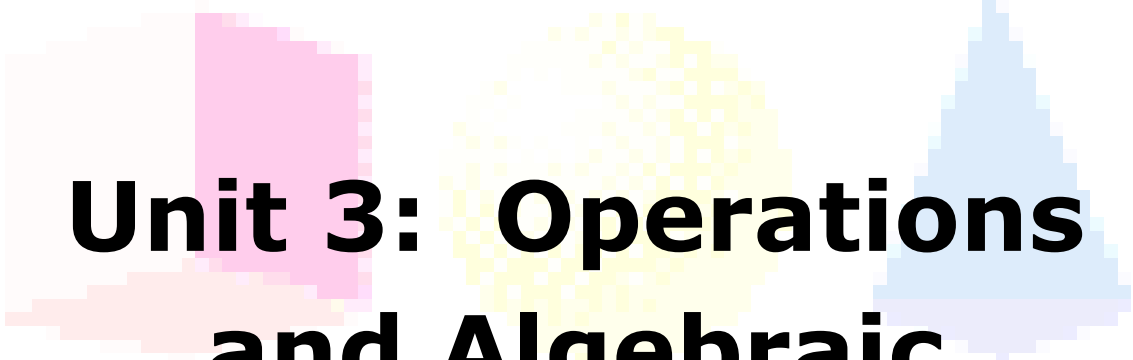


3rd Grade Mathematics



Unit 3: Operations and Algebraic Thinking: Properties of Multiplication and Division

**Excerpts from Georgia Department of
Education Webinar September 11, 2012**

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September 2012

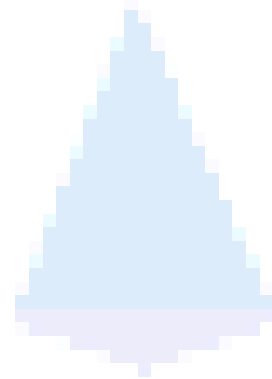
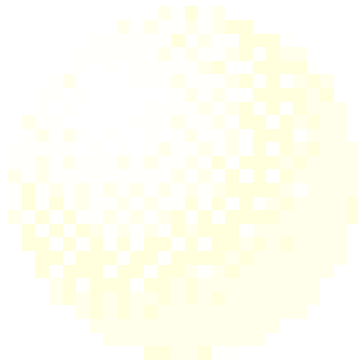
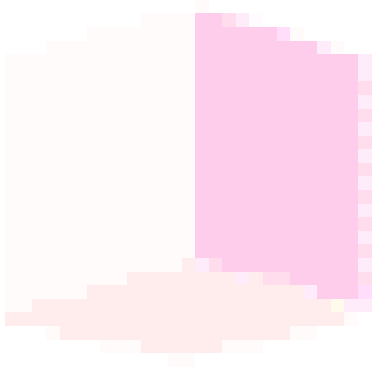
Warm-Up

Sue bought 3 lunch tickets on Monday and 5 lunch tickets on Friday. If each ticket costs \$2, how much did she spend in all?

Write to help explain your best thinking using words, numbers, or pictures.

What's the main idea of Unit 3?

- **Usefulness of properties of operations**
- **Strategies for fact fluency**
- **Data representation and interpretation**



Concepts & Skills to Maintain from Previous Grades

- odd and even numbers
- skip counting by twos, threes, fives, and tens
- determining reasonableness using estimation
- addition and subtraction as inverse operations
- multiplication of one-digit numbers
- commutative, associative, and identity properties of addition
- basic addition facts
- making tens in a variety of ways
- basic subtraction facts
- place value for ones, tens, hundreds, thousands, and tenths
- modeling numbers using base 10 blocks and on grid paper
- using addition to find the total number of objects in a rectangular array

Websites to help with the above:

www.aaamath.com

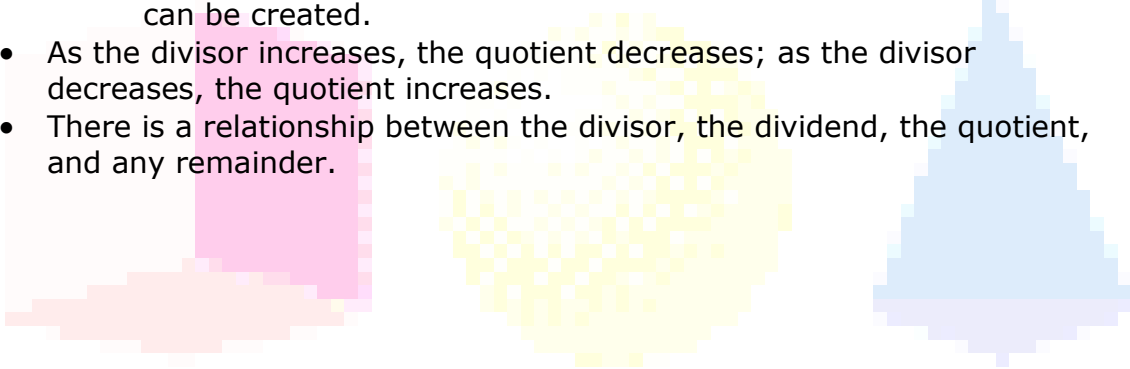
<http://www.arcademicskillbuilders.com/>

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Enduring Understandings from this Unit

- Multiplication facts can be deduced from patterns.
- The associative property of multiplication can be used to simplify computation.
- The distributive property of multiplication allows us to find partial products and then find their sum.
- Patterns are evident when multiplying a number by ten or a multiple of ten.
- Multiplication and division are inverses; they undo each other.
- Multiplication and division can be modeled with arrays.
- Multiplication is commutative, but division is not.
- There are two common situations where division may be used.
 - Partition (or fair-sharing) - given the total amount and the number of equal groups, determine how many/much in each group
 - Measurement (or repeated subtraction) - given the total amount and the amount in a group, determine how many groups of the same size can be created.
- As the divisor increases, the quotient decreases; as the divisor decreases, the quotient increases.
- There is a relationship between the divisor, the dividend, the quotient, and any remainder.



