Lesson Guide
In
Elementary Mathematics
Grade 6

Chapter II
Rational Numbers
Division of Decimals

DEPARTMENT OF EDUCATION
BUREAU OF ELEMENTARY EDUCATION
in coordination with
ATENEO DE MANILA UNIVERSITY

2010

Reformatted for distribution via
DepEd LEARNING RESOURCE MANAGEMENT and DEVELOPMENT SYSTEM PORTAL
INSTRUCTIONAL MATERIALS COUNCIL SECRETARIAT, 2011
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I N T R O D U C T I O N

The Lesson Guides in Elementary Mathematics were developed by the Department of Education through the Bureau of Elementary Education in coordination with the Ateneo de Manila University. These resource materials have been purposely prepared to help improve the mathematics instruction in the elementary grades. These provide integration of values and life skills using different teaching strategies for an interactive teaching/learning process. Multiple intelligences techniques like games, puzzles, songs, etc. are also integrated in each lesson; hence, learning Mathematics becomes fun and enjoyable. Furthermore, Higher Order Thinking Skills (HOTS) activities are incorporated in the lessons.

The skills are consistent with the Basic Education Curriculum (BEC)/Philippine Elementary Learning Competencies (PELC). These should be used by the teachers as a guide in their day-to-day teaching plans.
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Estimating Quotients of Whole Numbers and Decimals

I. Learning Objectives

Cognitive: Estimate quotients of whole numbers and decimals
Psychomotor: Write the estimated quotient
Affective: Extend help anytime

II. Learning Content

Skill: Estimating quotients of whole numbers and decimals
Reference: BEC PELC I.E.1
Materials: cards
Value: Helpfulness

III. Learning Experiences

A. Preparatory Activities

1. Drill – Mental Computation
   a) Group the class. Each group should have 10 members.
   b) Distribute number cards (0 to 9) to each group.
   c) The teacher flashes division equations.
   d) Pupils will solve it mentally and will show the quotient using the number cards they are holding.
      Ex. 5|25  5|300  20|280
   e) The first group to give the correct answer gets a point.

2. Review: Game – “Pick Me Up” (Rounding Off)
   a) Teacher will put number cards, face down, on the table.
   b) Then she gives a question about rounding numbers.
   c) The first pupil that can answer correctly will be the first to play.
   d) The teacher gives the place value the given number should be rounded to.
   e) The player picks a card, reads it, then gives its rounded form.
      Ex. 48 970  4 414  399  888  57
           1 560  73 009  1 873  39  182
   f) The teacher will repeat procedure b to d.
   g) The pupil with the most number of correct answers wins the game.

3. Motivation
   What do carpenters do before buying materials for building a house?
   Would it be alright to estimate the needed materials ahead of time? Why?

B. Developmental Activities

1. Presentation

   a. Activity 1 – Role Playing
      1) Group the class into 2.
      2) Distribute word problems for them to role play or act-out.
         Problem # 1 – Estimate by rounding off and using compatible numbers.
Tina and Rose volunteered to donate ballpens as prizes for a contest in school. They have ₱100. They want to know about how many ballpens they can buy if each ballpen costs ₱4.75.

Problem #2 – (Use rounding off and using compatible numbers)
Rona and Gina are working in a store. They have 375 cm of labeling tape. About how many things can be marked/labeled with it if each label is 2.8 cm long?

3) Have them answer the following:
   a) What word in the problem denotes estimation?
   b) Which problem can easily be estimated by rounding off?
   c) Which problem can easily be estimated by using compatible numbers?
   d) What is your estimated quotient for each problem?

Valuing: If you were Tina and Rose, are you willing to help your school? Why? In what way?

b. Activity 2 – Working in Pairs
1) Distribute equations on estimating quotient.
2) Have the pair work on the following:
   Ex.
   \[ \begin{array}{ccc}
   2.8 \div 375 & 0.8 \div 7.31 & 1.7 \div 35.68 \\
   \end{array} \]
   a) Give your estimated quotient using:
      • rounding off
      • compatible numbers
   b) Which technique is best for estimating quotient?
   c) Which technique gives reasonable estimates?

2. Practice Exercises/Fixing Skills

Estimate the quotient.
1) \[ 1.25 \div 625 \]  
2) \[ 2.5 \div 625 \]
3) \[ 7.5 \div 225 \]
4) \[ 12.5 \div 875 \]
5) \[ 1.2 \div 48 \]

3. Generalization

How do you estimate quotients?
What are compatible numbers?

C. Application

1) Estimate the following using compatible numbers.
   a) \[ 5.8 \div 3.257 \]  
   b) \[ 8.8 \div 14.08 \]  
   c) \[ 4.8 \div 196.7 \]

2) Solve the problem.
   a) Rhoda has ₱75. She wants to give her nieces ₱12.50 each. To how many nieces can she give?
   b) Bing has a ribbon 125 dm long. How many pieces of ribbon 2.5 dm long can be cut from it?
IV. Evaluation

1) Estimate the following: a) use rounding off; b) use compatible numbers.
   a) 7.3\,\overline{87.5}  d) 8.8\,\overline{978}  e) 9\,\overline{77.85}
   b) 0.8\,\overline{67}  d) 4.42\,\overline{872}  f) 7.8\,\overline{67.8}

2) Estimate the quotients of the following:
   a) by rounding off  
   b) by using compatible numbers
   
   1) 61.75\,\overline{4308}  1) 61.75\,\overline{4308}  
   2) 785\,\overline{559.8}   2) 785\,\overline{559.8}  
   3) 51.5\,\overline{1019}   3) 51.5\,\overline{1019}   
   4) 968\,\overline{88.975}   4) 968\,\overline{88.975}  
   5) 30.8\,\overline{19785}   5) 30.8\,\overline{19785}  

V. Assignment

Answer the following:
1) Rex traveled 154 km in 3.2 hours. Approximately, what was his average speed for the journey?
2) Jay has 6,584 metres of ribbon. He wants to cut it into 25.6 metres. About how many ribbons can be cut from it?

Dividing Whole Numbers by 1-Digit Decimals

I. Learning Objectives

Cognitive: Divide 2- to 5-digit whole numbers by 1- to 2-digit decimals
Psychomotor: Write solutions to division equations involving 1-digit decimal divisors correctly
Affective: Appreciate the importance of being industrious in one’s work

II. Learning Content

Skill: Dividing 2- to 5-digit whole numbers by 1-digit decimal
Reference: BEC PELC II.E.2.1
Materials: cards
Value: Industry

III. Learning Experiences

A. Preparatory Activities

1. Mental Computation Drill
   Dividing 3- to 4-Digit Numbers by 1-Digit Whole Number Divisors
   GAME:
   a) Divide the class into 2 groups.
   b) Prepare a set of cards with equations on division of 3- to 4-digit numbers by 1-digit whole number divisors. Place the cards facedown on top of the teacher’s table.
Ex.  $840 \div 4 = 210$
$393 \div 3 = 131$
$248 \div 8 = 31$

c) Call on a member of each group in front.
d) Let Player 1 pick the topmost card. He/she reads aloud the equation on the card and solves for the quotient mentally. If his/her answer is correct, his/her group gets 1 point. If not, the other player may steal. If the answer is correct, his/her group gets the point. If not, Player 2 picks another card and solves mentally for the answer. The game continues until all the cards are answered.

2. Review
Review the previous lesson. Give one or two examples.

3. Motivation
How does your family earn a living? Does your mother help your father earn for your family? If so, why? What good will it do to your family?
Show a picture of a mother sewing a table linen.

B. Developmental Activities

1. Presentation

a. Activity 1
Present the following problem:
Aling Dolores sews tablecloth to sell. She uses 0.6 metre of linen for every tablecloth she makes. How many table cloths can she make out of 18 m of linen?
Ask the following questions:
1) What is being asked in the problem?
2) What are given?
3) What operation will you use to solve the problem?
4) Give the number sentence for it.

b. Activity 2 - Manipulative Activity Card
1) Distribute assortment of cards to each group.
2) Students take turns drawing the cards.
3) He/she reads what is written on the card then gives the answer.

Ex.  $0.5 \overline{4595} \quad 0.6 \overline{18.0}$

4) For every wrong answer, the group gets a deduction of 2 points.
5) The group with the most number of correct answers wins the game.
6) Ask a volunteer to show the solution.
7) The teacher assists pupils in solving the equation:
   a) Move the decimal point of the divisor to the right to make it a whole number and move the decimal point in the dividend as many places as you move in the divisor. Place the decimal point of the quotient directly above the decimal point of the dividend. Moving the decimal points in the divisor and dividend is multiplying both by 10, 100, 1 000, etc. (or multiples of 10)
b) Divide just like dividing whole numbers

\[
6 \overline{)180}
\]

2. Generalization
How do we divide 2- to 5- digit whole numbers by 1-digit decimals?

C. Application
Have them solve the following:
1) \(0.3 \overline{)12}\)  
2) \(0.9 \overline{)135}\)  
3) \(0.3 \overline{)396}\)

IV. Evaluation

A. Find the quotient. Be sure to place the decimal point correctly in your quotient.
1) \(0.9 \overline{)756}\)  
2) \(0.12 \overline{)94}\)  
3) \(0.13 \overline{)2119}\)
4) \(0.8 \overline{)968}\)  
5) \(0.06 \overline{)138}\)

B. Solve the problem carefully by answering the questions below:
   Mrs. Roxas uses 0.3 metre of lace for her pillow case. How many pillow cases can she make out of 27 metres of lace?

