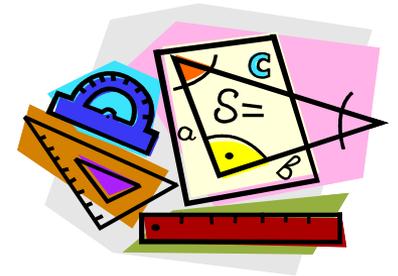
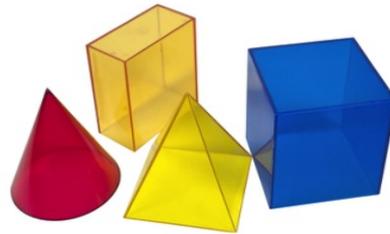


# ***Making Sense of Common Core Math in Expanded Learning***

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BOOST Conference 2015





# Objectives

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- 1) Obtain an overview of the Common Core Mathematics Standards for grades K-8.
- 2) Integrate the Learning in Afterschool & Summer (LIAS) principles with the Mathematics Standards for Processes and Proficiencies (Habits of Mind).
- 3) Examine key considerations regarding the teaching and learning of mathematics to support your students.
- 4) Access FREE, high-quality mathematics resources from CASRC.

# Math is Everywhere!

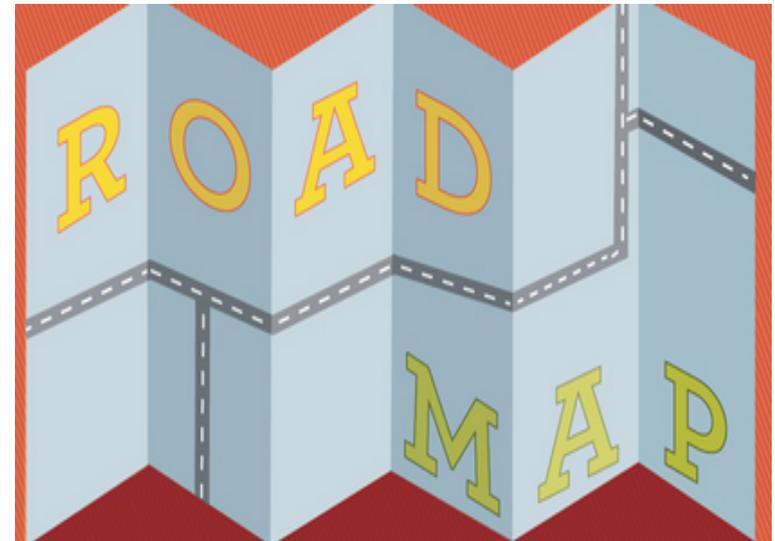
- Patterns
- Time
- Sports
- Locations
- Buildings
- Arts
- Weather and Climate



# Math Standards

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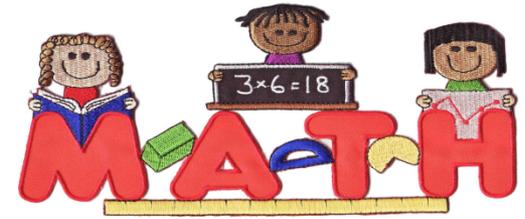
- Provide consistent set of essential skills and knowledge needed to succeed in 21<sup>st</sup> century college and careers.
- Outline WHAT to teach, not HOW to teach skills at various grade levels.



<http://www.corestandards.org>

# K-8 Mathematics Domains at-a-Glance

K	1	2	3	4	5	6	7	8
Counting & Cardinality			Number & Operations— Fractions			Ratios & Proportional Relationships		Functions
Measurement & Data						Statistics & Probability		
Number & Operations in Base Ten						The Number System		
Operations & Algebraic Thinking						Expressions & Equations		
Geometry								



## STANDARDS FOR MATHEMATICAL PRACTICE (HABITS OF MIND)

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and identify ways to create shortcuts when doing problems.

