



Concept: Multiplication and Division of Decimals

Name: _____

PART A: COMPUTER COMPONENT

Instructions: Select the computer program *Understanding Fractions* (Neufeld)
Follow the instructions to the Main Menu.
Select *Fractions and Decimals* from the Main Menu.



Work through all sections of this topic **in order**:

- *Recall the Basics*
- *Multiply by Repeated Addition*
- *Special Case*
- *Multiply by Partial Products- Area*
- *Distributive Method*
- *Standard Method*

Notice: *You will not be finishing the entire topic before stopping to complete some*
OFF COMPUTER EXERCISES.



As you work through the computer exercises, make your own **NOTES** in the blanks provided.

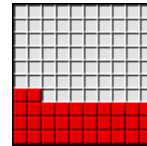
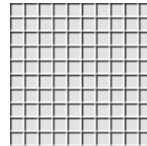
When you reach the end of the section *Standard Method* on the computer, move on to the **OFF COMPUTER EXERCISES** below.

NOTES

1. Multiply by Repeated Addition

We think...

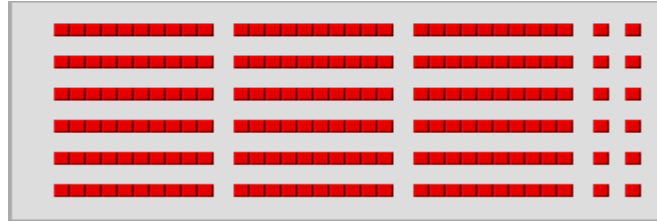
0 _____ of the large squares are *red*.



_____ of the large squares are *red*.

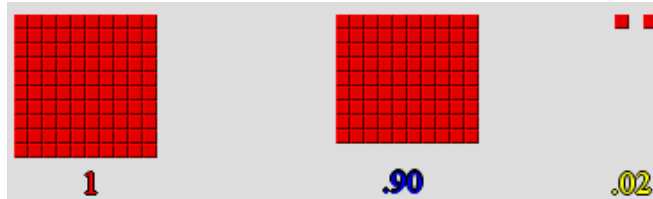
We want to multiply 6×0.32 .

This means, we want _____ groups of 0.32.

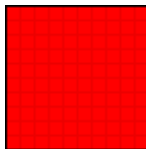


$$6 \times 0.32 = 0.32 + 0.32 + 0.32 + 0.32 + 0.32 + 0.32$$

$$= 1.92$$



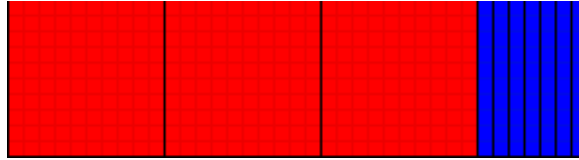
2. Special Case: *Multiply a Decimal by a Whole Number*



Large Red Square = 1

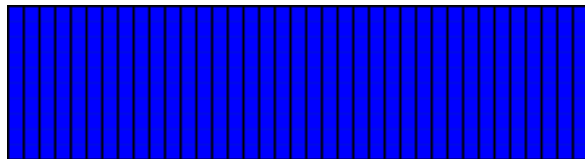
We want to multiply 2×3.7

This means, we want _____ groups of 3.7.



3.7 Ones

We can also say that the entire large rectangle is _____ tenths.



37 Tenths

When we multiply 2×3.7 ...is the same as multiplying 2×37 tenths.

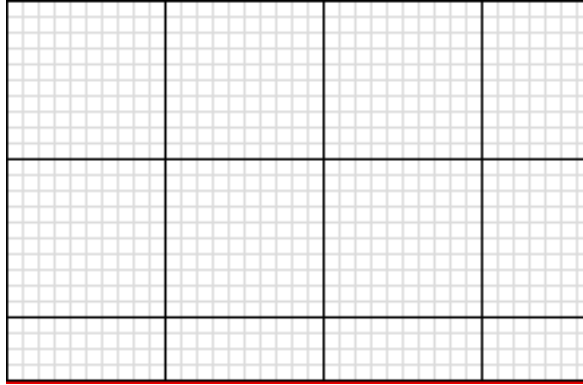
$$\begin{array}{r} 37 \text{ Tenths} \\ \times 2 \\ \hline 74 \text{ Tenths} = 7.4 \text{ Ones} \end{array}$$

3. Multiply by Partial Products

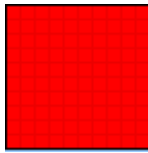
(a) We want to multiply 2.4×3.7 .

