac{2}{7}$, $\frac{2}{7}+\frac{2}{7}=\frac{4}{7}$; number bond shows $1\frac{2}{7}$ is $\frac{7}{7}$ and $\frac{2}{7}$

   e. $\frac{10}{10}+\frac{3}{10}=\frac{13}{10}$, $\frac{13}{10}-\frac{7}{10}=\frac{6}{10}$; $\frac{10}{10}-\frac{7}{10}=\frac{3}{10}$, $\frac{3}{10}+\frac{3}{10}=\frac{6}{10}$; number bond shows $1\frac{3}{10}$ is $\frac{10}{10}$ and $\frac{3}{10}$

Lesson 18

Practice Sheet

a. $\frac{8}{8}$

b. $\frac{7}{6}$

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

d. $\frac{4}{12}$

e. $\mathbf{\frac{10}{8}}$

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

Problem Set

1. a. $1\frac{1}{5}$
   b. $1\frac{1}{6}$
   c. 2
   d. $\frac{3}{8}$
   e. $1\frac{3}{9}$
   f. 2
   g. $\frac{5}{12}$
   h. 1
   i. 2

2. Answers will vary.

3. Answers will vary.

Exit Ticket

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

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

Homework

1. a. $1\frac{1}{3}$
   b. $1\frac{5}{8}$
   c. $1\frac{5}{6}$
   d. $\frac{11}{12}$
   e. $1\frac{3}{7}$
   f. 2
   g. $\frac{6}{10}$
   h. $\frac{3}{5}$
   i. 2

2. Answers will vary.

3. Answers will vary.

Lesson 19

Problem Set

1. $1\frac{6}{10}$ mi
2. $\frac{5}{8}$
3. $\frac{3}{7}$
4. $\frac{5}{8}$
5. $\frac{3}{4}$
6. $1\frac{5}{8}$ gal

Exit Ticket

1. $1\frac{7}{10}$ lb
2. $\frac{3}{4}$

Homework

1. $1\frac{2}{4}$ mi
2. $\frac{2}{3}$ hr
3. $1\frac{7}{8}$ lb
4. $1\frac{7}{8}$ c
5. $\frac{1}{6}$
6. $\frac{2}{4}$ page

Lesson 20

Problem Set

1. a. 2, 1, 3
   b. Tape diagrams model
   $\frac{1}{4}+\frac{1}{12}=\frac{3}{12}+\frac{1}{12}=\frac{4}{12}$
   c. Tape diagrams model $\frac{2}{6}+\frac{1}{3}=\frac{2}{6}+\frac{2}{6}=\frac{4}{6}$
   d. Tape diagrams model $\frac{1}{2}+\frac{3}{8}=\frac{4}{8}+\frac{3}{8}=\frac{7}{8}$
   e. Tape diagrams model
   $\frac{3}{10}+\frac{3}{5}=\frac{3}{10}+\frac{6}{10}=\frac{9}{10}$
   f. Tape diagrams model $\frac{2}{3}+\frac{2}{9}=\frac{6}{9}+\frac{2}{9}=\frac{8}{9}$

2. a. Answer provided
   b. Number line models $\frac{1}{2}+\frac{4}{10}$; $\frac{5}{10}+\frac{4}{10}=\frac{9}{10}$
   c. Number line models $\frac{6}{10}+\frac{1}{2}$; $\frac{6}{10}+\frac{5}{10}=\frac{11}{10}$
   d. Number line models $\frac{2}{3}+\frac{3}{6}$; $\frac{4}{6}+\frac{3}{6}=\frac{7}{6}$
   e. Number line models $\frac{3}{4}+\frac{6}{8}$; $\frac{6}{8}+\frac{6}{8}=\frac{12}{8}$
   f. Number line models $\frac{4}{10}+\frac{6}{5}$; $\frac{4}{10}+\frac{12}{10}=\frac{16}{10}$

3. $\frac{8}{6}$

Exit Ticket

1. Number line models $\frac{5}{8}+\frac{2}{4}$; $\frac{5}{8}+\frac{4}{8}=\frac{9}{8}$

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

Homework

1. a. Tape diagrams model $\frac{1}{3}+\frac{1}{6}=\frac{2}{6}+\frac{1}{6}=\frac{3}{6}$
   b. Tape diagrams model $\frac{1}{2}+\frac{1}{4}=\frac{2}{4}+\frac{1}{4}=\frac{3}{4}$
   c. Tape diagrams model $\frac{3}{4}+\frac{1}{8}=\frac{6}{8}+\frac{1}{8}=\frac{7}{8}$
   d. Tape diagrams model
   $\frac{1}{4}+\frac{5}{12}=\frac{3}{12}+\frac{5}{12}=\frac{8}{12}$
   e. Tape diagrams model $\frac{3}{8}+\frac{1}{2}=\frac{3}{8}+\frac{4}{8}=\frac{7}{8}$
   f. Tape diagrams model
   $\frac{3}{5}+\frac{3}{10}=\frac{6}{10}+\frac{3}{10}=\frac{9}{10}$

2. a. Answer provided
   b. Number line models $\frac{3}{5}+\frac{7}{10}$; $\frac{6}{10}+\frac{7}{10}=\frac{13}{10}$
   c. Number line models $\frac{5}{12}+\frac{1}{4}$; $\frac{5}{12}+\frac{3}{12}=\frac{8}{12}$
   d. Number line models $\frac{3}{4}+\frac{5}{8}$; $\frac{6}{8}+\frac{5}{8}=\frac{11}{8}$
   e. Number line models $\frac{7}{8}+\frac{3}{4}$; $\frac{7}{8}+\frac{6}{8}=\frac{13}{8}$
   f. Number line models $\frac{1}{6}+\frac{5}{3}$; $\frac{1}{6}+\frac{10}{6}=\frac{11}{6}$

