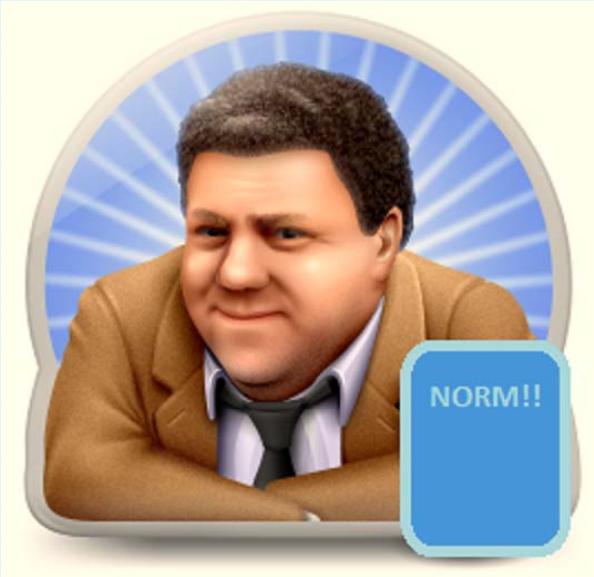
# Conference on Exceptional Children

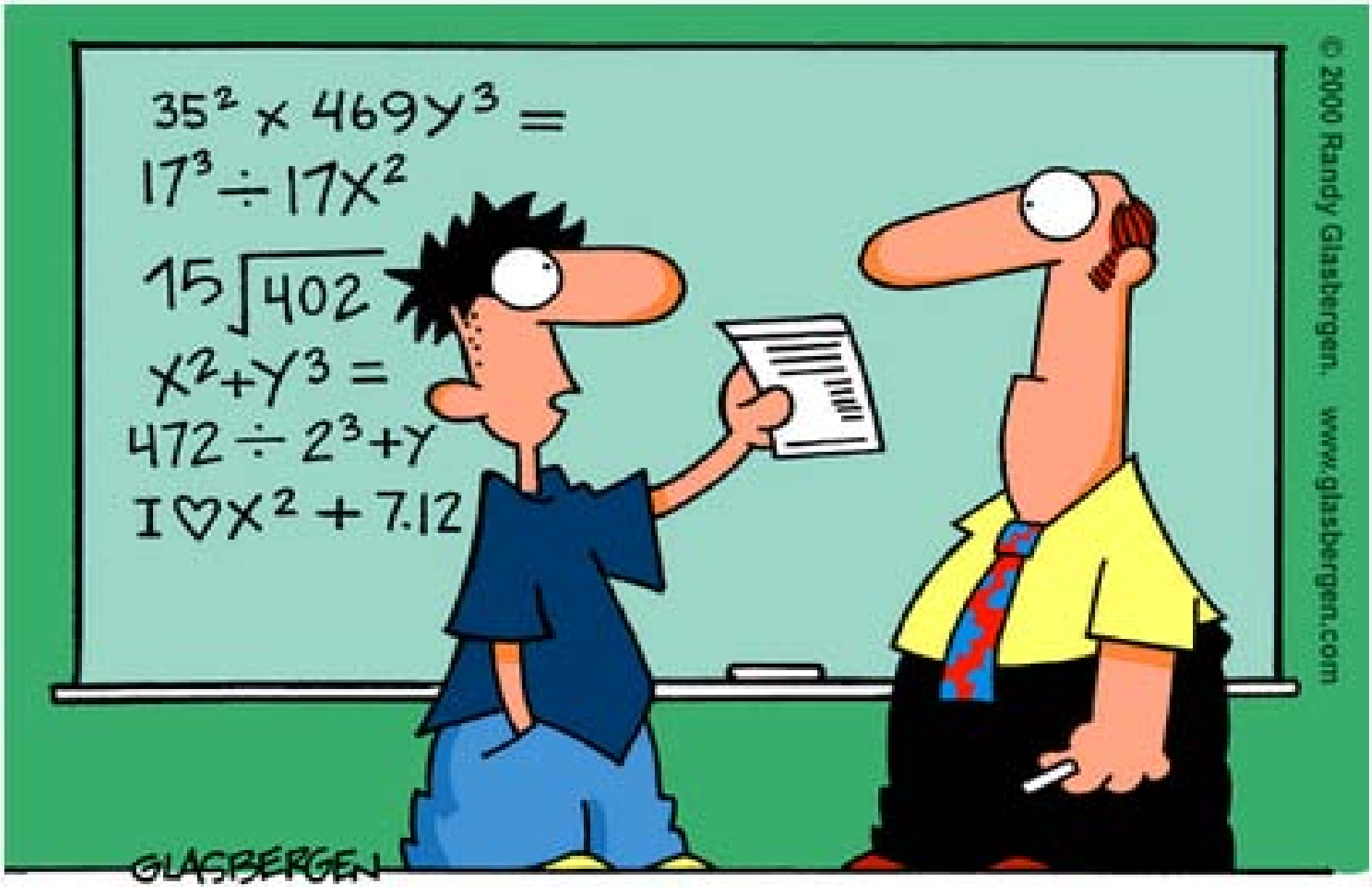
Kitty Rutherford

# Welcome
# “Who’s in the Room”

# Norms




- Listen as an Ally
- Value Differences
- Maintain Professionalism
- Participate Actively




"I HAD MY DOCTOR DO A D.N.A. BLOOD ANALYSIS. AS I SUSPECTED, I'M MISSING THE MATH GENE."

http://maccss.ncdpi.wikispaces.net/Home

NC Math Common Core - ...

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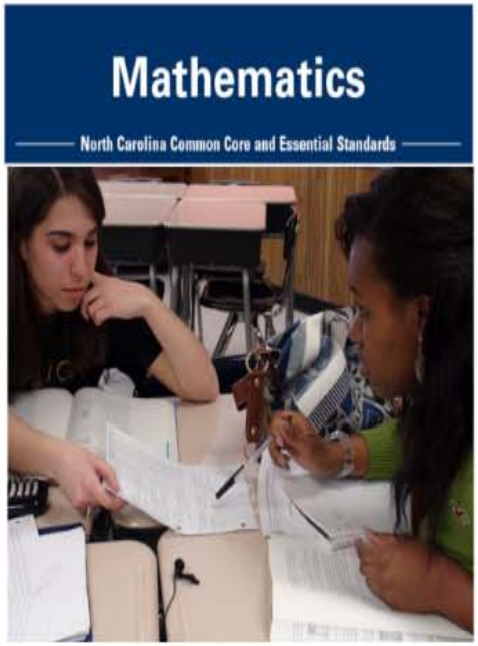
## North Carolina Mathematics

### Welcome

Please reference the pages in the navigation bar for links to various mathematics resources for teachers, administrators, teacher educators and others who are interested in the mathematics education of North Carolina's students.




*** FOCUS * * COHERENCE * * RIGOR ***

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8/4/2013

# Announcements

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Common Core State Standards
Elementary Resources
Middle School Resources
High School Resources
2003 Standard Course of Study

## Announcements

### K - 12 Updates

**Common Core Online Math Modules (FREE)**

UNC Charlotte's College of Education, in conjunction with the STEM Center and Southwest Education Alliance is proud to announce the release of Online Mathematics Modules. mathematics professional development, earn CEU for participating in an online module that focuses on the mathematical practices and content of the Common Core State Standa Each module takes approximately 10 hours to finish, and can be completed either individually at your own pace or preferably with other teachers in a Professional Learning Comm of teachers during professional development time.

To register for the course, contact Michelle Stephan at michelle.stephan@uncc.edu

**Recording of Webinar (February 5):** coming soon

**Now available from Print Shop (January)**

To order, please call

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or visit Publication Sales on the Web at www.ncpublicschools.org/publications

**Standards for Math Practice Poster**

This 22.5" X 28.5 " poster describes varieties of expertise that math educators at the elementary, middle and high school levels should seek to develop in their students. This poste

Price is per poster.

**MA190, 2013, $4**

**Formative Instructional & Assessments Tasks for Math Common Core (currently located on DPI Mathematics Wiki)**

In response to North Carolina legislative and State Board requirements, the NCDPI provides local school districts with state-developed assessments to be implemented in K-2. This is designed for use in a formative manner to guide instruction. All Blackline Masters and Student Forms are included. This booklet also contains a copy of the K-2 Common Core Sta

**Kindergarten MA191, 2013, $13**

**First Grade MA192, 2013, $15**

**Second Grade MA193, 2013, $15**

**Presidential Awards for Excellence in Mathematics and Science Teaching (November 3)**

The 2012-2013 nomination period for 7-12 grade mathematics and science teachers for the Presidential Awards for Excellence in Mathematics and Science Teachi

Please direct anyone interested in nominating a teacher to the PAEMST website (www.paemst.org)

# Notification of a slight change in the Numbering System of CCSS for Mathematics

| **Our Current CCSS Numbering System**<br>For example: **2.OA.1** | **New CCSS Numbering System**<br>For example: **2.OA.A.1** |
|---|---|
| **Operations & Algebraic Thinking**<br>**Represent and solve problems involving addition and subtraction.**<br>**2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[1]<br>**Add and subtract within 20.**<br>**2.OA.2** Fluently add and subtract within 20 using mental strategies.[2] By end of Grade 2, know from memory all sums of two one-digit numbers.<br>**Work with equal groups of objects to gain foundations for multiplication.**<br>**2.OA.3** Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends. | **Operations & Algebraic Thinking**<br>**Represent and solve problems involving addition and subtraction.**<br>**2.OA.A.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[1]<br>**Add and subtract within 20.**<br>**2.OA.B.2** Fluently add and subtract within 20 using mental strategies.[2] By end of Grade 2, know from memory all sums of two one-digit numbers.<br>**Work with equal groups of objects to gain foundations for multiplication.**<br>**2.OA.C.3** Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends. |