   6) What is being asked? 
   7) What are given? 
   8) What operation will you use to solve it? 
   9) Give the number sentence. 
   10) What is your answer?

V. Assignment
Solve the following exercises:
1) \(64 \div 0.4 = \)
2) \(714 \div 0.7 = \)
3) \(993 \div 0.03 = \)
4) \(565 \div 0.05 = \)
5) \(2460 \div 0.06 = \)
6) \(0.12 \overline{)146}\)
7) \(0.4 \overline{)2816}\)
8) \(0.3 \overline{)399}\)
9) \(0.7 \overline{)3514}\)
10) \(0.18 \overline{)29340}\)

Dividing Whole Numbers by 2-Digit Decimals

I. Learning Objectives

Cognitive: Divide 2- to 5- digit whole numbers by 2-digit decimals
Psychomotor: Write the number sentence and solution correctly
Affective: Keep oneself physically fit
II. Learning Content

Skill: Dividing 2- to 5-digit whole numbers by 2-digit decimals
Reference: BEC PELC II E.2.1
Materials: chart, flash cards, activity cards
Value: Health consciousness

III. Learning Experiences

A. Preparatory Activities

1. Drill: Dividing Whole Number by 1-Digit Divisor

Mechanics:
a) A player for each team will stand at the back.
b) As the teacher flashes an equation, players will give the answer orally.

e.g. $4)136$  $7)105$  $5)25$  $6)36$
c) The first to give the correct answer will take 1 step forward.
d) The first to reach the platform wins the game.

2. Review: Estimating Quotients

a) Teacher prepares division equations on estimating quotients by rounding off factors to the highest place value.

$$62 \div 7.2 = \quad 62.1 \div 2.3 = \quad 120 \div 2.57 =$$ $$90.4 \div 2.8 = \quad 751 \div 19.7 = \quad 1.8 \div 1.8 =$$
b) As the teacher flashes the card, pupils will give the answer.
c) The first to give the correct answer wins.

3. Motivation

Who has a store? What are the goods that are repacked less than a kilo? Why do you think they are doing it?

B. Developmental Activities

1. Presentation – Present the lesson through the following:

Activity 1 – Problem Analysis

1) Present the problem on the board:

Mother has a small sari-sari store. Everytime she buys a 50-kilo cavan of sugar, she repacks it into smaller bags weighing 0.25 kilo. How many small plastic bags are needed by mother?

2) Have the class work by pairs.

3) Tasks:
   a) What is asked in the problem?
b) What are the given facts?
c) What should be done to solve the problem?
d) Translate the problem into an equation.
e) Show your solution, step by step:

\[
\begin{align*}
0.25 \div 50 & \quad \text{Step 1 \ Multiply the divisor by 100 to make the divisor a whole number or just move the decimal point to the right as many places as there are decimals in the divisor.} \\
0.25 \div 0.20 & \quad \text{Step 2 \ Multiply also the dividend by 100.} \\
0.20 \times 100 & = 200 \\
0.25 \times 5000 & = 1250 \\
50 & \\
0 & \\
0 & \\
0 & \\
0 & \\
0 & \\
200 \times 0.25 & = 50.00 \quad \text{Step 4 \ Check your work by multiplying the quotient by the divisor. The product should be equal to the dividend.}
\end{align*}
\]
f) Have each group report their work to the class.

**Activity 2 – Problem Opener: Whole Class Activity**

1) Teacher presents the problem written on the chart/activity cards.

Mr. Valencia jogged a total of 40 kilometres during his stay in the city. If he jogged 0.20 km daily, how long was his stay in the city?

2) Pupils analyze the problem by answering the following questions:
   a) What did Mr. Valencia do when he was in the city? Why is it good to jog? Why?
   b) What is asked in the problem?
   c) What facts are given to solve the problem?
   d) What facts will you use to solve the problem?
   e) Give the number sentence.
   f) Solve the problem step by step.

   Step 1 - Move the decimal point of the divisor 2 places to the right or multiply by 100 to make it a whole number:

   \[
   0.20 \text{ or } 0.20 \times 100 = 20
   \]

   Step 2 - Do the same with the dividend.

   \[
   40 \times 100 = 4000
   \]
Step 3 - Divide like dividing whole numbers.

Therefore,

\[
\begin{array}{c}
  200 \\
  40 \overline{400} \\
  0 \\
  - 0 \\
  0 \\
  - 0 \\
  0 \\
\end{array}
\]

Answer: Mr. Valencia stayed 200 days in the city.

Activity 3 – Relating to Mixed Form: Following Directions

Note: Use the same problem presented above.

1) Divide the class into groups with 4 members each.
2) Each group should follow strictly the instruction.

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<th>Expected Result</th>
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<td>Step 1</td>
<td>Multiply both decimals by 100</td>
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<tr>
<td></td>
<td>$40 \times 100 = 4000$</td>
</tr>
<tr>
<td></td>
<td>$0.20 \times 100 = 20$</td>
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| Step 2      | Change the number to fractional form using 100 as denominators |
|             | $\frac{4000}{100} \div \frac{20}{100}$ |

| Step 3      | Get the multiplicative inverse of the divisor; then change division sign to multiplication sign |
|             | $\frac{4000}{100} \times \frac{100}{20}$ |
|             | $\frac{200}{1} \times \frac{1}{1} = \frac{200}{1} = 200$ |

| Step 4      | Multiply. Use cancellation if possible. |
|             | $\frac{4000}{1} \times \frac{100}{20}$ |

3) Have each group make 2 examples.
4) Have each group report its work to the class.

Valuing: Why do you think Mr. Valencia always finds time to jog? Why do we have to be physically fit always?

2. Fixing Skills

Find the quotient. Check your answer.

1) $0.15 \overline{456}$
2) $0.32 \overline{48}$
3) $0.61 \overline{5185}$
4) $0.25 \overline{125}$
5) $0.36 \overline{22005}$
3. Generalization

How do you divide a whole number by a decimal?
What are the 2 ways of making the divisor a whole number?
If you change the divisor into a whole number, what will you do with the dividend?

C. Application

A) Find the quotient, then check:

1) \(132 \div 0.03 = \)
2) \(1848 \div 0.42 = \)
3) \(2608 \div 0.54 = \)

IV. Evaluation

A. Solve and check.

1) \(0.32\overline{1984} = \)
2) \(0.04\overline{92} = \)
3) \(13588 \div 0.43 = \)
4) \(39102 \div 0.06 = \)
5) \(848 \div 0.04 = \)
6) \(115 \div 0.23 = \)

B. Write the number sentence, then solve.

1) Cheska has 147 metres of red ribbon. She cut it into 0.21 metre long. How many pieces of ribbon does she have?
2) Cynthia was able to make a total of 138 metres of abaca braid. If she braided 0.23 metre a day, how long did it take her to braid the abaca?
3) How many pieces of string 0.62 dm long can be cut from a 21204 dm spool of string?
4) When 15 is added to the quotient of 969 and 0.03, the sum is \(N\). What is \(N\)?

C. 1.) Is 1984 divided by 0.32 equal to \(\frac{32}{10}\) of 1984?

2.) How many times greater is 92 than .04?
3.) Which will result to a greater quotient \(3 \div 0.1\) or \(3 \div 0.01\)? Why?
4.) How many times is 0.23 subtracted from 115?
5.) Which will result to a quotient of 10?
   A. \(32 \div 3.2\)
   B. \(165 \div 16.5\)
   C. both
   D. neither

V. Assignment

Solve and check.

1) \(0.30\overline{19} 470 = \)
2) \(0.23\overline{11} 868 = \)
3) \(0.07\overline{44} 919 = \)
4) \(0.62\overline{21} 204 = \)
5) \(0.05\overline{10} 5 = \)
6) \(0.2\overline{868} = \)
Dividing Whole Numbers by Whole Numbers with Decimal Quotient

I. Learning Objectives

Cognitive: Divide whole numbers by whole numbers with decimal quotients
Psychomotor: Solve problems using division of whole numbers with decimal quotient
Affective: Show fairness to all

II. Learning Content

Skill: Dividing whole numbers by whole numbers with decimal quotients
Reference: BEC PELC E.2.2
Materials: flash cards, activity cards
Value: Fairness

III. Learning Experiences

A. Preparatory Activities

1. **Drill – Mental computation - Give the quotient**
   
   Game Relay
   
   a. Teacher prepares flash cards with division.
   b. Players for each group stand at the back.
   c. As the teacher flashes the card, each player will give the answer.
   d. The first to give the answer correctly, will take 1 step forward.
   e. The first to reach the platform, wins the game.

