Concept: Multiplying and Dividing Whole Numbers

Name:

COMPUTER COMPONENT

Instructions: In UMATH X follow the **Content Menu** path:

Whole Numbers and Integers > Multiplying and Dividing Whole Numbers

Work through all Sub Lessons of the following Lessons **in order**:

- *Multiplication Facts*
- *Commutative Property*
- *The 10 x 10 Multiplication Table*
- *The 12 x 12 Multiplication Table*
- *Associative Property*
- *Patterns in Multiplication*
- *Multiply by a Single Digit Multiplier*
- *Multiply by a Two Digit Multiplier*
- *Divide by a Single Digit Divisor*
- *Divide by partial quotients*
- *Word Problems by Various Methods*

As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

OFF COMPUTER EXERCISES

1. ***Warm-up***

There are **5** groups of **7**.

7 + 7 + 7 + 7 + 7 = 35

5 × 7 = 35

(b)

There are **7** groups of **9.**

9 + 9 + 9 + 9 + 9 + 9 + 9 = 63

7× 9 = 63

2. One of the cool things about multiplication and addition is that the order of the numbers does not matter. Your result will always be the same! This is called the ***commutative property***.

(a) 

2 × 5 is the same as **5 × 2**

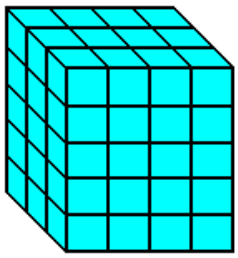
Both have a product of **10.**

(b) 

3 × 4 is the same as **4 × 3.**

Both have a product of **12**.

3. Sometimes factors in a multiplication question can be grouped. This strategy is called the ***Associative/Grouping Property.***

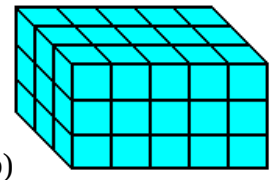
(a) 

Each layer has **4 × 3**

There are **5** layers.

Then **5** layers have:

12 × **5** = **60**

(b) 

Each slice has **5 × 3**

There are **3** slices.

Then **3** slices have:

15 × 3 = 15

4. We can use our knowledge of basic multiplication facts to solve multiplication questions with much larger numbers.

For instance, when multiplying multiples of ***10, 100 and 1000***, you simply multiply the whole numbers and then add the zero(s)

Examples:

$4 \times 30 = 4 \times 3 \times 10$
$= 12 \times 10$
$= 120$

$40 \times 30 = 4 \times 3 \times 10 \times 10$
$= 12 \times 10 \times 10$
$= 1{,}200$

$40 \times 300 = 4 \times 3 \times 10 \times 100$
$= 12 \times 10 \times 100$
$= 12{,}000$

Now it's your turn:

(a) $6 \times 50 =$

$= 6 \times 5 \times 10$
$= 300$

(b) $40 \times 50 =$

$= 4 \times 5 \times 10 \times 10$
$= 2{,}000$

(c) $60 \times 900 =$

$= 6 \times 9 \times 10 \times 10$
$= 54{,}000$

(d) $200 \times 300 =$

$= 2 \times 3 \times 100 \times 100$
$= 60{,}000$

(e) Which stack would you most like to have?

400 $20 bills

300 $50 bills

200 $100 bills

Explain your choice:

I would prefer to have 200 $100 bills, as this amounts to $20, 000.

200×100
$= 2 \times 1 \times 100 \times 100$
$= 20{,}000$

400×20
$= 4 \times 2 \times 100 \times 10$
$= 8{,}000$

300×50
$= 3 \times 5 \times 100 \times 10$
$= 15{,}000$

(f) A map has a scale where 1 cm represents 200 km.

Calculate how many kilometres are represented by 40 cm.

Show your calculations:

If 1 cm = 200 km, we need to find how many km are represented by 40 cm.

We do this by multiplying:

200×40

$= 2 \times 4 \times 100 \times 10$

= 8, 000 km are represented by 40 cm.

There are a variety of strategies that you can employ when completing multiplication questions. Here are some examples of approaches you can take when ***Multiplying by a Single Digit Multiplier****:*

Repeated Addition

5×27
$= 27 + 27 + 27 + 27 + 27$
$= 54 + 54 + 27$
$= 108 + 27$
$= 135$

Partial Products

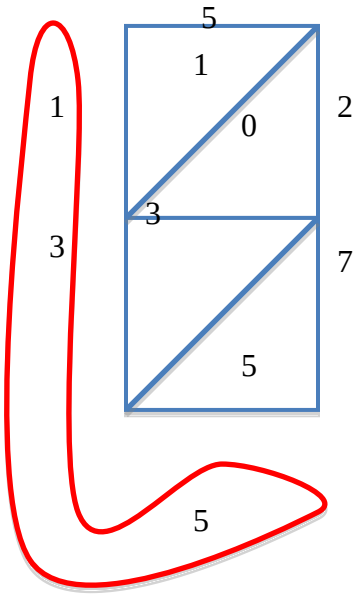
$5 \times 27 = (7 \times 5) + (5 \times 20)$
$= 35 + 100$
$= 135$

Distributive Method

$5 \times 27 = 5 \times (20 + 7)$
$= 100 + 35$
$= 135$

Lattice Method

$5 \times 27 =$



You now have many options to choose from!

Now that you are well versed in some of the various multiplication strategies, attempt to use a different strategy for each of the following questions.

