**Grade 6 Math
Unit 3: Multiplication and Division of Decimals**

Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 3: Lesson 1 – Estimation Strategies for Multiplying Decimals**

In Grade 5, students learned four strategies for estimating: front-end estimation, compatible numbers, rounding and compensation. Below, each method will be used to estimate the product of the equation 3.681 x 4

Front-end estimation

When using the front-end estimation method, you keep only the whole number and change the decimals to zeroes. For example,

3.681 x 4 becomes 3.000 x 4 = 12

Compatible Numbers

When using the compatible numbers method, you round the decimal to a “friendly” number to help make estimation easier. For example,

3.681 x 4 becomes 3.5 x 4 = 14 or 4 x 4 = 16

Rounding

When using the rounding method, you round to the nearest whole number, tenth, etc. For example,

3.68 x 4 becomes 3.7 x 4 = 14.8

3.2 x 4 becomes 3 x 4 = 12

Compensation

When using the compensation method, you reformulate (change) an equation to one that can be estimated more easily. For example,

3.681 x 4 is about 3 x 4 = 12 and,

.681 x 4 is about .5 x 4 = 2

12 + 2 = 14

**\*Remember that the most appropriate estimation strategy depends on the situation. Not every strategy is appropriate for every situation.**

1. Amber goes to the store to buy make-up for her Halloween costume. She buys three sets for $5.28 each (tax included). Estimate how much Amber spent using all four methods.

|  |
| --- |
| Front-end estimation |
| Compatible numbers |
| Rounding |
| Compensation |

2. Josh says that the product of 21.13 x 5 is greater than 100. Use any estimation method to determine whether or not he is correct.

|  |
| --- |
|  |

3. James says that the product of 2.319 x 3 is somewhere between 6 and 9. Use any estimation method to determine whether or not he is correct.

|  |
| --- |
|  |

4. Mr. Field is putting a border around a bulletin board. He knows that all four sides of the board are 3.25 feet long. He estimates that he will need 12 feet of border. Use any estimation method to determine if he will have enough border for his bulletin board.

|  |
| --- |
|  |

**Unit 3: Lesson 2 – Multiplying decimals using base-ten materials**

Base-ten materials can be a helpful tool for multiplying decimals. In the example of 2.35, two would be represented using flats (blocks of 100), 3 tenths would be represented using rods (blocks of 10) and 1 hundredths would be represented using 1 unit (block of 1).

     

The equation 2.35 x 3 would therefore be expressed as:

    

 



In the above example, there are 6 flats, 9 rods and 15 units. Since 10 units make a rod, there are 10 rods in total, and 5 units left over. In the same way, since 10 rods make a flat, there a total of 7 flats and five units.

**Confused yet? Try it on your desk with
base-ten materials!**

*Use base-ten blocks to solve the following equations, then draw them in the space provided.*

1) 0.6 x 3

|  |
| --- |
|  |

2) 3.2 x 2

|  |
| --- |
|  |

3) 4.94 x 3

|  |
| --- |
|  |

4) 1.55 x 4

|  |
| --- |
|  |

**Unit 3: Lesson 3 – Multiplying Decimals**

Multiplying decimals is no different than multiplying whole numbers, with the addition of one simple step. In the following example, you simply calculate 1.29 x 3 as if there were no decimal point in the number 1.29. Then, you count all of the digits that follow the decimal point. In this example, there are two. Therefore, you count two places from the end of the product (answer) and insert the decimal point.
1.29
 x 33.87

In this next example, there are three digits following the decimal point. Therefore, you count three spaces from the end of the product and insert the decimal point.

2.136

 x 2
4.272

1. Solve the following equations.

A) 4.26 x 3 B) 6.91 x 4

C) 2.58 x 5 D) 3.62 x 6

E) 1.79 x 4 F) 6.63 x 2

**Lesson 4: Estimating the quotient of whole and decimal numbers**

The same four estimating strategies (front-end estimation, compatible numbers, rounding and compensation) used for multiplying decimals can be used for dividing decimals. As an example, take 24.58 $÷$ 3

|  |  |
| --- | --- |
| Front-end estimation | Compatible numbers |
| 24.58 🡪 24 $÷$ 3 = 8 | 24.58 🡪 24 $÷$ 3 = 8Or 24.58 🡪 24.6 $÷$ 3 = 8.2 |
| Rounding | Compensation |
| 24.58 🡪 24.6 $÷$ 3 = 8.2 | 24.58 🡪 24.624 $÷$ 3 = 80.6 $÷$ 3 = 0.28 + 0.2 = 8.2 |

1. Complete the following questions using any appropriate estimating strategy.

A) 36.17 $÷$ 2

|  |
| --- |
|  |

B) 45.26 $÷$ 3

|  |
| --- |
|  |

C) 15.96 $÷$ 4

|  |
| --- |
|  |

D) 20.6 $÷$ 7

|  |
| --- |
|  |

2. Mackenzie has 2.72 litres of ice cream which she would like to share equally among 9 students. About how much ice cream would each student get?

|  |
| --- |
|  |

3. Jordyn, Nicholas, Kendra and Alexander decide to order a pizza. The pizza costs $16.42 altogether. If each boy pays an equal amount, about how much does each boy pay?

|  |
| --- |
|  |

4. Angel, Owen and Finleigh decide to do a fundraiser for Christmas. They decide to distribute the $96.34 equally amongst three charities. About how much will each charity receive?

|  |
| --- |
|  |

**Lesson 5: Dividing decimal numbers using base-ten blocks**

\*How to use base-ten blocks to divide decimal numbers is not easily explained on paper. Please refer to the ShowMe video on my website for a detailed explanation of this topic.

*Draw base-ten blocks to solve the following equation.*

1. 2.52 $÷$ 3

|  |
| --- |
|  |

2. 4.2 $÷$ 4

|  |
| --- |
|  |

3. 4.48 $÷$ 2

|  |
| --- |
|  |

4. 7.59 $÷$ 3

|  |
| --- |
|  |

**Lesson 6: Dividing decimal numbers using long division**

\*How to divide decimal numbers using long division is not easily explained on paper. Please refer to the ShowMe video on my website for a detailed explanation of this topic.

1) 3.72 $÷$ 3 2) 7.64 $÷$ 4

3) 6.78 $÷$ 6 4) 6.27 $÷ $3

5) 11.32 $÷$ 4 6) 8.24 $÷$ 8

7) 2.8 $÷$ 5 8) 7.38$ ÷ $3

9) 4.85 $÷$ 5 10) 12.42 $÷$ 2