3. $\frac{7}{6}$

Lesson 21

Sprint

Side A

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

Side B

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

Problem Set

1. a. Tape diagrams represent $\frac{3}{4}$ and $\frac{2}{4}$; $\frac{3}{4}+\frac{2}{4}=\frac{5}{4}$; number bond shows $\frac{5}{4}$ as $\frac{4}{4}$ and $\frac{1}{4}$; $1\frac{1}{4}$

   b. Tape diagrams represent $\frac{4}{6}$ and $\frac{3}{6}$; $\frac{4}{6}+\frac{3}{6}=\frac{7}{6}$; number bond shows $\frac{7}{6}$ as $\frac{6}{6}$ and $\frac{1}{6}$; $1\frac{1}{6}$

   c. Tape diagrams represent $\frac{5}{6}$ and $\frac{2}{6}$; $\frac{5}{6}+\frac{2}{6}=\frac{7}{6}$; number bond shows $\frac{7}{6}$ as $\frac{6}{6}$ and $\frac{1}{6}$; $1\frac{1}{6}$

   d. Tape diagrams represent $\frac{8}{10}$ and $\frac{7}{10}$; $\frac{8}{10}+\frac{7}{10}=\frac{15}{10}$; number bond shows $\frac{15}{10}$ as $\frac{10}{10}$ and $\frac{5}{10}$; $1\frac{5}{10}$

2. a. Number line models $\frac{2}{4}+\frac{3}{4}$; $\frac{2}{4}+\frac{3}{4}=\frac{5}{4}$; number bond shows $\frac{5}{4}$ as $\frac{4}{4}$ and $\frac{1}{4}$; $1\frac{1}{4}$

   b. Number line models $\frac{4}{8}+\frac{6}{8}$; $\frac{4}{8}+\frac{6}{8}=\frac{10}{8}$; number bond shows $\frac{10}{8}$ as $\frac{8}{8}$ and $\frac{2}{8}$; $1\frac{2}{8}$

   c. Number line models $\frac{7}{10}+\frac{6}{10}$; $\frac{7}{10}+\frac{6}{10}=\frac{13}{10}$; number bond shows $\frac{13}{10}$ as $\frac{10}{10}$ and $\frac{3}{10}$; $1\frac{3}{10}$

   d. Number line models $\frac{4}{6}+\frac{5}{6}$; $\frac{4}{6}+\frac{5}{6}=\frac{9}{6}$; number bond shows $\frac{9}{6}$ as $\frac{6}{6}$ and $\frac{3}{6}$; $1\frac{3}{6}$

3. a. $\frac{6}{8}+\frac{2}{8}=\frac{8}{8}=1$

   b. $\frac{4}{6}+\frac{3}{6}=\frac{7}{6}=1\frac{1}{6}$

   c. $\frac{4}{6}+\frac{4}{6}=\frac{8}{6}=1\frac{2}{6}$

   d. $\frac{8}{10}+\frac{6}{10}=\frac{14}{10}=1\frac{4}{10}$

   e. $\frac{5}{8}+\frac{6}{8}=\frac{11}{8}=1\frac{3}{8}$

   f. $\frac{5}{8}+\frac{4}{8}=\frac{9}{8}=1\frac{1}{8}$

   g. $\frac{4}{8}+\frac{5}{8}=\frac{9}{8}=1\frac{1}{8}$

   h. $\frac{3}{10}+\frac{8}{10}=\frac{11}{10}=1\frac{1}{10}$

Exit Ticket

1. $\frac{1}{4}+\frac{7}{8}=\frac{2}{8}+\frac{7}{8}=\frac{9}{8}$; number bond shows $\frac{9}{8}$ as $\frac{8}{8}$ and $\frac{1}{8}$; $1\frac{1}{8}$

2. $\frac{2}{3}+\frac{7}{12}=\frac{8}{12}+\frac{7}{12}=\frac{15}{12}$; number bond shows $\frac{15}{12}$ as $\frac{12}{12}$ and $\frac{3}{12}$; $1\frac{3}{12}$

Homework

1. a. Tape diagrams represent $\frac{7}{8}$ and $\frac{2}{8}$; $\frac{7}{8}+\frac{2}{8}=\frac{9}{8}$; number bond shows $\frac{9}{8}$ as $\frac{8}{8}$ and $\frac{1}{8}$; $1\frac{1}{8}$

   b. Tape diagrams represent $\frac{4}{8}$ and $\frac{4}{8}$; $\frac{4}{8}+\frac{4}{8}=\frac{8}{8}$; 1

   c. Tape diagrams represent $\frac{4}{6}$ and $\frac{3}{6}$; $\frac{4}{6}+\frac{3}{6}=\frac{7}{6}$; number bond shows $\frac{7}{6}$ as $\frac{6}{6}$ and $\frac{1}{6}$; $1\frac{1}{6}$

   d. Tape diagrams represent $\frac{6}{10}$ and $\frac{8}{10}$; $\frac{6}{10}+\frac{8}{10}=\frac{14}{10}$; number bond shows $\frac{14}{10}$ as $\frac{10}{10}$ and $\frac{4}{10}$; $1\frac{4}{10}$

2. a. Number line models $\frac{4}{8}+\frac{5}{8}$; $\frac{4}{8}+\frac{5}{8}=\frac{9}{8}$; number bond shows $\frac{9}{8}$ as $\frac{8}{8}$ and $\frac{1}{8}$; $1\frac{1}{8}$

   b. Number line models $\frac{6}{8}+\frac{3}{8}$; $\frac{6}{8}+\frac{3}{8}=\frac{9}{8}$; number bond shows $\frac{9}{8}$ as $\frac{8}{8}$ and $\frac{1}{8}$; $1\frac{1}{8}$

   c. Number line models $\frac{4}{10}+\frac{8}{10}$; $\frac{4}{10}+\frac{8}{10}=\frac{12}{10}$; number bond shows $\frac{12}{10}$ as $\frac{10}{10}$ and $\frac{2}{10}$; $1\frac{2}{10}$

   d. Number line models $\frac{2}{6}+\frac{5}{6}$; $\frac{2}{6}+\frac{5}{6}=\frac{7}{6}$; number bond shows $\frac{7}{6}$ as $\frac{6}{6}$ and $\frac{1}{6}$; $1\frac{1}{6}$

