Lesson Guide
In
Elementary Mathematics
Grade 6

Chapter II
Rational Numbers
Multiplication of Decimals

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

2010

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Lesson Guides in Elementary Mathematics
Grade VI

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INTRODUCTION

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.
## Rational Numbers

### C. Comprehension of Multiplication of Decimals

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</tr>
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<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
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</tr>
</tbody>
</table>
Estimating Products of Whole Numbers and Decimals

I. Learning Objectives

Cognitive: Estimate products of whole numbers and decimals
Psychomotor: Write the estimated product correctly
Affective: Make sound and logical decision in estimating

II. Learning Content

Skill: Estimate products of whole numbers and decimals
Reference: PELC II.D.1
Materials: number cards (whole numbers and decimals), problem cards
Value: Sound and logical decision

III. Learning Experiences

A. Preparatory Activities

1. Mental Computation
   Rounding whole numbers and decimals
   Relay Game:
   a) Divide the class into 2 groups.
   b) Teacher flashes a number card with an underlined digit.
      Ex. 27 583
      This means that the students will round off the number to the nearest thousands
      (depending on the underlined digit).
   c) The first student in each group will go to the board and write the rounded
      number.
   d) Continue the game until everyone in each group has participated.
   e) The group with the highest number of correct answers wins.

2. Review
   Estimating sum/difference
   Ask: How do you estimate the sum/difference?
   Round to the nearest whole number and estimate the sum/difference. How many
   can you do orally?
   Flash problem cards for the pupils to solve.
   Ex.
   a) 7.82 + 2.35 =
   b) 7.82 – 2.35 =
   c) 9.15 + 3.84 =
   d) 9.15 – 3.84 =
   e) 8.46 – 1.93 =
   f) 8.46 – 1.93 =

3. Motivation
   Present the following problem:
   Carlo bought 5 notebooks at ₱38.95 each. About how much
   did he pay in all?

B. Developmental Activities

1. Presentation
   a. Ask the following questions:
      1) What are given?
      2) What is being asked?
3) Do we need an exact answer or just an estimate to solve the problem? Why do you think so?
4) What is the number sentence?
5) How do we estimate products of whole numbers and decimals?
b. Explain step-by-step the process of estimating products of whole numbers and decimals. If possible, elicit this from the pupils or have them do the explaining.
c. Discuss the importance of estimation and its practical applications in real life. Elicit examples of situations where estimation is needed.
d. Strategy 1

GAME
Materials: number cards, calculator
Mechanics: Organize the pupils in pairs. Shuffle the number cards. Have both pupils select a number card and place them on the table. Then have each pair estimate the product of the two numbers by rounding the factors. After recording the original numbers and the estimated product, the pupils use a calculator to check the exact answer and to determine whether the estimate is good or reasonable.
e. Strategy 2
Give an equation and ask a pupil to give the “new” or rounded numbers and the estimated product. If the child is correct, he now gives a new equation and calls on a classmate to answer. This goes on until all the pupils have been called to answer and give an equation. (Make sure that the child answering is fast to prevent waste of time. Try to see if the “new” numbers they are using are correct.)
f. Strategy 3
Form the children into 4 or 5 groups with equal members. Number the members of each group as 1, 2, 3, and so on. Ask all number 1s to go to the board and solve the estimated product of the numbers given. Determine if the answer of each group reasonable or not. If the estimated product is correct, the group earns a point. Give another operation to be solved by the next member on the board. Check the answer and give a score for every correct answer. Continue until all members have the chance to answer on the board.

2. Generalization

How do you estimate the products of whole numbers and decimals?

C. Application

The following are some items that you need to buy from a store:

- a pair of socks – P20.95
- handkerchief – P24.25
- t-shirt – P119.50
- shorts – P52.30
- face towel – P8.75

1) About how much money must you have to be able to buy:
   - a pair of socks?
   - two t-shirts?
   - five face towels?
   - seven handkerchiefs?
   - three shorts?

2) About how much would you pay for the above purchase?
   Will you be able to buy all you need if you don’t have enough money?
   What is the benefit of knowing the approximate or estimated amount of the things you need to buy?
   How does this apply to other real-life situations? Cite examples.
Why is it important to make sound and logical decisions? Have you done any? How did it affect you?

IV. Evaluation

Estimate each product by rounding the multiplicand.
1) 22.7 x 0.08 =
2) 4.3 x 0.9 =
3) 4.53 x 0.77 =
4) 6.28 x 0.58 =
5) 78.5 x 1.2 =
6) 27.97 00 x 8
7) 8.213 0 x 0.9
8) 4.075 0 x 0.7
9) 49.91 0 x 8.7
10) 429.2 x 0.65
11) 53.74 0 x 4.3

V. Assignment

A. Estimate each product by rounding:
1) 0.381 x 7
2) 73.82 x 20
3) 8.493 x .08
4) 74.73 x 0.28
5) 9.713 x 4.12
6) 561.73 x 5.17

B. Read carefully, analyze and solve.
1) Weng runs 4.8 km every morning. About how many kilometres does she run each week?
2) In 6.75 x 8.56 if both factors are rounded to the nearest whole number, will the estimate be greater or smaller than the actual product? Explain.

Multiplying Decimals with 1- to 3- Digit by 1- to 2- Digit Factors without and with Regrouping

I. Learning Objectives

Cognitive: Multiply up to 3-digit factors by 1- to 2-digit factors of whole numbers and decimals with or without regrouping
Psychomotor: Solve 1- to 3-digit by 1- to 2-digit factors of whole numbers and decimals
Affective: Use leisure time wisely

II. Learning Content

Skill: Multiply up to 3-digit factors by 1- to 2-digit factors
Reference: BEC PELC II.D.2
Materials: charts
Value: Wise use of time
III. Learning Experiences

A. Preparatory Activities

1. Mental Computation – Drill
   Puzzling Patterns – Multiplication
   Let each pair of pupils find the missing factor/s to complete the puzzle.

2. Review
   Estimate the cost.
   Let each pair of pupils give an estimate of the total cost for each of the following problems. Find out who gave the best estimate and why.
   a) 2 kilos of tomatoes at ₱32.50 per kilo
   b) 31 metres of cotton dress material at ₱49.95 per metre
   c) 90 bananas at ₱2.25 each
   d) 58 cans of milk at ₱18.90 per can
   e) 4 dozen eggs at ₱38.50 per dozen

3. Motivation
   Ruel’s hobby is collecting butterflies. One Saturday after doing all his homework, he went to the field and collected some butterflies. He loves to see the different shapes and colors of butterflies.
   Discussion:
   a) What is Ruel’s hobby?
   b) Why does he love collecting butterflies?
   c) How about you, how do you spend your free time?
   d) What is your hobby? Is it a worthwhile one? Why do you say so?

B. Developmental Activities

1. Presentation
   Present the lesson thru the following:

   a. Activity 1

   Ruel loves to collect different kinds of butterflies. In one of his framed collection, he mounted 12 butterflies of one specie with the same length and width. If each butterfly weighs 0.43 gram, what is the total weight of the butterflies?

   Discussion:
   1) Analysis of the problem
   2) Let each pair draw the butterflies and write the weight of each. Then let them find the total weight.
   3) How did you find the answer? What process did you use?
4) What are the steps in multiplying decimals and whole numbers?

\[
\begin{align*}
\text{Addition sentence:} &\quad 0.43 + 0.43 + 0.43 + 0.43 + 0.43 + 0.43 + 0.43 + 0.43 = N \\
\text{Multiplication sentence:} &\quad 12 \times 0.43 = N
\end{align*}
\]

5.16 grams total weight of 12 butterflies

- Multiply the first digit in the multiplier with all the digits in the multiplicand. Then multiply the second digit with all the digits in the multiplicand. (Do the same step if there is a third digit in the multiplier.)
- Count the number of decimal places in the multiplicand and the multiplier.
- The number of decimal places in the product is equal to the number of decimal places in the factors (multiplicand and multiplier).

