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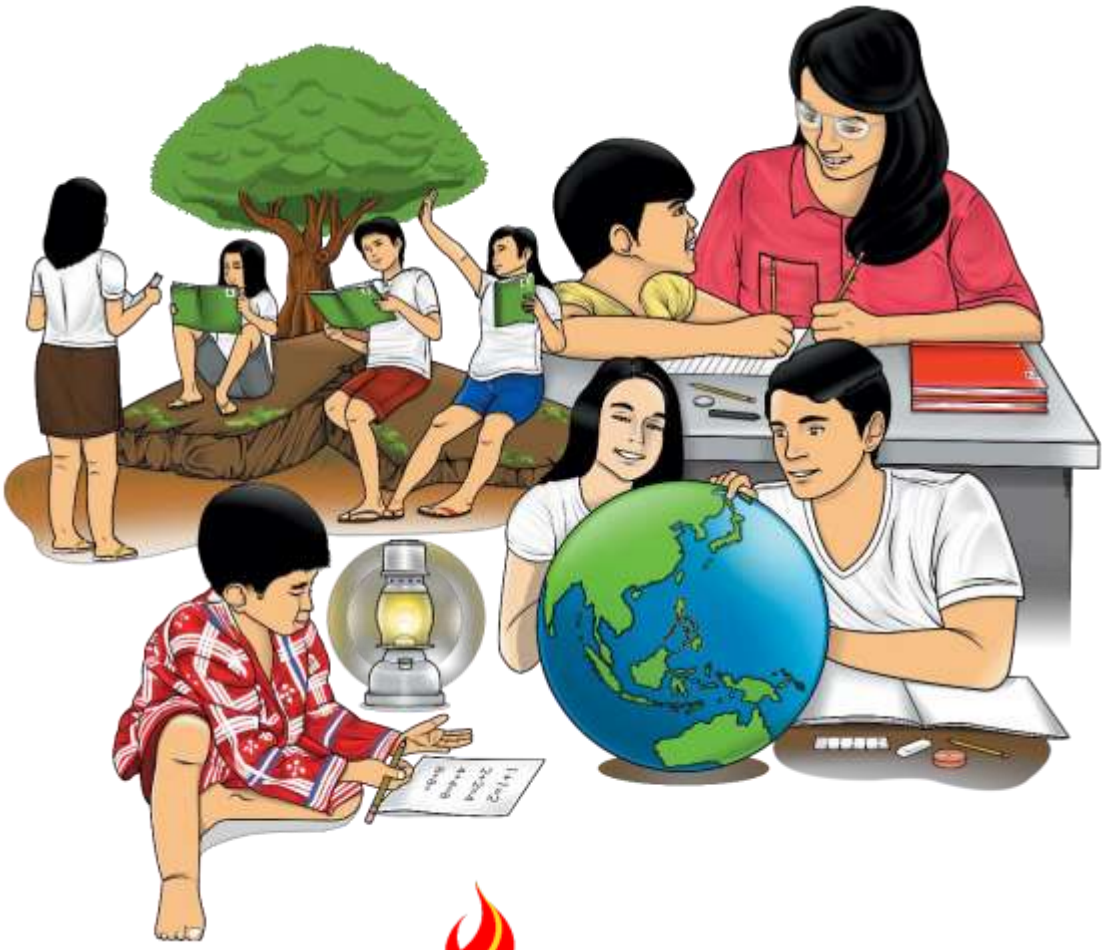
DEPARTMENT OF EDUCATION

Mathematics

Quarter 1 – Module 5: Expressing Rational Numbers from Fraction Form to Decimal Form and Vice-versa



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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by- step as you discover and understand the lesson prepared for you.

Pre-test are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module, or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teachers are also provided to the facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. Read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

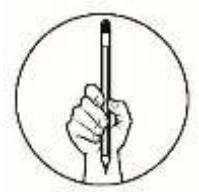
This module was designed and written with you in mind. It is here to help you master the process of expressing rational numbers from decimals to fractions and vice-versa. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

The module contains:

- Lesson on expressing Rational numbers from Fraction form to Decimal form and vice-versa.