3. a. $\frac{4}{8}+\frac{6}{8}=\frac{10}{8}=1\frac{2}{8}$

   b. $\frac{7}{8}+\frac{6}{8}=\frac{13}{8}=1\frac{5}{8}$

   c. $\frac{5}{6}+\frac{2}{6}=\frac{7}{6}=1\frac{1}{6}$

   d. $\frac{9}{10}+\frac{4}{10}=\frac{13}{10}=1\frac{3}{10}$

   e. $\frac{4}{12}+\frac{9}{12}=\frac{13}{12}=1\frac{1}{12}$

   f. $\frac{3}{6}+\frac{5}{6}=\frac{8}{6}=1\ \frac{2}{8}$

   g. $\frac{3}{12}+\frac{10}{12}=\frac{13}{12}=1\frac{1}{12}$

   h. $\frac{7}{10}+\frac{8}{10}=\frac{15}{10}=1\frac{5}{10}$

Lesson 22

Sprint

Side A

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

Side B

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

Problem Set

1. a. Tape diagram drawn; $3\frac{1}{3}$
   b. Tape diagram drawn; $4\frac{3}{4}$
   c. Tape diagram drawn; $2\frac{3}{4}$
   d. Tape diagram drawn; $4\frac{3}{5}$
2. a. $6\frac{3}{8} - \frac{3}{8} = 6, 6\frac{3}{8} - 6 = \frac{3}{8}, 6 + \frac{3}{8} = 6\frac{3}{8}, \frac{3}{8} + 6 = 6\frac{3}{8}$
   b. $9 - \frac{4}{7} = 8\frac{3}{7}, 9 - 8\frac{3}{7} = \frac{4}{7}, 8\frac{3}{7} + \frac{4}{7} = 9, \frac{4}{7} + 8\frac{3}{7} = 9$
3. a. Answer provided
   b. $4\frac{1}{3}$; number bond shows 5 as 4 and $\frac{3}{3}$; number line drawn
   c. $6\frac{5}{8}$; number bond shows 7 as 6 and $\frac{8}{8}$; number line drawn
   d. $9\frac{6}{10}$; number bond shows 10 as 9 and $\frac{10}{10}$; number line drawn
4. a. $2\frac{9}{10}$; number bond shows 3 as 2 and $\frac{10}{10}$
   b. $4\frac{1}{4}$; number bond shows 5 as 4 and $\frac{4}{4}$
   c. $5\frac{3}{8}$; number bond shows 6 as 5 and $\frac{8}{8}$
   d. $6\frac{6}{9}$; number bond shows 7 as 6 and $\frac{9}{9}$
   e. $7\frac{4}{10}$; number bond shows 8 as 7 and $\frac{10}{10}$
   f. $28\frac{3}{12}$; number bond shows 29 as 28 and $\frac{12}{12}$

Exit Ticket

1. $5\frac{4}{5}$; number bond shows 6 as 5 and $\frac{5}{5}$.
2. $7\frac{1}{6}$; number bond shows 8 as 7 and $\frac{6}{6}$.
3. $6\frac{3}{8}$; number bond shows 7 as 6 and $\frac{8}{8}$.

Homework

1. a. Tape diagram drawn; $2\frac{1}{4}$
   b. Tape diagram drawn; $3\frac{2}{3}$
   c. Tape diagram drawn; $1\frac{4}{5}$
   d. Tape diagram drawn; $2\frac{1}{4}$
2. a. $4\frac{5}{8}-\frac{5}{8}=4, 4\frac{5}{8}-4=\frac{5}{8}, 4+\frac{5}{8}=4\frac{5}{8}, \frac{5}{8}+4=4\frac{5}{8}$
   b. $6-\frac{2}{7}=5\frac{5}{7}, 6-5\frac{5}{7}=\frac{2}{7}, 5\frac{5}{7}+\frac{2}{7}=6, \frac{2}{7}+5\frac{5}{7}=6$
3. a. Answer provided
   b. $7\frac{1}{6}$; number bond shows 8 as 7 and $\frac{6}{6}$; number line drawn
   c. $6\frac{1}{5}$; number bond shows 7 as 6 and $\frac{5}{5}$; number line drawn
   d. $2\frac{7}{10}$; number bond shows 3 as 2 and $\frac{10}{10}$; number line drawn
4. a. $5\frac{3}{4}$; number bond shows 6 as 5 and $\frac{4}{4}$
   b. $6\frac{8}{10}$; number bond shows 7 as 6 and $\frac{10}{10}$
   c. $4\frac{1}{6}$; number bond shows 5 as 4 and $\frac{6}{6}$
   d. $5\frac{2}{8}$; number bond shows 6 as 5 and $\frac{8}{8}$
   e. $2\frac{1}{8}$; number bond shows 3 as 2 and $\frac{8}{8}$
   f. $25\frac{3}{10}$; number bond shows 26 as 25 and $\frac{10}{10}$

Lesson 23

Problem Set

1. a. $\frac{0}{3}, \frac{1}{3}, \frac{2}{3}, \frac{3}{3}, \frac{4}{3}, \frac{5}{3}, \frac{6}{3}; \frac{0}{3}, \frac{3}{3}, \frac{6}{3}$ circled; 0, 1, 2 recorded

   b. $\frac{0}{2}, \frac{1}{2}, \frac{2}{2}, \frac{3}{2}, \frac{4}{2}, \frac{5}{2}, \frac{6}{2}, \frac{7}{2}, \frac{8}{2}; \frac{0}{2}, \frac{2}{2}, \frac{4}{2}, \frac{6}{2}, \frac{8}{2}$ circled; 0, 1, 2, 3, 4 recorded

2. $\left(\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}\right)+\left(\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}\right)+\left(\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}\right)=3$

3. a. Answer provided

   b. $6 \times \frac{1}{2} = 3 \times \frac{2}{2} = 3$; number line supports answer.

   c. $12 \times \frac{1}{4} = 3 \times \frac{4}{4} = 3$; number line supports answer.