5) Provide other examples.

\begin{itemize}
  \item[a)] \hspace{2cm} \begin{align*}
  0.235 &\quad \rightarrow \text{multiplicand (3 decimal places)} \\
  \times 0.57 &\quad \rightarrow \text{multiplier (2 decimal places)} \\
  1645 &\quad \rightarrow \text{partial product} \\
  1175 &\quad \rightarrow \text{partial product} \\
  0.13395 &\quad \rightarrow \text{product (5 decimal places)}
  \end{align*}
\end{itemize}

\begin{itemize}
  \item[b)] \hspace{2cm} \begin{align*}
  0.163 &\quad \rightarrow \text{multiplicand (3 decimal places)} \\
  \times 0.38 &\quad \rightarrow \text{multiplier (2 decimal places)} \\
  1304 &\quad \rightarrow \text{partial product} \\
  489 &\quad \rightarrow \text{partial product} \\
  0.06194 &\quad \rightarrow \text{product (5 decimal places)}
  \end{align*}
\end{itemize}

b. **Activity 2**

Write on the board this equation:

Let each group analyze and decide if the answer is correct or not. Let them explain their answers. Let them give the steps in multiplying decimals. (See Activity 1)

\[
\begin{align*}
0.348 &\quad \times 0.19 = 0.06512
\end{align*}
\]

Provide other such activities for teams to analyze and check if the solution and the answer are correct. Let them give their reasons.
Ex.: 

\[
\begin{array}{c|c|c}
0.417 & \times 0.63 & 0.294 \\
\hline
1251 & \times 36 & 2352 \\
2502 & & 882 \\
3753 & & 0.11172 \\
\end{array}
\]

2. **Fixing Skills**

Find the product.

- a) \(0.432 \times 0.23\)
- b) \(0.83 \times 36\)
- c) \(0.914 \times 0.6\)
- d) \(0.7 \times 46\)
- e) \(0.132 \times 0.54\)

3. **Generalization**

How do you multiply decimals and whole numbers?

C. **Application**

The butterfly collector measures the wings of a butterfly and finds that
the length is 0.79 dm. If 25 butterflies have the same length of wings, what
is the total length of all the wings?

1) Find N in this equation: \(0.847 \times 0.69 = N\)
2) The product of 86 and 0.249 is _____.

IV. **Evaluation**

A. Find the product.

1) \(0.67 \times 0.24\)
2) \(34 \times 0.293\)
3) \(0.518 \times 0.65\)
4) \(0.92 \times 57\)
5) \(0.39 \times 0.764\)

B. 1.) Nora needs 1.75 metres of cloth to make a short. About how much should she buy for five
Shirts? If a metre costs ₱35.50 how much will it cost her to buy what she needs?
2.) A hamburger and a chocolate drink cost ₱58.50. Is the sales crew correct to charge
Nora ₱386.50 before EVAT if she ordered 6 of it?
3.) Explain why \(3 \times 0.5\) is not equal to 0.15.

V. **Assignment**

Multiply.

1) \(0.57 \times 0.24\)
2) \(0.442 \times 26\)
3) \(65 \times 0.179\)
4) \(0.392 \times 0.78\)
5) \(0.827 \times 0.36\)
6) Mother bought 0.75 kilogram of beef for ₱145 per kilogram. How much did she pay in
all?
Find solutions to the puzzle.

\[ \begin{array}{ccc}
X & = & 17.746 \\
X & \times & X \\
X & = & 0.969 \\
\end{array} \]

\[ \begin{array}{ccc}
X & = & 1.4944 \\
\end{array} \]

**Multiplying 1- to 3- Digit Factors by 1- to 2- Digit Factors of Decimals and Whole Numbers without and with Regrouping and with Zero Difficulty**

### I. Learning Objectives

**Cognitive:** Multiply up to 3-digit factors by 1- to 2-digit factors of decimals and whole numbers without and with regrouping and with zero difficulty

**Psychomotor:** Solve 1- to 3-digit by 1- to 2-digit factors of decimals and whole numbers with zero difficulty

**Affective:** Keep one's body fit and healthy

### II. Learning Content

**Skill:** Multiply up to 3-digit factors by 1- to 2-digit factors of decimals and whole numbers without and with regrouping and with zero difficulty

**Reference:** BEC PELC II D.2

**Materials:** charts, cards with number sentences

**Value:** Keeping oneself physically fit and healthy

### III. Learning Experiences

#### A. Preparatory Activities

1. **Mental Computation**

   Let each team answer the puzzle correctly. The team who answers first and gets the puzzle correctly will be declared the winner.

   **WORLD RECORD**
   
   The world's __?__ __?__ weighed 1,299.5 kilograms. Find the answer by solving the sentences mentally. Use the code to find the letter.

<table>
<thead>
<tr>
<th>CODE</th>
<th>848</th>
<th>175</th>
<th>427</th>
<th>312</th>
<th>704</th>
<th>238</th>
<th>164</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>E</td>
<td>G</td>
<td>H</td>
<td>L</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>264</td>
<td>720</td>
<td>1160</td>
<td>327</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>S</td>
<td>T</td>
<td>U</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


FIRST WORD  |  Answer | Letter  | SECOND WORD  | Answer | Letter |
---|---|---|---|---|---|
a) 235 + 3 | 238 | L | h) 2112 + 3 | | |
b) 212 x 4 | | | i) 106 x 8 | | |
c) 469 – 205 | | | j) 132 + 32 | | |
d) 1248 + 4 | | | k) 875 ÷ 5 | | |
e) 335 + 92 | | | l) 897 – 570 | | |
f) 1649 – 929 | | | m) 528 ÷ 2 | | |
g) 58 x 20 | | | n) 39 x 8 | | |
h) | | | o) 830 – 403 | | |
i) | | | p) 159 + 105 | | |

2. Review

Teacher will make 30 or more cards with multiplication sentences. The cards will be shuffled and put on a table with the numbers facing down. The teacher calls the leaders of the groups then deal the cards so that each group gets 5 cards. The leader shows the cards to the members who will find the products cooperatively. The group who answers first all the items correctly wins the game.

Examples:

<table>
<thead>
<tr>
<th>0.26</th>
<th>0.193</th>
<th>275</th>
</tr>
</thead>
<tbody>
<tr>
<td>x 57</td>
<td>x 0.4</td>
<td>x 0.16</td>
</tr>
</tbody>
</table>

3. Motivation

What do you do in order to be physically fit and healthy? Eat foods that give us vitamins and minerals. What are some of the vitamins that you know? How do we keep ourselves physically fit and healthy?

B. Developmental Activities

1. Presentation

a. Present the lesson by doing the following:

   * Activity 1

   Nutritionists say we need 0.0017 gram of riboflavin every day. How much do we need in a week?

   Discussion:
   1) Let the pupils analyze the problem.
   2) Let each group give an estimate of the answer.
   3) Let them get the actual answer. Discuss the steps they make in finding the product.

   
   
   
   0.0017
   x 7
   0.0119

   a) Multiply the decimals as with whole numbers.
   b) Count the number of decimal places in the factors (multiplicand and multiplier).
   c) Place the decimal point in the product. The number of decimal places in a product is the sum of the number of decimal places of the factors.
   d) Sometimes it is necessary to insert zero's between the decimal point and the first digit of the product when the number of digits obtained
in the product is less than the total number of decimal places in the factors. (In the example, we need to insert 1 zero.)