# Building Mathematical Language

| Third Grade | | | | |
|---|---|---|---|---|
| **Operations and Algebraic Thinking** | **Number and Operations in Base Ten** | **Number and Operations-Fractions** | **Measurement and Data** | **Geometry** |
| **Represent and solve problems involving multiplication and division.**<br>operations, multiplication, division, factor, product, quotient, partitioned equally, equal shares, number of groups, number in the groups, array, equation, unknown, expression<br>**Understand properties of multiplication and the relationship between multiplication and division.**<br>operation, multiply, divide, factor, product, quotient, dividend, divisor, strategies, unknown, (properties)-rules about how numbers work<br>**Multiply and divide within 100.**<br>operation, multiply, divide, factor, product, quotient, unknown, strategies, reasonableness, mental computation, property<br>**Solve problems involving the four operations, and identify and explain patterns in arithmetic.**<br>operation, multiply, divide, factor, product, quotient, subtract, add, addend, sum, difference, equation, expression, unknown, strategies, reasonableness, mental computation, estimation, rounding, patterns, (properties)-rules about how numbers work | **Use place value understanding and properties of operations to perform multi-digit arithmetic.**<br>place value, round, addition, add, addend, sum, subtraction, subtract, difference, strategies, (properties)-rules about how numbers work | **Develop understanding of fractions as numbers.**<br>partition(ed), equal parts, fraction, equal distance ( intervals), equivalent, equivalence, reasonable, denominator, numerator, comparison, compare, ‹, ›, = , justify, inequality | **Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.**<br>estimate, time, time intervals, a.m, p.m, digital clock, analog clock, minute, hour, elapsed time, measure, liquid volume, mass, standard units, metric, gram (g), kilogram (kg), liter (L)<br>**Represent and interpret data.**<br>scale, scaled picture graph, scaled bar graph, line plot, data<br>**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**<br>attribute, area, square unit, plane figure, gap, overlap, square cm, square m , square in., square ft, nonstandard units, tiling, side length, decomposing<br>**Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.**<br>attribute, perimeter, plane figure, linear, area, polygon, side length | **Reason with shapes and their attributes.**<br>attributes, properties, quadrilateral, open figure, closed figure , three-sided, 2-dimensional, 3-dimensional, rhombi, rectangles, and squares are subcategories of quadrilaterals, cubes, cones, cylinders, and rectangular prisms are subcategories of 3-dimensional figures shapes: polygon, rhombus/rhombi, rectangle, square, partition, unit fraction, kite, example and non-example<br>From previous grades: triangle, quadrilateral, pentagon, hexagon, cube, trapezoid, half/quarter circle, circle, cone, cylinder, sphere |

# STANDARDS FOR MATHEMATICAL PRACTICE

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 express regularity in repeated reasoning.

http://maccss.ncdpi.wikispaces.net/Elementary

NC Math Common Core - ...

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## Elementary

| | | |
|---|---|---|
| Kindergarten | First Grade | Second Grade |
| Third Grade | Fourth Grade | Fifth Grade |

**Elementary Mathematics Add-On Licensure**

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# Common Core State Standards: One Page Layouts

## Third Grade – Standards

1. **Developing understanding of multiplication and division and strategies for multiplication and division within 100 –** Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.
2. **Developing understanding of fractions, especially unit fractions (fractions with numerator 1) –** Students develop an understanding of fractions, beginning with unit fractions. Students view fractions in general as being built out of unit fractions, and they use fractions along with visual fraction models to represent parts of a whole. Students understand that the size of a fractional part is relative to the size of the whole. For example, 1/2 of the paint in a small bucket could be less paint than 1/3 of the paint in a larger bucket; but 1/3 of a ribbon is longer than 1/5 of the same ribbon because when the ribbon is divided into 3 equal parts, the parts are longer than when the ribbon is divided into 5 equal parts. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.
3. **Developing understanding of the structure of rectangular arrays and of area –** Students recognize area as an attribute of two-dimensional regions. They measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle.
4. **Describing and analyzing two-dimensional shapes –** Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.

### MATHEMATICAL PRACTICES

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
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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 express regularity in repeated reasoning.**

### OPERATIONS AND ALGEBRAIC THINKING

**Represent and solve problems involving multiplication and division.**

**3.OA.1** Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*

**3.OA.2** Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*

**3.OA.3** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (Note: See Glossary, Table 2.)

**3.OA.4** Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = □ ÷ 3, 6 × 6 = ?.*

**Understand properties of multiplication and the relationship between multiplication and division.**

**3.OA.5** Apply properties of operations as strategies to multiply and divide. (Note: Students need not use formal terms for these properties.) *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)*

**3.OA.6** Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*

**Multiply and divide within 100.**

**3.OA.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

**Solve problems involving the four operations, and identify and explain patterns in arithmetic.**

**3.OA.8** Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (Note: This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order – Order of Operations.)

**3.OA.9** Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

### NUMBER AND OPERATIONS IN BASE TEN

**Use place value understanding and properties of operations to perform multi-digit arithmetic.** (Note: A range of algorithms may be used.)

**3.NBT.1** Use place value understanding to round whole numbers to the nearest 10 or 100.

**3.NBT.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

**3.NBT.3** Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

### NUMBER AND OPERATIONS - FRACTIONS

Note: Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.

**Develop understanding of fractions as numbers.**

**3.NF.1** Understand a fraction 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a*/*b* as the quantity formed by a parts of size 1/*b*.

## Third Grade – Standards

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North Carolina Department of Public Instruction
INSTRUCTIONAL SUPPORT TOOLS
FOR ACHIEVING NEW STANDARDS

# Unpacking Document

***3rd Grade Mathematics* ● Unpacked Content**

For the new Common Core State Standards that will be effective in all North Carolina schools in the 2012-13 school year.

This document is designed to help North Carolina educators teach the Common Core (Standard Course of Study). NCDPI staff are continually updating and improving these tools to better serve teachers.

**What is the purpose of this document?**

To increase student achievement by ensuring educators understand specifically what the new standards mean a student must know, understand and be able to do. This document may also be used to facilitate discussion among teachers and curriculum staff and to encourage coherence in the sequence, pacing, and units of study for grade-level curricula. This document, along with on-going professional development, is one of many resources used to understand and teach the CCSS.

**What is in the document?**

Descriptions of what each standard means a student will know, understand and be able to do. The "unpacking" of the standards done in this document is an effort to answer a simple question "What does this standard mean that a student must know and be able to do?" and to ensure the description is helpful, specific and comprehensive for educators.

**How do I send Feedback?**

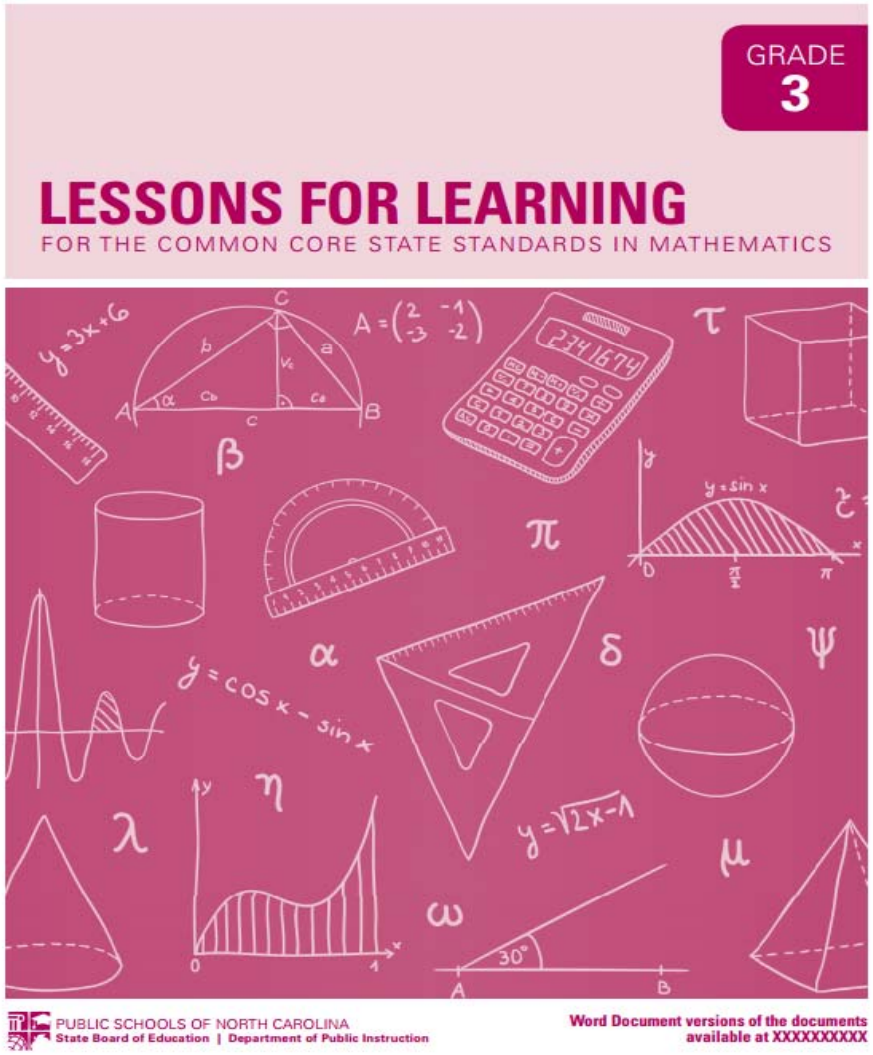
We intend the explanations and examples in this document to be helpful and specific. That said, we believe that as this document is used, teachers and educators will find ways in which the unpacking can be improved and made ever more useful. Please send feedback to us at feedback@dpi.state.nc.us and we will use your input to refine our unpacking of the standards. Thank You!