After going through this module, you are expected to:

1. Express Rational numbers from Fraction form to Decimal form
2. Express Rational numbers from Decimal form to Fraction form



What I Know

Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. It describes how many parts of a certain size there are.
   a. decimal
   b. fraction
   c. set
   d. percent

2. It is a number whose whole number part and the fractional part is separated by a decimal point.
   a. decimal
   b. fraction
   c. set
   d. percent

3. It is a point or dot we use to separate the whole number part from the fractional part of a decimal number.
   a. fraction form
   b. percentage
   c. decimal point
   d. set of point

4. The first place to the right of the decimal point in a number.
   a. ones
   b. tenths
   c. hundredths
   d. thousandths

5. The second place to the right of the decimal point in a number.
   a. ones
   b. tenths
   c. hundredths
   d. thousandths

6. Express 0.25 to fraction.
   a. $\frac{1}{2}$
   b. $\frac{1}{3}$

c. $\frac{1}{4}$
d. $\frac{2}{3}$

7. Express $\frac{1}{2}$ to decimal form.
   a. 0.75
   b. 0.25
   c. 0.125
   d. 0.50

8. Express 0.75 to fraction.
   a. $\frac{3}{4}$
   b. $\frac{1}{2}$
   c. $\frac{2}{3}$
   d. $\frac{1}{4}$

9. Express $\frac{1}{4}$ to decimal form.
   a. 0.25
   b. 0.50
   c. 0.125
   d. 0.75

10. Express $\frac{1}{8}$ to decimal form.
    a. 0.75
    b. 0.25
    c. 0.125
    d. 0.50

Lesson 1 Expressing Rational Numbers from Fraction form to Decimal form and Vice-Versa

What's In

This module is a continuation of the concepts on Operations on Integers and on greatest common factors. Mastering the rules in the previous module will speed you in completing this module. Let's check your learning!

Greatest Common Factor (GCF)

A. Find the greatest common factor of the two numbers:

1. 7 and 14 _____
2. 12 and 32 _____
3. 9 and 21 _____
4. 10 and 45 _____
5. 4 and 28 _____

Operations on Integers

B. Perform the indicated operations on integers.

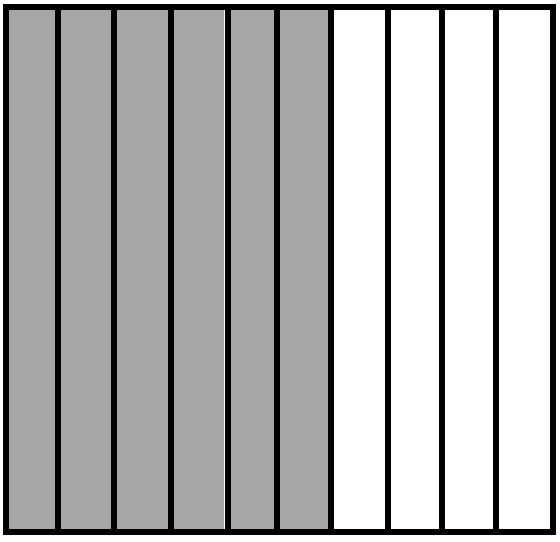
6. (-7) + (+2) =_____
7. (-7) – (-3) = _____
8. (+8) x (+3) = _____
9. (+3) x (-1) = _____
10. (-3) ÷ (+3) = _____

What's New

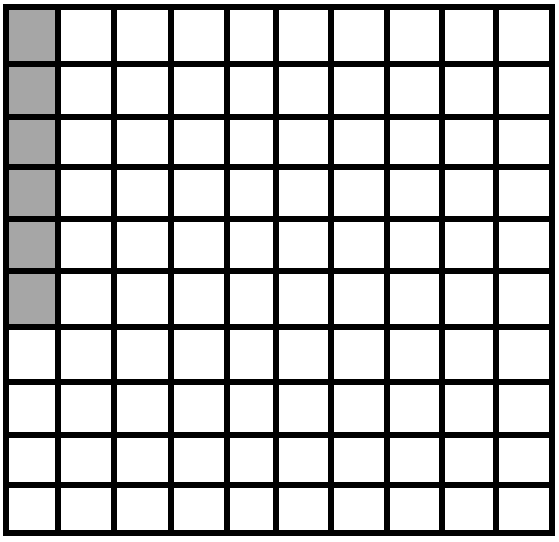
In our previous lesson, we learned about fraction and decimal, we also learned how to perform operations on integers, and we learned how to find the greatest common factor (GCF). Now, we can use them in expressing Rational numbers from Fraction form to Decimal form and vice-versa.