# Learning in Afterschool & Summer Principles

Active



Meaningful



Collaborative



Supports mastery

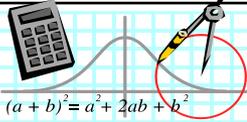


Complementary of school day

Expands horizons



# LIAS Principles Defined

Learning Principle	Description	Examples
<b>Active</b>	Multisensory, hands-on	
<b>Collaborative</b>	Socially-centered, homogeneous	
<b>Meaningful</b>	Relevant, student-centered	
<b>Conducive to Mastery</b>	Skill-based, sequenced	
<b>Expands Horizons</b>	Connects to real-world, promotes civic values	
<b>Complementary of School Day</b>	Reinforces classroom learning and objectives	

(Learning in Afterschool and Summer Project, 2012).



# Key Considerations in the Teaching and Learning of Math

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- Understand the Common Core math shifts.
- Rely on a balanced approach.
- Build on prerequisite knowledge.
- Use literature as a springboard.
- Create a math-rich environment that includes manipulatives and resources.
- Reduce math anxiety.

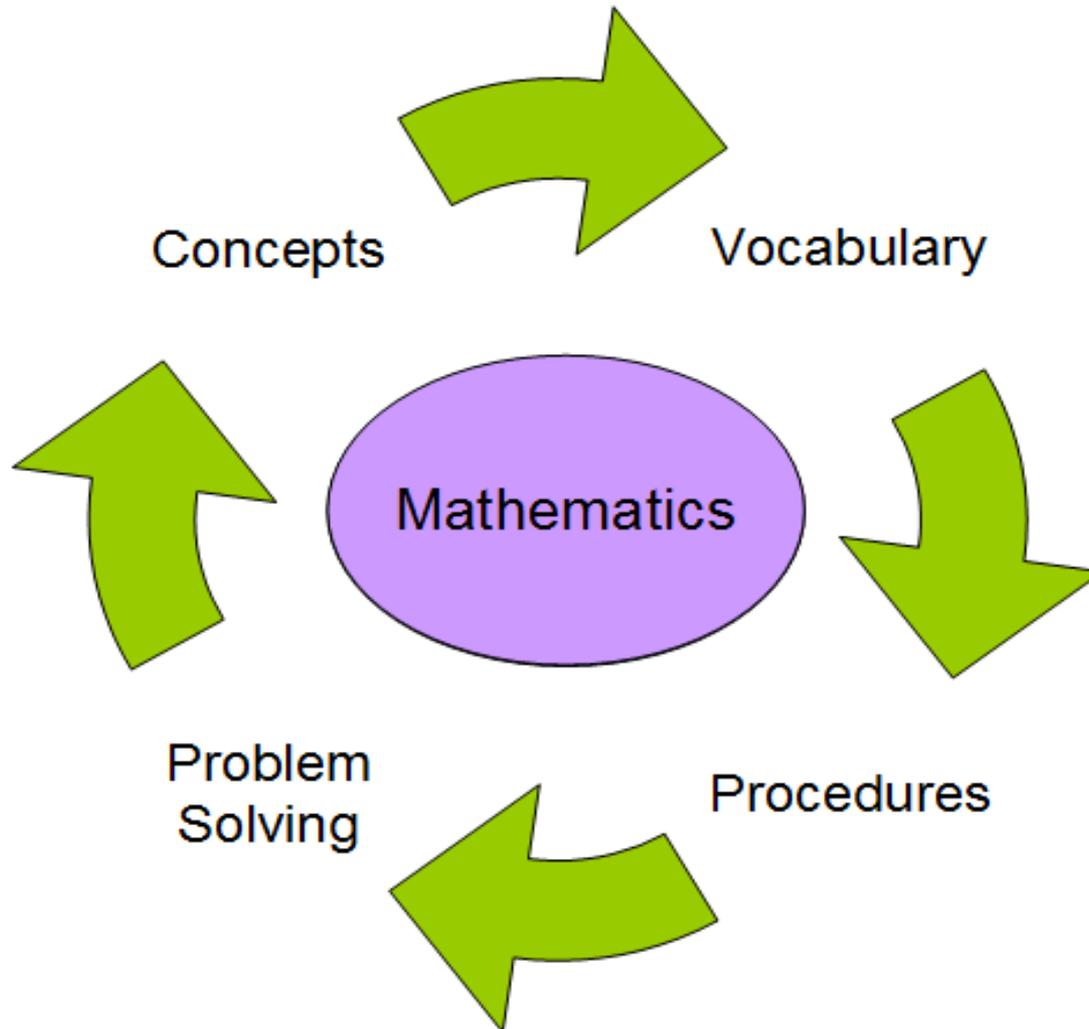
# 1: Understand the Common Core Math Shifts

- Focus on key concepts.
- Coherence across grades.
- Fluency—speed and accuracy with operations.
- Deep understanding/reasoning behind math.
- Application of the right concepts.
- Dual intensity in practice and understanding.