   Ex: \( \frac{30}{5} = n \) \( \frac{16}{4} = n \)

2. **Review: Dividing a decimal by a whole number**

   Game Relay
   
   a. Teacher prepares activity cards.
   
   Mechanics:
   
   1) Place equal stacks of cards with identical problems.
   2) As the teacher says “Go” the first player for each team goes to the board and solves the first problem on the first card.
   3) As soon the first player is finished, the second player takes the next card and solves the problem correctly.
   4) If the solution is incorrect, the next player must solve the same problem.
   5) The first team to complete its stack of problems correctly answered is the winner.

   Ex.
   
   a. Jean has 35 metres of wire for hanging pictures. If she needs 0.5 metre of wire for each picture, how many pieces of wire can be cut from it?
   b. A piece of string is 372 dm long. How many pieces of 2.5 dm long can be cut from it?

3. **Motivation**

   How many are you in the family?
   Have you experienced bringing home something which is not enough for your family?
   How did you share it equally to every one?
B. Developmental Activities

1. Presentation
   Activity 1
   a) Form a group of 4.
   b) Present this problem.
      Ana brought home 3 suman. If she has 4 sisters, how will she divide it equally among her sisters?
   c) Task for each group
      1) Use strips of paper to present the 3 suman.
      2) Divide each strip into 4 equal parts.
      3) Give one piece to each member of the group. Do the same with the other strips.
      4) Answer the following.
         a) What do you call each part? \( \frac{1}{4} \)
         b) How many fourths did each one receive? \( \frac{3}{4} \)
         c) How did you change \( \frac{3}{4} \) to decimal?
            (By multiplying both terms by 25; that is, \( 3 \times 25 = 75; 4 \times 25 = 100 \))
         d) How will you write 75 and 100 in fractional form? \( \frac{75}{100} \)
         e) How is \( \frac{75}{100} \) written in decimal form? (0.75)
         f) What is the quotient of \( 3 \div 4 \)?
         g) Show your solution.
   d) Have each group present its work.
   e) Teacher should guide pupils how to round the answer to a given place value like tenths and hundredths.

2. Fixing Skills
   Find the quotient. Show your solution.
   a) \( \frac{5}{4} \)  c) \( \frac{5}{3} \)  e) \( \frac{16}{10} \)
   b) \( \frac{50}{49} \)  d) \( \frac{25}{24} \)  f) \( \frac{20}{15} \)

3. Generalization
   When does division result to a decimal quotient?
   What is the rule in rounding the decimal quotient to the nearest tenths or hundredths?

C. Application
   1) \( 15 \div 16 = N \)   2) \( 99 \div 100 = N \)   3) \( 2 \div 4 = N \)
   4) \( 25 \div 50 = N \)   5) \( 56 \div 58 = N \)
   6) A dressmaker has a bolt of fabric that is 49 metres long. She plans to make 50 table runners. How long will each piece be?
IV. Evaluation
A. Find the quotient. Round your answer to the nearest place value indicated.

<table>
<thead>
<tr>
<th></th>
<th>tenths</th>
<th>hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>$12 \div 18$</td>
<td>__________</td>
</tr>
<tr>
<td>2)</td>
<td>$5 \div 6$</td>
<td>__________</td>
</tr>
<tr>
<td>3)</td>
<td>$12 \div 48$</td>
<td>__________</td>
</tr>
<tr>
<td>4)</td>
<td>$16 \div 80$</td>
<td>__________</td>
</tr>
<tr>
<td>5)</td>
<td>$15 \div 80$</td>
<td>__________</td>
</tr>
</tbody>
</table>

B. Solve.
1) Tina has a 19 cm ribbon. She has 20 friends who want to have a piece of ribbon. How long will each one have?
2) A 24-metre string is to be divided into 30 pieces. How long will each be?

V. Assignment
Find the quotient. Round answers to the nearest place value indicated.

<table>
<thead>
<tr>
<th></th>
<th>tenths</th>
<th>hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>$3 \div 4$</td>
<td>__________</td>
</tr>
<tr>
<td>2)</td>
<td>$7 \div 8$</td>
<td>__________</td>
</tr>
<tr>
<td>3)</td>
<td>$15 \div 48$</td>
<td>__________</td>
</tr>
<tr>
<td>4)</td>
<td>$12 \div 25$</td>
<td>__________</td>
</tr>
<tr>
<td>5)</td>
<td>$45 \div 48$</td>
<td>__________</td>
</tr>
</tbody>
</table>

Terminating and Repeating/Non-Terminating Decimal Quotients

I. Learning Objectives

Cognitive: Recognize and differentiate between terminating and repeating/non-terminating decimal quotients
Psychomotor: Write solutions to problems correctly
Affective: Practice cooperation in working with the group

II. Learning Content

Skill: Recognizing and differentiating between terminating and repeating/non-terminating decimal quotients
Reference: BEC PELC II.E.2.2.1 Mathematics in Action p. 246, Mathematics 8 p. 122
Materials: problem cards, number cards
Value: Cooperation

III. Learning Experiences

A. Preparatory Activities

1. Mental Computation – Game
   Prepare problem cards with answers written on separate cards. Shuffle the cards separately and have each pupil pick a card from the two sets. Form the pupils into groups. Call on a pupil to start the game. The first player reads aloud the problem on the card and computes mentally for the answer. He then says the
answer aloud and the one holding that answer card hands it to the first player, and he now reads his problem and answers it. This goes on until all the problem cards are answered. The group with the most answer cards wins.

Ex.:  

| 100 ÷ 50 | 30 ÷ 4 | 7.5 | 2 |

2. Review  
Prepare the following problems on separate sheets.

| T = 1 ÷ 2 | T = 6 ÷ 12 | E = 1 ÷ 4 | E = 2 ÷ 8  
|———|———|———|———|
| N = 3 ÷ 5 | B = 5 ÷ 8 | A = 4 ÷ 5 | R = 9 ÷ 12  

| R = 3 ÷ 4 | R = 6 ÷ 8 | T = 2 ÷ 4 | M = 1 ÷ 5  
|———|———|———|———|
| I = 2 ÷ 5 | E = 3 ÷ 12 | P = 3 ÷ 8 | R = 9 ÷ 12  

| N = 3 ÷ 5 | E = 3 ÷ 12 | G = 1 ÷ 8 | T = 6 ÷ 12  
|———|———|———|———|
| T = 4 ÷ 8 | T = 1 ÷ 2 | I = 2 ÷ 5 | E = 1 ÷ 4  

| D = 7 ÷ 8 | T = 2 ÷ 4 |  
|———|———|———|
| N = 3 ÷ 5 | T = 6 ÷ 12 |  

Hand out one problem sheet to groups of 4s. Tell them to work together (cooperative learning) in solving the problem given. While the pupils are answering, write the problem on the board in sequence. After a few minutes, ask a member from each group to answer one problem on the board. Check the answer.

3. Motivation  
Post the following on the board:

0.5 0.25 0.75 0.2 0.4 0.6 0.8 0.5 0.4 0.6 0.125

0.75 0.25 0.375 0.25 0.8 0.5 0.4 0.6 0.125

Tell them that two terms that are important in the day’s lesson are hidden in the puzzle. Ask if any one has identified the two terms.

B. Developmental Activities

1. Presentation

   a. Activity 1

      1) Have the pupils examine their solutions to the problem sheets given during the review. Lead them to notice that the last remainder is zero. Tell them that the decimal quotients of these problems are called terminating decimal.

      2) Hand out another set of problem sheets to be solved.

| A | B | C |
|——|——|——|
| 2 ÷ 3 | 2 ÷ 7 | 4 ÷ 7 |
| 5 ÷ 11 | 3 ÷ 11 | 9 ÷ 11 |
| 4 ÷ 6 | 7 ÷ 9 | 3 ÷ 9 |
| 1 ÷ 2 | 7 ÷ 2 | 4 ÷ 12 |
3) Have volunteers from each group show their solutions on the board. Discuss the solutions given. Ask for their observations.

4) Lead them to say that the decimal quotient is a repeating decimal. (Non-terminating decimal can also be accepted.)

5) Have an open discussion on the difference between terminating and repeating/non-terminating decimal. Give another problem for them to solve and identify.

b. Activity 2

1) Tell the pupils to write five numbers on their papers. Shuffle cards with numbers 3 to 9 written on them. Ask a member from each group to pick a card. The number picked will be the divisor.

2) Tell the class that the group can already write their solution on the board once they finish. (If the board space is not enough, manila paper and pens can be used and then posted afterwards.) Have a volunteer from each group share/explain his/her work to the class.

