Fraction and Mixed-Number Computation; Measurement

In Unit 3 students learned how to compare and order fractions and decimals. In Unit 5 they deepen their understanding by learning how a fraction such as $\frac{3}{4}$ can be broken into smaller parts, such as $\frac{1}{4} + \frac{1}{4} + \frac{1}{4}$. Based on this understanding, students are able to see how adding and subtracting fractions with like denominators is simply putting together or taking away some number of same-size parts. For example, $\frac{3}{4} - \frac{1}{4}$ can be thought of as taking away 1 of the 3 parts, or fourths, that make up the fraction $\frac{3}{4}$.

In this unit students extend this idea to adding and subtracting mixed numbers, such as $1\frac{1}{4} + 2\frac{2}{4}$. They use different fraction representations and tools, including fraction circles, number lines, and drawings, to build a concrete understanding of the meaning of fractions, as opposed to just learning rules and procedures.

Line Plots

Line plots are used to organize and display data. As you can see from the diagram, a line plot can be thought of as a rough sketch of a bar graph.

From this line plot we can learn that the tallest books are 9 inches tall and that there are 3 of them, that no books are $8\frac{3}{4}$ inches tall, and so on.

Students also create line plots with data they collect in fractional units and then use information in the plots to solve problems involving adding and subtracting fractions.

Book Heights

Height (in inches)
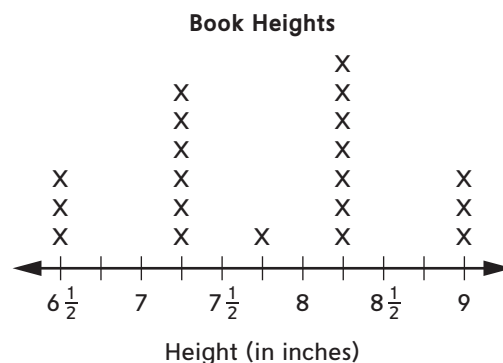
Angles: Unit Iteration and Rotations

Students begin their work with angle measurement by exploring the attribute of angle size. They begin measuring angles using a nonstandard unit—a wedge—as a way to see how measuring an angle is the same as measuring any other attribute. Iterating (or repeating) unit angles fills the spread between an angle's rays, just as iterating unit lengths fills a given length. Students discuss the need for a standard unit of measure, and they are introduced to the degree. An angle that measures 1 degree is a very small angle, which, when iterated 360 times, forms a circle.

Symmetry

Students complete symmetric figures that are partially given and create their own symmetric figures.

Multistep Multiplication Number Stories

Students continue solving multistep number stories, with a focus on multidigit multiplication strategies. They use number models that include a letter for the unknown, and they consider the reasonableness of their answers.

Please keep this Family Letter for reference as your child works through Unit 5.

Vocabulary

Important terms in Unit 5:

arc A part of a circle centered on the vertex of an angle. An arc is sometimes used to indicate where to measure the angle.

decompose To break apart a number or shape into smaller numbers or shapes.

degree A unit of measure for angles based on dividing a circle into 360 equal arcs.

full-turn A 360° rotation.

half-turn A 180° rotation.

like denominator A denominator that is the same in two or more fractions. For example, the fractions $\frac{3}{8}$, $\frac{5}{8}$, and $\frac{6}{8}$ have a like denominator, which is 8.

mirror image A point, line, or figure that exactly matches another point, line, or figure when it is reflected or folded over a line of symmetry so that it comes to rest on top of the corresponding image.
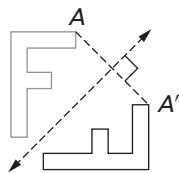
Sometimes the line of reflection is called a mirror, or mirror line.

mixed number A number that is written using both a whole number and a fraction.

quarter-turn A 90° rotation.

reflex angle An angle measure that is between 180° and 360°.

rotation A change in the direction an object faces; a turn.

straight angle An angle that measures 180°.

three-quarter turn A 270° rotation.

unit fraction A fraction whose numerator is 1. For example: $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{12}$ are unit fractions.

whole The entire object, collection of objects, or quantity being considered in a problem situation; 100%.