4. a. Answer provided

   b. $7 \times \frac{1}{2} = \left(3 \times \frac{2}{2}\right) + \frac{1}{2} = 3 + \frac{1}{2} = 3\frac{1}{2}$; number line supports answer.

   c. $10 \times \frac{1}{4} = \left(2 \times \frac{4}{4}\right) + \frac{2}{4} = 2 + \frac{2}{4} = 2\frac{2}{4}$; number line supports answer.

   d. $14 \times \frac{1}{3} = \left(4 \times \frac{3}{3}\right) + \frac{2}{3} = 4 + \frac{2}{3} = 4\frac{2}{3}$; number line supports answer.

Exit Ticket

1. $8 \times \frac{1}{2} = 4 \times \frac{2}{2} = 4$; number line supports answer.
2. $7 \times \frac{1}{4} = \left(1 \times \frac{4}{4}\right) + \frac{3}{4} = 1\frac{3}{4}$; number line supports answer.
3. $13 \times \frac{1}{3} = \left(4 \times \frac{3}{3}\right) + \frac{1}{3} = 4\frac{1}{3}$; number line supports answer.

Homework

1. a. $\frac{0}{4}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}; \frac{0}{4}, \frac{4}{4}$ circled; 0, 1 recorded

   b. $\frac{0}{6}, \frac{1}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}, \frac{6}{6}, \frac{7}{6}, \frac{8}{6}, \frac{9}{6}, \frac{10}{6}, \frac{11}{6}, \frac{12}{6}, \frac{13}{6}, \frac{14}{6}; \frac{0}{6}, \frac{6}{6}, \frac{12}{6}$ circled ; 0, 1, 2 recorded

2. $\left(\frac{1}{3}+\frac{1}{3}+\frac{1}{3}\right)+\left(\frac{1}{3}+\frac{1}{3}+\frac{1}{3}\right)+\left(\frac{1}{3}+\frac{1}{3}+\frac{1}{3}\right)+\left(\frac{1}{3}+\frac{1}{3}+\frac{1}{3}\right)=4$

3. a. Answer provided

   b. $10 \times \frac{1}{2} = 5 \times \frac{2}{2} = 5$; number line supports answer.

   c. $8 \times \frac{1}{4} = 2 \times \frac{4}{4} = 2$; number line supports answer.

4. a. Answer provided

   b. $7 \times \frac{1}{4} = \left(1 \times \frac{4}{4}\right) + \frac{3}{4} = 1 + \frac{3}{4} = 1\frac{3}{4}$; number line supports answer.

   c. $11 \times \frac{1}{5} = \left(2 \times \frac{5}{5}\right) + \frac{1}{5} = 2 + \frac{1}{5} = 2\frac{1}{5}$; number line supports answer.

   d. $7 \times \frac{1}{2} = \left(3 \times \frac{2}{2}\right) + \frac{1}{2} = 3 + \frac{1}{2} = 3\frac{1}{2}$; number line supports answer.

   e. $9 \times \frac{1}{5} = \left(1 \times \frac{5}{5}\right) + \frac{4}{5} = 1 + \frac{4}{5} = 1\frac{4}{5}$; number line supports answer.

Lesson 24

Problem Set

1. a. Answer provided.

   b. $2\frac{2}{5}$; number bond shows $\frac{12}{5}$ as $\frac{10}{5}$ and $\frac{2}{5}$; number line drawn

   c. $6\frac{1}{2}$; number bond shows $\frac{13}{2}$ as $\frac{12}{2}$ and $\frac{1}{2}$; number line drawn

   d. $3\frac{3}{4}$; number bond shows $\frac{15}{4}$ as $\frac{12}{4}$ and $\frac{3}{4}$; number line drawn

2. a. Answer provided

   b. $\frac{9}{2} = \frac{2 \times 4}{2} + \frac{1}{2} = 4 + \frac{1}{2} = 4\frac{1}{2}$; number line drawn

   c. $\frac{17}{4} = \frac{4 \times 4}{4} + \frac{1}{4} = 4 + \frac{1}{4} = 4\frac{1}{4}$; number line drawn

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

   b. $3\frac{2}{5}$

   c. $4\frac{1}{6}$

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

   e. $4\frac{6}{8}$

   f. $5\frac{3}{9}$

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

   h. $8\frac{4}{10}$

   i. $3\frac{1}{12}$

Exit Ticket

1. $3\frac{2}{5}$; number bond shows $\frac{17}{5}$ as $\frac{15}{5}$ and $\frac{2}{5}$; number line drawn
2. $6\frac{1}{3}$; number line drawn
3. $2\frac{3}{4}$

Homework

1. a. Answer provided.
   b. $3\frac{1}{4}$; number bond shows $\frac{13}{4}$ as 3 and $\frac{1}{4}$; number line drawn
   c. $3\frac{1}{5}$; number bond shows $\frac{16}{5}$ as 3 and $\frac{1}{5}$; number line drawn
   d. $7\frac{1}{2}$; number bond shows $\frac{15}{2}$ as 7 and $\frac{1}{2}$; number line drawn
   e. $5\frac{2}{3}$; number bond shows $\frac{17}{3}$ as 5 and $\frac{2}{3}$; number line drawn

2. a. Answer provided.
   b. $\frac{13}{2} = \frac{2 \times 6}{2} + \frac{1}{2} = 6 + \frac{1}{2} = 6\frac{1}{2}$; number line drawn
   c. $\frac{18}{4} = \frac{4 \times 4}{4} + \frac{2}{4} = 4 + \frac{2}{4} = 4\frac{2}{4}$; number line drawn

