SHOW WHAT YOU KNOW

LESSON ORGANIZER

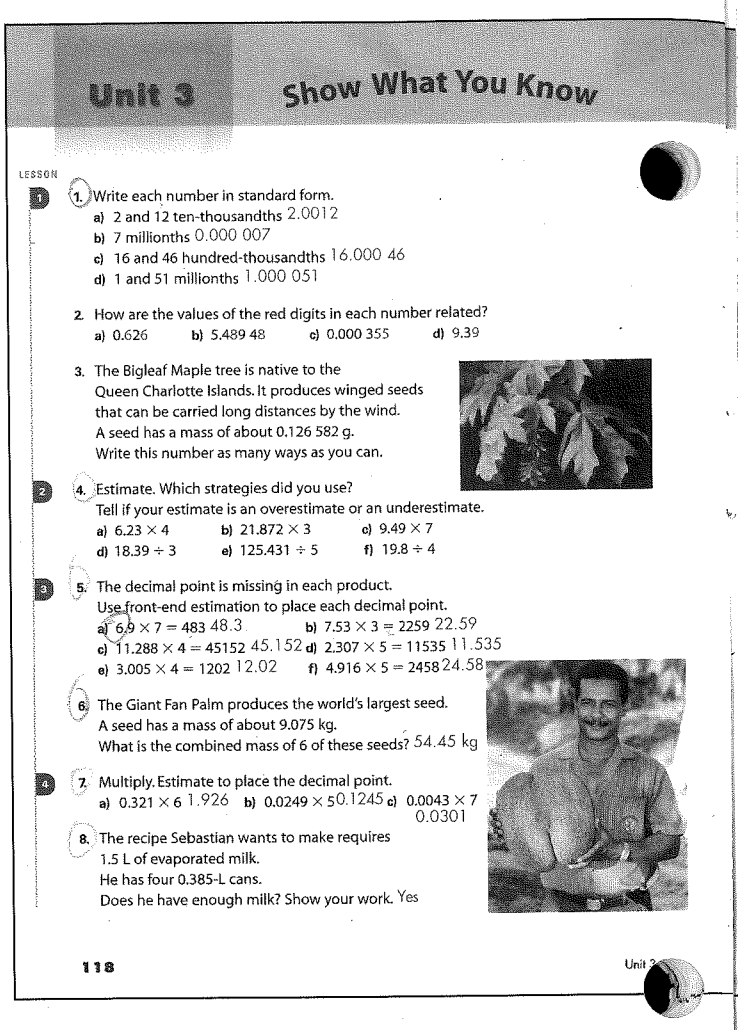
40–50 min

Student Materials

Optional

- Base Ten Blocks
- place-value mats
- place-value charts

Assessment: Master 3.1 Unit Rubric: Decimals; Master 3.4 Unit Summary: Decimals



Unit 3 Show What You Know

LESSON

1. Write each number in standard form.
   a) 2 and 12 ten-thousandths 2.0012
   b) 7 millionths 0.000 007
   c) 16 and 46 hundred-thousandths 16.000 46
   d) 1 and 51 millionths 1.000 051

2. How are the values of the red digits in each number related?
   a) 0.626 b) 5.489 48 c) 0.000 355 d) 9.39

3. The Bigleaf Maple tree is native to the Queen Charlotte Islands. It produces winged seeds that can be carried long distances by the wind. A seed has a mass of about 0.126 582 g. Write this number as many ways as you can.

2

4. Estimate. Which strategies did you use? Tell if your estimate is an overestimate or an underestimate.
   a) 6.23 × 4 b) 21.872 × 3 c) 9.49 × 7
   d) 18.39 ÷ 3 e) 125.431 ÷ 5 f) 19.8 ÷ 4

3

5. The decimal point is missing in each product. Use front-end estimation to place each decimal point.
   a) 6.9 × 7 = 483 48.3 b) 7.53 × 3 = 2259 22.59
   c) 11.288 × 4 = 45152 45.152 d) 2.307 × 5 = 11535 11.535
   e) 3.005 × 4 = 1202 12.02 f) 4.916 × 5 = 2458 24.58