Do-Anytime Activities

To work with your child on concepts taught in this unit, try these activities:

1. Have your child help you measure when you are cooking or baking, using fractional measurements like $2\frac{1}{2}$ cups of flour or $\frac{1}{4}$ teaspoon of salt. Ask your child how you would double the measurements to make two batches instead of one. See whether he or she can show you one or two ways to do this.

2. Work with your child to create a line plot showing the number of hours family members spend sleeping or engaged in some other routine activity. Ask questions about the line plot; for example: "How many people in the family sleep for $8\frac{1}{2}$ hours?"

3. At home or when you are out together, encourage your child to point out items he or she believes are symmetric. Ask how many lines of symmetry there are in each of these objects.

4. Have your child point out angles in your home. Ask whether the angles are obtuse, acute, or right angles.

Building Skills through Games

In this unit, your child will play the following games as a way to increase his or her understanding of adding and subtracting fractions and mixed numbers, as well as angles, symmetry, and multistep multiplication number stories. For detailed instructions, see the *Student Reference Book*.

Decimal Top-It See *Student Reference Book,* page 253. This game provides practice comparing, ordering, reading, and identifying the values of digits in decimal numbers.

Fishing for Fractions (**Addition/Subtraction**) See *Student Reference Book,* page 260. In this game students practice adding together two like fractions or subtracting one like fraction from another.

Fraction/Decimal Concentration See *Student Reference Book,* page 262. This game helps students recognize when fractions and decimals are equivalent.

Fraction Match See *Student Reference Book,* page 263. This game develops skill in naming equivalent fractions.

Fraction Top-It See *Student Reference Book,* page 265. This game develops skill in comparing fractions.

As You Help Your Child with Homework

As your child brings assignments home, it may be helpful to review the instructions together, clarifying them as necessary. The answers listed below will guide you through some of the Home Links in Unit 5.
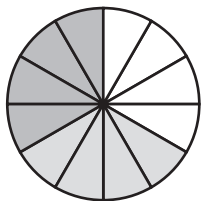
Home Link 5-1

1. Sample answers:

$\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$;
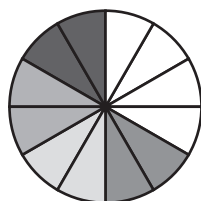
$\frac{5}{5} + \frac{5}{5} + \frac{1}{5}$;

$\frac{5}{5} + \frac{6}{5}$;

$1 + 1 + \frac{1}{5}$; $\frac{2}{5} + \frac{3}{5} + \frac{6}{5}$

3. **a.** Sample answer: $\frac{4}{12} + \frac{4}{12} = \frac{8}{12}$;

b. Sample answer: $\frac{8}{12} = \frac{2}{12} + \frac{2}{12} + \frac{2}{12} + \frac{2}{12}$;
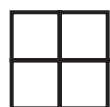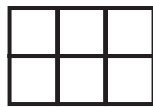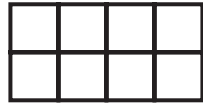
5. 3,227　　　　　7. 1,950

Home Link 5-2

1. **a.**　　　**b.**　　　**c.**

3. **a.**

b.

c.

d.

5. 4

Home Link 5-3

1. **a.** | Whole |
| new trees |

b. Sample answer: $\frac{1}{10} + \frac{3}{10} + \frac{2}{10} = t$

c. Sample answer:

O	P	P	P	W	W				

d. $\frac{6}{10}$ oak, willow, or pine

3. $\frac{3}{5}$　　　　　5. $\frac{10}{6}$, or $1\frac{4}{6}$

7. 0.4　　　　　9. 0.6

Home Link 5-4

1. **a.** | Whole |
| ball of yarn |

b. Sample answer: $6\frac{2}{3} + 2\frac{2}{3} = s$

c. Sample answer: I decomposed the mixed numbers. Then I combined the wholes and the fractions. $6 + \frac{2}{3} + 2 + \frac{2}{3} = 8 + \frac{4}{3} = 9\frac{1}{3}$

d. $9\frac{1}{3}$, or $\frac{28}{3}$, balls

3. $8\frac{3}{6}$, or $\frac{51}{6}$

5. $6\frac{2}{4}$, or $\frac{26}{4}$　　7. 5,022　　9. 1,092

Home Link 5-5

1. 20 hundredths + 15 hundredths = 35 hundredths

3. $\frac{10}{100} + \frac{50}{100} = \frac{60}{100}$, or $\frac{1}{10} + \frac{5}{10} = \frac{6}{10}$