4) Provide other examples:
   a) \(0.064 \times 0.08\) \(\rightarrow\) 3 decimal places
    \(\times 0.08\) \(\rightarrow\) 2 decimal places
    \(0.00512\) \(\rightarrow\) 5 decimal places

   b) \(0.075 \times 0.60\) \(\rightarrow\) 3 decimal places
    \(\times 60\) \(\rightarrow\) 0
    \(4.500\) \(\rightarrow\) 3 decimal places

• Activity 2
   a) Put this equation on the board.

   \[
   0.03 \times 0.08 = N
   \]

   b) How can we find \(N\)?

   c) Show multiplication of decimals through multiplication of fractions.
   Change decimal numbers to fractions then multiply.

   \[
   \frac{0.03}{\frac{3}{100}} \times \frac{0.08}{\frac{8}{100}} = \frac{24}{10000}
   \]
   hundredths x hundredths = ten thousandths
   \(\uparrow\) \(\uparrow\) \(\uparrow\)
   2 decimal places 2 decimal places 4 decimal places

   - Let the pupils change the fraction form \(\left(\frac{24}{10000}\right)\) to decimal number (0.0024).
   - Let each team discuss the relationship between fractions and the decimal places in decimal numbers.
   - Relate their findings in multiplying decimals with zero difficulty.
   - Focus their attention to the number of decimal places in the factors and the number of decimal places in the product. Let them see that sometimes zero/s is/are inserted between the decimal point and the first digit of the product.
   - Guide them to give the steps in multiplying decimals with zero difficulty. (See Activity 1.)

   d) Provide other examples:

   \[
   \begin{align*}
   0.029 & \quad \rightarrow\text{3 decimal places} \\
   \times 0.13 & \quad \rightarrow\text{2 decimal places} \\
   & \quad \rightarrow\text{5 decimal places (2 zeros are inserted)}
   \end{align*}
   \]

9
2. **Fixing Skills – Working In Pairs**

Multiply:

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th></th>
<th>b</th>
<th></th>
<th>c</th>
<th></th>
<th>d</th>
<th></th>
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<tbody>
<tr>
<td>1)</td>
<td>0.003</td>
<td>x</td>
<td>0.52</td>
<td>x</td>
<td>0.04</td>
<td>x</td>
<td>0.06</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>0.4</td>
<td></td>
<td>0.013</td>
<td></td>
<td>0.029</td>
<td></td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td>0.032</td>
<td>x</td>
<td>0.02</td>
<td>x</td>
<td>0.013</td>
<td>x</td>
<td>0.43</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>0.2</td>
<td></td>
<td>0.04</td>
<td></td>
<td>0.01</td>
<td></td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>3)</td>
<td>0.0008</td>
<td>x</td>
<td>0.009</td>
<td>x</td>
<td>18</td>
<td>x</td>
<td>0.003</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>0.6</td>
<td></td>
<td>25</td>
<td></td>
<td>0.05</td>
<td></td>
<td>0.009</td>
<td></td>
</tr>
<tr>
<td>4)</td>
<td>0.03</td>
<td>x</td>
<td>0.025</td>
<td>x</td>
<td>0.057</td>
<td>x</td>
<td>0.009</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td>0.008</td>
<td></td>
<td>0.38</td>
<td></td>
<td>46</td>
<td></td>
</tr>
</tbody>
</table>

Determine whether the expressions in each item/set are equal.

1.) 4 tenths of 3 thousands and 3 tenths of four thousandths.
2.) Thrice 52 hundredths and twice 78 thousandths.
3.) Six thousandths multiplied by 1000 and 6 hundredths multiplied 1 hundred.
4.) Adding .032 five times and 64 hundredths.
5.) Seven tenths of 1000 and seven thousandths of 1 tenth.

3. **Generalization**

How do you multiply 1- to 3-digit by 1- to 2-digit factors of decimals and whole numbers with or without regrouping and with zero difficulty?

C. **Application**

1) A box contains 48 cans of food each weighing 0.375 kg. What is the total weight of the box of food?
2) A 1-m long steel bar has a mass of 0.78 kg. What is the mass of a steel bar which is 0.056 m long?

IV. **Evaluation**

1.) Which of the following shows the correct way of multiplying 0.34 x 0.25?

<table>
<thead>
<tr>
<th></th>
<th>a.)</th>
<th>b.)</th>
<th>c.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.34</td>
<td>0.34</td>
<td>0.34</td>
</tr>
<tr>
<td></td>
<td>x 0.25</td>
<td>x 0.25</td>
<td>x 0.25</td>
</tr>
<tr>
<td></td>
<td>0.0850</td>
<td>0.0980</td>
<td>0.2380</td>
</tr>
</tbody>
</table>

2.) Explain whether the statement is correct or not.

a.) The product of 2.02 x 46 is equal to the product of 20.2 x 4.6.
b.) The half of the sum of (12 + 16 + 17) is equal to 3 x 7.5.
c.) Ten times 75.6 is equal to one hundred multiplied by 7.56.
d.) Six hundredths of 70 is equal to two and eight tenths of 1.5.

3.) Find the product.

<table>
<thead>
<tr>
<th></th>
<th>1) 0.7 x 0.4</th>
<th>3) 0.403 x 0.2</th>
<th>5) 0.008 x 35</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2) 0.412 x 0.8</td>
<td>4) 0.34 x 0.21</td>
<td></td>
</tr>
</tbody>
</table>
V. Assignment

Multiply.
1) 0.02 x 0.03  
2) 0.236 x 0.04  
3) 0.5 x 0.7  
4) 0.1 x 0.1  
5) 0.412 x 0.8  
6) 0.156 x 0.34  
7) 0.47 x 0.002  
8) 0.53 x 0.02

Multiplying Decimals up to the Hundredths Place

I. Learning Objectives

Cognitive: Multiply decimals up to the hundredths place

Psychomotor:  
1. Write the decimal point correctly in the product
2. Write solutions to multiplication equations involving decimals up to the hundredths place

Affective: Show kindness to others

II. Learning Content

Skill: Multiplying decimals up to the hundredths place

Reference: PELC I.D.3

Materials: problem cards, bells, flash cards, number cards, cutouts of turtle, snail and worm, tape, three number lines of the same length, boxed strips

Value: Kindness

III. Learning Experiences

A. Preparatory Activities

1. Mental Computation – Traveling Game
   Post the number lines on the board. Place the turtle, snail, and worm cutouts on the left-side of each number line.
   a) Form the pupils into three equal groups to represent each of the cutouts.
   b) A member of each group holds a bell. Teacher flashes a problem card and the one who rings the bell first has the chance to give the answer. If he is wrong, the other two groups can steal.
   c) If the answer given is correct, the member moves their cutout or “mascot” one step on the number line. Another member from each group now holds the bell and he is the next to answer the problem flashed by the teacher.
   d) This continues until the “mascots” reach the right side of the number line, the group to reach it first is the winner.

   (Make a number line that can be shortened or lengthened according to the number of members of each group.)

   Sample equations:
   
   \[0.2 \times 0.4 = \square\]  
   \[30 \times 0.05 = \square\]  
   \[40 \times 0.6 = \square\]  
   \[0.9 \times 0.05 = \square\]

2. Review
   Review the previous lesson. Give 1 to 2 examples.

3. Motivation
   Mike bought a dozen doughnuts worth ₱9.95 each. He gave these to some street children whom he saw begging for food. How much did he pay for the
doughnuts? What good trait did Mike show? Have you had the same experience? How did you feel?

B. Developmental Activities

1. Presentation
a. Present the lesson by discussing the problem.
   1) What is being asked?
   2) What are given?
   3) What operation is needed to solve the problem?
   4) What is the equation or number sentence?
   5) Draw out the equation: 12 x 9.95 = N
   6) Discuss the step-by-step solution to the problem:
      
      \[
      \begin{array}{c}
      \text{9.95} \\
      \times 12 \\
      \hline
      \text{995} \\
      \times 12 \\
      \hline
      \text{1990} \\
      + \text{9950} \\
      \hline
      \text{11940}
      \end{array}
      \]
      
    7) Place the decimal point correctly in the product.
    8) Mike paid P119.40 for the doughnuts.
    9) Discuss the importance of helping others in need, even in small ways.
   10) Give more examples: 0.76 x 1.2

b. Activity 1 – Game
   1) Teacher prepares a set of 50 number cards with 1- to 2-digit whole numbers and/or decimals up to the hundredths place.
   Place the cards face down on the teacher's table.
   2) Divide the class into 2 groups.
   3) Call on one member from each group to come in front and pick a card.
   4) They will put the cards face up on the table and solve for the product on the board.
   Ex. 
   
   \[
   \begin{array}{c}
   \text{0.12} \\
   \text{0.84}
   \end{array}
   \]
   Player 1’s card \hspace{1cm} Player 2’s card
   5) Whoever gives the correct answer gets 1 point for his/her group.
   6) Call on another set of players (1 from each group) to pick one card each.
   7) Repeat (4) to (6).
   8) The group with the highest number of points wins.

c. Activity 2
   1) Write the number sentence \[
   \frac{36}{x 2}
   \] on the board.
   2) Let the pupils compute for the product. Ask a volunteer to write the product on a strip of paper similar to this:
   
   \[
   \begin{array}{c}
   \text{7} \\
   \text{2}
   \end{array}
   \]
   Post it on the board.
   2) Change the multiplier 2 to 5 and let the pupils repeat number 2.
3) Change the factors to \[
\frac{36}{52}
\] and ask for the product. Ask if they see any relation among the 3 products. Have an open discussion.