Here's an example of how the fractional part can be converted into decimals.

	Hundreds	Tens	Ones		Tenths	Hundredths	Thousandths
$25\frac{6}{10}$		2	5	.	6		
$25\frac{6}{100}$		2	5	.	0	6	
$25\frac{6}{1000}$		2	5	.	0	0	6



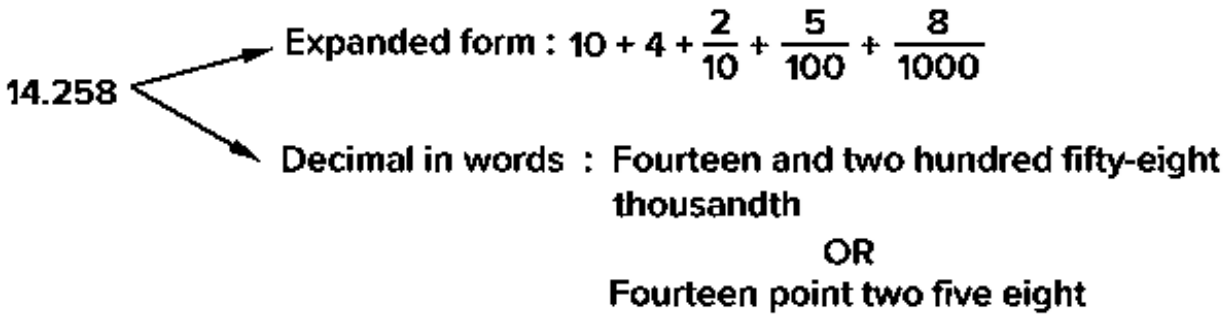
$\frac{6}{10}$ or 0.6 or Six Tenths



$\frac{6}{100}$ or 0.06 or Six Hundredths

$\frac{6}{1000}$ or 0.006 or Six Thousandths

Decimal numbers can be written both in expanded form and in words.



The whole number part and the fractional part of a Decimal number is separated by a decimal point.

What is It

Throughout the discussion, let us express the Rational numbers from Fraction form to Decimal form and vice-versa. There are some steps that you may follow.

To express fraction to decimal form, follow these steps:

- **Step 1**: Find a number you can multiply by the bottom of the fraction to make it 10, or 100, or 1000, or any 1 followed by 0s.
- **Step 2**: Multiply both top and bottom by that number.
- **Step 3**. Then write down just the top number, putting the decimal point in the correct spot (one space from the right hand side for every zero in the bottom number)

Example 1: Express $\frac{3}{4}$ to Decimal form

Step 1: We can multiply 4 by 25 to become 100

Step 2: Multiply top and bottom by 25:

$$\frac{3}{4} \overset{\times 25}{=} \frac{75}{100}$$

Step 3: Write down 75 with the decimal point 2 spaces from the right (because 100 has 2 zeros);

Answer: $\frac{3}{4} = 0.75$

Example 2: Express $\frac{1}{3}$ to Decimal form

Step 1: There is no way to multiply 3 to become 10 or 100 or any "1 followed by 0s", but we can calculate an **approximate** decimal by choosing to multiply by, say, 333

Step 2: Multiply top and bottom by 333:

$$\frac{1}{3} \overset{\times 333}{=} \frac{333}{999}$$

Step 3: Now, **999 is *nearly* 1,000**, so let us write down 333 with the decimal point 3 spaces from the right (because 1,000 has 3 zeros):

Answer: $\frac{1}{3}$ = 0.333 (accurate to only 3 decimal places!!)