**Just want the standards alone?**

You can find the standards alone at http://corestandards.org/the-standards

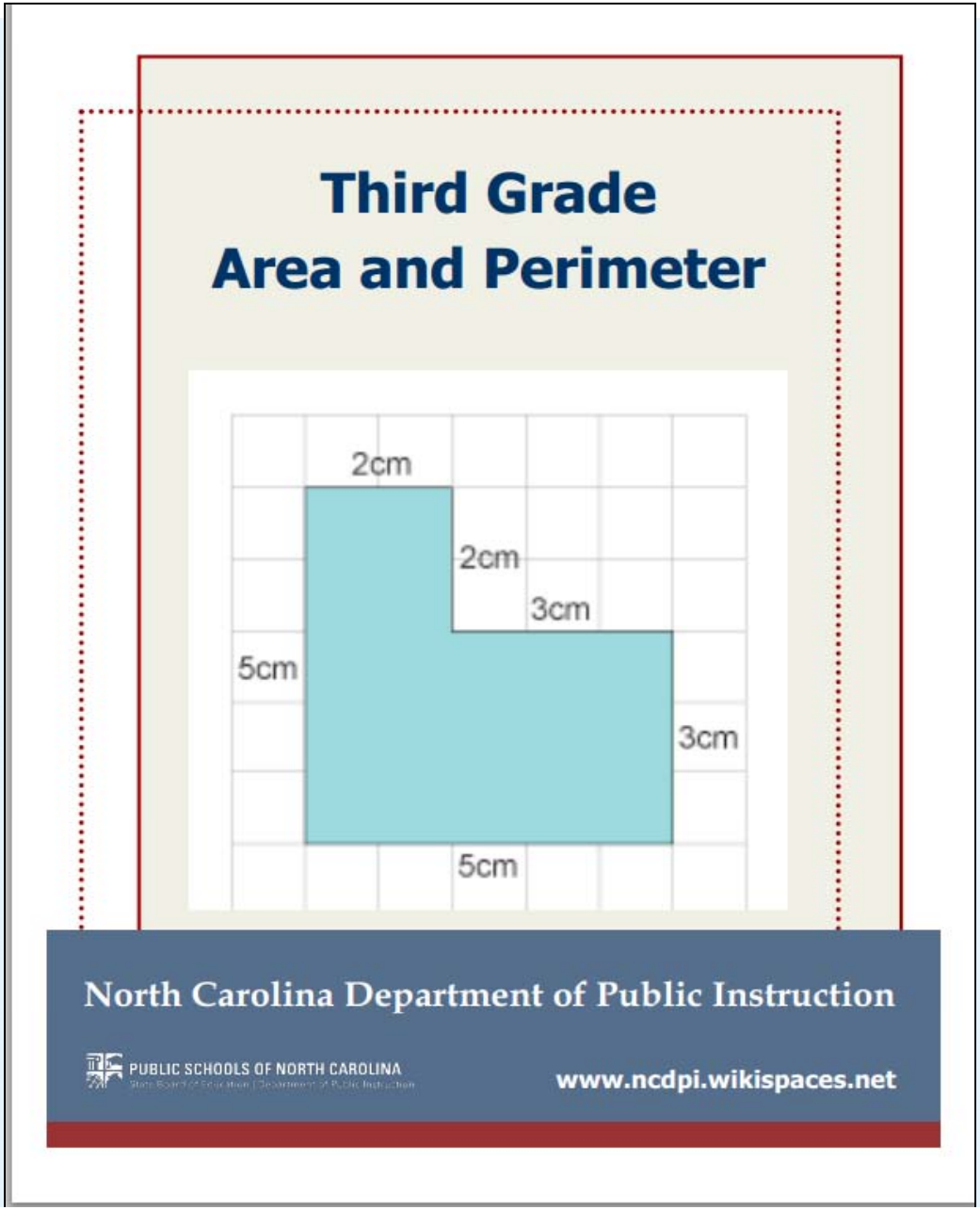
# Major Work

| Third Grade | |
|---|---|
| **Major Clusters** | **Supporting/Additional Clusters** |
| **Operations and Algebraic Thinking**<br>• Represent and solve problems involving multiplication and division.<br>• Understand properties of multiplication and the relationship between multiplication and division.<br>• Multiply and divide within 100.<br>• Solve problems involving the four operations, and identify and explain patterns in arithmetic.<br><br>**Number and Operations—Fractions**<br>• Develop understanding of fractions as numbers.<br><br>**Measurement and Data**<br>• Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.<br>• Geometric measurement: understand concepts of area and relate area to multiplication and to addition. | **Number and Operations in Base Ten**<br>• Use place value understanding and properties of operations to perform multi-digit arithmetic.<br><br>**Measurement and Data**<br>• Represent and interpret data.<br>• Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.<br><br>**Geometry**<br>• Reason with shapes and their attributes. |

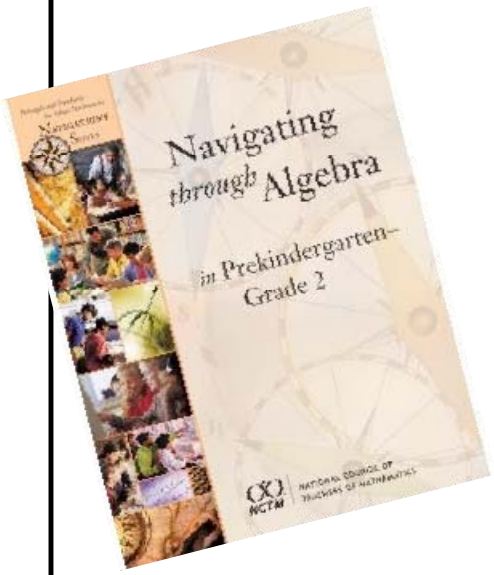



# K-8 Lessons for Learning

# K-5 Grade Level Unit or Collection of Lessons



# Navigation Alignment

| Fourth Grade | | | |
|---|---|---|---|
| **Generalize place value understanding for multi-digit whole numbers.**<br>4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*<br>4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.<br>**Understand decimal notation for fractions, and compare decimal fractions.**<br>4.NBT.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model. | Navigating *through* Number *and* Operations in Grades 3-5 | **Chapter 1: Understanding and Representing Numbers**<br>Place Value in Whole Numbers and Decimals<br>page 15<br>  <br> | **Mathematical Practice** focus is in **bold**:<br>1. Make sense of problems and persevere in solving them.<br>**2. Reason abstractly and quantitatively.**<br>**3. Construct viable arguments and critique the reasoning of others.**<br>4. Model with mathematics.<br>5. Use appropriate tools strategically.<br>6. Attend to precision.<br>**7. Look for and make use of structure.**<br>8. Look for and express regularity in repeated reasoning. |

# K-12 AIG Lessons

# New

## Ask Dr. Math

**Second Grade**
**Common Core State Standard For Mathematic Addressed:**
**Operations and Algebraic Thinking**
**Represent and solve problems involving addition and subtraction.**
**2.OA.1** Use addition and subtraction within 100 to solve on-and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions e.g. by using drawings and equations with a symbol for the unknown number to represent the problem. (See CCSS glossary, Table 1) See standard 1.0A.6 for a list of mental strategies.
**Mathematical Practices:**
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
4. Model with mathematics
6. Attend to precision
7. Look for and make use of structure.

**Overview**
In this activity, students are introduced to the "Ask Dr. Math" website. Using strategies they have learned, they will answer math questions (fictional) from students across the state.
**Needed Resources/Materials**
Students will need to understand the problem types (See CCSS glossary, Table 1)

- Result Unknown,
- Change Unknown
- Start Unknown

Student Activity Directions and Letters 1, 2, and 3 (included below)
Only three problem letters are included. The teacher may wish to make up more letters that include information that is interesting or familiar to his/her students. This is also an opportunity for the students to make up problem letters or to ask older students to make up letters.
Ask Dr. Math Site: **http://mathforum.org/library/drmath/drmath.elem.html**

**Task:**
Show the students some of the questions on the Dr. Math website. Here is a good example:
http://mathforum.org/library/drmath/view/58765.html
Possible discussion:
Do students like the way the answer is given? What would they change? How can we be sure an answer given is clearly understood?
Discuss with students the term **pseudonym.** Let students create their own pseudonyms.

Give each student 1 or more of the letters (below). Decide whether students will work alone or in pairs. If teachers have a particular format for writing letters, go over that format. Have students read each other's responses and give feedback.

# Help Dr. Math

Dr. Math has been really busy this year helping students understand math. Since you have been working with many kinds of addition and subtraction problems this year, he could use your help in answering some of these letters. These students need help in understanding so be sure to explain clearly and use drawings and equations to support your explanations. You may wish to choose your own **pseudonym** (Dr. Math is not a real name!).

# Dear Dr. Math,

I have a problem I don't know how to solve. I have been making a photo album of my summer vacation. I put 78 pictures in my album. I left the room to get a snack and I thought I saw my little sister go into my room. When I returned to my room, there were 92 photos in my album! How can I find out how many photos my sister put in the book?
Sincerely,
Stuck in Statesboro

# Operations and Algebraic Thinking

## Represent and solve problems involving addition and subtraction.

**2.OA.1** Use addition and subtraction within 100 to solve on-and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions e.g. by using drawings and equations with a symbol for the unknown number to represent the problem.

Students will need to understand the problem types:

- Result Unknown
- Change Unknown
- Start Unknown

COMING
SOON

# The Big "Z"

**Directions:**
Each student needs a gameboard, one die and one marker. In turn each player puts a marker on any number on the board and then rolls a die. A player can move one space in any direction (vertically, horizontally, or diagonally) to a space that contains the number on the die. Points are determined by the place value of that number. For example: If a player's marker is on 542 and he or she rolls a "6", the player may move to 461. The score would be 60 points, since the "6" is in the ten's place. If the move is to 625, the score is 600 points. Players take turns until each player has five turns. Students total their scores at the end of the game. High score wins.

| | | | | | | |
|---|---|---|---|---|---|---|
| 342 | 423 | 364 | 132 | 453 | 361 | 534 |
| 234 | 536 | 425 | 241 | 421 | 613 | 362 |
| 625 | 461 | 653 | 423 | 362 | 425 | 241 |
| 542 | 124 | 315 | 532 | 641 | 253 | 364 |
| | | 453 | 265 | 154 | 635 | 126 |
| | | 241 | 643 | 435 | 514 | 243 |
| | | 532 | 356 | 643 | 351 | 436 |
| | | 324 | 413 | 534 | 165 | 513 | 234 | 652 |
| | | 143 | 365 | 413 | 243 | 351 | 146 | 425 |
| | | 651 | 543 | 564 | 136 | 562 | 251 | 536 |
| | | 425 | 264 | 132 | 653 | 351 | 413 | 624 |

(1_01b)

14

# Realigning and creating additional games for CCSS

# K-2 Assessments

- Formative Assessments on Wiki
  (This can be purchased in printable form.)
- Mid-Year Benchmark Assessment
  (Released last years assessment – now on math wiki)
- Summative Assessment
  (Released last years assessment – now on math wiki)

North Carolina Dep... | NC Math Common... | commoncoretasks - ...
commoncoretasks.ncdpi.wikispaces.net/home
Search

Public Schools of North Carolina
State Board of Education
Department of Public Instruction



# home

Edit 0 0 25 ...