4) Change the equation to \[
\frac{0.36}{0.52}
\]. Ask if there is a similarity between the product of the whole numbers in number 4 and the product of the factors above. Let them explain their observations.

5) Show \[
\frac{0.48}{0.19}
\] and have the pupils explain the steps to solve for the product.

2. Fixing Skills

Form the pupils into smaller groups and hand out a puzzle sheet to each group. Encourage them to use cooperative learning.

Why is it good to whisper? Because it is not aloud.

Solve the equations to know the answer.

\[
\begin{align*}
A &= 0.23 \times 0.12 & E &= 0.84 \times 0.03 & O &= 0.24 \times 0.07 \\
B &= 0.25 \times 0.08 & I &= 0.93 \times 0.82 & S &= 0.55 \times 0.81 \\
C &= 0.14 \times 0.42 & L &= 0.36 \times 0.75 & T &= 0.61 \times 0.35 \\
D &= 0.59 \times 0.09 & N &= 0.62 \times 0.17 & U &= 0.67 \times 0.11 \\
\end{align*}
\]

\[
\begin{array}{cccccccc}
0.02 & 0.0252 & 0.0588 & 0.0276 & 0.0737 & 0.4455 & 0.0252 \\
0.7626 & 0.2135 & 0.7626 & 0.4455 & 0.1054 & 0.0168 & 0.2135 & 0.0276 & 0.27 & 0.0168 & 0.0737 & 0.0531 \\
\end{array}
\]

3. Generalization

How do you multiply decimals up to the hundredths place?

C. Application

The General PTA of a school held a fund-raising activity for their scholarship and utilities maintenance projects. The Auditor announced that they earned P25,536.75. The President said that they will put aside twenty-five percent of it for the scholarship project. The Treasurer multiplied their earnings by 0.25 to know how much will be put aside.

1) How much will they have for their scholarship project?

2) Do you think the GPTA officers are wise in including a scholarship in their project? Why?
IV. Evaluation

A. Multiply. Show your solutions.
   1) 0.38 2) 0.75 3) 0.59
      \[ \times 0.64 \quad \times 0.48 \quad \times 0.37 \]
   4) 0.78 \times 0.68 = N
   5) 0.27 \times 0.93 = N
   6) 0.83 \times 0.55 = N

B. Solve for what is being asked.
   1) The product of 0.85 and itself is _______.
   2) What is the product of 0.97 and the next odd decimal number?
   3) Multiply 0.79 and the difference of 0.93 and 0.26.

V. Assignment

1) Place the decimal point correctly in each product.
   a) 0.67 \times 0.48
   b) 0.84 \times 0.37
   c) 0.55 \times 0.87
      \[
      \begin{array}{c}
      536 \\
      268 \\
      3216 \\
      \end{array}
      \begin{array}{c}
      588 \\
      252 \\
      3108 \\
      \end{array}
      \begin{array}{c}
      385 \\
      440 \\
      4785 \\
      \end{array}
      \]

2) Which of these has the correct product? Solve correctly those that are not.
   a) 0.28 \times 0.34
   b) 0.75 \times 0.85
   c) 0.79 \times 0.83
      \[
      \begin{array}{c}
      0.952 \\
      0.6375 \\
      \frac{6.557}{6}
      \end{array}
      \]

3) Solve and show your solutions.
   a) I am thinking of two decimals. Add them and you get 0.1. Multiply them and you get 0.0016. What are the two decimals?
   b) Multiply 0.86 and the sum of 0.37 and 0.28.
   c) Multiply 0.47 and the difference of 0.81 and 0.26.

Multiplying Mixed Decimals by Mixed Decimals with Hundredths

I. Learning Objectives

Cognitive: Multiply mixed decimals by mixed decimals with hundredths
Psychomotor: Write the product correctly
Affective: Show cooperation in solving problems

II. Learning Content

Skill: Multiplying mixed decimals by mixed decimals with hundredths
Reference: BEC PELC II.D.4
Materials: handkerchief, problem cards, number cards
Value: Cooperation
III. Learning Experiences

A. Preparatory Activities

1. Mental Computation – Find the Product
   Relay Game (Naming the Mother)
   There will be 2 groups of 5 pupils in a line. The teacher names the babies and
   the first pupil in the line names the mother. The teacher continues to name the
   babies until all the members of the group have participated. The group who finishes
   first with all correct answers wins.
   Example of babies:
   a) 2.5 and 0.4
   b) 1.7 and 0.3
   c) 3.2 and 0.6

2. Review
   a) Divide the class into groups with 4 members, each numbered 1 to 4.
   b) Choose a volunteer pupil to hold a handkerchief in front.
   c) Call all 1s of each group in front of the one holding the handkerchief.
   d) At the go signal of the teacher, players try to snatch the handkerchief raised high
      by the volunteer pupil.
   e) The one who gets the handkerchief will answer the problem.
      Ex: What is the sum of 0.15 and 0.22?
   f) If the answer is wrong, other players can answer to earn a point.
   g) The group with the most number of correct answers wins.
   Example of problems: 3.15 x 24.8 x 7 0.38 x 0.15

3. Motivation: Problem Opener

   Rina weighs 46.15 kilograms. Cathy weighs 1.06 times as much as
   Rina. If you were Rina, how would you know how heavy Cathy is?

B. Developmental Activities

1. Presentation
   a. Activity 1
      1) Mix two sets of number cards, labeled 0 through 9, in a container.
      2) Draw boxes like the ones below for each pupil to copy. (Each pupil can
         choose one or copy all.)
         a)      b)      c)
         \[\begin{array}{ccc}
         \bullet & \bullet & \bullet \\
         \bullet & \bullet & . \\
         \times & \bullet & \bullet \\
         \end{array}\]  \[\begin{array}{ccc}
         \bullet & . & . \\
         \bullet & . & . \\
         \times & . & . \\
         \end{array}\]  \[\begin{array}{ccc}
         \bullet & . & . \\
         \bullet & . & . \\
         \times & \bullet & \bullet \\
         \end{array}\]
      3) Ask a pupil to pick six cards one at a time, reading aloud each number
         drawn.
      4) The pupils write the numbers in each box in order.
5) Have the pupils solve the product. Let them apply the process used in the previous lessons. Have them practice cooperative learning.

6) Ask volunteers to write their numbers and solutions for A, B, and C.

7) Have the pupils observe similarities and differences in the solutions and answers. Have a free discussion on their observation.

8) Repeat the activity by picking another set of six cards.

9) Discuss the steps in multiplying a mixed decimal by another mixed decimal (2 and 3).

10) Add the following on the board:

d) \[ \square \cdot \square \]

e) \[ \square \square \cdot \square \]

\[ \underline{\square \cdot \square} \times \underline{\square \cdot \square} \]

11) Pick another set of six numbers to use in a to e. Discuss the answers.

b. Activity 2 – Cooperative Learning

Each group will be given an index card with problems. The pupils work on the problems cooperatively. The group who finishes first sends a member to write the answer on the board.

Problems:
1) A rectangle is 7.8 cm long and 6.2 cm wide. What is its area?
2) If gasoline costs \( \text{P} \) 17.68 per litre, how much will 10.5 litres cost?
3) Tina works 4.5 hours a day. If her hourly rate is \( \text{P} \) 67.45, how much is she paid a day?

Each group leader will explain their computation on the board.

c. Activity 3 – Discovery

1) Pupils work by pair.

2) They have to answer the following questions after observing the exercises presented by the teacher. Present these exercises on the board.

a) \[ 7.4 \times 3.8 \]

b) \[ 9.21 \times .46 \]

c) \[ 2.83 \times 5.7 \]

\[ 592 \]

\[ 5526 \]

\[ 1981 \]

\[ 222 \]

\[ 3684 \]

\[ 1415 \]

\[ 2812 \]

\[ 42366 \]

\[ 16131 \]

1) How many decimal places are there in the factors? products?

