NAME_____

Module 5 **Decimal Operations, Exponents, and Powers**
Lesson 5 **Dividing Decimals**

Lesson Notes 5.5

Lesson Objectives

- Estimate quotients using rounding and compatible numbers.
- Model division of decimals using diagrams and/or illustrations of manipulatives.
- Develop and use algorithms to divide decimals (hundredths by tenths up to thousandths by thousandths).

Subtopic 1 Estimating Quotients Using Front-end Estimation, Rounding, and Compatible Numbers

If the **dividend** and **divisor** are multiplied by the same number, the quotient does not change.

Estimate.

1 40.3 ÷ 0.2

402 ÷ 2 = 201
40.3 ÷ 0.2 ≈ 201

2 54.29 ÷ 0.11

5,500 ÷ 11 = 500
54.29 ÷ 0.11 ≈ 500

Subtopic 2 Dividing Decimals Using Models

3 If each amount is shared equally by two people, how much will each person get?

$1,000	$100	$10	$1	$0.10
$500	**$50**	**$5**	**$0.50**	**$0.05**

4 How many quarters are in $1.30? If necessary, express the remainder as a decimal part of a quarter.

5.2 quarters

Subtopic 3 Dividing Decimals by Whole Numbers

Dividing Decimals by Whole Numbers

- Place the decimal point in the quotient directly **above** the decimal point in the dividend.
- Divide as with **whole** numbers.
- Place zeros to the **right** of the decimal in the dividend to complete the division problem.
- Place a zero in the quotient when the dividend is **less than** the divisor.
- A **repeating** decimal is a decimal with one or more digits repeating without end.
- When a division results in a repeating decimal, the number of repeating digits can be at most **one less** than the divisor.
- For $7\overline{)1}$, the number of repeating digits is at most **six**.
- A **terminating** decimal is a decimal that has a finite number of decimal places.
- Any rational number can be expressed as a **terminating** or **repeating** decimal.

Estimate and divide.

5 $25 \div 37$

Estimate:
$30 \div 40 = 0.75$

$$
\begin{array}{r}
0.675 \\
37\overline{)\,25.0000} \\
-222 \\
\hline
280 \\
-259 \\
\hline
210 \\
-185 \\
\hline
25
\end{array}
$$

6 $66.08 \div 16$

Estimate:
$64 \div 16 = 4$

$$
\begin{array}{r}
4.13 \\
16\overline{)\,66.08} \\
-64 \\
\hline
20 \\
-16 \\
\hline
48 \\
-48 \\
\hline
0
\end{array}
$$

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Module 5 **Decimal Operations, Exponents, and Powers**
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Subtopic 4 Dividing Decimals by Decimals

Dividing Decimals by Decimals

- Multiply the divisor by a power of 10 to make a **whole** number.
- Multiply the **dividend** by that power of 10.
- Place the decimal point in the quotient directly **above** the decimal point in the dividend.
- Divide as with **whole** numbers.

Estimate and divide.

7 625 ÷ 12.5

Estimate:
600 ÷ 12 = 50

$$12.5\overline{)625} \rightarrow 125\overline{)6250}$$

$$\begin{array}{r} 50. \\ 125\overline{)6250} \\ -625 \\ \hline 0 \end{array}$$

8 0.84 ÷ 0.042

Estimate:
80 ÷ 4 = 20

$$0.042\overline{)0.84} \rightarrow 42\overline{)840}$$

$$\begin{array}{r} 20. \\ 42\overline{)840} \\ -84 \\ \hline 0 \end{array}$$