## 2. Rely on a Balanced Approach

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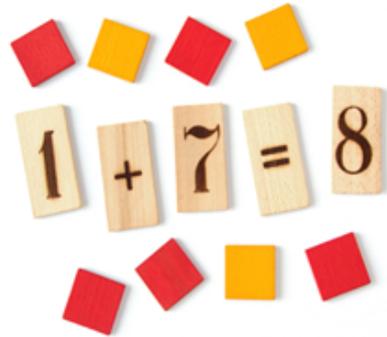
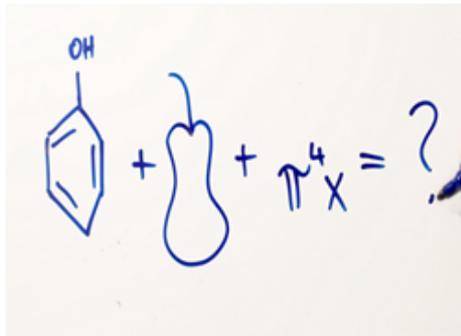


# Tips for Balancing Math

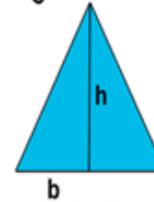
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- Use cross-age and skill-level grouping.
- Know the lingo. Use dictionaries and teacher-provided vocabulary lists.
- Build math fluency in arithmetic.
- Encourage cooperative problem-solving.
- Understand the concepts (OK to learn alongside with students).

# Creating a Balance

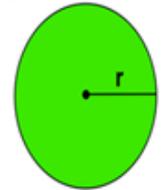


triangle



$$\text{Surface} = \frac{b \times h}{2}$$

circle



$$\text{Surface} = \pi \times r^2$$



**Math in After School**

# 3. Build on Prerequisite Knowledge

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Math is developmental. What do your students need help with?



# Raising for Remainders

---

1. Review the **divisibility rules** you want to focus on:
  - 2 → the last digit is even (**0, 2, 4, 6, 8**)
  - 3 → the sum of the digits is a multiple of 3 (e.g., 63 or  $6+3=9$ )
  - 4 → the last 2 digits are divisible by 4 (e.g., **1312**)
  - 5 → ends in **0** or **5**
2. Listen carefully.
3. Sit if the answer to the problem you hear has no remainder.
4. Stand if the answer to the problem you hear has a remainder.
5. Invite students to create their own problems!

# Moving with Multiples!

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- Multiples of 2 = peace sign
- Multiples of 3 = applause
- Multiples of 5 = high five someone



# Tips for Long Division

**Post the steps and a visual aid:**

1. Start at the left.
2. Divide.
3. Multiply.
4. Subtract.
5. Bring down the digit.



**Dead Mice Smell Bad**

÷

x

-

↓

$$\begin{array}{r} \text{Quotient} \longrightarrow 015 \\ \text{Divisor} \longrightarrow 32 \overline{) 487} \\ \quad \underline{0} \\ \quad 48 \\ \quad \underline{32} \\ \quad 167 \\ \quad \underline{160} \\ \quad 7 \\ \text{Remainder} \longrightarrow 7 \end{array}$$

# Solve

- A) The Sunshine Committee has \$372 to buy ice cream for the school carnival. If each ice cream container costs \$11, how many containers can they afford, and how much money will they have left over?



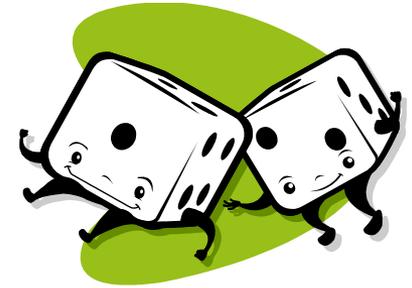
- B) Woodworks Furniture needs to ship 44 couches across the country. Each of their trucks can fit 8 couches. How many trucks do they need for the shipment?



