# MATH NEWS

3rd Grade Volume 3

## Unit 3

2nd 9 Weeks

### UNIT 3 WE WILL BE ABLE TO

- Determine the unknown whole number in a multiplication or division equation.
- Apply the properties of operations as strategies to multiply and divide.
- Understand division as an unknown-factor problem.
- Fluently multiply and divide within 100.
- Identify arithmetic patterns and explain the patterns using properties of operations.
- Multiply one-digit whole numbers by multiples of 10-90 using multiplication strategies.
- Tell and write time to the nearest minute and measure elapsed time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, eg. by representing the problem on a number line diagram, drawing a pictorial representation on a clock fact, etc.

### VOCABULARY

Unit 2

**Array** – repeated rows of numbers or objects

**Multiply** - an operation showing how many times a number is added to itself

**Equal groups** – same number of objects in each group

**Factor** – number of groups and the number in each group

**Equation** – a statement that two expressions are equal, for example 5 x 4 = 20

**Divide** – separate into equal groups

### Unit 3: Strategies for Multiplication

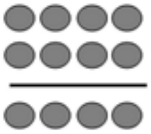
Students will use strategies to help them understand and learn their multiplication facts. By the end of Third Grade, students should know all one-digit multiplication facts from memory!

***Multiplication Facts-Twos***
***Doubles Strategy***

**2**
**x 7**

Double 7
7
+ 7

***Multiplication Facts-Threes***
***Double and One More Set***
**3 x 4**



Double 4
and
one more
set of 4

***Think:***
***Double 4 is 8 and one more set of 4 is 12.***
***(2 x 4 = 8; 1 x 4 = 4; 8 + 4 =12)***

***3 x 4 = 12***

***Multiplication Facts-Fours***
***Double and Double Again***
***4 x 9***

***Think:***
***Double 9 is 18 and Double 18 is 36.***

***4 x 9 = 36***

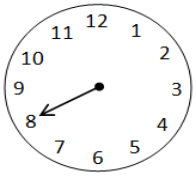
***Multiplication Facts-Eights***
***Double, Double, & Double Again***
***8 x 7***

***Think:***
***Double 7 is 14; Double 14 is 28; and Double 28 is 56.***

***8 x 7 = 56***

***Multiplication Facts-Fives***
***Clock Strategy***
***5 x 8***

***Focus on the minute hand.***
***How many minutes after the hour is it? 40 minutes***
***so 5 x 8 = 40***




5
x 8

***Multiplication Facts-Sixes***
***Multiply by 5 and One More Set***
***6 x 8***

***Think:***
***5 x 8 = 40 plus one more set of 8 is 48.***
***(5 x 8 = 40; 1 x 8 = 8; 40 + 8 = 48)***

***6 x 8 = 48***

***Multiplication Facts-Sevens***
***Multiply by 5 and Two More Sets***
***7 x 6***

***Think:***
***5 x 6 = 30 plus two more sets of 6 is 42.***
***(5 x 6 = 30; 2 x 6 =12; 30 + 12 = 42)***

***7 x 6 = 42***

***Multiplication Facts-Nines***
***Multiply by 10 and Subtract One Set***
***9 x 7***

***Think:***
***10 x 7 = 70 minus one set of 7 is 63***
***(10 x 7 = 70; 70 – 7 = 63)***

***9 x 7 = 63***

## Unit 3: Strategies for Division

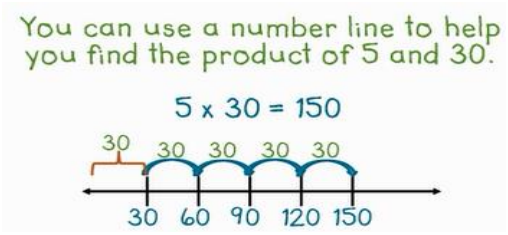
**Students will understand division as an unknown factor problem.**