5. Find the product for each of the following multiplication questions.

NOTE**:** Various strategies may be employed to solve these questions. *Only the products will be provided.*

(a) 48×6
$= 288$

(b) 35×7
$= 245$

(c) 93×5
$= 465$

(d) 89×8
$= 712$

Here are some examples of approaches you can take when ***Multiplying by a two- digit Multiplier****:*

Partial Products

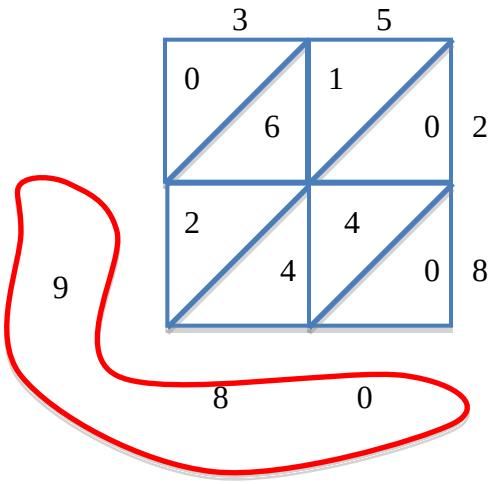
$35 \times 28 = (5 \times 8) + (5 \times 20) + (8 \times 30) + (20 \times 30)$
$= 40 + 100 + 240 + 600$
$= 140 + 840$
$= 980$

Distributive Method

$35 \times 28 = (30 + 5) \times (20 + 8)$
$= 600 + 240 + 100 + 40$
$= 840 + 140$
$= 980$

Lattice Method

35×28



You now have many options to choose from!

Now that you are well versed in some of the various multiplication strategies, attempt to use a different strategy for each of the following questions.

6. Find the product for each of the following multiplication questions.

NOTE**:** Various strategies may be employed to solve these questions. *Only the products will be provided.*

(a) 27×29
$= 783$

(b) 24×34
$= 816$

(c) 35×18
$= 630$

(d) 31×28
$= 868$

7. Find the quotient of each of these ***single divisor*** division questions.

Example:

10

$$7\overline{)819}\quad 117$$

-7

11

-7

49

-49

0

(a)

$$4\overline{)658}\quad 164$$

-4

25

-24

18

-16

2

164 r 2

(b)

$$5\overline{)329}\quad 65$$

-30

29

-25

4

65 r 4

(c

$$6\overline{)162}\quad 27$$

-12

42

-42

0

27

(d)

$$8\overline{)868}\quad 108$$

-8

68

-64

4

108 r 4

8. Complete the following division questions using "Partial Quotients." Try two different sets of friendly numbers for each question. The first one is done for you.

Example:

or

29) 986			29) 986		
− 290	10		− 580	20	
696			406		
− 290	10		− 406	14	
406			0		
− 290	10				
116					
− 116	4				
0					

NOTE: These are just examples of the many ways that these questions may be divided

(a) or

5) 236			5) 236		
- 100	20		- 200	40	
136			36		
- 100	20		- 35	+ 7	
36			1	47	
- 35	+ 7				
1	47				

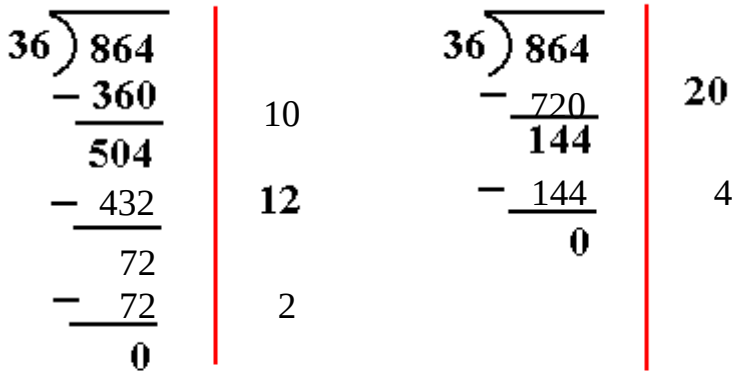
47 r 1 *47 r 1*

(b) or

16) 660			16) 660		
- 640	40		- 320	20	
20			340		
- 16	+ 1		- 320	20	
4	41		20		
			- 16	+ 1	
			4	41	

41 r 4 *41 r 4*

(c) Fill in the missing numbers to complete the division question in two different ways.



9. A school has 300 students. They all come to school by bus, and each bus carries the same number of students. How many students ***might*** there be on each bus?

There may be 60 students on each bus. 60 × 5 = 300

There may be 50 students on each bus. 50 × 6 = 300

There may be 30 students on each bus. 30 × 10 = 300

You may arrive at the above solutions by using division as well.

10. What could you add to 451 to make it divisible by 10?

You could simply add '9' to 451 to make it divisible by 10. By adding '9', you make 451 a multiple of 10. Therefore, it will be divisible by 10 evenly.

Step 1. 451
+ 9
460

Step 2. 10 √460 = 46

11. ? × ? = 1,440. What *might* the missing numbers be? How many different answers can you find?

There are a variety of answers that may be suitable for this question. One strategy may be to attempt to divide numbers in to 1,440 evenly.

10 × 144 = 1,440 **2 × 720 = 1,440** **20 × 72 = 1,440**

30 × 48 = 1,440 **3 × 480 = 1, 440** **60 × 24 = 1, 440**

This is just a sample…there are many more. Has anyone attempted to incorporate decimals?