# CCSS Critical Areas (K-2)

Grade K	Grade 1	Grade 2
<ol style="list-style-type: none"><li>1. Representing &amp; comparing whole numbers, initially with sets of objects.</li><li>2. Describing shapes and space.</li></ol>	<ol style="list-style-type: none"><li>1. Developing understanding of +, -, and strategies for + and - within 20.</li><li>2. Developing understanding of whole number relationships and place value, including grouping in tens and ones.</li><li>3. Developing understanding of linear measurement and length.</li><li>4. More reasoning about attributes of and composition of geometric shapes.</li></ol>	<ol style="list-style-type: none"><li>1. Deeper understanding of base-ten notation.</li><li>2. Fluency with + and -.</li><li>3. Using standard units of measurement.</li><li>4. Describing and analyzing shapes.</li></ol>

# Number & Operations in Base Ten (K-5)



- Counting
- Algorithms (processes/sets of rules)
- Place value
- Rounding and estimation

# CCSS Critical Areas (3-5)

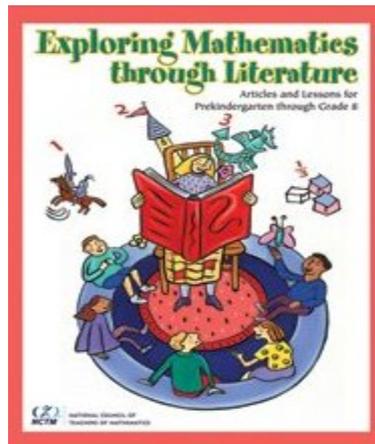
Grade 3	Grade 4	Grade 5
<ol style="list-style-type: none"><li>1. Developing understanding <math>\times</math> and <math>\div</math> and strategies for <math>\times</math> and <math>\div</math> within 100.</li><li>2. Developing understanding fractions.</li><li>3. Developing understanding of the structure of rectangular arrays and of area.</li><li>4. Describing/analyzing two-dimensional shapes.</li></ol>	<ol style="list-style-type: none"><li>1. Developing understanding and fluency with multi-digit <math>\times</math> and <math>\div</math> with multi-digit dividends.</li><li>2. Developing understanding of fraction equivalence, <math>+</math> and <math>-</math> of fractions with like denominators, and <math>\times</math> of fractions by whole numbers.</li><li>3. Understanding/analyzing geometric figures based on their properties (e.g., sides, angles, symmetry).</li></ol>	<ol style="list-style-type: none"><li>1. Developing fluency with <math>+</math> and <math>-</math> of fractions, and understanding of the <math>\times</math> and <math>\div</math> of fractions.</li><li>2. Extending <math>\div</math> to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations of decimals to hundredths, and fluency with whole number decimal operations.</li><li>3. Developing understanding of volume.</li></ol>

## 4. Use Literature as a Springboard

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Books based on math concepts can:

- Create a context for a math activity.
- Introduce, review, or reinforce a math concept.
- Present math in creative ways.

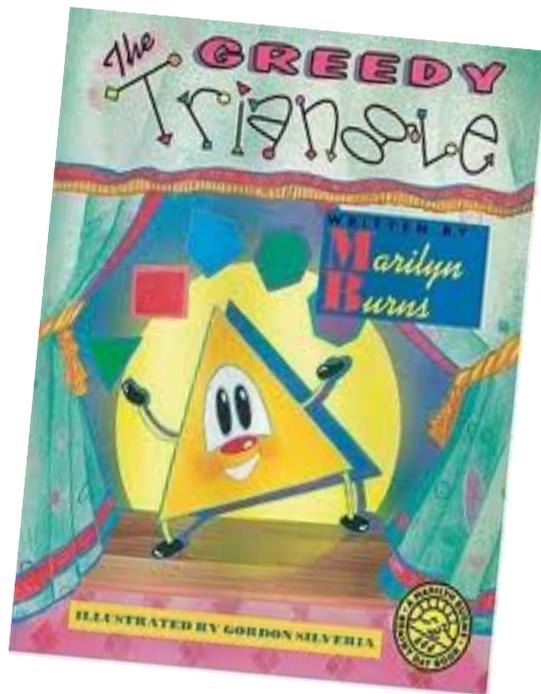


#7864

# Sit Back and Enjoy a Story

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*The Greedy Triangle* by Marilyn Burns



