# Objective
To extend the long division algorithm to problems in which a decimal is divided by a whole number.

## Doing the Project

### Recommended Use
During or after Lesson 4-5 and Project 4

### Key Activities
Students extend the whole-number long division algorithm to decimal dividends.

### Key Concepts and Skills
- Use long division to solve division problems with decimal dividends.  
  [(Operations and Computation Goal 3)]
- Apply multiplication facts in carrying out the long division algorithm.  
  [(Operations and Computation Goal 2)]
- Estimate products and quotients.  
  [(Operations and Computation Goal 6)]
- Find average speeds, given times and distances.  
  [(Operations and Computation Goal 7)]

### Key Vocabulary
- long division
- dividend
- remainder

## Extending the Project

### Recommended Use
During or after Lesson 4-5 and Project 4

### Key Activities
Students use long division to rename fractions as decimals.

### Key Vocabulary
- long division
- dividend
- remainder

## Technology
See the iTLG.
1. **Doing the Project**

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### Long Division with Dollars and Cents

*(Math Journal, p. 13; Student Reference Book, pp 54E and 54F)*

Have students solve Problems 1–3 on journal page 13. When most students have finished, write Emma’s **long division** work from the journal page introduction on the board or a transparency. Ask questions such as the following:

- Where does the 53 in the fourth line of Emma’s method come from? The 53 refers to 53 dimes, 50 dimes from the $5 left over after the whole dollars were shared and 3 dimes in the original **dividend**: 50 dimes + 3 dimes = 53 dimes.

- Where does the 48 in the fifth line of Emma’s method come from? The 48 is the number of dimes shared when each of 6 shares gets 8 dimes: 6 * 8 dimes = 48 dimes.

- What is the 1 at the very bottom? It is the **remainder**; it represents $0.01 that is left over after $17.35 is divided by 6.

Have students make up a number story that fits 17.35 / 6. Ask volunteers to share their number stories and explain what should be done with the remainder in each case. Emphasize that what to do with the remainder depends on the problem situation.

Have partners complete journal page 13. Students may find the examples on **Student Reference Book**, pages 54E and 54F helpful.
Long Division with Decimal Dividends

(Math Journal, p. 14)

Have students solve Problems 1 and 2 on journal page 14. For Problem 2, remind students that a decimal point and trailing 0s can be attached to the dividend: 224 = 224.000... and that a table of easy multiples of 12 might be helpful. Problem 2 involves a division that will never come out evenly and introduces students to a process that repeats forever. This idea is explored further in Part 2 of this project.

When most students have finished, have volunteers copy their work on the board or a transparency and explain their solutions. Ask questions such as the following:

Problem 1
- Why does dividing 7.95 by 3 give the average speed in feet per minute? Feet per minute means feet in one minute. At the average speed, the snail would go 7.95 feet in 3 minutes; 7.95 / 3 gives the distance traveled in 1 minute.
- What does the digit 2 in the quotient mean? If 7 feet are shared into 3 equal parts, then each part would get 2 feet with 1 foot left over.

Problem 2
- Why does dividing 224 by 12 give the average speed in miles per hour? Miles per hour means miles in one hour. At the average speed, Otto would go 224 miles in 12 hours. 224 / 12 gives the distance traveled in 1 hour.

Have partners complete journal page 14.

Using Long Division to Rename Fractions as Decimals

(Student Reference Book, p. 54; Math Journal, p. 15)

Have students solve Problems 1–8 on journal page 15.