This means, we want _____ groups of 3.7.

We want to find the _____ of the rectangle.



To help us:



= 1

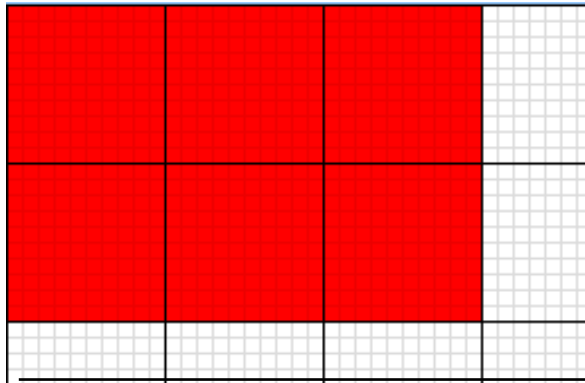


= 0.1 or 1 tenth

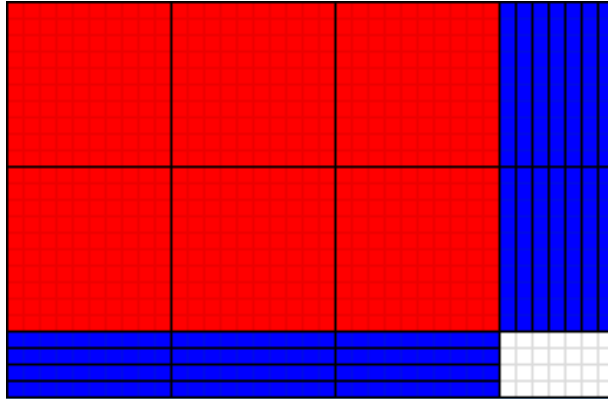


= 0.01 or 1 hundredth

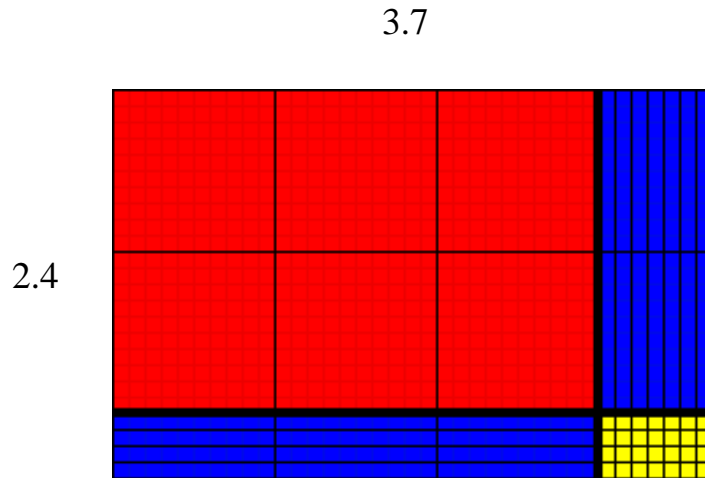
- First, we add as many _____ blocks as possible to the rectangle.



- Then, we add as many tenths blocks as possible to the rectangle.



➤ Now, we add as many hundredths blocks as possible to the rectangle.



We want to multiply 2.4×3.7 .