The Marilyn Burns  
Classroom Libraries  
#9181-3

# Musical Math

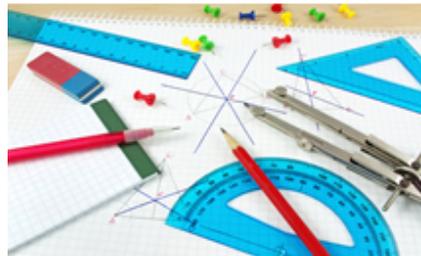
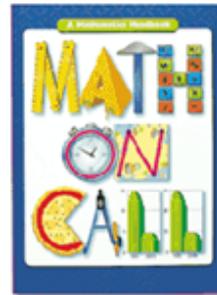
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- Decide on the concepts to be emphasized.
- Select the music to be used.
- Divide the students into appropriately-sized teams.
- Give clear directions.
- Give clear cues.
- Invite students to create their own cues and pictures.

# 5. Create a Math-Rich Environment

- Reference and literature books
- Visual aids
- Computer-based resources
- Study guides
- Instructional DVDs
- Calculators
- Geometry sets
- Journals
- Manipulatives



MULTIPLICATION TABLE

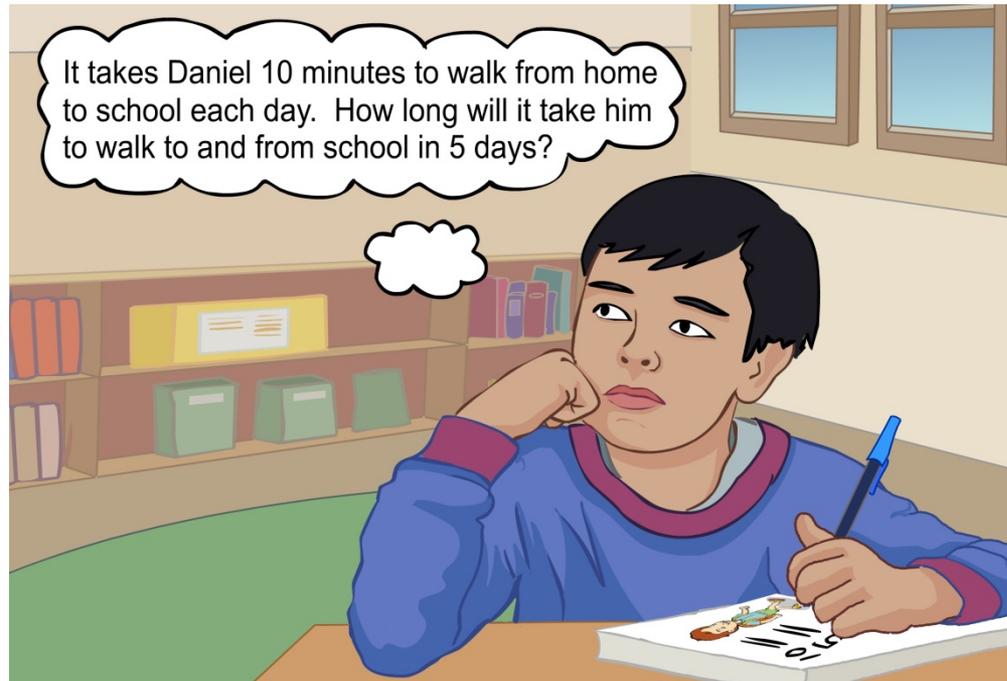
X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