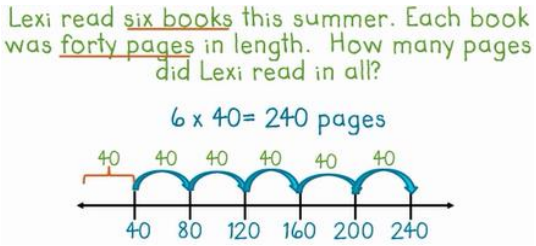
Examples:

$42 \div 6 = 7$ $\quad$ $45 \div 9 = 5$

$7 \times 6 = 42$ $\quad$ $5 \times 9 = 45$

**Multiply one-digit whole numbers by multiples of 10-90 using multiplication strategies.**



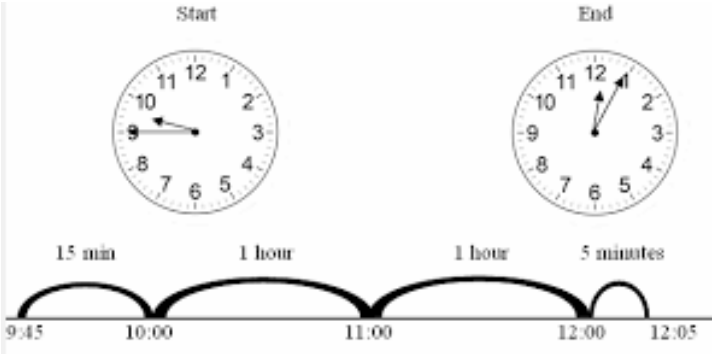

Students will discover a pattern when multiplying with multiples of 10.

Examples:
6 groups of 4 is 24 (6 x 4 =24) and
6 groups of 40 is 240 (6 x 40 = 240)

7 groups of 3 is 21 (7 x 3 = 21) and
7 groups of 30 is 210 (7 x 30 = 210)

**Solve word problems involving addition and subtraction of time intervals in minutes, eg. by representing the problem on a number line diagram, drawing a pictorial representation on a clock face, etc.**

Example:
Tony and Jimmy went to a movie last Saturday. The movie started at 9:45 and ended at 12:05. How long was the movie?




15 minutes + 1 hour + 1 hour + 5 minutes = 2 hours 20 minutes
The movie lasted 2 hours and 20 minutes.

**Suggested order to learn the multiplication facts**

(Starting with discovering patterns and then developing strategies and practicing strategy retrieval for each set of facts.):

***Start with the Foundation Facts:***
- 2s
- 10s & 5s
- 0s
- 1s

***Building on the Foundation Facts:***
- 4s & 8s
- 3s & 6s
- 9s
- 7s

**Identify arithmetic patterns and explain the patterns using properties of operations.**

Students need ample opportunities to observe and identify important numerical patterns related to operations. They should build on their previous experiences with properties related to addition and subtraction. Students investigate addition and multiplication tables in search of patterns and explain why these patterns make sense mathematically.

| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2 | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 3 | 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| 4 | 0 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| 5 | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 6 | 0 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| 7 | 0 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| 8 | 0 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| 9 | 0 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| 10 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

Example:
Teacher: What pattern do you notice when 2, 4, 6, 8, or 10 are multiplied by any number (even or odd)?
Student: The product will always be an even number.
Teacher: Why?

| + | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 2 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 3 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 4 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 5 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 6 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 7 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 8 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 9 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 10 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

More Examples of Arithmetic Patterns:
- Any sum of two even numbers is even.
- Any sum of two odd numbers is even.
- Any sum of an even number and an odd number is odd.
- The multiples of 4, 6, 8, and 10 are all even because they can all be decomposed into two equal groups.
- The doubles (2 addends the same) in an addition table fall on a diagonal while the doubles (multiples of 2) in a multiplication table fall on horizontal and vertical lines.
- The multiples of any number fall on a horizontal and a vertical line due to the commutative property.
- All the multiples of 5 end in a 0 or 5 while all the multiples of 10 end with 0. Every other multiple of 5 is a multiple of 10.