*We want to find the **AREA** of the rectangle.*

Part 1

= (_____ \times _____) Hundredths

=

Part 2

$$= (\text{_____} \times \text{_____}) \text{ Tenths}$$

=

Part 3

$$= (\text{_____} \times \text{_____}) \text{ Tenths}$$

=

Part 4

$$= (\text{_____} \times \text{_____}) \text{ Ones}$$

=

$$2.4 \times 3.7 = \text{Area of Part 1} + \text{Area of Part 2} + \text{Area of Part 3} + \text{Area of Part 4}$$

$$= \text{_____}$$

$$= \text{_____}$$

(b) We want to multiply 2.2×4.2 (without blocks)

			$\begin{array}{r} 4.2 \\ \times \underline{2.2} \end{array}$
Hundredths	(_____ \times _____)	→	_____
Tenths	(_____ \times _____)	→	_____
Tenths	(_____ \times _____)	→	_____
Ones	(_____ \times _____)	→	_____
		Product	_____

4. Multiply by the Distributive Method

The Distributive Method simply *distributes* numbers, so that they are easier to work with.

We want to multiply 1.3×3.21

$$\begin{array}{r} 3.21 \\ \times \underline{1.3} \end{array}$$

Part 1

3.21	→	($3 + 0.2 +$ _____)
$\times \underline{1.3}$	→	($1 +$ _____)

Part 2

$(3 + 0.2 + 0.01)$	<i>which is the same as</i>	$(1 + 0.3) \times (3 + 0.2 + 0.01)$
$\times \underline{(1 + 0.3)}$		

Reflection

Which strategy do you feel is the best suited to your learning style? Why?

OFF COMPUTER EXERCISES

For this first set of questions, try to use a different strategy each time.

1. Multiply the following.

(a) 3.2×6.3

(b) 2.5×3.3

(c) 4.12×2.3

(d) 1.6×3.22

2. Complete the following problems. *You may use your preferred method for these.*

- (a) Isabella lost the results of her calculation multiplying 0.512×2.04 . Based on her notes, she knows that it is one of 1.04882, 1.04448, 10.4448, or 0.10448. Alexander immediately tells her the answer, without calculating. *Which number is the answer? How did he know?*

- (b) Jamal earns \$6.25/hr working at the local *Foot Zone*. His Saturday shift starts at 9 am and concludes at 1:30 pm. *How much money will Jamal earn before taxes?*

(c) If coffee costs \$8.25 per pound, *how much did Archie pay for 3.5 pounds?*

(d) Two numbers multiply together to get 15.4. *What might the two numbers be?*

(e) I multiplied two decimal numbers on a calculator and the answer was a whole number.
What might the two decimal numbers be?

(f) $?.? \times ?.? = ?.?$ *What might the missing numbers be?*

3. *After completing some questions, which strategy/method would you prefer to use? Why?*



Concept: Multiplication and Division of Decimals

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PART B: COMPUTER COMPONENT

Instructions: Select the computer program *Understanding Fractions* (Neufeld)
Follow the instructions to the Main Menu.
Select *Fractions and Decimals* from the Main Menu.



Work through all sections of this topic **in order**:

- *Preliminaries to Division*
- *Partial Quotients*
- *Fair Sharing- Long Division*
- *Decimals Around Us-Word Problems*

Notice: *You will not be finishing the entire topic before stopping to complete some*
OFF COMPUTER EXERCISES.



As you work through the computer exercises, make your own **NOTES** in the blanks provided.

When you reach the end of the section *Decimals Around Us* on the computer, move on to the **OFF COMPUTER EXERCISES** below.

NOTES

1. Partial Quotients

We want to find $4.73 \div 3$ (Example 1)

or

How many groups of _____ are in 4.73?

How many other ways can you write this question?

Use the computer prompts to assist you in completing this question.

$$3 \overline{)4.73}$$

Your Notes:

(a) *What types should you try to work with when you are dividing using 'Partial Quotients'?*

(b) *How do you know when you are finished this type of question?*

2. Fair Sharing

We want to share 95.7 equally among 4 people. (Example 2)

We write: $4 \overline{)95.7}$

Record the steps required to divided 95.7 equally by 4.

Step 1

$$4 \overline{)95.7}$$

Reflection

Which strategy do you feel is the best suited to your learning style? Why?

OFF COMPUTER EXERCISES

For this first set of questions, try to alternate between strategies.