3. a. $4\frac{2}{3}$
   b. $4\frac{1}{4}$
   c. $5\frac{2}{5}$
   d. $4\frac{4}{6}$
   e. $3\frac{2}{7}$
   f. $4\frac{5}{8}$
   g. $5\frac{6}{9}$
   h. $7\frac{4}{10}$
   i. $3\frac{9}{12}$

Lesson 25

Problem Set

1. a. Answer provided.
   b. $\frac{14}{5}$; number line models work.
   c. $\frac{29}{8}$; number line models work.
   d. $\frac{44}{10}$; number line models work.
   e. $\frac{43}{9}$; number line models work.
2. a. Answer provided.
   b. $4\frac{1}{3} = 4 + \frac{1}{3} = \left(4 \times \frac{3}{3}\right) + \frac{1}{3} = \frac{12}{3} + \frac{1}{3} = \frac{13}{3}$
   c. $4\frac{3}{5} = 4 + \frac{3}{5} = \left(4 \times \frac{5}{5}\right) + \frac{3}{5} = \frac{20}{5} + \frac{3}{5} = \frac{23}{5}$
   d. $4\frac{6}{8} = 4 + \frac{6}{8} = \left(4 \times \frac{8}{8}\right) + \frac{6}{8} = \frac{32}{8} + \frac{6}{8} = \frac{38}{8}$
3. a. $\frac{11}{4}$
   b. $\frac{12}{5}$
   c. $\frac{21}{6}$
   d. $\frac{27}{8}$
   e. $\frac{31}{10}$
   f. $\frac{35}{8}$
   g. $\frac{17}{3}$
   h. $\frac{13}{2}$
   i. $\frac{73}{10}$

Exit Ticket

1. $\frac{16}{5}$
2. $\frac{13}{5}$
3. $\frac{38}{9}$

Homework

1. a. Answer provided.

   b. $\frac{22}{5}$; number line models work.

   c. $\frac{43}{8}$; number line models work.

   d. $\frac{37}{10}$; number line models work.

   e. $\frac{56}{9}$; number line models work.

2. a. Answer provided.

   b. $5\frac{2}{3} = 5 + \frac{2}{3} = \left(5 \times \frac{3}{3}\right) + \frac{2}{3} = \frac{15}{3} + \frac{2}{3} = \frac{17}{3}$

   c. $4\frac{1}{5} = 4 + \frac{1}{5} = \left(4 \times \frac{5}{5}\right) + \frac{1}{5} = \frac{20}{5} + \frac{1}{5} = \frac{21}{5}$

   d. $3\frac{7}{8} = 3 + \frac{7}{8} = \left(3 \times \frac{8}{8}\right) + \frac{7}{8} = \frac{24}{8} + \frac{7}{8} = \frac{31}{8}$

3. a. $\frac{7}{3}$

   b. $\frac{11}{4}$

   c. $\frac{17}{5}$

   d. $\frac{19}{6}$

   e. $\frac{53}{12}$

   f. $\frac{22}{5}$

   g. $\frac{41}{10}$

   h. $\frac{26}{5}$

   i. $\frac{35}{6}$

   j. $\frac{25}{4}$

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

   l. $\frac{95}{12}$

Lesson 26

Problem Set

1. a. $2\frac{7}{8}, 3\frac{1}{6}, \frac{29}{12}$ plotted
   b. i. <
      ii. <
2. a. $\frac{70}{9}, 8\frac{2}{4}, \frac{25}{3}$ plotted
   b. i. >
      ii. <
   c. Explanations will vary.
3. a. >; explanations will vary.
   b. <; explanations will vary.
   c. <; explanations will vary.
   d. <; explanations will vary.
   e. >; explanations will vary.
   f. >; explanations will vary.
   g. <; explanations will vary.
   h. >; explanations will vary.
   i. <; explanations will vary.
   j. <; explanations will vary.

Exit Ticket

1. =
2. >
3. >
4. >

Homework

1. a. $2\frac{1}{6}$, $3\frac{3}{4}$, $\frac{33}{9}$ plotted
   b. i. >
   ii. <
2. a. $\frac{65}{8}$, $8\frac{5}{6}$, $\frac{29}{4}$ plotted
   b. i. >
   ii. <
   c. Explanations will vary.
3. a. <; explanations will vary.
   b. <; explanations will vary.
   c. <; explanations will vary.
   d. >; explanations will vary.
   e. >; explanations will vary.
   f. >; explanations will vary.
   g. <; explanations will vary.
   h. <; explanations will vary.
   i. <; explanations will vary.
   j. >; explanations will vary.

Lesson 27

Problem Set

1. a. Tape diagram models comparison; <
   b. Tape diagram models comparison; <
   c. Tape diagram models comparison; >
   d. Tape diagram models comparison; <
2. a. Area model shows like units; >
   b. Area model shows like units; >
3. a. >
   b. <
   c. >
   d. >
   e. >
   f. >
   g. >
   h. <
   i. <
   j. >

Exit Ticket

1. >
2. <
3. <
4. <

Homework

1. a. Tape diagram models comparison; <
   b. Tape diagram models comparison; =
   c. Tape diagram models comparison; >
   d. Tape diagram models comparison; <
2. a. Area model shows like units; >
   b. Area model shows like units; <
3. a. >
   b. <
   c. >
   d. <
   e. >
   f. <
   g. >
   h. >
   i. >
   j. >

Lesson 28

Problem Set

1. Line plot created accurately
2. a. Morgan
   b. Morgan
   c. Saisha and Anson; 9 quarter miles
   d. 2 miles
   e. $1\frac{3}{4} > 1\frac{5}{8}$
   f. $1\frac{2}{8}$ miles
   g. $1\frac{3}{10} > 1\frac{2}{8}$; Mr. Reynolds
3. Answers will vary.