## North Carolina Department of Public Instruction

## K-2 Formative Instructional and Assessment Tasks for the Common Core State Standards in Mathematics

In response to North Carolina legislative and State Board requirements, the North Carolina Department of Public Instruction provides Local Education Agencies with state-developed assessments to be implemented for Kindergarten, First and Second Grades. These assessments include documented, on-going individualized assessments throughout the year and a summative evaluation at the end of the year. Local Education Agencies may use these assessment instruments as presented, adaptations of them, or adopt unique assessments.

On this site you will find tasks aligned to the Common Core State Standards for Mathematics that are designed to be used in a formative manner to guide instruction. Take a moment to review the Assessment Manual to learn more about how to use these assessments in your classroom and in your LEA.

Please know that this is a dynamic site- the tasks presented here will continually be evolving as we move forward with implementing the new Common Core State Standards. As you use these tasks with your students, add to and adapt the materials in order to make them useful for your particular situation. The North Carolina Department of Public Instruction appreciates any suggestions and feedback, which will help improve upon this resource. Please send all correspondence to Kitty Rutherford (kitty.rutherford@dpi.nc.gov) and Barbara Bissell (barbara.bissell@dpi.nc.gov),
This site has been created and is maintained by the North Carolina Department of Public (NCDPI) Elementary Mathematics Consultants and their public school partners.

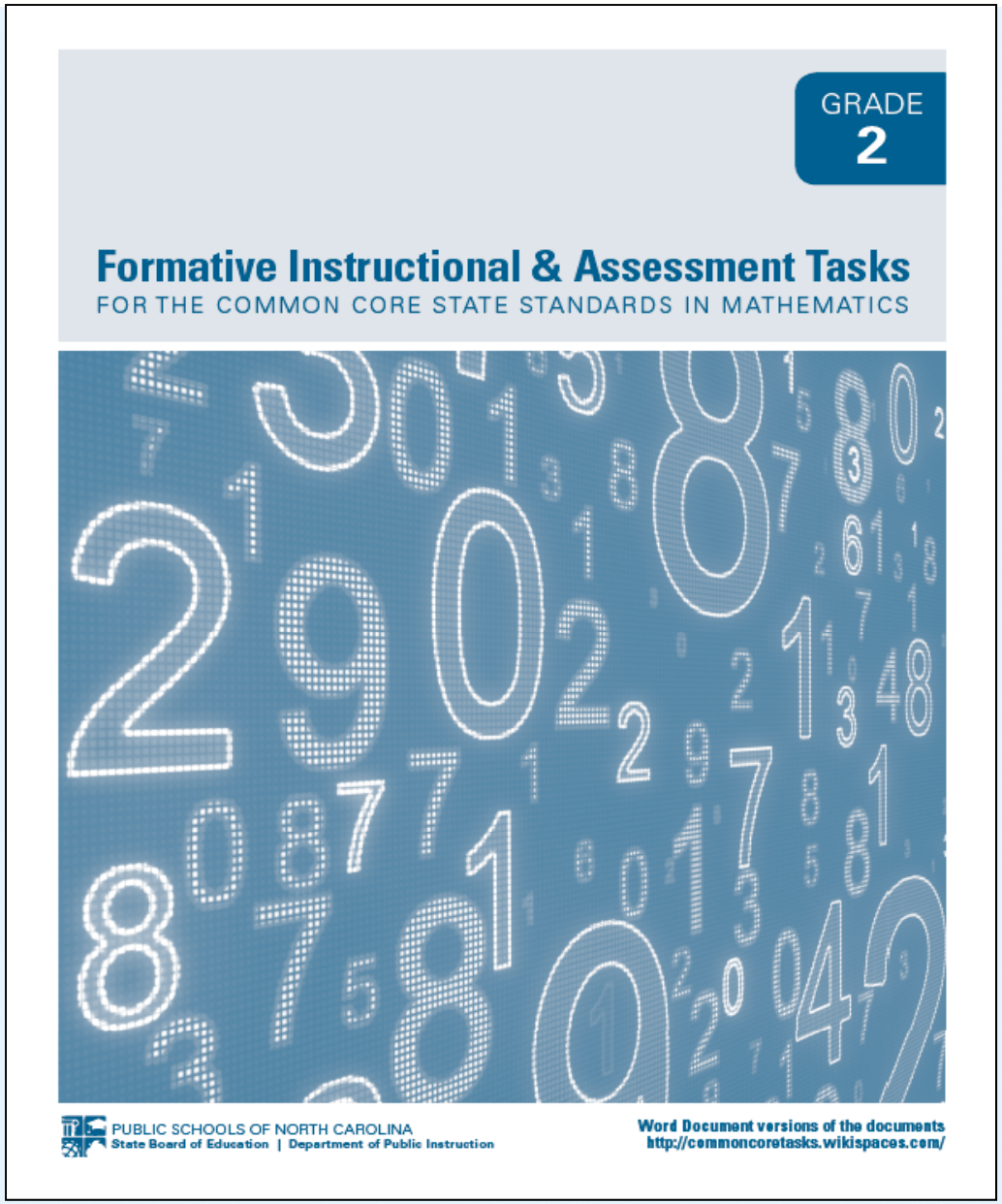
**NOTE:** A mid-year benchmark assessment for K-2 will be sent directly to district leaders in the Fall. A year-end summative assessment will be sent in early 2013 . As in years past, districts may adjust the mid-year assessment to align with the district's pacing guide or adopt unique assessments.

**Additional NCDPI Common Core resources can be found on the Mathematics wiki.**

### K-2 Assessment Instructional Videos- NEW!

- **Introduction to K-2 Formative Assessment Tasks**

start | Document2 - ... | Meredith Sym... | Inbox - Micro... | commoncoret... | 3:11 PM



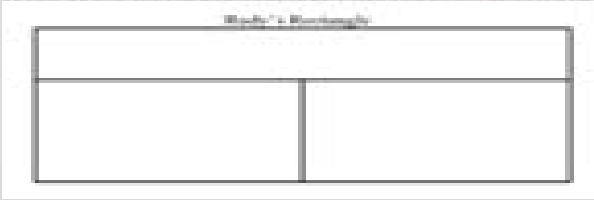

# Available in print form

Released
SECOND GRADE
Mathematics
Mid-Year Benchmark Assessment
2012-2013
Administration Manual
PUBLIC SCHOOLS OF NORTH CAROLINA
SECOND GRADE
Mathematics
Summative Assessment
2012-2013
Administration Manual
PUBLIC SCHOOLS OF NORTH CAROLINA

# 3-5 Assessments

- *NEW* Formative Assessments on Wiki - in draft form
- EOG (Released form on mathematics wiki)
- Smarter Balanced Assessment Consortium (sample assessment items and practice test)

# Formative Instructional and Assessment Tasks

| Rudy's Rectangle<br>3.NF.1 – Task 2 | |
|---|---|
| **Domain** | **Number and Operations - Fractions** |
| **Cluster** | **Develop understanding of fractions as numbers.** |
| **Standard(s)** | **3.NF.1** Understand a fraction $1/b$ as the quantity formed by 1 part when $a$ whole is partitioned into $b$ equal parts; understand a fraction $a/b$ as the quantity formed by a parts of size $1/b$. |
| **Materials** | Copies of Rudy's Rectangle (one per student), pencils, scissors, rulers |
| **Task** | Distribute a copy of "Rudy's Rectangle" to each student.<br>Read the following task aloud:<br>*Rudy was asked to partition a rectangle into thirds. His solution is below.*<br>  <br>*Did Rudy correctly partition the rectangle into thirds? Prove your answer using pictures, numbers, or words. You may cut the square into parts, if needed.* |