1. Divide the following.

(a) $6.4 \div 2$

(b) $18.6 \div 3$

(c) $\$4.45 \div 5$

(d) $\$12.75 \div 3$

2. Complete the following problems. *You may use your preferred method for these.*

(a) Johnny paid \$ 5.12 for a box of 8 chocolates. *How much did he pay for each chocolate?*
(Round to the nearest cent)

(b) Coach Rivers paid \$341.40 to outfit a team of 12 basketball players. *How much did it cost to outfit each player?*

(c) I divided 12.12 by 4 and wrote down the answer of 3.3. *What did I do wrong and what other similar questions might I get wrong?*

3. *After completing some questions, which strategy/method would you prefer to use? Why?*



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PART C: COMPUTER COMPONENT

Instructions: Select the computer program *Understanding Fractions* (Neufeld)
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Work through all sections of this topic **in order**:

- *Fractions to Decimals*
- *Repeating Decimals*
- *Rounding Decimals*
- *Fractions to Decimals Division Table*
- *Compare Fractions*
- *Decimals to Fractions*
- *Decimal Parts of a Tangram*
- *Shapes in a Square*
- *My Day*
- *Practice Questions*



As you work through the computer exercises, make your own **NOTES** in the blanks provided.

When you reach the end of the section *Practice Questions* on the computer, move on to the **OFF COMPUTER EXERCISES** below.

NOTES

1. Fractions to Decimals

(a) To change the fraction to a decimal we can _____ the *numerator*
by the _____.

$$\frac{3}{8} = 8 \overline{)3}$$

(b) We can also work with _____ fractions, which will assist us
in changing _____ to decimals.



$$\frac{6}{10} = \underline{\hspace{2cm}}$$

2. Repeating Decimals ... An Example

$$\frac{4}{9} = 9 \overline{)4}$$

Instead of dividing forever, we write $\frac{4}{9} = \underline{\hspace{2cm}}$

(a) *What does a line over a number tell us?* _____

3. Rounding Decimals

Rule for Rounding:

4. Compare Fractions

(a) Fractions can be compared if they have common _____.

$$\frac{5}{8} \quad \text{_____} \quad \frac{9}{16}$$

$$\frac{5}{8} \text{ becomes } \underline{\hspace{1cm}} \quad \text{_____} \quad \frac{9}{16}$$

(b) Decimal equivalents are found by _____ the
 _____ by the numerator.

$$\frac{5}{8} \text{ becomes } 8\overline{)5} \quad \text{and} \quad \frac{9}{16} \text{ becomes } 16\overline{)9}$$