Example 3: Express $\frac{1}{9}$ to Decimal form

Step 1: There is no way to multiply 9 to become 10 or 100 or any "1 followed by 0s", but we can calculate an **approximate** decimal by choosing to multiply by, say, 11

Step 2: Multiply top and bottom by 11:

$$\frac{1}{9} \overset{\times 11}{=} \frac{11}{99}$$

Step 3: Now, **99 is *nearly* 100**, so let us write down 11 with the decimal point 2 spaces from the right (because 100 has 2 zeros):

Answer: $\frac{1}{9}$ = 0.11 (accurate to only 2 decimal places!!)

Example 4: Express $\frac{1}{11}$ to Decimal form

Step 1: There is no way to multiply 11 to become 10 or 100 or any "1 followed by 0s", but we can calculate an **approximate** decimal by choosing to multiply by, say, 9

Step 2: Multiply top and bottom by 9:

$$\frac{1}{11} \overset{\times 9}{=} \frac{9}{99}$$

Step 3: Now, **99 is *nearly* 100**, so let us write down 09 with the decimal point 2 spaces from the right (because 100 has 2 zeros):

Answer: $\frac{1}{11}$ = 0.09 (accurate to only 2 decimal places!!)

To express a Decimal number to a Fraction, follow these steps:

- **Step 1:** Write down the decimal divided by 1, like this: $\frac{\text{decimal}}{\mathbf{1}}$
- **Step 2:** Multiply both top and bottom by 10 for every number after the decimal point. (For example, if there are two numbers after the decimal point, then use 100, if there are three then use 1000, etc.)
- **Step 3:** Simplify (or reduce) the fraction

Example 1: Express 0.75 to fraction

Step 1: Write down 0.75 divided by 1:

$$\frac{0.75}{\mathbf{1}}$$

Step 2: Multiply both top and bottom by **100** (because there are 2 digits after the decimal point so that is 10×10=100):

$$\frac{\mathbf{0.75}}{\mathbf{1}} \overset{\times 100}{=} \frac{\mathbf{75}}{\mathbf{100}}$$

(Turns you see how it turns the top number into a whole number?)

Step 3: Simplify the fraction by dividing 5 both top and bottom (this took me two steps):

(1st step) (2nd step)

$$\frac{\mathbf{75}}{\mathbf{100}} \overset{\div 5}{=} \frac{\mathbf{15}}{\mathbf{20}} \longrightarrow \frac{\mathbf{15}}{\mathbf{20}} \overset{\div 5}{=} \frac{\mathbf{3}}{\mathbf{4}}$$

Answer: 0.75 = $\frac{3}{4}$

or

We can simply get the Greatest Common Factor (GCF) of 75 and 100. Just follow these steps:

Step 1: List the multiple of 75 and 100 and find their GCF;

75 = 1, 3, 5, 15, (25), 75

100 = 1, 2, 4, 5, 10, 20, (25), 50, 100

Step 2: Simplify the fraction by dividing their GCF;

$$\frac{75}{100} \div \frac{25}{25} = \frac{3}{4}$$

Answer: 0.75 = $\frac{3}{4}$

*Note: 75/100 is called a **decimal fraction** and 3/4 is called a **common fraction**!*

When there is a whole number part, put the whole number aside and bring it back at the end:

Example 2: Express 2.35 to a fraction

Put the 2 aside and just work on 0.35

Step 1: write down:

$$\frac{0.35}{1}$$

Step 2: multiply both top and bottom by **100** (2 digits after the decimal point so that is 10×10=100):

$$\frac{35}{100}$$

Step 3: Simplify the fraction by dividing their GCF (supposed our GCF of 35 and 100 is 5):

$$\frac{35}{100} \overset{\div 5}{=} \frac{7}{20}$$

Bring back the 2 (to make a mixed fraction):

Answer: 2.35 = $\mathbf{2\frac{7}{20}}$

What's More

A. Express each Fraction in Decimal form. Round off your answers into thousandths place.

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

2. $\frac{21}{6}$

3. $\frac{4}{29}$

4. $\frac{11}{316}$

5. $\frac{2}{37}$

B. Express each Decimal number in Fraction in lowest terms or a mixed number in simple form.

6. 0.15
7. 0.225
8. 2.33
9. 9.08
10. 4.404

What I Have Learned

Fill in the blanks. Refer your answer on the box below.

divided by	decimal point	fraction	
top	multiply	10	Simplify
decimal point	fraction	bottom	

To express a Fraction to a Decimal, follow these steps:

Step 1: Find a number you can (1) by the bottom of the (2) to make it 10, or 100, or 1000, or any 1 followed by 0s.