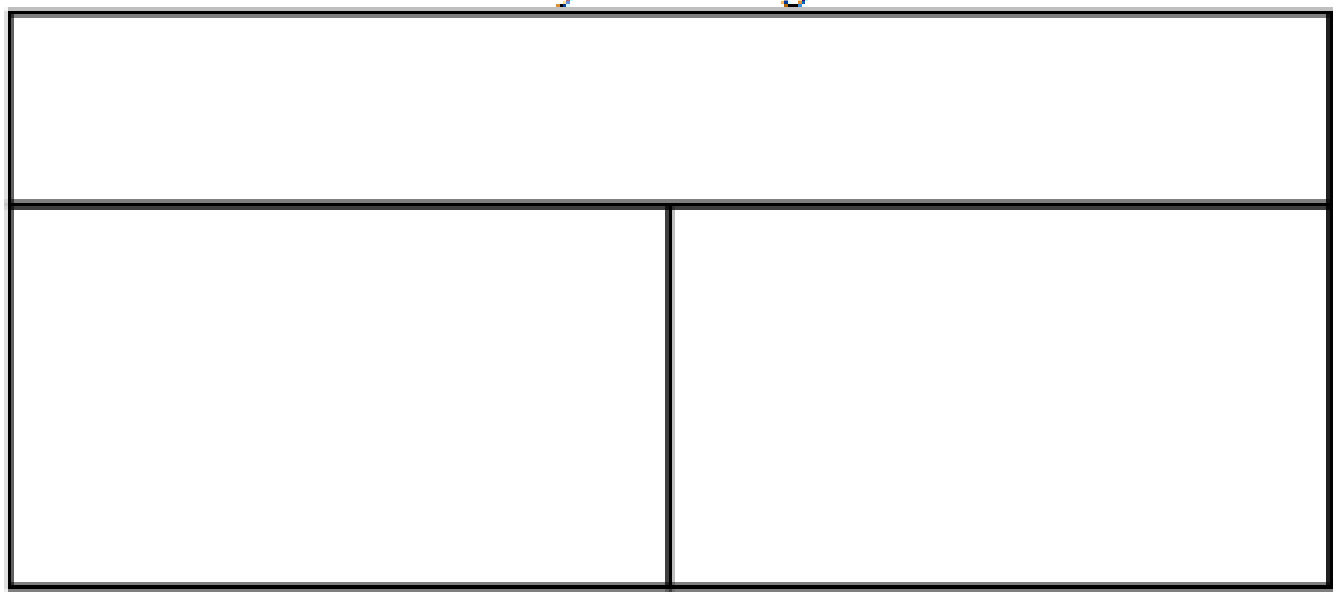
| Rubric | | |
|---|---|---|
| **Level I** | **Level II** | **Level III** |
| Limited Performance<br>• Student uses inappropriate solution strategy and does not obtain the correct solution. | Not Yet Proficient<br>• Student may have correct drawing but is unable to explain solution strategy. ***OR***<br>• Student has partially sufficient solution strategy, but was unable to generate a correct picture. | Proficient in Performance<br>• Student accurately draws an image of the completed deck.<br>• Student accurately explains his/her solution strategy. |

| Standards for Mathematical Practice |
|---|
| 1. Makes sense and perseveres in solving problems. |
| 2. **Reasons abstractly and quantitatively.** |
| 3. Constructs viable arguments and critiques the reasoning of others. |
| 4. **Models with mathematics.** |
| 5. Uses appropriate tools strategically. |
| 6. **Attends to precision.** |
| 7. Looks for and makes use of structure. |
| 8. Looks for and expresses regularity in repeated reasoning. |

# *Did Rudy correctly partition the rectangle into thirds?*

*Justify your thinking using pictures, numbers, and/or words.*

Rudy's Rectangle



Released Form

# North Carolina READY End-of-Grade Assessment Mathematics

RELEASED

## Student Booklet

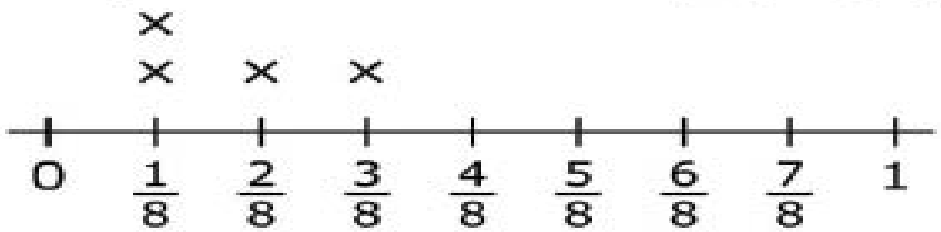
Academic Services and Instructional Support
Division of Accountability Services

Copyright © 2013 by the North Carolina Department of Public Instruction. All rights reserved.

Judy conducted an experiment. She put a total of $2\frac{1}{8}$ cups of water into an empty container. Then, Judy recorded the amount of water that evaporated from the container each day for four days.

The line plot below shows the amount of water that evaporated from the container on each of the four days.

**Amount of Water That Evaporated Each Day (cups)**




Each × represents 1 day.

What mixed number represents the amount of water left in the container at the end of the fourth day?

$\square\frac{\square}{\square}$ Cups

# The North Carolina Elementary Mathematics Add-On License Project

For more information on EMAoL offerings contact:

| ASU | ECU | NCSU | UNC |
|---|---|---|---|
| Kathleen Lynch Davis<br>lynchrk@<br>appstate.edu | Sid Rachlin<br>rachlins@<br>ecu.edu | Paola Sztajn<br>papaola_sztajn<br>@ncsu.edu | Susan Friel<br>sfriel@<br>email.unc.edu |
| **UNCC** | **UNCG** | **UNCW** | |
| Drew Polly<br>drew.polly@<br>uncc.edu | Kerri Richardson<br>kerri_richardson<br>@uncg.edu | Tracy Hargrove<br>hargrovet@<br>uncw.edu | |

# Nominate An Outstanding Teacher

PRESIDENTIAL AWARDS FOR EXCELLENCE IN MATHEMATICS AND SCIENCE TEACHING

**Website: www.paemst.org**

**Kitty.rutherford@dpi.nc.gov**

**NCCTM Outstanding Educators Awards**

This award is sponsored by the NCCTM

**NCCTM State Math Fair Winners**

Public Schools of North Carolina
State Board of Education
Department of Public Instruction

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**Common Core State Standards**

- Elementary Resources
- Middle School Resources
- High School Resources

**2003 Standard Course of Study**

**Professional Development**
**Mini Math**
**Assessment**
**Websites of Interest**

# Webinars

Edit 0 0 37 ...

## February 19, 2013

### Elementary Mathematics Add-On License

Here's what teachers and math coaches who have earned the Elementary Mathematics Add-on License are saying about the EMAoL Program-of-Study.

- Digging deeper is one thing I can say the EMAoL program and the CCSS have in common. For this reason, the coursework of the EMAoL has increased my knowledge of the content. I have found that my ability to present "rich" lessons to my students is birthed out of my own depth of understanding of the standards I am teaching.
- Throughout the coursework, the question for me became: "How do I implement these practices? What should it look like in action?" Thankfully, each of the courses completed during this program focused on research-based instructional strategies that help support student learning.
- Looking at where the students are coming from and going to has enabled me to present the material at my grade level in a more effective manner. I feel more confident in my teaching of math this year than I have in the past. Being exposed to information about cognitively demanding tasks has caused me to examine the tasks I present and has benefited my students because they are now participating in more tasks that promote higher-level thinking. Learning about math talks and questioning has increased the productive conversation during my math lessons. I feel my lessons and class discussions focus more on the math and are more beneficial for my students.
- Being taught years ago in a procedure based way left me clueless to many of the "whys?" I am supposed to be having my students explore. This program has done what most people don't have the opportunity to do!!!! That is have a "do over" in my own my learning to be able to present standards in a conceptual "doing math" way to my students!
- Albert Einstein once said, "The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking." These courses have done just that. They have widened my view of what math instruction looks like and deepened my own knowledge of the content required of the K-5 curriculum. I could not be happier to have taken these courses, especially as teachers look to me now to help support them through this change to "deeper", not broader, standards.

Learn what the Elementary Mathematics Add-On License Program has to offer elementary teachers, where this program is being offered, and how to get involved in the program.

Recording of Webinar

## February 5, 2013

### Common Core Online Math Modules (FREE)

UNC Charlotte's College of Education, in conjunction with the STEM Center and Southwest Education Alliance is proud to announce the release of Online Mathematics Modules. If you are a K-2, 3-5 or 6-8, 9-12 mathematics teacher, facilitator, coach or administrator in charge of mathematics professional development, earn CEU for participating in an online module that focuses on the mathematical practices and content of the Common Core State Standards for Mathematics.
Each module takes approximately 10 hours to finish, and can be completed either individually at your own pace or preferably with other teachers in a Professional Learning Community. We envision these modules being used by math coaches and facilitators at their schools with groups of teachers during professional development time.
To register for the course, contact Michelle Stephan at michelle.stephan@uncc.edu
**Recording of Webinar**

## March 8, 2012

### K-2 Mathematics Hot Topics: Assessment and Calendar Time

Public Schools of North Carolina
State Board of Education
Department of Public Instruction

Wiki Home
Recent Changes
Pages and Files
Members
Manage Wiki
Search Wiki

**Home**
**Announcements**
**Recognitions**
**Contact Us**

**Common Core State Standards**
Elementary Resources
Middle School Resources
High School Resources
**2003 Standard Course of Study**

**Professional Development**
**Mini Math**
**Assessment**
**Websites of Interest**

# Links of Interest

Edit 0

## Website Resources

| Website Name | Website |
|---|---|
| Balanced Assessment in Mathematics | http://balancedassessment.concord.org/ |
| Calculation Nation | http://calculationnation.com/ |
| CCSS Math | http://ccssmath.org/ |
| CCSS Support Videos | http://secc.sedl.org/common_core_videos/ |
| Dynamic Software "Core Math Tools" | http://www.nctm.org/resources/coremathtools |
| Enriching Mathematics | http://nrich.maths.org/public/ |
| Illustrative Mathematics | http://www.illustrativemathematics.org/standards/hs |
| Inside Mathematics | http://www.insidemathematics.org/index.php/tools-for-teachers |
| K-5 Math Teaching Resources | http://www.k-5mathteachingresources.com/ |
| Mathalicious | http://www.mathalicious.com/ |
| Mathematics Assessment Project | http://map.mathshell.org/materials/tasks.php<br>http://map.mathshell.org.uk/materials/index.php |
| Mathematics Modeling Lesson Plans | http://www.indiana.edu/~iucme/mathmodeling/lessons.htm |
| Mathematics Blackline Masters (K-5) | http://lrt.ednet.ns.ca/PD/BLM/table_of_contents.htm<br>http://wps.ablongman.com/ab_vandewalle_math_6/0,12312,3547876-,00.html<br>http://www.ablongman.com/vandewalleseries/ |
| National Council of Teachers of Mathematics | http://www.nctm.org/ |
| National Council of Supervisors of Math | http://www.mathedleadership.org/ |
| Number line created to your specifications | http://themathworksheetsite.com/numline.html |
| Ohio Resources | http://www.ohiorc.org/ |
| Open Resources | http://davidwiley.org/ |
| Shodor | http://www.shodor.org/ |
| Turn on Common Core Math | http://www.turnonccmath.com/ |
| National Library of Virtual Manipulatives | http://nlvm.usu.edu/ |
| NCTM Illuminations | http://illuminations.nctm.org/ |
| Learn O Zillion | http://learnzillion.com/ |
| North Carolina Council of Teachers of Mathematics | http://www.ncctm.org/ |

Sign in: Username or Email | Password (forgot?) | Log in | or sign up

Illustrative Mathematics

# Content Standards: Kindergarten Through Grade Eight

- HOME
- ILLUSTRATIONS
- **K-8 STANDARDS**
- HIGH SCHOOL STANDARDS
- PRACTICE STANDARDS
- FRACTIONS PROGRESSION
- FREQUENTLY ASKED QUESTIONS
- COMMUNITY
- ABOUT US
- TERMS OF USE

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

☐ Reveal standards automatically (?)