(e) $0.\overline{45}$

(f) $7.444\dots$

3. Change from a fraction to a decimal.

(a) $\frac{2}{5} =$

(b) $\frac{5}{8} =$

(c) $\frac{4}{7} =$

(d) $\frac{17}{5} =$

(e) $\frac{7}{8} =$

(f) $\frac{9}{11} =$

4. Compare the following fractions

(a) $\frac{4}{12}$ _____ $\frac{9}{36}$

(b) $\frac{6}{18}$ _____ $\frac{4}{9}$

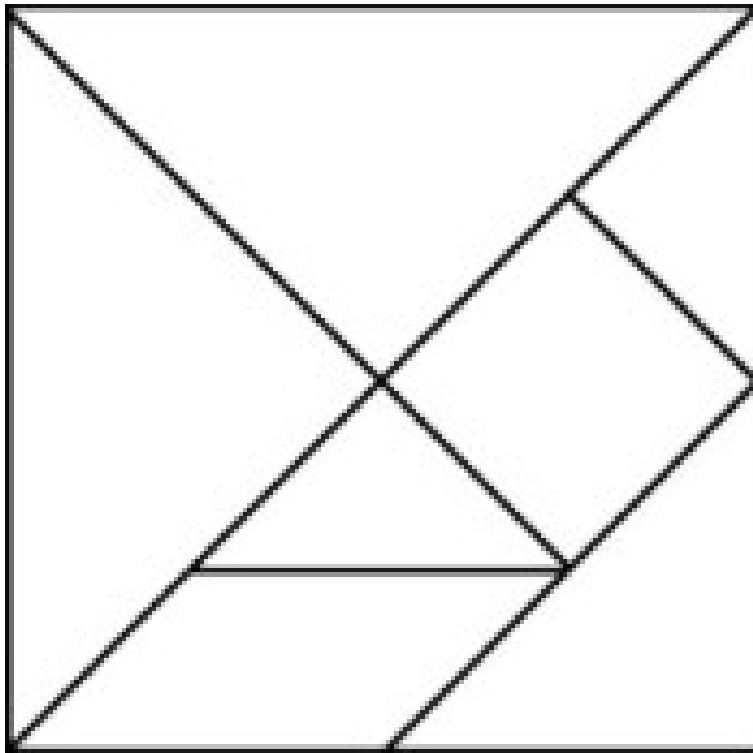
(c) $\frac{7}{9}$ _____ $\frac{11}{14}$

(d) $\frac{6}{11}$ _____ $\frac{9}{15}$

5. **Tangrams** are excellent tools that may be used to demonstrate many concepts in fractions, decimals and percents.

This tangram has been made available for you to use for the next series of questions.

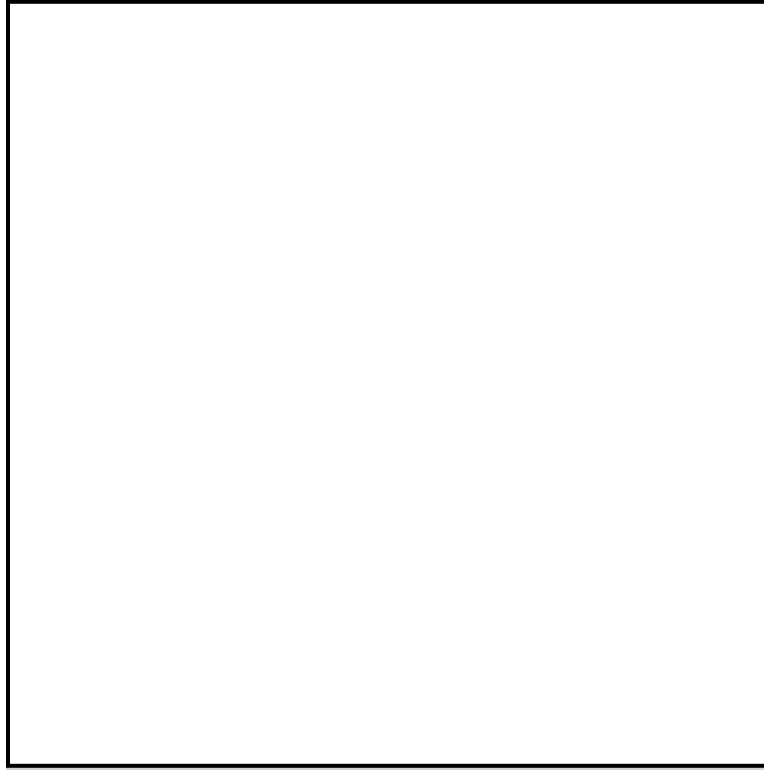
Carefully cut out all of the individual shapes.



5. Continued

Place all seven of the tangram pieces on this square.

- (a) Move the tangram pieces around, compare them, and establish the decimal value of each piece.
- (b) Label each piece with its decimal value.



6. Place your tangram pieces back on the above square and answer the following questions.

- (a) *What decimal part of the whole tangram are the two large triangles?* _____
- (b) *What decimal part of the whole tangram is one large triangle?* _____
- (c) *What decimal part of a large triangle is the medium triangle?* _____
- (d) *What decimal part of the whole tangram is the medium triangle?* _____
- (e) *What decimal part of the whole tangram is the small triangle?* _____
- (f) *What decimal part of the whole tangram is the small square?* _____

7. Determine the 25th digit to the right of the decimal point when $\frac{41}{333}$ is converted to a decimal.