# CCSS Critical Areas (6-8)

Grade 6	Grade 7	Grade 8
<ol style="list-style-type: none"> <li>1. Connecting ratio and rate to whole number multiplication and division and using this to solve problems.</li> <li>2. Completing understanding of division of fractions and extending the notion of number to the system of rational numbers, including negative numbers.</li> <li>3. Writing, interpreting, and using expressions and equations.</li> <li>4. Developing understanding of statistical thinking.</li> </ol>	<ol style="list-style-type: none"> <li>1. Developing understanding of and applying proportional relationships.</li> <li>2. Developing understanding of operations with rational numbers and working with expressions and linear equations.</li> <li>3. Solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume.</li> <li>4. Drawing inferences about populations based on samples.</li> </ol>	<ol style="list-style-type: none"> <li>1. Formulating and reasoning about expressions and equations, including modeling an association bet. bivariate data with a linear equation, and solving linear equations and systems of linear equations.</li> <li>2. Grasping the concept of a function and using functions to describe quantitative relationships.</li> <li>3. Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding/applying the Pythagorean Theorem.</li> </ol>

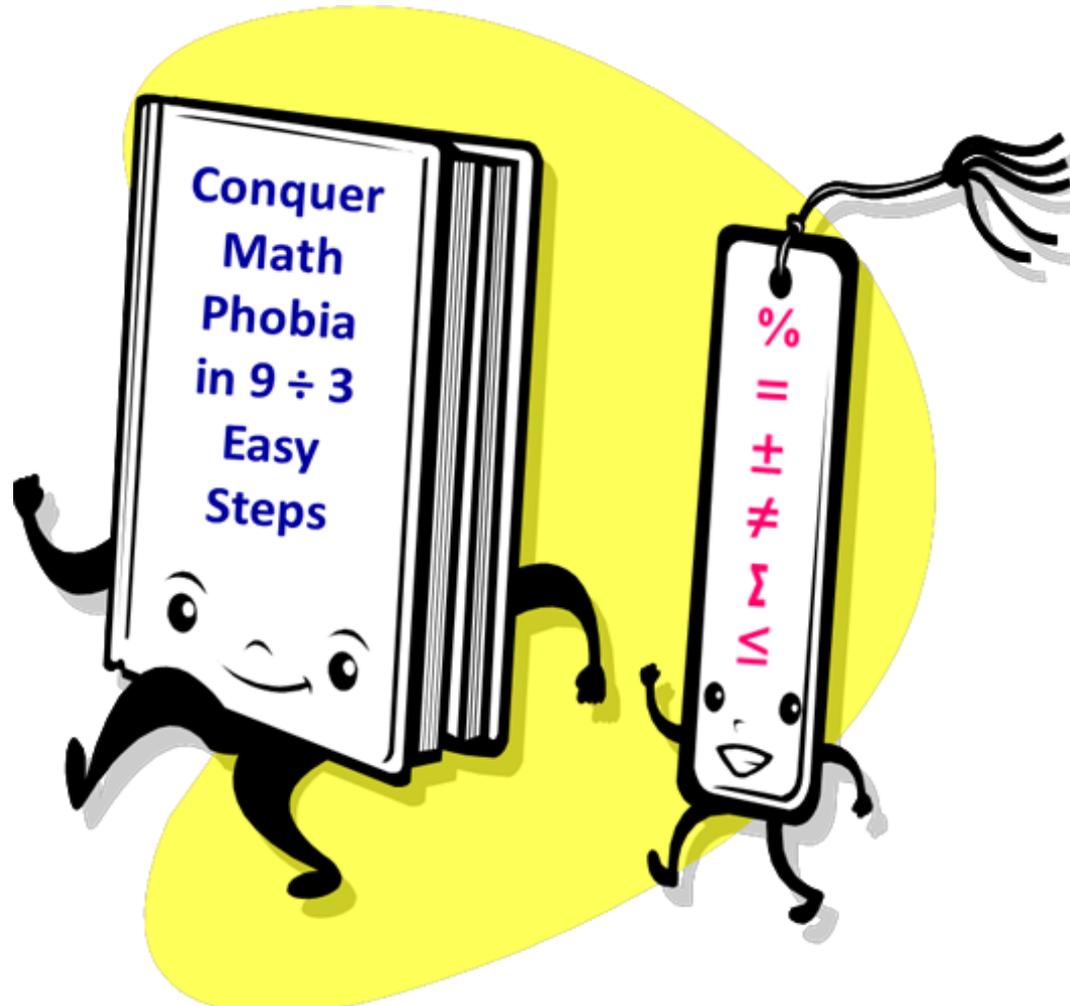
# Expressions & Equations (6-8)

- Numerical expressions
- Equations & inequalities
- Proportional relationships, lines, and linear equations



## 6. Reduce Math Anxiety

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# Conquer Math Phobia with Three Essential E's

---

- 1) Empower** all students to do their best.
- 2) Explore** actual applications.
- 3) Exhibit** a positive attitude.