3) Have them look again at the solution on the board. Tell the pupils to place the decimal quotients under the two columns.

<table>
<thead>
<tr>
<th>Ends in Zeros</th>
<th>Continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>2 ÷ 3</td>
<td>1 ÷ 6</td>
</tr>
<tr>
<td>3 ÷ 7</td>
<td>3 ÷ 11</td>
</tr>
<tr>
<td>7 ÷ 11</td>
<td>5 ÷ 7</td>
</tr>
<tr>
<td>5 ÷ 12</td>
<td>10 ÷ 12</td>
</tr>
</tbody>
</table>

4) Guide them to notice that the solution with a zero remainder terminates, thus, the term for the decimal quotient is terminating decimal. If the solution does not terminate or is continuous, the term for the decimal quotient is non-terminating.

5) Have them go back to the solution of non-terminating decimal quotients and observe the remainder to point out the term REPEATING DECIMAL.

2. Fixing Skills

Solve and identify if the decimal quotient is a terminating or a repeating/non-terminating decimal.

- a) 1 ÷ 13  
- b) 2 ÷ 13  
- c) 3 ÷ 13  
- d) 4 ÷ 13  
- e) 6 ÷ 13  
- f) 6 ÷ 13  
- g) 7 ÷ 13  
- h) 8 ÷ 13  
- i) 9 ÷ 13  
- j) 10 ÷ 13 
- k) 11 ÷ 13
- l) 12 ÷ 13

3. Generalization

How do you differentiate a terminating decimal from a repeating/non-terminating decimal?
C. Application
Father left ₱50 on the table for you and your two brothers’ snack. The three of you decided to share it equally so each one can buy what he likes for a snack.
1) What will be the amount each of you can receive?
2) How much, from ₱50, will you set aside so each one will get an equal share?
3) What will you do with the extra money?

IV. Evaluation
Solve and identify if the decimal quotient is a terminating or repeating/non-terminating decimal.
1) \(7 \div 4\)
2) \(15 \div 9\)
3) \(11 \div 2\)
4) \(3 \div 16\)
5) \(6 \div 21\)

V. Assignment
A. Solve and identify if the decimal quotient is a terminating or repeating/non-terminating decimal.
1) \(3 \div 20\)
2) \(6 \div 11\)
3) \(20 \div 12\)
4) \(2 \div 6\)
5) \(81 \div 48\)

B. Choose a number as a divisor, ex. 25. Use any ten numbers as your dividend. Solve for the quotient. Identify the quotient if it is a terminating or repeating/non-terminating decimal. List your work on a cartolina or manila paper. Be ready to share your work the next school day.

Visualizing Division Using Money

I. Learning Objectives
   Cognitive: Divide mixed decimals by whole numbers
   Psychomotor: 1. Write solutions correctly
                 2. Write a decimal point in its proper place
   Affective: 1. Show obedience to others, especially elders
              2. Show helpfulness to others

II. Learning Content
   Skill: Visualizing division using money as model
   Reference: BEC PELC II.E.2.3 – 2.3.1
              Mathematics in Action, pp. 128-129
   Materials: flats, longs and ones, problem cards, number cards, tree diagram, fruit cards, play money
   Value: Helpfulness

III. Learning Experiences
   A. Preparatory Activities
      1. Mental Computation
         Concentration Game
a) On one board post problem cards with letters written at the back, face down. On another board post answer cards, with numbers written at the back. Make sure that the problems and the answers are not arranged in the same order.
b) Call on two pupils to help open the cards as the game is played.
c) Divide the class into two groups. Decide which group will go first.
d) A member from the group will call out a letter and number to be opened. If they match, the group keeps the card. If not, the cards are placed face down again. The next group picks two cards. The game continues until all cards have been correctly paired. The team with the most cards paired wins.

3. Review

Post a picture of a tree on the board and attach plenty of fruit cards. Problems from the previous lesson, e.g., 21 ÷ 5, are written on the fruit cards. Call on volunteers to pick a fruit, read the problem aloud, and give the answer by computing mentally. Attach more fruits if all have been picked.

4. Motivation

Give this situation.

Both your parents have their work from Monday to Saturday. Everyday, before they leave, they just leave food for your meals in the morning and for lunch. They also leave you just enough money for your other expenses at home while they’re gone. They always remind you to take care of your brothers and sister while they are away.

How will you help your parents take care of your brothers and sisters?

B. Developmental Activities

1. Presentation

a. Activity 1

1) Form pupils into groups of 5s (or more, depending on the total number of pupils present). Tell them to role play the situation given in the motivation. Give 5 minutes for brainstorming and 2 to 3 minutes each group for their presentation.

2) After all have presented, discuss what they did, what value/s they portrayed in the role play, etc.

3) Extend the problem:

If your parents left P50 for your snack, what should be the maximum price of each one’s snack if you are to share equally with your:

a) 2 brothers and a sister?

b) 2 brothers and 2 sisters?

c) 7 other siblings?

4) Use play money to show partitive division in each of a, b, and c. Write the number sentence for each. Let them relate the money partition to writing solution of long division.

5) Give other numbers for practice, e.g. P100,25 ÷ 5, etc.

b. Activity 2

1) Discuss how pupils help at home. Ask if they follow what their parents (or even elder brothers/sisters) ask them to do. Have an open discussion on this. Point out the importance of being obedient and helpful to others, young and old alike.

2) Go back to the motivation situation:
Say for example, there are 4 children and the parents left P50 for them to spend. How much should each one get so they will have the same amount?

3) Bid for possible amounts (list all the amounts given by the pupils). Call on four pupils in front to represent the 4 children. Call on another to get 50 flats to represent P50. Tell him to divide equally the flats among the 4 children using partitive division.

4) After dividing the flats, two flats remain. Ask how many flats each one got (12). Elicit answers on what should be done to the 2 flats so the 4 can still share. Encourage giving of opinions – this caters to critical thinking in a simple way.

5) Try out any (or all) of the suggestions given. Or, have the flats traded for longs and then divided among the 4 children. Ask how many longs each one got (5). Ask a volunteer to write the amount on the board. Try to see if they can recognize that flats are for the peso and the longs are used for the centavos. If not, this should be identified by the teacher.

6) Give another pair of numbers, say P60.75 and 3 children. Have them do the same.

7) Rewrite the 2 pairs of numbers and call on volunteers to use long division in solving the equations. Have the pupils observe the answers and compare with the “distribution” activity. Give other numbers for practice. Let them decide which one they will use to solve for the answer – visualization using models or long division.

2. Fixing Skills

Prepare envelopes with 10 problem cards each. Group the pupils and give each group an envelope with an instruction card:

<table>
<thead>
<tr>
<th>Directions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Shuffle the problem cards and place on the table face down.</td>
</tr>
<tr>
<td>b) Each member of the group picks one card and solves in his/her notebook (or paper).</td>
</tr>
<tr>
<td>c) Return the cards and shuffle again.</td>
</tr>
<tr>
<td>d) Repeat b and c until each one has answered 5 problems.</td>
</tr>
</tbody>
</table>

Post each card with the answer so the pupils can check their work.

3. Generalization

How do you divide mixed decimals by whole numbers?

C. Application

Your neighbor, an old lady who lives alone, requested you to clean her house on Saturday. She will give you P100 for the job. What will you do?

Discuss all answers that will be given, identifying the good and bad attitudes as well as the values that are linked with their answers.

If the lady lives in a two-story house with a total floor area of 70.5 sq. metres, how big will be each level you’re going to clean? (35.25 sq. m.)

Add other questions to extend the problem.

IV. Evaluation

A. Write the letter of the correct answer.

1) $8 \div 18.16$

   a) 227  b) 22.7  c) 2.27  d) 0.227
B. Read and solve.

1) What is the quotient of 17.682 divided by 14?
2) If the divisor is 15 and the quotient is 21.05, what is the dividend?