Exit Ticket

1. Line plot created accurately
2. $2\frac{1}{4}$ hours; Gail

Homework

1. Line plot created accurately
2. a. Mary
   b. Ben
   c. 31 quarter inches
   d. $\frac{1}{4}$ inch
   e. $7\frac{1}{2} < 7\frac{3}{4}$
   f. 4
   g. 8
   h. $\frac{25}{2} > 8\frac{3}{4}$; Mr. Jones
3. Answers will vary.

Lesson 29

Problem Set

1. a. 4; explanations will vary.
   b. 8; explanations will vary.
   c. 7; explanations will vary.
   d. 4; explanations will vary.
   e. $8\frac{1}{2}$; explanations will vary.
2. a. 6; explanations will vary.
   b. 3.5; explanations will vary.
   c. $8\frac{1}{2}$; explanations will vary.
3. Julio's; explanations will vary.
4. a. 45
   b. 58
   c. 9 or $9\frac{1}{2}$
   d. 2

Exit Ticket

1. 5; explanations will vary.
2. $8\frac{1}{2}$; explanations will vary.

Homework

1. a. 5; explanations will vary.
   b. 8; explanations will vary.
   c. 5; explanations will vary.
   d. 3; explanations will vary.
   e. 11; explanations will vary.
2. a. 7.5; explanations will vary.
   b. 2; explanations will vary.
   c. 10 or 10.5; explanations will vary.
3. Gina's; explanations will vary.
4. a. 24
   b. 26
   c. 7
   d. 4

Lesson 30

Sprint

Side A

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

Side B

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

Problem Set

1. a. $3\frac{2}{4}$
   b. 8
   c. $5\frac{5}{8}$
   d. 7
2. a. $\frac{1}{8}$
   b. $\frac{3}{5}$
   c. $\frac{5}{6}$
   d. $\frac{11}{12}$
3. a. Number bond and arrow way used to make one; $3\frac{1}{4}$
   b. Number bond and arrow way used to make one; $4\frac{1}{5}$
4. a. $5\frac{1}{3}$
   b. $4\frac{2}{5}$
   c. $6\frac{3}{6}$
   d. $7\frac{3}{8}$
   e. $8\frac{6}{10}$
   f. $10\frac{6}{12}$
   g. $3\frac{57}{100}$
   h. $17\frac{28}{100}$
5. Explanations will vary.

Exit Ticket

1. $\frac{3}{5}$
2. $3\frac{2}{8}$

Homework

1. a. $4\frac{2}{3}$
   b. $5\frac{3}{4}$
   c. 4
   d. 8
2. a. $\frac{1}{6}$
   b. $\frac{4}{7}$
   c. $\frac{7}{8}$
   d. $\frac{8}{12}$
3. a. Number bond and arrow way used to make one; $3\frac{1}{5}$
   b. Number bond and arrow way used to make one; $4\frac{1}{3}$
   c. Number bond and arrow way used to make one; $5\frac{3}{6}$
4. a. $3\frac{1}{5}$
   b. $4\frac{2}{8}$
   c. $6\frac{1}{6}$
   d. $7\frac{3}{10}$
   e. $9\frac{4}{10}$
   f. $8\frac{7}{12}$
   g. $4\frac{48}{100}$
   h. $15\frac{39}{100}$
5. Explanations will vary.

Lesson 31

Sprint

Side A

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

Side B

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

Problem Set

1. a. 6
   b. $7\frac{3}{4}$
   c. 9
2. a. $4\frac{1}{5}$; number line used
   b. $5\frac{2}{4}$; number line used
   c. $6\frac{1}{8}$; number line used
3. a. $4\frac{3}{6}$; arrow way used to make one
   b. $5\frac{2}{4}$; arrow way used to make one
   c. $6\frac{1}{8}$; arrow way used to make one
4. a. $5\frac{2}{5}$
   b. $6\frac{5}{8}$
   c. $6\frac{3}{12}$

Exit Ticket

1. 4
2. $6\frac{2}{5}$

Homework

1. a. 4
   b. $4\frac{4}{5}$
   c. 5
2. a. $4\frac{1}{4}$; number line used
   b. $6\frac{3}{6}$; number line used
   c. $3\frac{4}{12}$; number line used
3. a. $4\frac{2}{4}$; arrow way used to make one
   b. $6\frac{3}{8}$; arrow way used to make one
   c. $6\frac{3}{9}$; arrow way used to make one
4. a. $3\frac{2}{5}$
   b. $5\frac{3}{10}$
   c. $6\frac{4}{7}$

Lesson 32

Problem Set

1. a. $3\frac{2}{4}$; number line or arrow way drawn
   b. $4\frac{4}{10}$; number line or arrow way drawn
   c. $4\frac{2}{3}$; number line or arrow way drawn
   d. $8\frac{4}{5}$; number line or arrow way drawn
2. a. $4\frac{4}{5}$; number line or arrow way drawn
   b. $3\frac{3}{4}$; number line or arrow way drawn
   c. $4\frac{2}{3}$; number line or arrow way drawn
   d. $1\frac{6}{8}$; number line or arrow way drawn
3. a. Answer provided
   b. $4\frac{2}{8}$; total decomposed as $4\frac{1}{8}$ and 1
   c. $4\frac{4}{5}$; total decomposed as $4\frac{3}{5}$ and 1
   d. $4\frac{5}{6}$; total decomposed as $4\frac{4}{6}$ and 1
   e. $5\frac{9}{12}$; total decomposed as $5\frac{4}{12}$ and 1
   f. $8\frac{4}{8}$; total decomposed as $8\frac{1}{8}$ and 1
   g. $6\frac{2}{6}$; total decomposed as $6\frac{1}{6}$ and 1
   h. $7\frac{9}{10}$; total decomposed as $7\frac{3}{10}$ and 1
   i. $11\frac{4}{5}$; total decomposed as $11\frac{3}{5}$ and 1
   j. $10\frac{3}{6}$; total decomposed as $10\frac{2}{6}$ and 1