Grade 3

| | | |
|---|---|---|
| Operations and Algebraic Thinking | 3.OA | show all |
| Number and Operations in Base Ten | 3.NBT | show all |
| Number and Operations---Fractions | 3.NF | show all |
| Measurement and Data | 3.MD | show all |
| Geometry | 3.G | show all |

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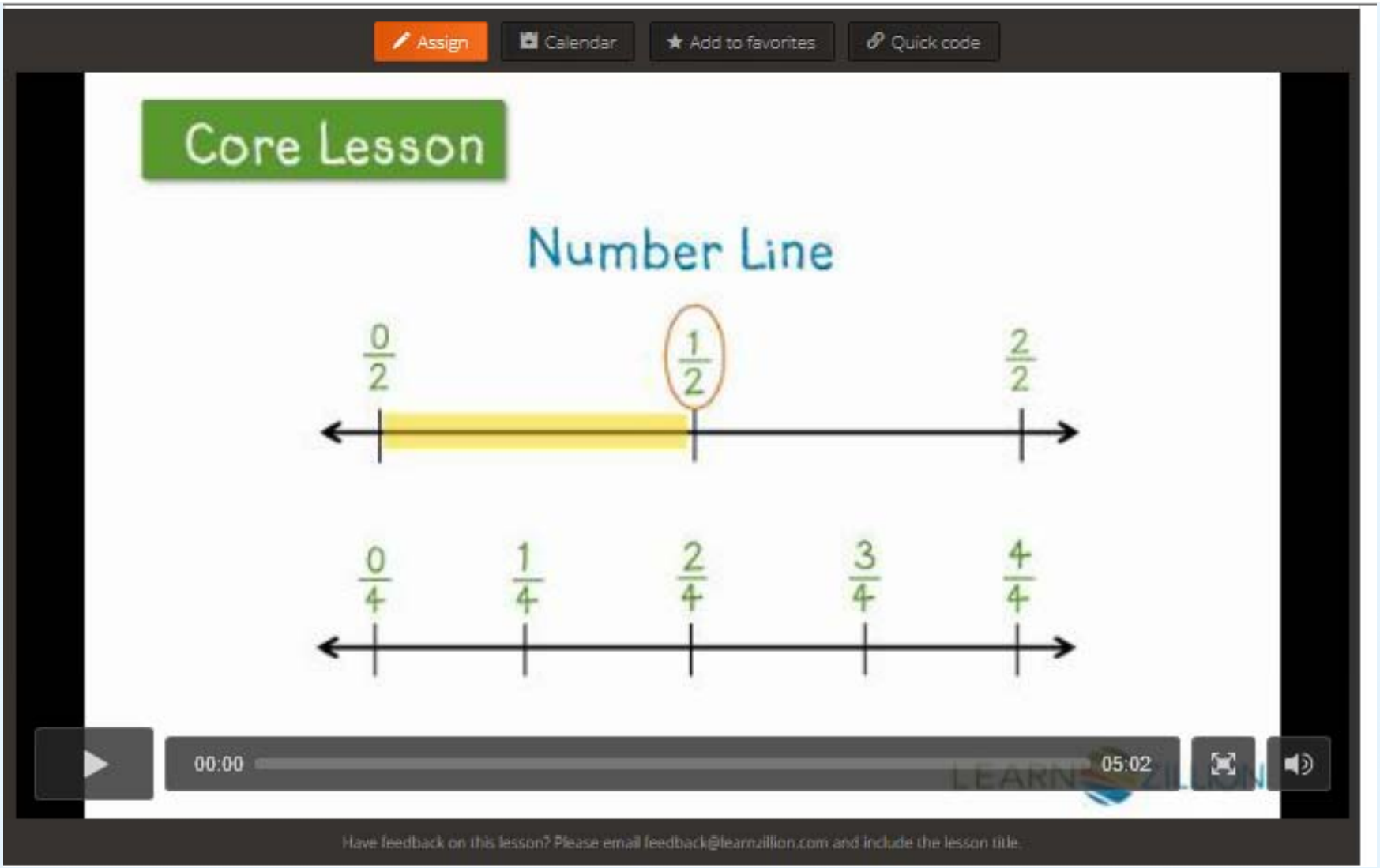
http://www.illustrativemathematics.org/standards/hs




http://learnzillion.com

# Join Our Listserv

1. Send an email to the Listserv by cutting and pasting the following address into the "To" box within your email application.

join-k-5_math@lists.dpi.state.nc.us[Elementary requests]

2. Leave the subject line and the body of the message blank.

3. Once successfully subscribed, a confirmation email will be sent.

# Let's Define the Problem

# "Teaching for Understanding"

## Dr. Phil Daro

http://vimeo.com/30924981

# Turn and Talk

- How might these ideas challenge teachers in your district or school?
- How can we move from “answer getting” to “learning mathematics”?
- What evidence do you have that teachers might not know the difference?

**Problem:** Mile wide –inch deep

**Cause:** Too little time per concept

**Cure:** More time per topic

**"LESS TOPICS"**

# Why do students have to do math problems?

a. To get answers because Homeland Security needs them, pronto.

b. I had to, why shouldn't they?

c. So they will listen in class.

d. To learn mathematics.

# To Learn Mathematics

- Answers are part of the process, they are not the product.
- The product is the student's mathematical knowledge and know-how.
- The 'correctness' of answers is also part of the process. Yes, an important part.

# "Answer Getting vs. Learning Mathematics"

United States:

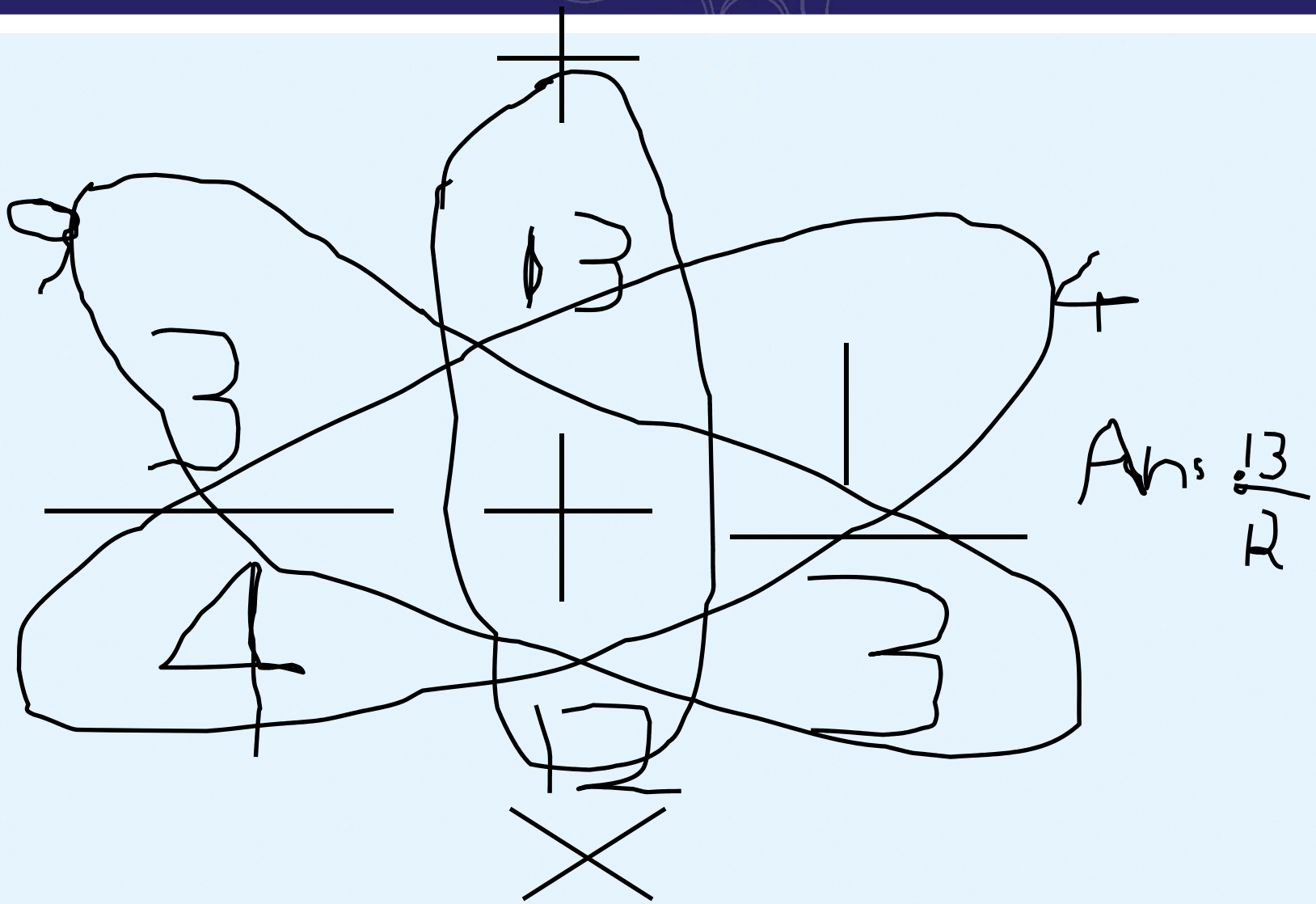
- **"How can I teach my kids to get the answer to this problem?"**