2) What will you do to determine where to write the decimal point correctly.

3) If there are not enough digits in the product, what will you do?

2. Fixing Skills

Use the data in the table to complete the sentences

<table>
<thead>
<tr>
<th>Menu Item (One Serving)</th>
<th>Energy (Calories)</th>
<th>Protein (grams)</th>
<th>Carbohydrates (grams)</th>
<th>Fat (grams)</th>
<th>Salt (grams)</th>
<th>Fiber (gram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple pie</td>
<td>219</td>
<td>2.4</td>
<td>21.4</td>
<td>13.8</td>
<td>0.2</td>
<td>4.3</td>
</tr>
<tr>
<td>Buttered muffin</td>
<td>163</td>
<td>5.7</td>
<td>25.9</td>
<td>3.6</td>
<td>0.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Plain doughnut</td>
<td>282</td>
<td>4.2</td>
<td>29.7</td>
<td>16.3</td>
<td>0.4</td>
<td>1.8</td>
</tr>
<tr>
<td>Regular French fries</td>
<td>259</td>
<td>3.2</td>
<td>30.5</td>
<td>13.8</td>
<td>0.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Garden salad</td>
<td>111</td>
<td>8.9</td>
<td>1.0</td>
<td>6.2</td>
<td>0.2</td>
<td>7.5</td>
</tr>
</tbody>
</table>
a.) Five servings of buttered muffins contain _______ calories of energy.
b.) Ten doughnuts contain _______ grams of fiber.
c.) If you eat 100 servings of garden salad, you will gain _______ grams of protein.
d.) _______ apple pies contain approximately 30.6 kg of carbohydrates.
e.) How much fiber intake is obtained from 4 servings of garden salad, regular French fries and an apple pie.

Solve.

\[
\begin{array}{ccc}
a) & 2.07 & b) & 48.12 & c) & 9.24 \\
x & 3.82 & x & 5.50 & x & 14.63 \\
\end{array}
\]

3. **Generalization**

How do you multiply mixed decimals by mixed decimals? How do you put the decimal point?

C. **Application**

Father and other farmers harvested tomatoes for the town’s Tiangge Day. They were able to fill 56.5 kaings each weighing 18.75 kilograms.

1) How many kilograms of tomatoes were harvested for the Tiangge Day?
2) If they will sell the tomatoes for ₱24.25 a kilo,
   a) how much will they get for one kaing?
   b) how much will they get for all the tomatoes?
3) A businessman will buy all the tomatoes, but will be given 1.5 kilograms free for each kaing. How much will he pay?
4) Do you think that much of tomatoes will be ready to be sold for Tiangge Day if only Father picked the tomatoes? Why?

IV. **Evaluation**

1. Place the decimal point in each product correctly.
   a) \[83.52 \times 2.4 = 196.48\]
   b) \[6.5 \times 4.36 = 28.34\]
   c) \[2.56 \times 7.22 = 18.43\]

2. Use the fact to find each product.
   \[
   384 \times 127 = 48768
   \]
   a) \[3.84 \times 12.7 = \]
   b) \[38.4 \times 1.27 = \]
   c) \[3.84 \times 1.27 = \]
   d) \[38.4 \times 12.7 = \]

3. How many of these can you solve:
   a) Find the cost of 7.5 metres of cloth at ₱67.45 a metre.
   b) Mangoes cost ₱65.50 a kilogram. How much will 8.5 kilograms cost?
   c) A lot has an area of 154.6 square metres. How much will it cost if one square metre is ₱1,800.75?

V. **Assignment**

1. Find the product.
   a) \[72.08 \times 6.9 = \]
   b) \[8.056 \times 7.4 = \]
   c) \[59.17 \times 2.04 = \]
2. Using $1293 \times 315 = 407295$, give the product of the following:
   
a) $12.93 \times 31.5$
   
b) $1.293 \times 3.15$
   
c) $129.3 \times 3.15$
   
d) $1.293 \times 31.5$

3. Analyze and solve.
   
a) If an architect makes a drawing to scale so that 1 cm represents 4.25 m, what distance is represented by 7.5 cm?
   
b) What is the area of a rectangle with a length of 9.75 cm and a width of 6.35 cm?

### Multiplying Decimals by 0.1, 0.01, 0.001

#### I. Learning Objectives

**Cognitive:** Multiply mentally decimals by 0.1, 0.01, 0.001

**Psychomotor:** Write solutions to problems correctly

**Affective:**
   1. Practice teamwork in the activities
   2. Show kindness/generosity

#### II. Learning Content

**Skill:** Multiplying decimals by 0.1, 0.01, and 0.001 mentally

**References:**
   - BEC PELC II.D.6
   - Connections p. 57, Mathematics in Action p. 84-85

**Materials:** number puzzle, game board set, problem cards

**Value:** Kindness/Generosity

#### III. Learning Experiences

**A. Preparatory Activities**

1. **Mental Computation: Mental Math Game**

   Form groups of 4s and hand each group a game board, two colors of chips (bottle caps can be used), two colors of number cards (ex. yellow cards have decimals numbers, blue cards have 10, 100, and 1000 written).

   **Example:**

<table>
<thead>
<tr>
<th>Board Game</th>
<th>Yellow Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>384.1</td>
<td>0.7 3.841</td>
</tr>
<tr>
<td>529.6</td>
<td>52.96 0.004</td>
</tr>
<tr>
<td>99</td>
<td>6.773</td>
</tr>
<tr>
<td>0.4</td>
<td>990 700 5296</td>
</tr>
</tbody>
</table>

   **Blue Cards**

   | 10 10 100 100 1000 1000 |

   **Directions for the group:**
   
a) Choose a partner. Partners will be A & B, C & D.
b) Shuffle the cards separately and place them face down on the table.
c) A and C will compete first. Toss a coin to know who will start.
d) Pick a card from the yellow and blue pile.
e) Mentally multiply the two numbers. Your partner can check your answer.
f) If correct, put a chip on the square in the game board that contains the product.
g) The next opponent now does the same.
h) Four chips in a row, in any direction, wins the game.
i) B and D will play the next game.

Who won? Why did Team ___ win? What enabled them to win? How does team work contribute to the success of a team?

2. Review: Dividing Whole Numbers by Decimals

Match Column A with Column B. Write your answers on a piece of paper (or in your notebook).

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) 2.18</td>
<td>a) 0.6 x 0.2</td>
</tr>
<tr>
<td>2) 0.00158</td>
<td>b) 4.36 x 0.5</td>
</tr>
<tr>
<td>3) 1.004</td>
<td>c) 2.5 x 0.03</td>
</tr>
<tr>
<td>4) 0.12</td>
<td>d) 0.04 x 25.1</td>
</tr>
<tr>
<td>5) 0.075</td>
<td>e) 0.002 x 0.79</td>
</tr>
</tbody>
</table>

3. Motivation

Give number puzzles to each group. (Number puzzles are number cards cut into pieces to create puzzle pieces.) Tell each group to complete the puzzles. (The numbers to be formed are powers of 10, e.g. 10², 10⁻², etc.) Tell the groups to paste the pieces on a piece of paper or tape them together. Post their work on the board in an organized way.

Ask if they could identify the numbers they formed. Give a hint that the exponents indicate the number of decimal places to the left or right of 1. Let them give a guess. Check and discuss their answer.

Sample answers:

10³ = 1000
10⁻² = 0.01
10⁵ = 100 000
10⁻⁴ = 0.0001

B. Developmental Activities

1. Presentation

a. Activity 1

1) Present this problem:

Mrs. Santos owns 0.9 hectare of land. She plans to make 0.1 of the land into a residential lot by putting up an apartment. She asked her tenant, Elen, to manage the said apartment. Since Elen is a trustworthy and loyal tenant, Mrs. Santos decided to give Elen 0.01 of the 0.9 hectare of land near the apartment lots.

a) How many square metres of the land will be converted to residential lots?

b) How big is the lot given to Elen?

2) Form pupils into groups and have them analyze the problem using any method. Emphasize the use of cooperative learning. Give time for each group to present their work.
3) If no one presented the solution using drawings, show this as another method of solving the problem. This is important to give the pupils idea on how big (or how small) 0.1 and 0.01 of the 0.9 hectare of land are (in sq. m).