Exit Ticket

1. $10\frac{1}{6}$
2. $7\frac{5}{8}$

Homework

1. a. $6\frac{2}{5}$; number line or arrow way drawn
   b. $4\frac{2}{12}$; number line or arrow way drawn
   c. $6\frac{2}{4}$; number line or arrow way drawn
   d. $7\frac{6}{8}$; number line or arrow way drawn
2. a. $1\frac{3}{5}$; number line or arrow way drawn
   b. $1\frac{2}{3}$; number line or arrow way drawn
   c. $3\frac{3}{6}$; number line or arrow way drawn
   d. $2\frac{4}{6}$; number line or arrow way drawn
   e. $8\frac{4}{8}$; number line or arrow way drawn
   f. $6\frac{5}{10}$; number line or arrow way drawn
   g. $9\frac{4}{8}$; number line or arrow way drawn
   h. $8\frac{9}{12}$; number line or arrow way drawn
   i. $10\frac{4}{5}$; number line or arrow way drawn
   j. $16\frac{5}{9}$; number line or arrow way drawn
3. a. Answer provided
   b. $4\frac{4}{5}$; total decomposed as $4\frac{2}{5}$ and 1
   c. $6\frac{6}{8}$; total decomposed as $6\frac{1}{8}$ and 1
   d. $2\frac{8}{9}$; total decomposed as $2\frac{3}{9}$ and 1
   e. $5\frac{6}{10}$; total decomposed as $5\frac{3}{10}$ and 1
   f. $1\frac{6}{9}$; total decomposed as $1\frac{5}{9}$ and 1

Lesson 33

Sprint

Side A

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

Side B

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

Problem Set

1. a. $1\frac{2}{3}, 1\frac{2}{3}$
   b. $2\frac{2}{4}, 2\frac{3}{4} + 2\frac{2}{4} = 5\frac{1}{4}$
2. a. Answer provided
   b. $1\frac{2}{5}; \frac{4}{5}$ decomposed as $\frac{1}{5}$ and $\frac{3}{5}$
   c. $1\frac{4}{7}; \frac{6}{7}$ decomposed as $\frac{3}{7}$ and $\frac{3}{7}$
3. a. $2\frac{4}{5}$
   b. $\frac{4}{6}; 1\frac{3}{6}$ decomposed as $\frac{3}{6}$ and 1
   c. $5\frac{6}{10}; 6\frac{3}{10}$ decomposed as $5\frac{3}{10}$ and 1
4. a. $2\frac{2}{4}$
   b. $2\frac{2}{8}$
   c. $4\frac{7}{12}$
   d. $2\frac{4}{100}$

Exit Ticket

1. $2\frac{1}{3}$
2. $3\frac{6}{8}$

Homework

1. a. $1\frac{3}{5}, 1\frac{3}{5}$
   b. $2\frac{6}{8}, 2\frac{6}{8} + 2\frac{5}{8} = 5\frac{3}{8}$ or $2\frac{5}{8} + 2\frac{6}{8} = 5\frac{3}{8}$
2. a. Answer provided
   b. $1\frac{4}{7}$; $\frac{4}{7}$ decomposed as $\frac{1}{7}$ and $\frac{3}{7}$
   c. $1\frac{9}{12}$; $\frac{8}{12}$ decomposed as $\frac{5}{12}$ and $\frac{3}{12}$
3. a. $2\frac{6}{8}$
   b. $\frac{7}{12}$; $1\frac{3}{12}$ decomposed as $\frac{3}{12}$ and 1
   c. $2\frac{2}{10}$; $3\frac{1}{10}$ decomposed as $2\frac{1}{10}$ and 1
4. a. $1\frac{7}{9}$
   b. $1\frac{7}{10}$
   c. $2\frac{10}{12}$
   d. $4\frac{12}{100}$

Lesson 34

Sprint

Side A

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

Side B

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

Problem Set

1. a. $3\frac{2}{3}$
   b. $4\frac{3}{4}$
   c. $7\frac{4}{5}$
2. a. Answer provided.
   b. $2\frac{4}{5}$
   c. $1\frac{3}{6}$
   d. $6\frac{4}{5}$
3. a. $4\frac{6}{8}$
   b. $2\frac{6}{10}$
   c. $4\frac{7}{12}$
   d. $7\frac{9}{50}$

Exit Ticket

1. $4\frac{3}{6}$
2. $8\frac{6}{8}$

Homework

1. a. $4\frac{2}{4}$
   b. $5\frac{5}{8}$
   c. $6\frac{5}{6}$
2. a. Answer provided
   b. $1\frac{4}{6}$
   c. $5\frac{6}{8}$
   d. $4\frac{6}{10}$
3. a. $2\frac{6}{12}$
   b. $3\frac{8}{10}$
   c. $7\frac{11}{16}$
   d. $3\frac{11}{100}$

Lesson 35

Problem Set

1. a. Tape diagram drawn and labeled
   b. Tape diagram drawn and labeled
2. a. 7 × 2 thirds = 14 thirds
   b. 4 × 2 fourths = 8 fourths
   c. 16 × 3 eighths = 48 eighths
   d. 6 × 5 eighths = 30 eighths
3. a. $\frac{28}{9}$
   b. $\frac{18}{5}$
   c. $\frac{24}{4}$
   d. $\frac{48}{8}$
   e. $\frac{84}{10}$
   f. $\frac{162}{100}$
4. $\frac{18}{5}$ yd

Exit Ticket

1. 5 × 2 thirds = 10 thirds
2. $\frac{55}{6}$

Homework

1. a. Tape diagram drawn and labeled
   b. Tape diagram drawn and labeled
2. a. 10 × 2 fifths = 20 fifths
   b. 3 × 5 sixths = 15 sixths
   c. 9 × 4 ninths = 36 ninths
   d. 7 × 3 fourths = 21 fourths
3. a. $\frac{18}{4}$
   b. $\frac{35}{8}$
   c. $\frac{26}{3}$
   d. $\frac{36}{3}$
   e. $\frac{98}{10}$
   f. $\frac{98}{100}$
4. $\frac{10}{3}$ c