Japan:

- **"How can I use this problem to teach the mathematics of this unit?"**

# “The Butterfly Method”

$$\frac{3}{4} + \frac{1}{3}$$


3
4
13
12
1
3
Ans 13
R

# “The Butterfly Method”

http://www.youtube.com/watch?v=AQNUE0YvMwg&feature=player_embedded

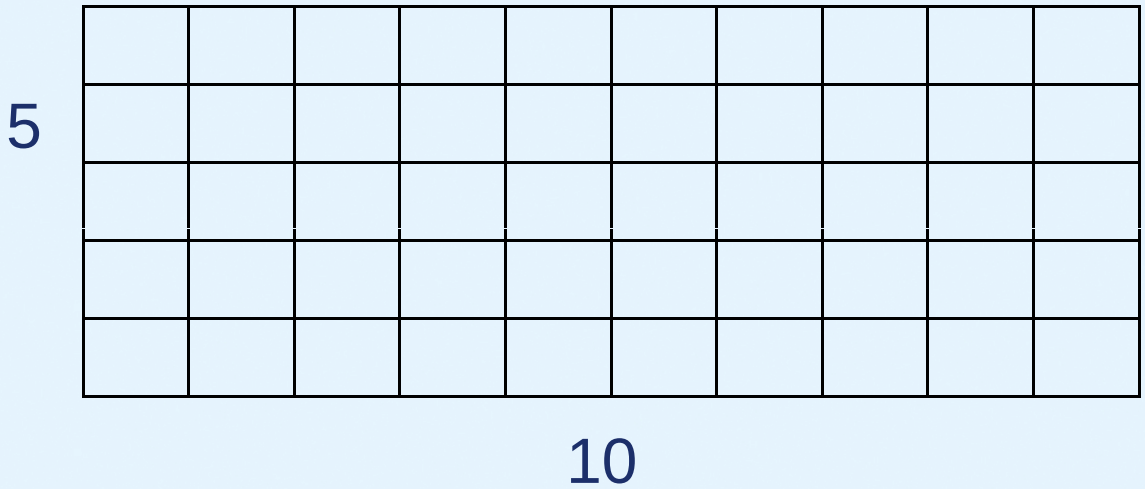
# Area and Perimeter

- What rectangles can be made with a perimeter of 30 units? Which rectangle gives you the greatest area? How do you know?
- What do you notice about the relationship between area and length of the sides?

# Instructions

- Discuss the following at your table
  - What thinking and learning occurred as you completed the task?
  - Would this task be considered “Deep Mathematics”? Why or why not?

# Compared to….




What is the area of this rectangle?
What is the perimeter of this rectangle?

# Standards for Mathematical Practices

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 express regularity in repeated reasoning.

# Why is change necessary?

# 8 + 4 = [ ] + 5

## Turn and Talk

# 8 + 4 = [ ] + 5

| | Percent Responding with Answers | | | |
|---|---|---|---|---|
| Grade | 7 | 12 | 17 | 12 & 17 |
| 1st - 2nd | | | | |
| 3rd - 4th | | | | |
| 5th - 6th | | | | |

Thinking Mathematically: Integrating Arithmetic & Algebra in Elementary School.
Carpenter, Franke, & Levi
Heinemann, 2003

# 8 + 4 = [ ] + 5

| | Percent Responding with Answers | | | |
|---|---|---|---|---|
| **Grade** | **7** | **12** | **17** | **12 & 17** |
| **1st - 2nd** | 5 | 58 | 13 | 8 |
| **3rd - 4th** | | | | |
| **5th - 6th** | | | | |

Thinking Mathematically: Integrating Arithmetic & Algebra in Elementary School.
Carpenter, Franke, & Levi
Heinemann, 2003

# 8 + 4 = [ ] + 5

| | Percent Responding with Answers | | | |
|---|---|---|---|---|
| **Grade** | **7** | **12** | **17** | **12 & 17** |
| **1st - 2nd** | 5 | 58 | 13 | 8 |
| **3rd - 4th** | 9 | 49 | 25 | 10 |
| **5th - 6th** | | | | |

Thinking Mathematically: Integrating Arithmetic & Algebra in Elementary School.
Carpenter, Franke, & Levi
Heinemann, 2003

# 8 + 4 = [ ] + 5

| | Percent Responding with Answers | | | |
|---|---|---|---|---|
| **Grade** | **7** | **12** | **17** | **12 & 17** |
| **1st - 2nd** | 5 | 58 | 13 | 8 |
| **3rd - 4th** | 9 | 49 | 25 | 10 |
| **5th - 6th** | 2 | 76 | 21 | 2 |

Thinking Mathematically: Integrating Arithmetic & Algebra in Elementary School.
Carpenter, Franke, & Levi
Heinemann, 2003

# Estimate the answer to (12/13) + (7/8)

A. 1
B. 2
C. 19
D. 21

Only 24% of 13 year olds answered correctly. Equal numbers of students chose the other answers.

NAEP

# Students were given this problem:

## $168 \div 20$

4th grade students in reform math classes solved it with no problem. Sixth graders in traditional classes responded that they hadn't been taught that yet.

Dr. Ben Klein, Mathematics Professor
Davidson College

# Students are shown this number. Teacher points to the 6 and says, “Can you show me this many?”

16

# When the teacher points to the 1 in the tens place and asks, "Can you show me this many?"

16

Constance Kamii

# Research

**By third grade nearly half the students still do not 'get' this concept.**

16

# More research - It gets worse!

A number contains 18 tens, 2 hundreds, and 4 ones.

What is that number?