4) Expand the problem:

5) Elen plans to build a sari-sari store in the lot given to her equivalent to 0.001 of the 0.9 ha. How big (in sq m), will she need for her store?

6) Have the pupils see the difference in the sizes of the lots. Write the number sentences on the board. Guide them in observing/looking for a pattern.

7) Give another situation for them to solve. Let them state a shortcut method and use it in this situation.

b. Activity 2

1) Give the following for the pupils to answer with a partner.
   a) 9.86 x 10  (98.6)  d) 0.83 x 10  (8.3)
   b) 9.86 x 100  (986)  e) 0.83 x 100  (83)
   c) 9.86 x 1000  (9860)  f) 0.83 x 1000  (830)

2) Discuss their answers and how they solved the problems. Ask for a pattern.

3) Give the following for them to answer:
   a) 9.86 x 0.1  (0.986)  d) 0.83 x 0.1  (0.083)
   b) 9.86 x 0.01  (0.0986)  e) 0.83 x 0.01  (0.0083)
   c) 9.86 x 0.001  (0.00986)  f) 0.83 x 0.001  (0.00083)

2. Fixing Skills

1. Multiply mentally.
   1) 0.01 x 0.9  6) 0.001 x 6.409
   2) 0.09 x 0.1  7) 0.1 x 0.05
   3) 0.008 x 0.6  8) 0.01 x 1.4
   4) 0.001 x 5.8  9) 0.7 x 0.01
   5) 0.007 x 0.1  10) 0.001 x 1.217

2. a.) Multiply 356 by .01, .1, .001 and arrange the product in increasing order.
   b.) How many times greater is (70 x 0.1) than (7 x 0.1)?
   c.) What will you multiply to 0.015 to get 15?
   d.) Explain why the product (.001 x 75.30) is not equal to 75.30.
   e.) Which to the following will result to equal products. Analyze the result.

\[
\begin{align*}
21.31 & \quad 2131 & \quad 213.1 & \quad 0.02131 \\
\times .01 & \quad \times .001 & \quad \times .001 & \quad \times 10
\end{align*}
\]

3. Generalization

How do you multiply decimals by 0.1, 0.01, and 0.001? What is a shorter way of doing this?

C. Application

If you were Mrs. Santos and your land is 1.6 hectares, how much would now be allotted for: (refer to the previous problem)
   a) the apartment lots?
   b) Elen’s house?
   c) Elen’s sari-sari store?
What kind of a person is Mrs. Santos? Why?
Would you do the same if you also have a big piece of land?
IV. Evaluation

Multiply mentally. Choose the letter of the correct answer.

1) \(0.01 \times 8.56\)  
   a) 85.6  
   b) 8.56  
   c) 0.856  
   d) 0.0856

2) \(0.001 \times 0.49\)  
   a) 4.9  
   b) 0.49  
   c) 0.049  
   d) 0.00049

3) \(0.07 \times 0.1\)  
   a) 7  
   b) 0.7  
   c) 0.07  
   d) 0.007

4) \(0.003 \times 0.01\)  
   a) 0.00003  
   b) 0.0003  
   c) 0.3  
   d) 30

5) \(0.1 \times 79.5\)  
   a) 79.5  
   b) 7.95  
   c) 0.795  
   d) 0.0795

V. Assignment

A. Multiply mentally.
   1) \(0.001 \times 45.267\)
   2) \(4.01 \times 0.1\)
   3) \(0.01 \times 0.03\)
   4) \(0.217 \times 0.001\)
   5) \(0.1 \times 0.0011\)

B. Complete the table. Multiply mentally.

<table>
<thead>
<tr>
<th>(x 0.1)</th>
<th>(x 0.01)</th>
<th>(x 0.001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) 3.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) 455.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) 0.094</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Make 5 problem cards with answers written at the back.

Example:  

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 (x 0.01)</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Computing Decimal Products Mentally

I. Learning Objectives

Cognitive: Apply the different properties of multiplication to compute for products mentally
Psychomotor: Show speed in doing the different activities
Affective: Show teamwork

II. Learning Content

Skill: Compute decimal products mentally using the different properties of multiplication
Reference: BEC PELC II.D.7
Materials: improvised bingo cards, equation/problem cards, puzzle sheet, pocket chart
Value: Teamwork
III. Learning Experiences

A. Preparatory Activities

1. Mental Computation

**BINGO**
- a) Prepare bingo cards in which numbers are products of a given problem.
- b) The teacher reads the problem orally.
- c) Pupils cover the cell that has the correct answer for the given problem.
- d) The first one to cover all the cells wins.