V. Assignment

A. Divide.

1) \( 9 \overline{) 39.24} \) 
2) \( 66 \overline{) 16.5} \) 
3) \( 90 \overline{) 21.24} \) 
4) \( 25 \overline{) 426.5} \) 
5) \( 12 \overline{) 1027.68} \)

6) \( 1.8 \div 100 \) 
7) \( 6.2 \div 400 \) 
8) \( 0.45 \div 150 \) 
9) \( 0.018 \div 45 \) 
10) \( 1352.182 \div 26 \)

B. Find the missing number.

1) \( \square \div 45 = 8.05 \) 
2) \( 249.6 \div \square = 64 \) 
3) \( 106.5 \div \square = 213 \)

C. Complete. Write >, < or =.

1) \( 2.675 \div 5 \square 2.675 + 0.5 \) 
2) \( 336 \div 12 \square 25.2 \div 9 \) 
3) \( 2.4 \div 200 \square 0.24 \div 200 \)

---

Dividing Whole Numbers by Decimals and Mixed Decimals

I. Learning Objectives

Cognitive: Divide a whole number by decimal and mixed decimal
Psychomotor: Write answers to problems correctly
Affective: Strive hard to succeed

II. Learning Content

Skill: Dividing a whole number by decimal and mixed decimal
References: BEC PELC E.2.2.4
Mathematics for Everyday Use, pp. 188-190
Materials: flash cards
Value: Industry
III. Learning Experiences

A. Preparatory Activities

1. Mental Computation
   Divide mentally:
   \[ \begin{align*}
   638 \div 10 &= N \\
   79 \div 10 &= N \\
   457 \div 100 &= N \\
   437 \div 1000 &= N \\
   784 \div 100 &= N
   \end{align*} \]

2. Review
   a) Divide the class into 4 groups.
   b) At the signal of the teacher the first player in each group will go in front and solve the division exercises on the board.
   
   \[ \begin{align*}
   1) & \quad 7 \, 28 \, 7 \\
   2) & \quad 9 \, 58 \, 5 \\
   3) & \quad 6 \, 48 \, 0 \\
   4) & \quad 6 \, 13 \, 8 \\
   5) & \quad 8 \, 72 \, 8
   \end{align*} \]

5. Motivation
   Ask pupils if they own the lot they are occupying.
   Ask them also how they acquired it. If they don’t own it, what must they do in order to own one.

B. Developmental Activities

1. Presentation

   Activity 1 – Problem Opener
   
   1) Present the problem on the board:
   
   Mang Lucio is a hardworking man who owns six hectares of land. In his will, he divided his lot equally among his sons. If each son will get 1.2 hectares, how many sons does the man have?

   2) Ask the following questions:
   a) How many hectares has Mang Lucio?
   b) How many hectares will each son get?

   3) Lead pupils to solve the problem.
   
   \[ 1.2 \overline{6} \]
   a) Ask pupils to change the divisor into a whole number by moving the decimal point one place to the right and so with the dividend.
   \[ 1.2 \overline{6} \]
   b) Let them place the decimal point of the quotient directly above the decimal point of the dividend, then divide like dividing whole numbers.

   4) Answer the question in the problem.

   5) Have another example:
   
   \[ 1.75 \overline{1575} \]
   a) Make the divisor whole number by moving the decimal point 2 places to the right or multiplying it by 100.
   b) Multiply the dividend also by 100.
   c) Divide like dividing whole numbers.
Activity 2 – Role Playing

1) Present the situation:

A developer will develop a subdivision with an area of 454,865 sq. metres to be subdivided into 72.5 sq. metres per lot. How many lots would there be?

2) Ask some questions about the situation:
   a) Who will develop a subdivision?
   b) How big is the lot to be subdivided?
   c) How many sq. metres should one lot be?

3) Lead pupils to write the division problem.

4) Let them solve the operation.
   a) Ask them to change the divisor into a whole number by multiplying it by 10.
   b) Do the same with the dividend.
   c) Place the decimal point of the quotient directly above the decimal point of the dividend and affix zero if necessary.
   d) Divide like dividing whole numbers.
   e) Give the answer to the situation. Check through multiplication.

Activity 3 – Data Interpretation

1) Present the following data:

<table>
<thead>
<tr>
<th>Commodities</th>
<th>Weight</th>
<th>Weight/Pack</th>
<th>No. of Packs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabbage</td>
<td>105 kilos</td>
<td>3.5 kilos</td>
<td>30</td>
</tr>
<tr>
<td>Sugar</td>
<td>749 kilos</td>
<td>1.75 kilos</td>
<td>428</td>
</tr>
<tr>
<td>Vetsin</td>
<td>460 lbs</td>
<td>2.5 lbs</td>
<td>184</td>
</tr>
<tr>
<td>Iodized salt</td>
<td>4086 mg</td>
<td>4.5 mg</td>
<td>908</td>
</tr>
</tbody>
</table>

2) Ask questions about the data presented:
   a) How many kilos of cabbage are there?
   b) What commodities have the least number of packs? the biggest?

3) Ask pupils to explain how to get the number of packs for each commodity.

Ex. cabbage

4) Lead pupils on how the number of packs were arrived at.

5) Guide the child to write the division sentence.

\[
\begin{align*}
3.5)\text{105} & = \text{3.5)105.0} \\
\text{Step 1} & \quad \text{Change the divisor into a whole number by multiplying it by 10.} \\
\text{Step 2} & \quad \text{Multiply the dividend also by 10.}
\end{align*}
\]
Step 3  Divide like dividing whole numbers.
So: 3.5 becomes 35 and
105 becomes 1050

\[
\begin{array}{c}
35 \overline{)1050} \\
35 \underline{105} \\
0
\end{array}
\]

Step 4  Place the decimal point of the quotient directly above the decimal point of the dividend. Affix zero if needed.

Step 5  Give the answer to the problem.

6) Have another example.
a) Take sugar. How did you get 428 packs?
b) Lead the class to write the division sentence.

\[
1.75 \overline{)749}
\]
c) Guide the class in changing the divisor into a whole number by multiplying it by 100.
So: 1.75 \times 100 = 175 or simply move the decimal point two places to the right
d) Do the same with the dividend
So: 749 \times 100 = 74,900
e) Place the decimal point of the quotient directly above the decimal point of the dividend and affix zero/zeroes if necessary.
f) Divide like dividing whole numbers.
So: 1.75 \overline{)749900} \rightarrow 1.75 \overline{)749900}

g) Give the answer: 428 kilos.
h) Have some exercises like:
1) 2.5 \overline{)175}  \quad 2) 7.2 \overline{)648} \quad 3) 2.7 \overline{)8463}

2. Fixing Skills
Divide. (Pair Activity)
a) 2.5 \overline{)175}  \quad d) 0.35 \overline{)42}
b) 7.2 \overline{)648}  \quad e) 0.09 \overline{)135}
c) 2.17 \overline{)8463}

3. Generalization
To divide whole numbers by decimals or mixed decimals, change the divisor into a whole number by moving the decimal point to the right or multiplying by a power of 10. Multiply also the dividend by the same power of 10. Then divide as in whole numbers. Check by multiplying.

C. Application
Solve. Be sure to show your solution.
1) Mr. Leonardo borrowed ₱2,946 from a friend to be repaid at ₱245.50 a month. How long will it take him to repay his friend?
2) A balikbayan gave ₱375.25 to each of his nephews and nieces. If he gave a total amount of ₱3,002, how many nephews and nieces shared the amount?

IV. Evaluation

A. Divide 7,904 by a) 0.2   b) 0.02   c) 0.002
What happens to the quotient as the decimal place increase?

B. Find the quotient.
1) 905)7904
2) 3.15)2709
3) 3.8)1026

IV. Assignment

Divide and check through multiplication.
1) 0.04)473
2) 0.53)656
3) 0.8)872

Dividing Mixed Decimals by Mixed Decimals

I. Learning Objectives

Cognitive: Divide mixed decimals by mixed decimals
Psychomotor: Solve word problems involving division of mixed decimals by mixed decimals
Affective: Show honesty in dealing with people

II. Learning Content

Skill: Divide mixed decimals by mixed decimals
References: BEC PELC E.2.2.5
Materials: flash cards, activity cards
Value: Honesty

III. Learning Experiences

A. Preparatory Activities

1. Drill: Mental Computation

Game: Relay
a) Teacher prepares flash cards of division of whole numbers by whole numbers with decimal quotients.

Ex: 4/3  2/1  5/4  8/6  10/9
     8/7  4/1  5/1  4/2  6/3
b) Group pupils by row.
c) As the teacher flashes the card, the first pupil in the row will write his answer in an answer sheet provided for their group.
d) He then passes the answer sheet to the next pupil to answer the problem flashed by the teacher.
e) Teacher keeps on flashing problem cards until the last pupil in the row has answered.
f) The team with the most number of correct answers wins.

2. Review: Dividing Whole Numbers by Decimals
   Game: Fish Bowl
   Mechanics:
   a) Teacher prepares division equations on dividing whole numbers by decimals written on a piece of paper, rolled and then placed in a fish bowl.
   b) Teacher will ask questions about mathematics facts.
   c) The first pupil to give the correct answer has the chance to pick a rolled paper in the fish bowl, read the problem, then solve it on the board.
   d) If the answer is correct, he/she gets a point.
   e) If the answer is wrong, the teacher will ask the question again.
   f) The pupil with the most number of points wins.

Ex.: 

0.5)250  0.2)308  0.6)336  0.8)480  0.25)100

3. Motivation
   Have you seen table runners? How does it look like? Where do we use table runners? How big is a table runner?