Above all, remember to model a positive attitude toward math!

# Connecting to the Habits of Mind and LIAS Principles

**Mathematics Standards for Processes and Proficiencies (Habits of Mind)**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and identify ways to create shortcuts when doing problems.

**LIAS Principles**

Learning that is  active  collaborative  meaningful

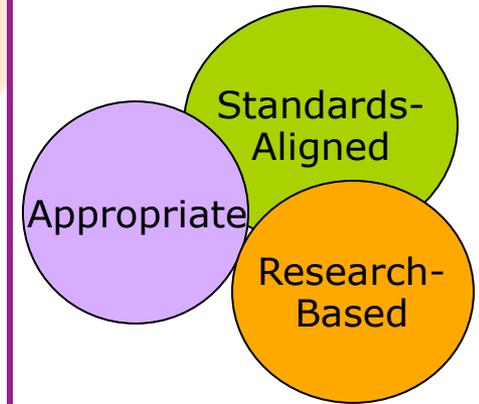
supports mastery  expands horizons  complementary of the school day

Please reflect on how the activities presented today support the Math Habits of Mind and the LIAS Principles.

# Library Resources with FREE Delivery in California!

**Resource Library**

- Alcohol & Other Drugs
- Behavior Management
- Career Education
- Growth and Development
- Health Services
- History-Social Science
- Injury & Safety
- Mathematics
- Mental, Emotional & Social Health
- More Enrichment Areas
- Nutrition
- Physical Activity
- Program Administration
- Reading/Language Arts
- Science
- Sexual Health
- Tobacco
- Violence
- Visual & Performing Arts
- Youth Development

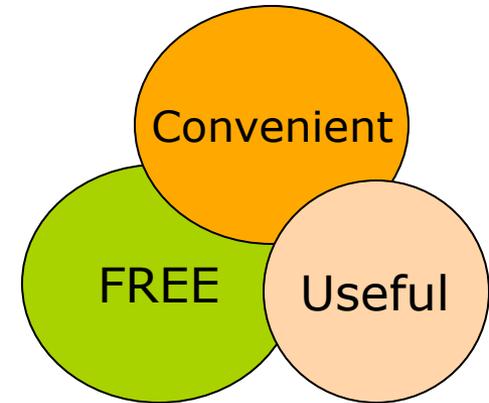


[www.californiaafterschool.org](http://www.californiaafterschool.org)

# FREE Online Trainings

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- English Learning in Action
  - Project-Based Learning & Play
  - Multicultural Read-Alouds
  - Hands-On STEM
  - Career Ed. Nuts & Bolts
  - Fun Facts! History in the Making!
  - Bridging the Digital Divide
- 
- + Health & Safety, Nutrition & Physical Activity  
and MORE!



[www.californiaafterschool.org](http://www.californiaafterschool.org)



# Today We Learned About

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1. How the Common Core Math Standards are organized for grades K-8, with emphasis on the Habits of Mind.
2. The recommended approach to supporting the CCSS in expanded learning programs: through the Habits of Mind and LIAS Principles.
3. Key considerations in the teaching and learning of math.
4. Activities that can help you support students with math in your programs.
5. How to access CASRC resources and trainings.



# Put CASRC in Your Team

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- Access to reviewed library resources with free delivery to your doorstep.
- Free online professional development suite available 24/7.

[www.californiaafterschool.org](http://www.californiaafterschool.org)

[nzamora@californiaafterschool.org](mailto:nzamora@californiaafterschool.org)

888-318-8188 toll-free

Thank You

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*Congratulations!*



**Please take a moment to complete the evaluations.**