6. The Giant Fan Palm produces the world's largest seed. A seed has a mass of about 9.075 kg. What is the combined mass of 6 of these seeds? 54.45 kg

4

7. Multiply. Estimate to place the decimal point.
   a) 0.321 × 6 1.926 b) 0.0249 × 5 0.1245 c) 0.0043 × 7 0.0301

8. The recipe Sebastian wants to make requires 1.5 L of evaporated milk. He has four 0.385-L cans. Does he have enough milk? Show your work. Yes

118

Unit 3

Sample Solutions

2. a) Six tenths are 100 times as great as 6 thousandths.
   b) Eight hundredths are 1000 times as great as 8 hundred-thousandths.
   c) Five hundred-thousandths are 10 times as great as 5 millionths.
   d) Nine ones are 100 times as great as 9 hundredths.
3. Expanded form: 0.1 + 0.02 + 0.006 + 0.0005 + 0.000 08 + 0.000 002
   Expanded word form: 1 tenth + 2 hundredths + 6 thousandths + 5 ten-thousandths + 8 hundred-thousandths + 2 millionths
   Word form: One hundred twenty-six thousandths, five hundred eighty-two millionths
4. a) About 24; I used decimal benchmarks. 6.23 is closer to 6 than to 7, and 6 × 4 = 24. This is an underestimate because 6 is less than 6.23.
   b) About 60; I used front-end estimation. I wrote 21.872 as 20, then multiplied: 20 × 3 = 60. This is an underestimate because 20 is less than 21.872.
   c) About 63; I used decimal benchmarks. Since 9.49 is close to 9, I multiplied: 9 × 7 = 63. This is an underestimate because 9 is less than 9.49.
   d) About 6; I used compatible numbers. Since 18.39 is close to 18, I divided: 18 ÷ 3 = 6. This is an underestimate because 18 is less than 18.39.
   e) About 25; I used compatible numbers. Since 125.431 is close to 125, I divided: 125 ÷ 5 = 25. This is an underestimate because 125 is less than 125.431.
   f) About 5; I used compatible numbers. Since 19.8 is close to 20, I divided: 20 ÷ 4 = 5. This is an overestimate because 20 is greater than 19.8.
5. a) 6 × 7 = 42, so the product is close to 42.
   b) 7 × 3 = 21, so the product is close to 21.
   c) 10 × 4 = 40, so the product is close to 40.
   d) 2 × 5 = 10, so the product is close to 10.
   e) 3 × 4 = 12, so the product is close to 12.
   f) 4 × 5 = 20, so the product is close to 20.
8. Multiply the whole numbers: 385 × 4 = 1540. Estimate to place the decimal point: 0.385 is close to 0.4. Four tenths × 4 = 16 tenths, or 1 one + 6 tenths = 1.6. Place the decimal point so the product is close to 1.6. Sebastian has 1.54 L of milk. Since 1.54 L > 1.5 L, Sebastian has more than enough milk.
9. a) Compatible numbers: 36 ÷ 6 = 6; about 6
   b) Compatible numbers: 24 ÷ 4 = 6; about 6
   c) Compatible numbers: 4 ÷ 2 = 2; about 2

9. Estimate each quotient. Which strategies did you use?
   a) 36.57 ÷ 6 b) 22.41 ÷ 4 c) 4.189 ÷ 2
   d) 42.3 ÷ 9 e) 8.27 ÷ 4 f) 7.1348 ÷ 8

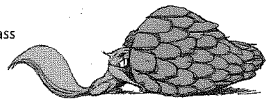
10. Estimate to choose the correct quotient for each division question.