B. Developmental Activities

1. Presentation: Present this lesson through the following:

   Activity 1 – Problem Opener
   a) Present this problem on the board:

   My friend is a businesswoman. One of her business is making and selling table runners. A restaurant owner orders from her table runners 1.75 m long each. She only has 26.25 m of cloth left. How many table runners can be made from it?

b) Have each pair of pupils answer the following:
   1) Who orders table runners?
   2) How long is the table runner?
   3) How many metres of cloth was left to be made into table runners?
   4) How many table runners can be made from it?
   5) If you were the businesswoman, what will you do to know exactly how many table runners can be made from the piece of cloth?
   6) Show your solution through:
      a. Changing 26.25 ÷ 1.75 to mixed fractions. Show the steps.
      Ex.: Step 1 -  \[
      \frac{26}{100} \div \frac{175}{100} \]
      Step 2 - Change to fraction form that is:
      \[
      \frac{26}{100} = \frac{26 \times 100 + 25}{100} = \frac{2625}{100} = 26.25 \\
      \frac{175}{100} = \frac{1 \times 100 + 75}{100} = \frac{175}{100} = 1.75
      \]
Step 3 - Divide:
\[
\frac{2.625}{0.175} = \frac{262.5}{17.5}
\]

Step 4 - Get the reciprocal of the divisor and change the division sign to multiplication sign.
\[
\frac{2.625}{0.175} = \frac{262.5}{17.5} \times \frac{1}{17.5}
\]

Step 5 - Use cancellation, if possible:
\[
\frac{2.625}{0.175} = \frac{262.5}{17.5} \times \frac{1}{17.5} = \frac{2.625}{0.175}
\]

Step 6 - Solve:
\[
\frac{2.625}{0.175} = 15 \text{ table runners}
\]

b. Dividing like whole number
Ex: \(1.75 \div 26.25\)

Step 1 Make the divisor a whole number by multiplying it by 10, 100 or 1000 or just move the decimal point to the right to make it a whole number.
Step 2 Move also the decimal point in the dividend as many places as in the divisor.
Step 3 Divide like whole numbers. Align the decimal point of the quotient with that of the dividend.
\[
1.75 \div 26.25 = 15
\]

Activity 2

a) Present the same problem:
   My friend is a businesswoman. One of her business is making and selling table runners. A restaurant owner orders from her table runners 1.75 m long each. She only has 26.25 m of cloth left. How many table runners can be made from it?

b) Group the class by pairs.

c) Task:
   1) Analyze the problem:
      a. What is asked in the problem?
      b. What are the given facts?
      c. What operation should be used to solve the problem?
      d. What is the number sentence?
      e. Show the steps in dividing 26.25 \(\div\) 1.75.

   Expected answer:
   \[
   1.75 \div 26.25 \quad \text{Step 1} \quad \text{Make the divisor a whole number by multiplying it by 10, 100, or 1000 or just move the decimal point to the right to make the divisor a whole number.}
   \]

24
Step 2  Move the decimal point in the dividend as many places as in the divisor.

\[
175 \div 26.25
\]

Step 3  Proceed to division like whole numbers. Align the decimal point of the quotient with the decimal point in the dividend.

\[
\begin{array}{c|cc}
15 & 2.625 \\
175 & \\
\hline
875 \\
875 \\
\hline
0
\end{array}
\]

\[262 \div 175 = 1 \quad 875 \div 175 = 5\]
\[1 \times 175 = 175 \quad 5 \times 175 = 875\]
\[262 - 175 = 87 \quad 875 - 875 = 0\]

f. Show the algorithm:
\[262 \div 175 = 1 \quad 875 \div 175 = 5\]
\[1 \times 175 = 175 \quad 5 \times 175 = 875\]
\[262 - 175 = 87 \quad 875 - 875 = 0\]

g. How will you check your work?

2. Fixing Skills
Show the new position of the decimal point, divide, and check.

a) \[2.6)10.14\]
b) \[1.5)1.332\]
c) \[1.9)12.35\]
d) \[12.5)156.25\]
e) \[7.3)332.88\]

3. Generalization
How do we divide mixed decimals by mixed decimals?
What are the two ways of making the divisor a whole number?

C. Application
Solve and check.

1) \[2.5)62.5\]
2) \[2.98)23.393\]
3) \[215)62.5\]

IV. Evaluation

A. Find the quotient. Check your answer.
1) \[1.5)439.5\]
2) \[5.7)27.36\]
3) \[1.15)583.05\]

B. Read and solve. Check your answer.
1) A box containing pingpong balls weighs 67.50 grams. Each ball weighs 2.5 grams. How many pingpong balls are there in the box?
2) A rope is 70.8 metres long. How many 5.9-metre pieces can be cut from it?
3) If \[a = 501.6\] and \[b = 1.9\], what is \[a \div b\]?
4) If \( d = 143.75 \) and \( e = 2.3 \), what is \( d \div e ? \)
5) The quotient of 75.02 divided by 34.1 is _____.

V. Assignment
Solve and check:
1) \( 3.6 \div 73.8 \)  
4) \( 1.4 \div 37.24 \)
2) \( 4.9 \div 313.11 \)  
5) \( 2.5 \div 35.14 \)
3) \( 2.6 \div 13.52 \)

Dividing Decimals by 10, 100, 1000 Mentally

I. Learning Objectives
Cognitive: Divide decimals by 10, 100, 1000 mentally
Psychomotor: Write quotients of decimals correctly
Affective: Being alert in solving for quotients of decimals

II. Learning Content
Skill: Dividing decimals by 10, 100, 1000 mentally
References: BEC PELC E.3
Materials: flash cards, manila paper, piece of paper, ballpen
Value: Alertness

III. Learning Experiences
A. Preparatory Activities
1. Drill: Mental Computation (Flash cards)
   Multiplying decimals by 10, 100, 1000
   a) Divide the class into 6 groups (per column).
   b) A student from each group goes at the back.
   c) Teacher flashes a card, like the ones shown below.
      For example:
      \[
      \begin{align*}
      0.3 \times 10 &= 0.63 \times 100 &= 0.383 \times 1000 = \\
      1.5 \times 10 &= 3.25 \times 100 &= 24.58 \times 1000 = \\
      32.5 \times 10 &= 25.6 \times 100 &= 16.8 \times 1000 = \\
      \end{align*}
      \]
   d) Pupils give the answer orally. The first to give the correct answer makes one giant step forward.
   e) Teacher flashes another card and whoever gives the correct answer first makes a giant step forward.
   f) Continue this until a student reaches the platform. The student who reaches the platform first wins.
   g) Repeat for a new set of players.

2. Review
   When multiplying decimals by 10, 100, or 1000, what do we do with the decimal point?
   To what direction do we move the decimal point?
B. Developmental Activities

1. Presentation

Activity 1
a) Study the following sets of equations:

<table>
<thead>
<tr>
<th>Set A</th>
<th>Set B</th>
</tr>
</thead>
<tbody>
<tr>
<td>450 ÷ 10 = 45</td>
<td>2.8 ÷ 10 = 0.28</td>
</tr>
<tr>
<td>450 ÷ 100 = 4.5</td>
<td>2.8 ÷ 100 = 0.028</td>
</tr>
<tr>
<td>450 ÷ 1000 = 0.45</td>
<td>2.8 ÷ 1000 = 0.0028</td>
</tr>
</tbody>
</table>

b) What do you notice in each set? Is there a pattern?
c) Elicit the pattern from the students.
d) Discuss the rule/steps in dividing whole numbers or decimals by 10, 100, and 1000.
e) Give more examples:

Activity 2 – Pass It On
a) Divide the class into 6 groups (per column).
b) Flash an equation, say, 92.3 ÷ 100 = ____.
c) The first student in the group solves the equation mentally and writes the answer on a piece of paper.
d) After 10 seconds, the teacher says “Pass” and he/she passes the paper to the next one in his/her group, who in turn, solves mentally the equation that will be shown by the teacher, and writes his/her answer on the same piece of paper.
e) Continue this until everyone in the group has participated.
f) The group with the most number of correct answers wins.
g) Discuss the importance of being alert in solving equations.

2. Fixing Skills

Divide mentally.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>34.5 ÷ 10 = N</td>
<td>248.32 ÷ 10 = N</td>
<td>456.3 ÷ 1000 = N</td>
</tr>
<tr>
<td>28.6 ÷ 100 = N</td>
<td>762.425 ÷ 100 = N</td>
<td>89.3 ÷ 1000 = N</td>
</tr>
<tr>
<td>58.33 ÷ 1000 = N</td>
<td>358.2 ÷ 100 = N</td>
<td>357 ÷ 1000 = N</td>
</tr>
</tbody>
</table>

3. Generalization

How do you divide decimals by 10, 100, or 1000?
To divide decimals by 10, 100, or 1000 we:
a) move the decimal point in the dividend to the left as many places as the number of zeros in the divisor.
b) prefix zero/zeros before the decimal point if needed.