**Ex.:**

```
<table>
<thead>
<tr>
<th></th>
<th>0.72</th>
<th>2.58</th>
<th>7.5</th>
<th>7.2</th>
<th>0.051</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.3</td>
<td>2.5</td>
<td>9.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4.5</td>
<td>2.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.5</td>
<td>2.2</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>4.5</td>
<td>1.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>4.8</td>
<td>1.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>2.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

2. Review: Multiplying Decimals by 10, 100, 1000 Mentally

**Relay – Competition for speed**

**Materials:** 3 by 5 cards on which problems have been written

**Mechanics:**

- a) Place equal stacks of 3 by 5 cards with identical problems on the table.
- b) Upon the teacher’s signal, the first player from each team goes in front, picks a card allotted for their team, reads and solves the problem mentally.
- c) As soon as the first player is finished, the second player follows, takes the next card, and solves the problem mentally.
- d) If the given answer is wrong, the next player solves the same problem.
- e) The first team to complete its stack of problems and answer them correctly is the winner.
Ex.:
\[50 \times 10^2 = \_] \quad 3.91 \times 10^2 = \_
\[0.086 \times 10^2 = \_] \quad 0.029 \times 10^2 = \_
\[3 \times 10^2 = \_] \quad 14.64 \times 10^1 = \_

3. Motivation

1) Present this puzzle card to each group.
2) Encircle the words that indicate properties of multiplication.

\[
\begin{array}{cccccccccccc}
A & B & C & D & E & F & G & H & I & D & J \\
C & K & L & M & Z & E & R & O & N & I & O \\
P & O & Q & R & S & T & U & N & V & S & W \\
X & Y & M & Z & A & B & C & E & D & T & E \\
F & G & H & M & I & J & K & L & M & R & N \\
O & P & Q & R & U & S & T & U & V & I & W \\
A & D & S & T & V & T & U & C & M & B & I \\
A & L & X & N & Z & A & C & T & I & T & O \\
B & O & X & E & S & T & I & M & I & I & S \\
A & S & S & O & C & I & A & T & I & V & E \\
C & X & A & O & M & Y & V & B & L & E & E \\
\end{array}
\]

3) The first to finish, wins.
4) Teacher asks if the properties of multiplication can be applied in multiplying decimals?

What made team ___ win? Did they show teamwork? How? What does teamwork do to the team? Will you do the same thing? Why?

B. Developmental Activities

1. Presentation
   
a. Activity 1 – Concentration Game
   
   Materials: 30 index cards
   
   Player: 2
   
   Mechanics:
   
   1) Information is written on one side of each activity card so that there are 15 pairs of cards containing equations and answer cards.
   
   2) The cards are turned face down.
   
   3) The object of the game is to turn face up two matching cards.
   
   4) If the cards match, the student keeps the two cards.
   
   5) If the cards do not match, they are turned face down in their original places and the second player selects.
   
   6) Students must concentrate to remember the information on the cards previously turned face up in order to make a match.
   
   7) The student with the most cards at the end of the game wins.
b. Activity 2

Place in a pocket chart equation cards (whole numbers), such as:

<table>
<thead>
<tr>
<th>Activity Card</th>
<th>Answer Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) (2.5 \times (0.3 + 0.4) = (2.5 \times 0.3) + (2.5 \times 0.4))</td>
<td>1.75</td>
</tr>
<tr>
<td>b) (0.5 \times (0.7 \times 3.2) = (0.5 \times 0.7) \times 3.2)</td>
<td>1.12</td>
</tr>
<tr>
<td>c) (5.6 \times 0.01 = 0.01 \times 5.6)</td>
<td>0.056</td>
</tr>
<tr>
<td>d) (1 \times 3.5)</td>
<td>3.5</td>
</tr>
<tr>
<td>e) (0.3 \times (0.2 \times 0.4) = (0.3 \times 0.2) \times 0.4)</td>
<td>0.024</td>
</tr>
<tr>
<td>f) ((0.8 \times 0.5) \times 0.3 = (0.3 \times 0.8) \times 0.5)</td>
<td>0.12</td>
</tr>
<tr>
<td>g) (1.8 \times 0.3 = 0.3 \times 1.8)</td>
<td>0.54</td>
</tr>
<tr>
<td>h) (0 \times 3.45 = N)</td>
<td>0</td>
</tr>
<tr>
<td>i) ((0.8 + 0.2) \times 3.9 = (3.9 \times 0.8) + (3.9 \times 0.2))</td>
<td>3.9</td>
</tr>
<tr>
<td>j) (45.7 \times 0 = N)</td>
<td>0</td>
</tr>
<tr>
<td>k) (3.005 \times 1 = 3.005)</td>
<td></td>
</tr>
<tr>
<td>l) (2.5 \times 0.01 = 0.01 \times 2.5)</td>
<td>0.025</td>
</tr>
<tr>
<td>m) ((4.2 \times 0.5) + (4.2 \times 0.4) = (0.5 + 0.4) \times 4.2)</td>
<td>3.78</td>
</tr>
<tr>
<td>n) ((1.6 \times 0.2) \times 0.5 = 1.6 \times (0.2 \times 0.5))</td>
<td>0.16</td>
</tr>
<tr>
<td>o) (16.5 \times 1 = N)</td>
<td>16.5</td>
</tr>
</tbody>
</table>

1) Call on a volunteer to pick a card and give the product as well as the property used.
   (Some cards need a partner to identify the property used.)

2) Place a new set of equation cards but this time using decimals and mixed decimals: Follow the same steps as above.

3) Group the children and hand out envelopes containing equation cards and blank index cards.

4) Tell the pupils to write the answers to each equation on the blank index cards, then identify the properties used.

5) Have them post their work once they have finished.
   (Allow variation in the equation cards given.)

6) Have a volunteer from each group discuss their work. Allow free flow of discussion among the pupils regarding the activity.

7) Discuss how the properties simplify computation.

c. Activity 2 – (Oral)

Materials: index cards

Distribute 5 cards to each pupil. Have the pupils write the property on one side of each index card and an example of the property on the other side. Collect and shuffle the cards. Each pupil draws a card, computes the example orally and names the property used. If both steps are correct, he keeps the card. If not, the card is replaced. The winner is the pupil with the most cards.
2. **Fixing Skills**
   Solve mentally.
   1) \(0.7 \times 0.02 = 0.02 \times 0.7\)
   2) \(0.8 \times 0.75 = 0.8 \times (0.7 + 0.05)\)
   3) \(1 \times 0.208 = \)
   4) \(0.8 \times (0.4 \times 0.2) = (0.8 \times 0.4) \times 0.2\)
   5) \(2.5 \times 3.4 = 3.4 \times 2.5\)

3. **Generalization**
   How does the distributive property help simplify the calculation? How about the other properties?

C. **Application**
   Myra will buy the following from the market:
   - 1.5 kilos of tomatoes at \(P48.50\) a kilo
   - 2.2 kilos of onions at \(P35.00\) a kilo
   - 7.5 kilos of makopa at \(P35.50\) a kilo
   1) Help Myra find how much she will pay for each item.
   2) What properties can be used to make the computation easy? Explain your work.

IV. **Evaluation**

1. Collaborative learning
   a) Working in teams of four.
   b) Dictate a mental math problem to all the teams. The first team to give the correct answer and name the property wins that round. The team with the highest score wins.

2. Using the “Show-Me-Card,” the teacher gives the problem. The pupils write the property used in the Show-Me-Card.
   Ex.: 
   a) \((0.27 \times 0.3) \times 0.2 = 0.27 \times (0.3 \times 0.2)\)
   b) \(0.8 \times 0.079 = 0.8(0.07 + 0.009)\)
   c) \(3.5 \times 4.2 = 4.2 \times 3.5\)

V. **Assignment**

Give 2 examples for each property of multiplication.

---

**Solving Problems involving Multiplication of Decimals**

I. **Learning Objectives**

<table>
<thead>
<tr>
<th>Cognitive:</th>
<th>Solve word problems involving multiplication of decimals including money</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychomotor:</td>
<td>Write the number sentence</td>
</tr>
<tr>
<td>Affective:</td>
<td>Spend money wisely</td>
</tr>
</tbody>
</table>
II. Learning Content

Skill: Solving word problems involving multiplication of decimals including money
Reference: BEC PELC II.D.8.2
Materials: chart, "Show-Me-Cards"
Values: Thriftiness

III. Learning Experiences

A. Preparatory Activities

1. Drill – Mental Computation

Mechanics:
   a) Put equation cards on the table.
   b) Each member of the group take turns in getting and reading the cards, then give the answer orally.
   c) If the given answer is wrong, the other group can steal and get the point if they can give the correct answer.
      Ex. $2.5 \times 2.5 = N$
      $2.3 \times 0.4 = N$
      $0.37 \times 0.2 = N$
      $1.9 \times 0.12 = N$
      $8.5 \times 8.5 = N$
      $1.1 \times 0.16 = N$
   d) The group with the most number of correct answers wins the game.

2. Review – Square Share

   a) Problem cards will be given to each group.
   b) Have each group read the problem given to them.
   c) Teacher will call:
      All 4s of each group – give the facts
      All 2s of each group – give the operation
      All 3s of each group – give the number sentence
      All 1s of each group – give the correct answer
   d) The group with the most number of correct answers, gets a point for their group.
      Sample Problem:
      Tina bakes pastries and sells them at $1.25 each. One day she sold 95 pieces. How much was her sale?

3. Motivation

   What are the steps in solving a word problem?
   Why do we have to analyze the word problem before giving the answer?
   How do you know that your answer is correct?
B. Developmental Activities

1. Presentation

   a. Activity 1 – Practical Works
      Present the menu on the board.

      | MENU                  |
      |-----------------------|
      | Ham and cheese sandwich – P 12.00 |
      | Hotdog sandwich        – P 10.00  |
      | Hamburger sandwich     – P 15.00  |
      | Hamburger with cheese  – P 18.75  |
      | Cheese sandwich        – P 8.50   |
      | Juice (in tetrapack)   – P 9.00   |
      | Juice (in can)         – P 15.00  |

   2) Let each group formulate 3 word problems using the menu for 10 minutes only.
   3) Let each group exchange papers for them to answer the problems presented by the other group for 10 minutes.
      • What is asked in the problem?
      • What operation should be used?
      • What is the equation?
      • What is the answer?
   4) Let each group return the paper to its owner for them to check if it is answered correctly.