Lesson 36

Problem Set

1. Tape diagram drawn; $4 \times \frac{3}{4}$
2. Tape diagram drawn; $3 \times \frac{7}{12}$
3. a. $\frac{28}{5} = 5\frac{3}{5}$
   b. $3 \times \frac{9}{10} = \frac{27}{10} = 2\frac{7}{10}$
   c. $5 \times \frac{11}{12} = \frac{55}{12} = 4\frac{7}{12}$
4. a. $5\frac{1}{3}$
   b. 9
   c. 40
   d. $22\frac{6}{8}$
5. $5\frac{4}{10}$ L
6. $10\frac{2}{4}$ c
7. 45 lb

Exit Ticket

1. $5\frac{1}{4}$
2. $3\frac{3}{5}$
3. $37\frac{4}{8}$

Homework

1. Tape diagram drawn; $4 \times \frac{2}{3}$
2. Tape diagram drawn; $3 \times \frac{7}{8}$
3. a. Answer provided
   b. $3 \times \frac{7}{10} = \frac{21}{10} = 2\frac{1}{10}$
   c. $6 \times \frac{5}{12} = \frac{30}{12} = 2\frac{6}{12}$
   d. $12 \times \frac{3}{8} = \frac{36}{8} = 4\frac{4}{8}$
4. a. $1\frac{5}{9}$
   b. $7\frac{1}{3}$
   c. $13\frac{2}{6}$
   d. 20
   e. $13\frac{4}{5}$
   f. $8\frac{4}{8}$
5. $12\frac{3}{4}$ in
6. $4\frac{1}{8}$
7. 9 ft

Lesson 37

Problem Set

1. Two tape diagrams drawn; $2 \times 4\frac{2}{3}$, $(2 \times 4) + \left(2 \times \frac{2}{3}\right)$
2. a. Answer provided
   b. $9\frac{1}{3}$
   c. $7\frac{7}{8}$
   d. $9\frac{4}{10}$
   e. $23\frac{1}{4}$
   f. 21
   g. $36\frac{4}{5}$
   h. 23
3. $23\frac{1}{3}$ feet

Exit Ticket

1. $21\frac{4}{8}$
2. $12\frac{9}{10}$

Homework

1. Two tape diagrams drawn; $3 \times 5\frac{1}{12}$, $(3 \times 5) + \left(3 \times \frac{1}{12}\right)$
2. a. Answer provided
   b. $20\frac{5}{6}$
   c. $15\frac{3}{5}$
   d. $14\frac{6}{10}$
   e. 58
   f. $40\frac{4}{8}$
3. $13\frac{8}{10}$ mi
4. $28\frac{2}{10}$ lb

Lesson 38

Problem Set

1. a. 7, 7
   b. 12, $\frac{7}{8}$
2. a. $58\frac{4}{5}$
   b. $43\frac{3}{6}$
   c. $26\frac{9}{12}$
   d. 104
   e. $100\frac{16}{100}$
3. $7\frac{5}{10}$ mi
4. $33\frac{1}{4}$

Exit Ticket

1. 8, 8
2. $46\frac{3}{8}$

Homework

1. a. 8, 8
   b. 7, $\frac{7}{10}$
2. a. $49\frac{5}{7}$
   b. $69\frac{3}{4}$
   c. 79
   d. $77\frac{5}{8}$
   e. $82\frac{8}{12}$
   f. $360\frac{36}{100}$
3. $41\frac{5}{8}$ ft
4. $45\frac{2}{4}$ c
5. $215\frac{5}{8}$ oz

Lesson 39

Sprint

Side A

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

Side B

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

Problem Set

1. $5\frac{2}{8}$ mi
2. $15\frac{9}{16}$ in
3. $6\frac{4}{8}$ yd
4. $33\frac{1}{3}$ yd
5. $211\frac{2}{10}$ mi
6. \$99

Exit Ticket

$31\frac{5}{8}$ lb

Homework

1. 20 lb
2. $15\frac{6}{8}$ in
3. $24\frac{1}{4}$ yd
4. $50\frac{4}{8}$ c
5. $290\frac{8}{10}$ mi
6. \$147

Lesson 40

Problem Set

1. a. Line plot drawn accurately

   b. $\frac{7}{8}$ ft

   c. $10\frac{4}{8}$ ft

2. Player C

3. $22\frac{2}{4}$ qt

4. $69\frac{3}{10}$ g

Exit Ticket

1. One mark added on $1\frac{6}{8}$; $2\frac{2}{8}$ circled

2. $5\frac{2}{8}$ miles

Homework

1. Line plot drawn accurately

2. $2\frac{7}{8}$ in

3. $1\frac{5}{8}$ in

4. $9\frac{3}{8}$ in

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

6. August and October

7. $22\frac{4}{8}$ in

Lesson 41

Problem Set

1. a. 2
   b. $2\frac{1}{2}$
   c. 3
   d. $3\frac{1}{2}$
   e. 4
   f. $4\frac{1}{2}$
2. Answers will vary.
3. The sum would remain the same.
4. a. $5\frac{5}{10}$
   b. $6\frac{6}{12}$
   c. 8
   d. 13
   e. $25\frac{25}{50}$
   f. $50\frac{50}{100}$
5. Answers will vary.
6. Answers will vary.

Exit Ticket

1. $10\frac{10}{20}$
2. $100\frac{100}{200}$

Homework

1. a. 3
   b. $3\frac{1}{2}$
   c. 4
   d. $4\frac{1}{2}$
   e. 5
   f. $5\frac{1}{2}$
2. Answers will vary.
3. The sums would remain the same.
4. a. $10\frac{10}{20}$
   b. 18
   c. $18\frac{18}{36}$
   d. 38
   e. $50\frac{50}{100}$
   f. 50
5. Answers will vary.