Step 2: Multiply both (3) and (4) by that number.

Step 3. Then write down just the top number, putting the (5) in the correct spot (one space from the right hand side for every zero in the bottom number)

To express a Decimal to a Fraction, follow these steps:

- **Step 1:** Write down the decimal (6) 1, like this: $\frac{\text{decimal}}{\mathbf{1}}$
- **Step 2:** Multiply both top and bottom by (7) for every number after the (8). (For example, if there are two numbers after the decimal point, then use 100, if there are three then use 1000, etc.)
- **Step 3:** (9) (or reduce) the (10).

What I Can Do

Express the Rational numbers from Fraction form to Decimal form and vice versa.

1. What is 0.75 in fraction?

2. What is 2.333 in fraction?

3. Hailey rode her bike $\frac{4}{5}$ of a mile to the nature park. What is the distance she rode her bike as a decimal number?

4. Sarah took $\frac{2}{4}$ of the ham and pineapple pizza. How much of the pizza did Sarah take written as a decimal number?

5. Erik got $\frac{1}{2}$ of the questions correct on the test. How is that fraction written as a decimal number?

Assessment

Fraction into Decimal

A. Express each Fraction into Decimal form. Round off your answers into thousandths place.

1.) $\frac{13}{5} =$ ☐

2.) $\frac{4}{21} =$ ☐

3.) $\frac{2}{13} =$ ☐

4.) $\frac{5}{35} =$ ☐

5.) $\frac{12}{19} =$ ☐

6.) $\frac{28}{521} =$ ☐

7.) $\frac{31}{163} =$ ☐

8.) $\frac{25}{16} =$ ☐

9.) $\frac{17}{11} =$ ☐

10.) $\frac{124}{117} =$ ☐

Decimal into Fraction

B. Express each Decimal into Fraction form:

1.) 0.6 = ☐

2.) 4.3 = ☐

3.) 0.22 = ☐

4.) 5.2 = ☐

5.) 0.1 = ☐

6.) 0.3 = ☐

7.) 1.5 = ☐

8.) 0.2 = ☐

9.) 2.3 = ☐

10.) 2.5 = ☐

Additional Activities

A. Express the Fractions to Decimals forms. Round off your answers to hundredths place.

1.) $\frac{2}{6} =$

2.) $\frac{1}{2} =$

3.) $\frac{2}{5} =$

4.) $\frac{3}{4} =$

5.) $\frac{3}{5} =$

B. Express the Decimals numbers to Fraction form.

1.) 0.83 =

2.) 0.4 =

3.) 0.24 =

4.) 0.96 =

5.) 0.6 =

Answer Key

What I Can Do

1. ¾
2. 2 1/3
3. 0.8
4. 0.5
5. 0.5

What's More

1. 0.750
2. 3.500
3. 0.138
4. 0.035
5. 0.054
6. 3/20
7. 9/40
8. 2 1/3
9. 9 2/25
10. 4 101/250

What's In

A.
1.) 7
2.) 4
3.) 3
4.) 5
5.) 4

B.
6.) -5
7.) -4
8.) 24
9.) -3
10.) -1

What I have learned

A.
1. multiply
2. fraction
3. top
4. bottom
5. decimal point
6. divided by
7. 10
8. decimal point
9. simplify
10. fraction

Assessment

A.
1. 2.600
2. 0.190
3. 0.154
4. 0.143
5. 0.632
6. 0.054
7. 0.190
8. 1.563
9. 1.545
10. 1.060

B.
1. 3/5
2. 4 3/10
3. 11/50
4. 5 1/5
5. 1/10
6. 3/10
7. 1 ½
8. 1/5
9. 2 3/10
10. 2 ½

Additional Activities

A.
6.) 0.33
7.) 0.50
8.) 0.40
9.) 0.75
10.) 0.60

B.
6.) 83/100
7.) 2/5
8.) 6/25
9.) 24/25
10.) 3/5

What I Know

1. b
2. a
3. c
4. b
5. c
6. c
7. d
8. a
9. a
10. c

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