C. Application

Mr. San Juan has ₱3,345.85, he wants to give it to the orphans in one of the many orphanages in the country. How much will each child receive if he decides to give it to 10 orphans? How about 100 orphans?
IV. Evaluation
Give the answers mentally as fast as you can.
1) $63.8 \div 10 = 6.38$
2) $56.51 \div 100 = 0.5651$
3) $635.2 \div 1000 = 0.6352$
4) $424.6 \div 10 = 42.46$
5) $2473 \div 100 = 24.73$
6) $34.83 \div 10 = 3.483$
7) $168.37 \div 100 = 1.6837$
8) $57.8 \div 100 = 0.578$
9) $149.2 \div 1000 = 0.1492$
10) $59.27 \div 100 = 0.5927$

V. Assignment
Complete the table below.

<table>
<thead>
<tr>
<th>Decimal</th>
<th>$\div 10$</th>
<th>$\div 100$</th>
<th>$\div 1000$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) 14.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) 27.632</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) 123.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) 376.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) 88.29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) 3.841</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) 21.273</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8) 148.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9) 3847.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) 4389.81</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dividing Decimals by 0.1, 0.01, 0.001

I. Learning Objectives
- **Cognitive:** Divide decimals mentally by 0.1, 0.01, or 0.001
- **Psychomotor:** Place decimal point correctly
- **Affective:** Observe thrift

II. Learning Content
- **Skills:** Dividing decimals by 0.1, 0.01, 0.001
- **Reference:** BEC PELC II.E.4
- **Materials:** flash cards
- **Value:** Thrift

III. Learning Experiences
A. Preparatory Activities
1. **Drill: Mental Computation – Multiplying Numbers by Powers of Ten**
   a) Group the class into groups of 4 members.
   b) The teacher flashes cards like:

   $5 \times 10 = 50$
   $5 \times 100 = 500$
   $5 \times 1000 = 5000$
   $5 \times 10000 = 50000$
   $5 \times 40 = 200$
   $5 \times 400 = 2000$
   $5 \times 4000 = 20000$
   $5 \times 50000 = 250000$
c) Before the teacher flashes the card, she must give instructions like:
   All number 4s from each group will answer the problem.
d) The first to give the correct answer wins.
e) Repeat the process for other players.
f) The group with the most number of correct answers wins.

2. Review

   Multiplying by 0.1, 0.01, or 0.001
   a) The teacher should prepare sheets of paper with problems on multiplying decimals by 0.1, 0.01, or 0.001 to be placed in a fish bowl.
   b) One at a time, players will pick one, read the problem aloud, then give the answer orally.
   c) Pupils will check the given answers.
   d) The group with the most number of correct answers wins.

3. Motivation

   Have you divided decimals by 0.1, 0.01, or 0.001? How did you do it? Have you found some easy ways to do it?

B. Developmental Activities

1. Presentation

   a. Activity 1 – Role Playing

      Tina and Vicky went to the market to buy 5.75 kilos of ground meat. When they came home, they divided the whole meat into one-tenths and put it in plastic bags for future use. How many bags of meat were there?
      If you were Tina and Vicky, will you divide it again into one-hundredths? If yes, how many bags of meat do you think you can make?

      *Valuing: What kind of girls are Tina and Vicky?
                  Do you also save for the future? How?

1) Have the group act out the situation.
2) Have them compute the problem mentally.
3) Ask:
   What is the answer in situation a? b?
   What is the pattern in dividing decimals by 0.1, 0.01, or 0.001? Explain.

b. Activity 2 – Finding the Path

1) Group the class into 5.
2) The teacher will prepare 5 mazes for each group.
3) Each group will play one at a time.
4) Then post the maze on the board.
5) The problems should be covered.
2. **Exercises**
   Perform mentally.
   1) \(651 \div 0.1 = \_\_\_\)
   2) \(6.238 \div 0.01 = \_\_\_\_\)
   3) \(85.72 \div 0.001 = \_\_\_\_\)
   4) \(.89 \div 0.01 = \_\_\_\_\)

3. **Generalization**
   How do you divide decimals by 0.1, 0.01, or 0.001?
   What is the pattern in dividing decimals by 0.1, 0.01, or 0.001?

C. **Application**
   Give the quotient orally.
   1) \(8.39 \div 0.01 = N\)
   2) \(125.85 \div 0.001 = N\)
   3) \(6.95 \div 0.01 = N\)
   4) \(85.32 \div 0.1 = N\)
   5) \(6.45 \div 0.001 = N\)

IV. **Evaluation**
   Find the quotient mentally.
   1) \(6.873 \div 0.01 = \_\_\_\_\)
   2) \(1.64 \div 0.1 = \_\_\_\_\)
   3) \(49.67 \div 0.001 = \_\_\_\_\_\)
   4) \(4.32 \div 0.01 = \_\_\_\_\)
   5) \(32.8 \div 0.01 = \_\_\_\_\)
   6) \(6.099 \div 0.1 = \_\_\_\_\)
   7) \(21.029 \div 0.01 = \_\_\_\_\)
   8) \(283.46 \div 0.1 = \_\_\_\_\)
   9) \(16.49 \div 0.01 = \_\_\_\_\)
   10) \(9.3738 \div 0.001 = \_\_\_\_\_)
V. Assignment
Divide mentally.
1) What is the quotient when 394.85 is divided by one-tenths?
2) When 67.39 is divided by 0.001, the quotient is _____.
3) Find the quotient of 188.13 divided by 0.01.
4) The quotient of 18.15 divided by 0.1 is _____.
5) _____ is the quotient when 418.394 is divided by 0.01.

One-Step Word Problems

I. Learning Objectives
Cognitive: Solve word problems involving division of decimals including money
Psychomotor: Write number sentences to represent the word problems
Affective: Divide wisely

II. Learning Content
Skill: Solving word problems involving division of decimals including money
References: BEC PELC II.E.5.2
Materials: activity cards, manila paper
Value: Decisiveness

III. Learning Experiences
A. Preparatory Activities
1. Opening Song: Mathematics (To the tune of “Are You Sleeping”)

Mathematics (2x)         Mathematics (2x)
How it thrills (2x)       Challenging (2x)
It is so exciting         Numbers are ideas
And so interesting        Numerals are symbols
I love math (2x)          That is Math (2x)

2. Review – Mental Computation
Complete the pattern.
a) Teacher prepares the following:

0.1)\(\overline{56}\)          0.01)\(\overline{56}\)          0.001)\(\overline{125}\)          0.0001)\(\overline{126}\)
0.1)\(\overline{125}\)          0.01)\(\overline{125}\)          0.001)\(\overline{125}\)          0.0001)\(\overline{126}\)
0.1)\(\overline{35}\)          0.01)\(\overline{35}\)          0.001)\(\overline{35}\)

b) Let pupils give the answer mentally.
3. Motivation
   a) Have a volunteer pupil act out the short dialogues.
      Situation: Tina and Rose went to the mall to buy things they need at home.
      Tina: We only have ₱273.50. What should we buy?
      Rose: Mother said, "We have to buy things that would cost about ₱273.50 only. What should we buy?"
      Tina: We go to the kitchenware section and see if there is an item worth ₱273.50.
      Rose: What kind of kitchenware do you think we can buy with ₱273.50?
      Tina: That's why we go there and see.
      Rose: I know now what to buy.
      Tina: What?
      Rose: We lack plates because I accidentally broke 5 plates yesterday, remember that?
      Tina: Good idea.
      Rose: How many plates can we buy with ₱273.50?
      Tina: That will depend on the kind of plate we want.
      Rose: Ok! Let's go now.

   b) After the role playing, ask the following questions:
      1) Who went to the mall? Why?
      2) How much money do they have?
      3) Do you think the girls made a wise decision? Why?

   "Valuing: If you were Rose, would you suggest the same? Why?
   If you were Tina, would you agree with Rose's suggestion? Why?

B. Developmental Activities

1. Presentation
   a. Strategy 1
      1) Group the class into pairs.
      2) Task for each pair:
         a) Is there a problem in the situation presented? What's the problem all about?
         b) What are the given facts?
         c) Is it possible that they can buy plates worth ₱273.50? How?
         d) What is the number sentence? (₱273.50 ÷ 5 = ₱54.70)
         e) About how much is the cost of each plate? Why? (₱54.70)
      3) Have each group present its work to the class.

2. Activity 2
   a) Group the class by pairs.
   b) Present this problem on the board:
      Tina and Rose went to the mall to buy plates seen by their mother yesterday which cost ₱54.50 each. Mother gave them ₱490.50. How many plates can they buy with the money?
c) Have each pair fill in the diagram.

PROBLEM

What is asked?

What are the given facts?

What operations should be used?

What is the number sentence?

What is the answer?

Look back

d) Have each pair report their work to the class.
e) Teacher should give emphasis on the steps of solving word problems.