   5) The group who gives a wrong answer will be deducted 2 points.

   b. Activity 2

   1) Teacher prepares word problems involving multiplication of decimals including money.
      Ex.: Cris spends P 35.50 for food each day. How much does she spend in 12 days?

      2) What is asked?

      What are the facts?

      What is the math sentence?

      Solution:

   3) The first pupil to tap the board will answer the first question, followed by other member of his group. A point will be given if they give the correct answer.
   4) The other group can steal if the given answer is wrong.
   5) After the game, the teacher will give emphasis on solving word problems involving multiplication of decimals including money.

       Valuing: Give emphasis on being thrifty since the lesson involves money.
       Example: How do you spend your baon/money?
2. **Fixing Skills**
   Write the number sentence, then solve.
   1) The rental for a Tamaraw FX is ₱3,500 a day. How much will it cost you if you rent it for 3.5 days?
   2) What is the area of a rectangle with a length of 9.72 cm and a width of 6.34 cm?

3. **Generalization**
   What are the steps in solving a word problem?
   How do you translate a problem into a number sentence or equation?
   How would you describe your answer?

**C. Application**
Translate the following problems to equations or number sentences then solve.
1) If 1 metre of cloth costs ₱72.95, how much would 6.5 metres cost?
2) Mang Quintin, a balot vendor, bought 120 duck eggs at ₱3.85 each. How much did he pay for all the eggs?
3) A cone of ice cream costs ₱16.25. How much will 8 cones of ice cream cost?

**IV. Evaluation**

A. Read and solve.
   1) A can of powdered milk has a mass of 0.345 kilogram. What is the mass of 12 cans of milk?
   2) Mrs. Diaz bought a residential lot with an area of 180.75 m² at ₱650.00 per square metre. How much did she pay for the lot?

B. Write the number sentence, solve, and label your answer correctly.
   1) Mrs. San Jose has 1.86 metre of lace. She used 0.5 of the lace for edging the collar of her blouse. What part of the lace was used?
   2) How much will 15 kilograms of ground beef cost if one kg costs ₱180.00.

**V. Assignment**

A. Translate these problems to number sentences then solve.
   1) A contractor finished 0.25 of a highway in 5 days. If the highway is 60.8 kilometres long, what part of the highway was finished?
   2) Mark works 40 hours a week. If his hourly rate is ₱38.25, how much is he paid a week?

B. Read each problem, analyze it step by step, and solve.
   1) A carpet costs ₱172.85 per square metre. If you want to buy 7.5 square metres of carpet, how much will you pay?
   2) A vendor has 96 red and blue balloons. If 0.625 of the balloons are red, how many of the balloons are blue?
Two to Three-Step Word Problems

I. Learning Objectives

Cognitive: Solve 2- to 3-step word problems involving addition, subtraction, and multiplication of decimals including money
Psychomotor: Write a number sentence correctly
Affective: Practice sharing in our day-to-day life

II. Learning Content

Skill: Solving 2- to 3-step word problems involving addition, subtraction, and multiplication of decimals
Reference: BEC PELC II.D.8.2
Materials: dartboard, activity cards, dice
Value: Sharing

III. Learning Experiences

A. Preparatory Activities

1. Drill: Identifying 2 numbers that satisfy the following:
   a) sum of 20 and difference of 8
   b) product of 72 and sum of 17
   c) difference of 49 and product of 50
   d) product of 100 and difference of 15
   e) sum of 17 and difference of 1

2. Review

   Board Game

   Mechanics:
   a. Present a problem on the board.
   b. Leaders will throw a die on the board placed on the table. The corresponding points if they can answer correctly the questions are the following:
      - Bull’s eye – 10 points
      - 2nd circle – 5 points
      - Big circle – 1 point
   c. Failure to give the correct answer means a deduction from their points.
   d. Teacher gives emphasis on analyzing 2-step problems.
Ex. In a class of 27 boys and 25 girls, 16 joined the choir.
How many are not members of the choir?

3. Motivation

What is the importance of knowing the hidden question in a problem?
Do all problems have hidden questions? Why?

B. Developmental Activities

1. Presentation

a. Activity 1 – Cooperative Learning

Problem Opener:

One day, Luz and Seng visited a book fair in one of the malls. Seng saw 2 books costing ₱44.85 and ₱67.50 each. She wanted to buy the 2 books and 8 pieces of bookmarks which cost ₱8.75 each but she only had ₱127.85. Luz offered to share her money. How much did Luz share to Seng so that she could buy the books and bookmarks?

Each of the groups will analyze the problem with the following questions:

a) What does the problem ask for?
b) What are given?
c) What process/es will you use to solve it?
d) What are the hidden questions?
e) Translate it into a number sentence.
f) Solve for the answer and label your answer.
The first to finish, will present their answers on the board.
Give another problem to be solved cooperatively by the class.

Problem:

Mrs. Ocampo makes blouses and skirts. She has 1.25 m for the blouse and 1.35 m for the skirt. How much will 12 blouses and skirts cost if a metre of the material used costs ₱45.25?

2. Fixing Skills

Read, analyze, and solve the problem.

Rhoda bought 2 notebooks at ₱48.50 each and a pad paper at ₱30.75. If her money was a 200-peso bill, how much was her change?

1) The problem asks you to look for _____.
2) The given facts in the problem are _____.
3) The relevant facts to solve the problem are _____.
4) The hidden questions are _____.
5) The processes to be used are _____.
6) The equation for the problem is _____.
7) The complete answer is _____.
8) How many more notebooks and pad paper can she buy with her change? List the possible answers.
3. Generalization

How many steps are needed to solve the first problem? second problem? What is a hidden question?
In the first problem, what did Luz do so Seng could buy the 2 books and the bookmarks? If you were Luz, would you do the same? Why?
Remind pupils to focus on the hidden question. Some problems have more than one hidden question.

C. Application

a. Read and analyze, then answer the questions that follow.

Sheila bought 1.5 kilos of ham at ₱240 a kilo, 4 packs of butter for ₱22.50, and 3 loaves of bread at ₱25.50 a loaf. She had ₱1,000. How much was left of her money after paying?

a) What is asked in the problem?
b) What are the given facts?
c) What is the hidden question?
d) What operation will you use to solve the problem?
e) What is the number sentence?
f) What is the answer?

Rico saves ₱4.50 on Monday, ₱7.25 on Tuesday, ₱5.15 on Wednesday, ₱3.90 on Thursday, and ₱8.20 on Friday from his daily transportation allowance for 3 weeks. From these savings, he wants to buy a t-shirt which costs ₱195.00. How much more must he save?

a) How much money was saved by Rico?
b) How much is the t-shirt he would like to buy?
c) How much more money must he save?
d) What is the number sentence?
e) How many hidden questions are there in the problem?

b. Solve.
The table below shows the fare for a journey by taxi.

<table>
<thead>
<tr>
<th>Distance</th>
<th>Fare</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 500 m</td>
<td>₱30</td>
</tr>
<tr>
<td>Every subsequent 500 m or part thereof</td>
<td>₱2.50</td>
</tr>
</tbody>
</table>

Mrs. Ruiz took a taxi from her home to her office, which was 4.25 km away. How much taxi fare did she have to pay?

IV. Evaluation

A. Read and analyze, then solve the following:

Mary prepared sandwiches for the seminar participants. She bought 5 loaves of bread at ₱22.50 each, 2 bottles of mayonnaise at ₱55.50 a bottle, and 1.5 kilograms of ham at ₱240 a kilogram. If she gave the saleslady ₱1,000, how much change did she receive?
What is asked?
What are given?
What is/are the hidden questions?
What operations will you use to solve the problem?
What is the number sentence?
What is the answer?

Bobby bought 2 t-shirts at ₱249.95 each and a pair of pants for ₱675.95. How much change did he get from his ₱1,000 peso bill?

What is asked?
What are given?
What is/are the hidden questions?
What operations will you use to solve the problem?
What is the number sentence?
What is the answer?

B. Write the number sentence for each problem then solve.

1) Barangay Maligaya is 28.5 km from the town proper. In going there, Jay traveled 15.75 km by jeep and 3.5 km by tricycle and the rest by walking. How many km did he travel by walking?
2) The Butal family went to a carnival. They bought 2 tickets for adults at ₱80.00 each and 3 tickets for children at ₱60.00 each. How much change did she receive from a ₱500 given to the ticket seller?
3) For Rina’s birthday, Mother bought a cake at ₱200, 4 gallons of ice cream at ₱350 each and cookies worth ₱225. She brought with her 2 ₱1,000 bills. How much was left of her money?

V. Assignment

1) Read, analyze, and solve for the answer.
   a. Mother bought 3 kg of sugar at ₱23.70 per kilogram and 2 kg of rice at ₱21.50 per kilogram. How much change did she receive from her ₱500 bill?
   b. Roy’s allowance is ₱500 a week. He spent ₱80 for transportation and ₱225 for meal and snacks. How much money can he save in 4 weeks?

2) Give the hidden question, write the number sentence, and solve.
   a. Mr. Salonga is paid ₱110.85 per hour of work. He worked six hours each day for four days. On the fifth day, he worked 3.25 hours. How much did he receive for 5 days of work?
   b. At a benefit show, special tickets cost ₱35.00 each while regular tickets cost ₱15.00. What was the total sales if 275 regular tickets and 120 special tickets were sold?
   c. Car A and Car B are running in opposite directions. Car A runs 65.5 kph while Car B runs 57.32 kph. How far apart will they be after 2.25 hours?