5. $1 + \frac{30}{100} + 5 + \frac{64}{100} = 6\frac{94}{100}$

7. $\frac{150}{100} + \frac{78}{100} = \frac{228}{100}$, or $2\frac{28}{100}$

9. $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}$

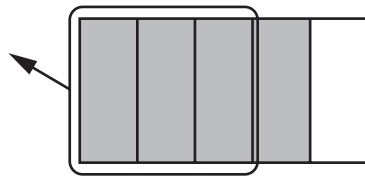**11.** $\frac{2}{8}, \frac{3}{12}, \frac{4}{16}$

Home Link 5-6

1. Sample answer: Bill and Carl didn't get $\frac{1}{5}$. They each got $\frac{1}{8}$. I know this because the two triangles are in $\frac{1}{4}$ of the whole land, so each is half of a fourth, or $\frac{1}{8}$.

3. 15,732

5. 10,591

Home Link 5-7

1. a.

> **Whole**
>
> Elijah's allowance

b. Sample answer: $\frac{4}{5} - \frac{3}{5} = a$

c. Sample answer:

d. $\frac{1}{5}$ of his allowance

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

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

7. 2,243

9. 17,437

Home Link 5-8

1. a.

> **Whole**
>
> 1 cup

b. Sample answer: $3\frac{1}{3} - 1\frac{2}{3} = c$

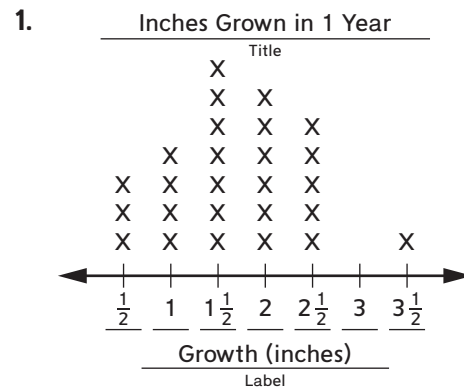**c.** Sample answer: I started with what we had and counted up to what we needed. $1\frac{2}{3} + \frac{1}{3} = 2. \; 2 + \mathbf{1\frac{1}{3}} = 3\frac{1}{3}$. Then I added: $\frac{1}{3} + 1\frac{1}{3} = 1\frac{2}{3}$.

d. $1\frac{2}{3}$, or $\frac{5}{3}$, cups

3. 1

5. $2\frac{3}{5}$, or $\frac{13}{5}$
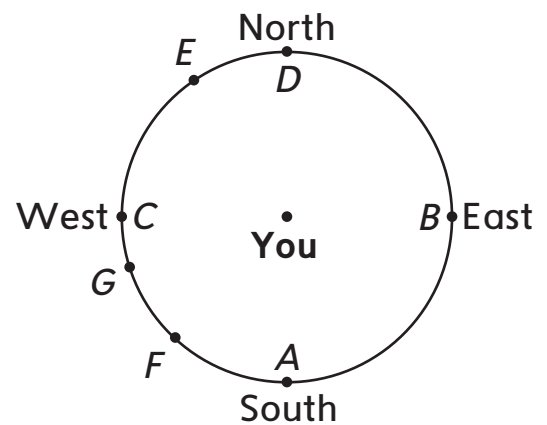
7. 540

9. 8,084

Home Link 5-9

1.

3. $3\frac{1}{2} - \frac{1}{2} = d$; 3 inches

5. $\frac{3}{4}, \frac{6}{8}, \frac{9}{12}$

7. $\frac{1}{2}, \frac{5}{10}, \frac{4}{8}$

Home Link 5-10

1–6. E, F, and G are sample answers

7. 4,250

9. 2,388

Home Link 5-11

1. angle *A*   **3.** angle *E*   **5.** angle *A* or *B*

7. 146,388   **9.** 12,961

Home Link 5-12

1. a. Triangle   **b.** 2 sides   **c.** 2 angles   **d.** No.

3. 9   **5.** 6   **7.** 9

Home Link 5-13

1. Sample answer: $3 * (8 * 2 * 42) = p$;
Sample answer: $3 * 800 = \$2{,}400$;
$2,016, or 2,016 dollars

3. 9   **5.** 6   **7.** 36