3. Exercises
Read, analyze then solve.
a) Cris is planning to buy a new CD player worth ₱4,595.25. He tries to save ₱306.35 a week from his allowance. How many weeks will it take him to save the amount enough to buy the CD player?
b) Dessa, Anne, and Dy bought materials for their project worth ₱276.45. The girls divided the amount equally among themselves. How much is each share?

4. Generalization
What are the steps in solving word problems?
How do you analyze and solve word problems involving decimals?

C. Application
1) Roxanne has ₱38.50 left in her purse. She has to buy ribbons for the gifts. Each metre of a ribbon costs ₱5.50. How many metres of ribbon can she buy?
2) Mang Tony has 7.5 hectares of land. He wants to divide it into 1.5 hectares each for his sons. How many sons does Mang Tony have?

IV. Evaluation
Read the word problems. Analyze then solve.
1) Jon saves ₱105.35 a week. How long will it take him to save ₱1,264.20?
2) Robert plans to go to the province for a vacation. He wanted to buy presents for his nephews worth ₱289.45 each. He allotted ₱1,157.80. How many nephews does he have in the province?
3) Christian is a businessman. Every first week of December, he deposits ₱51,028.00 for the Christmas bonus of his employees. Each employee receives ₱6,378.50. How many employees are there?
4) A fisherman caught 15.45 kg of fish. He distributed the fish equally among his 5 relatives. How many kilograms did each relative get?

V. Assignment
Make word problems involving division of decimals including money.

Two to Three-Step Word Problems

I. Learning Objectives

Cognitive: Solve 2- to 3-step word problems involving decimals including money
Psychomotor: Describe the answer in a complete sentence with proper labels/units
Affective: Work hard to succeed

II. Learning Content

Skill: Solving 2- to 3-step word problems involving decimals including money
References: BEC PELC II.E.5.3-5.3.2
Materials: pictures, charts, number wheel
Value: Industry

III. Learning Experiences

A. Preparatory Activities

1. Mental Computation
Solve the problems mentally:
Each pair of pupils will answer orally the word problems read by the teacher.
The teacher reads 5 or more word problems written in an index card. Each correct answer will be given 2 points. The team with the highest points wins the game.

Sample Problems:
a) After buying some books and school supplies worth P45.75, how much change will you receive from a P50-bill?
b) Aling Josie bought 1.5 kg of pork, 1.75 kg of chicken, and 1.25 kg of beef. How many kilograms of meat did she buy?
c) A kilo of onion costs P24.50. How much will 4 kilos cost?
d) Edgar reads a book for 1.5 hours per day. How many hours does he spend reading in a week?
e) Vicky sold 36 kilos of mangoes. If each person bought 1.5 kilos, how many people bought mangoes?

2. Review
Game: Spin-A-Wheel
a) Spin the wheel for a pair of contestants.
b) When the wheel stops, the pupils solve the operations inside the circle.
c) The pupil who gets the most number of correct answers wins.

3. Motivation
Do you want to get high grades?
What will you do?

B. Developmental Activities

1. Presentation

a. Activity 1
1) Read the problem:
Two pupils compared their average scores in 3 subjects after three grading periods.

<table>
<thead>
<tr>
<th>Grading Period</th>
<th>Melba</th>
<th>Rose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>88.38</td>
<td>88.75</td>
</tr>
<tr>
<td>2nd</td>
<td>87.13</td>
<td>86.75</td>
</tr>
<tr>
<td>3rd</td>
<td>85.88</td>
<td>86.88</td>
</tr>
</tbody>
</table>

2) Answer the following questions, using the table above:
a) What was Melba’s rating in the first grading?
b) What was Rose’s rating in the first grading?
c) Who performed better in the first grading?
d) What was Melba’s rating in the second grading? Rose’s rating?
e) Who worked harder in the second grading?
f) Who worked harder in the third grading?
Do you want to do what Melba and Rose are doing?

3) Group pupils into two.
Group 1 - Find Melba’s average score in the 3 grading periods.
Group 2 - Find Rose’s average score in the 3 grading periods.

4) Discussion
   a) What did you do to find the average?
   b) What did you add?
   c) What else did you do?
   d) What operations are involved?
   e) How will you write the correct equation?
   f) What operation will you perform first? last?
   g) What’s the answer? Describe your answer in a complete sentence.

b. Activity 2 – Role Playing
   1) Present the problem below.
      Rico wants to buy a battery-operated toy car which costs ₱587.50. He already saved ₱150.00 and his Ninong gave him ₱200.00. If he saves ₱12.50 a day from his allowance, how long will it take him to save the rest of the money to buy the toy car?
   2) Analyze the problem by answering the following:
      a) What is asked in the problem?
      b) What are the given facts?
      c) How many hidden questions are there?
      d) What is the first hidden question?
      e) What is the second hidden question?
      f) Write the mathematical expression for hidden questions a and b.
      g) What will you use to separate the first hidden question from the second hidden question?
   3) Ask pupils to solve the problem and describe its answer in a complete sentence.

c. Activity 3
   1) Present this problem:
      Mang Tisoy brought 2 bags of onions to market. One bag weighed 8 kilograms and the other bag weighed 6.5 kilograms. He repacked the onions in plastic bags of 0.25 kilogram per pack and sold each pack for ₱12.50. How much will he get if all the packs were sold?
   2) Analyze and solve the problem.
      a) What is asked? (the amount he gets for all the packs?)
      b) What are given? (8 kilograms of onions, 6.5 kilograms of onions, 0.25 kilogram per pack)
      c) What are the hidden questions?
         1) How many kilos of onions are there in all?
         2) How many packs were made?
      d) What operations will you use? (addition, division, and multiplication)
      e) What is the equation for the problem?
         \[(8 + 6.5) \div 0.25 \times 12.50 = N\]
      Solution:
         Step 1
         \[
         \begin{align*}
         8 & \text{ kilograms of onions} \\
         + 6.5 & \text{ kilograms of onions} \\
         14.5 & \text{ kilograms of onions in all}
         \end{align*}
         \]
Step 2  

weight/pack  \[ \frac{0.25}{1.450} \] kilograms of onions  

\[ \frac{125}{200} \]  
\[ \frac{200}{200} \]  
\[ \frac{0}{0} \]  

Step 3  

\[ \$12.50 \] cost of each pack  
\[ \times 58 \] packs  
\[ 10000 \]  
\[ 6250 \]  

\[ \$725.00 \] amount he would get for 58 packs

3) Discussion:  
   a) In solving 2- to 3- step problems, what do you solve first?  
   b) How do you express your answer to the problem?

2. Fixing Skills  
   1) There are 18 girls and 17 boys who will equally share the expenses for a bus trip that costs \( \$4,042.50 \). How much will each pay?  
   2) Aling Rosie bought a 50-kilogram sack of sugar for \( \$1,000.00 \). She packed it into 2.5 kilograms per pack and sold each pack for \( \$70.00 \). How much did she gain?

3. Generalization  
   How do you solve 2- to 3- step word problems involving decimals?

C. Application – Pair Activity (Think-Pair-Share)  
   How many of these can you solve? Tell why?  
   1) A carpenter agreed to make 2 tables for \( \$840.50 \) each, 25 desks for \( \$105.75 \) each, and 5 cabinets for \( \$550 \) each. The materials cost him \( \$12,340 \). What different questions can you ask to complete the problem? Solve each.  
   2) Belly saved \( \$5.25 \) a day. When he counted his money, he found out that he had \( \$73.50 \). How many days did it take him to save that amount?  
   3) Company A rents cars for \( \$500 \) per day plus \( \$14.75 \) per km. Company B rents cars for \( \$450 \) per day plus \( \$16.25 \) per km. What is the difference in the total rental charges on a trip of 550 km if the trip takes 2 days?

IV. Evaluation  
   Solve the problems below and label your answers.  
   1) Lerma and her classmates went swimming. They spent \( \$1,206.25 \) for food and \( \$1,172.50 \) for transportation and entrance fees. They got \( \$1,196.75 \) from the club funds and each one shared \( \$98.50 \) to pay for the remaining expenses. How many shared in the amount?  
   2) Grace receives \( \$220.50 \) as school allowance from her mother. Her aunt gave her an additional \( \$183.75 \). If her daily expenses is \( \$36.75 \), for how many days will her allowance last?  
   3) Ruby's expenses for Monday was \( \$39.50 \), Tuesday \( \$62.30 \), Wednesday \( \$56.70 \), Thursday \( \$39.50 \), and Friday \( \$45.80 \). What was her average expense per day?
V. Assignment
   Solve the following problems. Label your answers.
   1. Jun and Richard repaired a broken rattan bed and were paid ₱1,128.00. If Jun worked for 8.5 hours and Richard for 7.5 hours, how much were they paid per hour?

   2. The barangay officials of Barangay Masaya received 150 sacks of rice weighing 50 kilogram each. Three hundred fifty kilograms were distributed to the flood victims for the barangay. The rest were repacked in plastic bags of 2.5 kilograms each to be distributed to the street children. How many street children received a bag of rice?