Examples

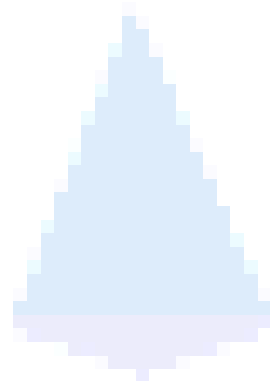
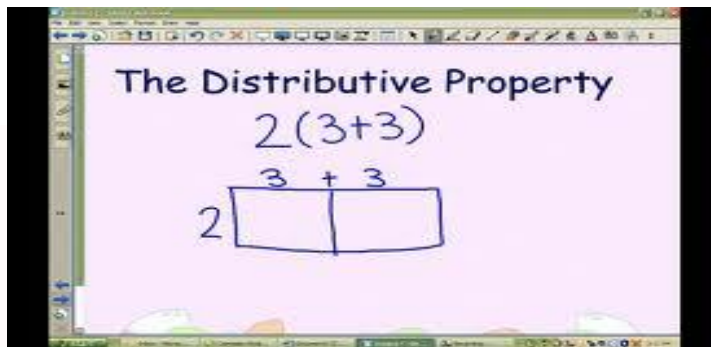
1. Properties

a. $3 + 8 = 8 + 3$

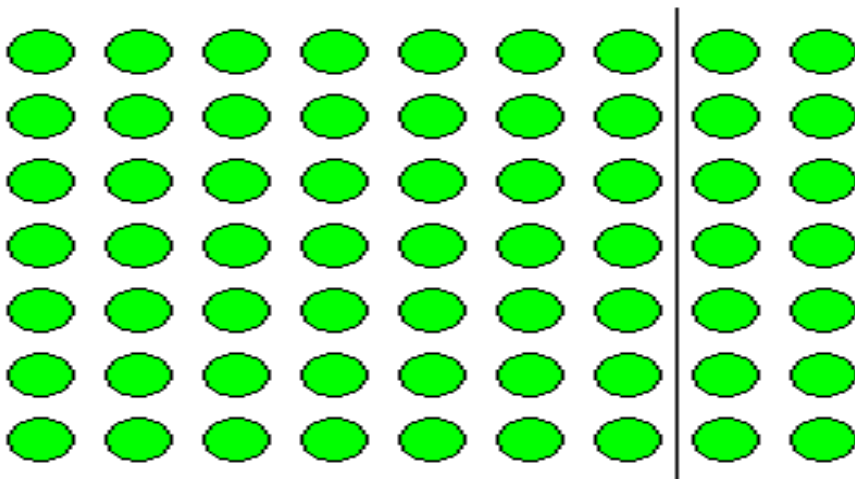
b. $31 + 42 = 42 + 13$

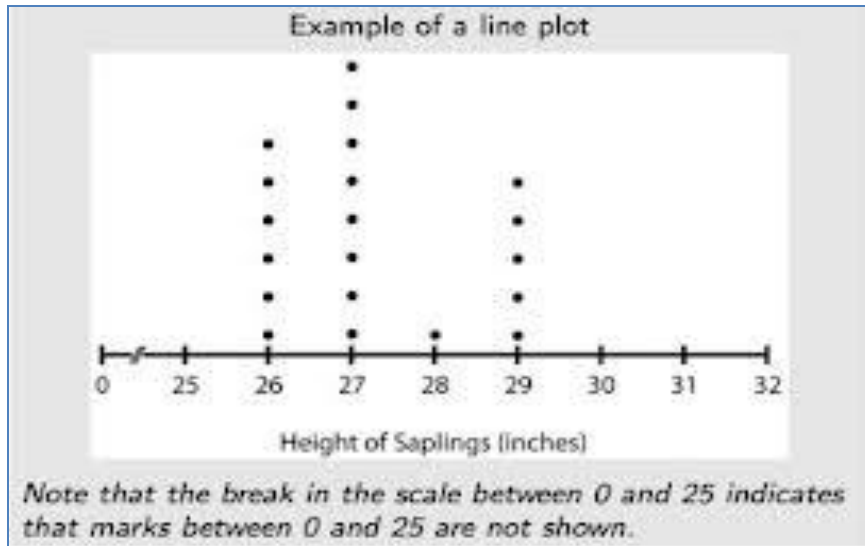
c. $25 + 46 = 46 + 25$

d. $165 + 785 = 785 + 868$



2. 7×9 can be represented as





3.

Additional Resources

- <http://www.learner.org/courses/learningmath/number//index.html>
!
- <http://www.multiplication.com/>
- Practice games for multiplication facts as well as teacher resource pages with instructional ideas on how to introduce multiplication.
- Note: This site contains advertising.
-
- Make arrays and see the associated fact
- http://www.haelmedia.com/OnlineActivities_tXH/mc_tXH3_002.html
- http://www.eduplace.com/math/mw/background/3/08/te_3_08_overview.html Provides background information on the relationship between multiplication and division.

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- **The student edition for Unit 3 can be found at**
<https://www.georgiastandards.org/Common-Core/Pages/Math-K-5.aspx>

On the left side, please look under mathematics, K - 5 . Then, the right side has a pull-down menu to access the units.