	Question	Possible Quotients		
a)	9.348 ÷ 3	(3.116)	31.16	311.6
b)	52.925 ÷ 5	0.105 85	1.0585	(10.585)
c)	1.888 ÷ 8	(0.236)	2.36	23.6

11. James Steacy of Saskatoon won the silver medal in the men's discus throw at the 2006 Commonwealth Games in Melbourne, Australia. In the finals, James threw the discus 6 times for a total distance of 431.94 m. About how far did he throw each discus? About 71.99 m

12. Divide.
   a) 24.15 ÷ 6 4.025 b) $31.87 ÷ 8 $3.98 c) 9.3 ÷ 6 1.55
   d) 14.523 L ÷ 4 3.631 L e) 3.5 m ÷ 9 0.4 m f) $11.68 ÷ 9 $1.30

13. The Coulter Pine produces the world's most massive pine cones. The combined mass of 8 of these cones is 25.259 kg. Find the mass of one Coulter Pine cone to the nearest hundredth of a kilogram. 3.16 kg



14. Divide. Which strategies did you use to estimate?
   a) 0.58 ÷ 8 0.0725 b) 0.066 ÷ 4 0.0165 c) 0.142 ÷ 8 0.017 75
   d) 0.0075 ÷ 6 0.001 25 e) 0.081 ÷ 6 0.0135 f) 0.09 ÷ 5 0.018

15. Darcy takes one chewable multivitamin each morning. Each week, Darcy gets 0.0119 g of riboflavin from the vitamins. How much riboflavin is in one multivitamin? Show your work. 0.0017 g

UNIT 3 Learning Goals

- ☑ use place value to represent numbers less than one thousandth
- ☑ multiply decimals by a 1-digit number
- ☑ divide decimals by a 1-digit number

d) Compatible numbers: 45 ÷ 9 = 5; about 5
e) Front-end estimation: 8 ÷ 4 = 2; about 2
f) Compatible numbers: 8 ÷ 8 = 1; about 1

10. a) 9 ÷ 3 = 3, so the quotient should be close to 3.
b) 50 ÷ 5 = 10, so the quotient should be close to 10.
c) 0 ÷ 8 = 0, so the quotient should be close to 0.

14. a) 58 hundredths are close to 56 hundredths, and 56 hundredths ÷ 8 = 7 hundredths. So, 0.58 ÷ 8 is about 0.07.
b) 66 thousandths are close to 64 thousandths, and 64 thousandths ÷ 4 = 16 thousandths. So, 0.066 ÷ 4 is about 0.016.
c) 142 thousandths are close to 120 thousandths, and 120 thousandths ÷ 8 = 15 thousandths. So, 0.142 ÷ 8 is about 0.015.
d) 75 ten-thousandths are close to 72 ten-thousandths, and 72 ten-thousandths ÷ 6 = 12 ten-thousandths. So, 0.0075 ÷ 6 is about 0.0012.
e) 81 thousandths are close to 90 thousandths, and 90 thousandths ÷ 6 = 15 thousandths. So, 0.081 ÷ 6 is about 0.015.
f) 9 hundredths are close to 10 hundredths, and 10 hundredths ÷ 5 = 2 hundredths. So, 0.09 ÷ 5 is about 0.02.

15. Divide the whole numbers: 119 ÷ 7 = 17. Estimate to place the decimal point: 119 ten-thousandths is close to 140 ten-thousandths, and 140 ten-thousandths ÷ 7 = 20 ten-thousandths. So, 0.0119 ÷ 7 is about 0.0020. One multivitamin contains 0.0017 g of riboflavin.

ASSESSMENT FOR LEARNING

What to Look For

Conceptual Understanding

✔ **Questions 1 and 3:** Students write a number with decimal places beyond thousandths in different forms.

✔ **Question 4:** Students determine if an estimate is an overestimate or an underestimate.

✔ **Question 12:** Students write a quotient to the same place-value position as the original measurement.

Procedural Knowledge

✔ **Questions 4 and 9:** Students use strategies such as front-end estimation, decimal benchmarks, and compatible numbers to estimate products and quotients with decimals.

✔ **Questions 5 and 7:** Students use different strategies to multiply a decimal by a whole number.

✔ **Questions 5 and 7:** Students use estimation to place the decimal point in a product.

✔ **Question 10:** Students use estimation strategies to predict quotients.

✔ **Questions 12 and 14:** Students use different strategies to divide a decimal by a 1-digit whole number.

Problem-Solving Skills

✔ **Questions 6, 8, 11, 13, and 15:** Students solve problems that involve multiplying or dividing a decimal by a whole number.