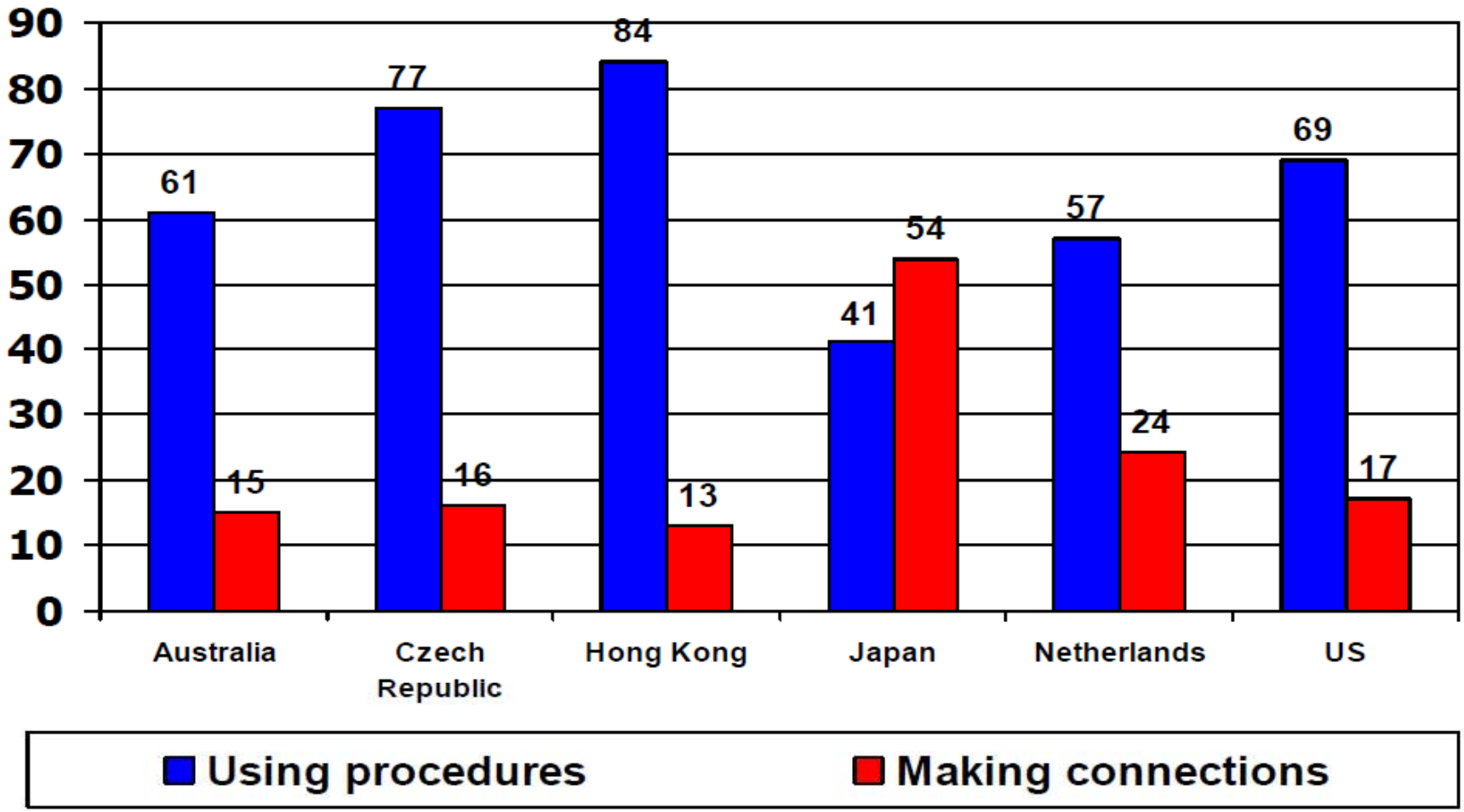
1824 2824

218.4 384

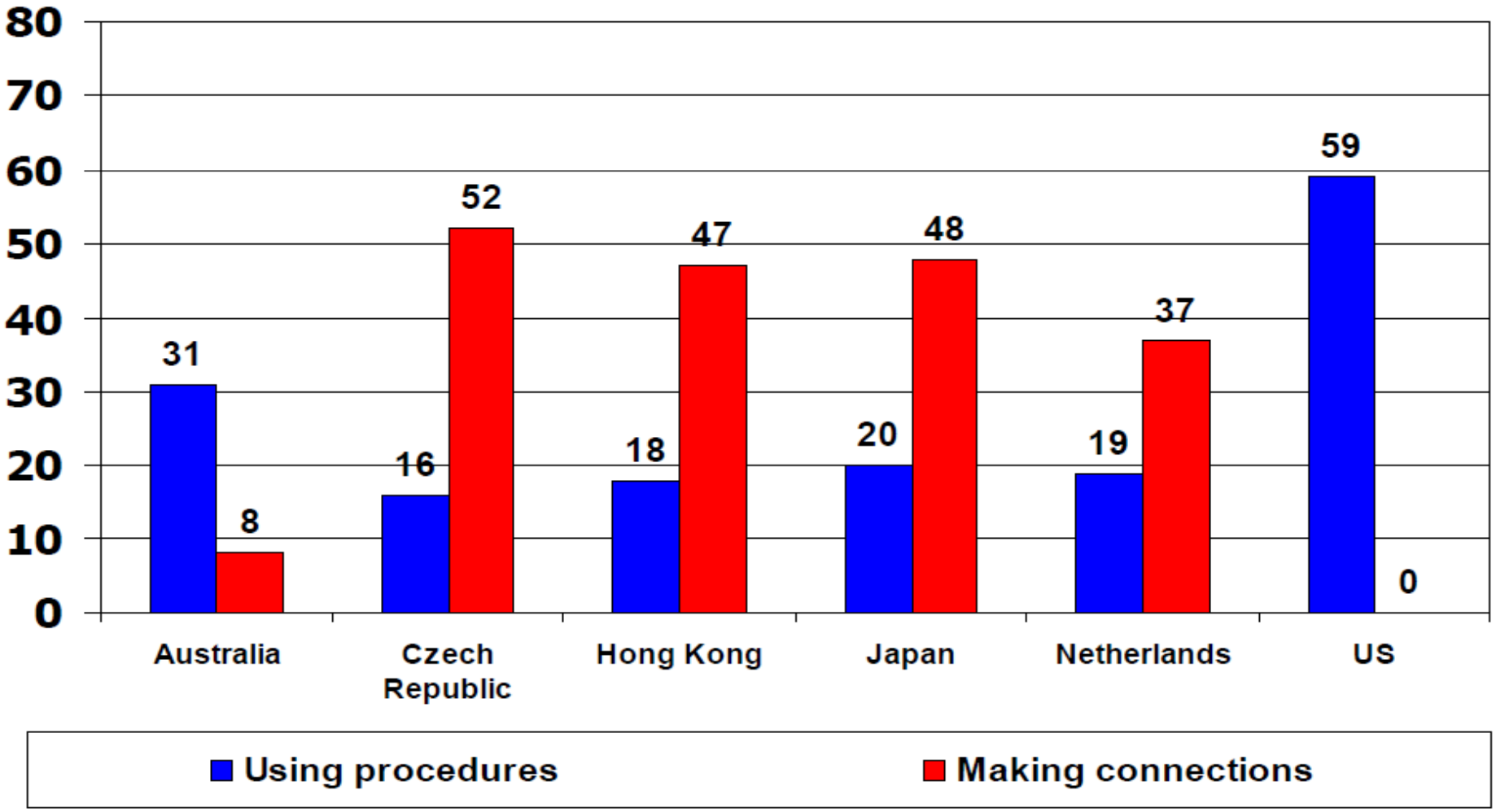
Grayson Wheatly

# Types of Math Problems Presented

## 1999 TIMSS Video Study



# How Teachers Implemented *Making Connections* Math Problems



# Lesson Comparison

## United States and Japan

| The emphasis on skill acquisition is evident in the steps most common in U.S. classrooms | The emphasis on understanding is evident in the steps of a typical Japanese lesson |
|---|---|
| •**Teacher instructs** students in concept or skill<br><br>•**Teacher solves** example problems with class<br><br>•**Students practice** on their own while teacher assists individual students | •**Teacher poses** a thought provoking problem<br><br>•**Students and teachers explore** the problem<br><br>•Various **students present** ideas or solutions to the class<br><br>•Teacher summarizes the class solutions<br><br>•Students solve similar problems |

# How are you feeling?

# Let's Do Some Math!

# The Famous Horse Problem

A farmer buys a horse for $60.

Later he sells it for $70.

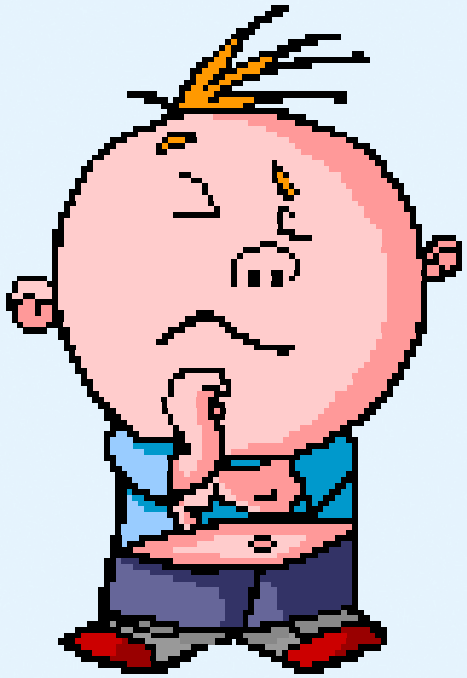
He buys it back for $80.

Finally, he sells it for $90.

How much money did the farmer make or lose?

# Feeling Better?

# Instruction Must Change



# Creating Active Thinkers

Do You Value Thinking?

"Teacher Test"

# The First Step

"Before all else, a classroom environment that fosters complex thinking must be predictable and safe."

*Creating Active Thinkers,* page 34-35

How do you know if a classroom is safe and predictable?

# The Next Step

"Complex thinking is developed in students primarily through the careful planning and teaching of lessons."

*Creating Active Thinkers,* page 37

What do you need to keep in mind when planning a lesson?

# Let's Jigsaw!

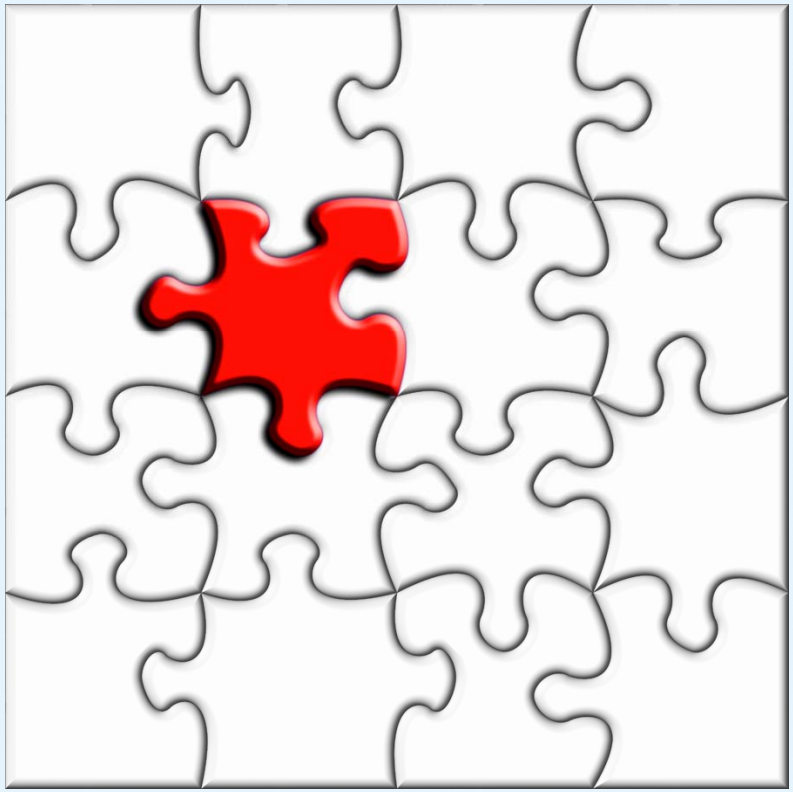
# Find your Teacher Strategy #

# Nine Teacher Strategies

The teacher will…

1. focus and refocus students on task. (pages 62-67)
2. ask open-ended questions.(pages 67-70)
3. ask extension questions.(pages 70-74)
4. wait for student responses.(pages74-78)
5. accept a variety of student responses.(pages 78-81)
6. encourage student interaction.(pages 81-84)
7. not give opinions or value judgments.(pages 84-86)
8. not repeat student responses.(pages 87-88)
9. ask students to reflect on their thinking.(pages 88-90)

# Find your Teacher Strategies Color



# Student Responsibilities

"The student takes his or her cues from the teacher."

Include your students in the journey.

Meet some of your students…

*Creating Active Thinkers*, page 97-100

# Student Behaviors

Read the student behaviors on page 101.

Are these student behaviors familiar?

**Surprise!**

Standards for Mathematical Practice.

# Standards for Mathematical Practices

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 express regularity in repeated reasoning.

# Let's Do Some Math using Standards for Mathematical Practice

# Fraction Riddle

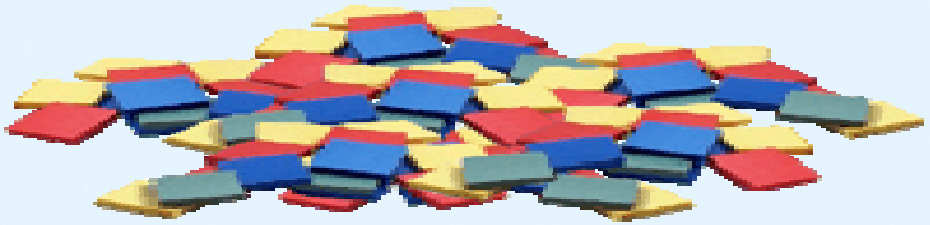
Using color tiles and grid paper.

Riddle 1: A rectangle is 1/2 red, 1/5 green, 1/10 blue, and the rest yellow. How much of the rectangle is yellow? Draw the rectangle on grid paper and record the fraction that tells which part is yellow.

# Fraction Riddle

Using color tiles and grid paper.

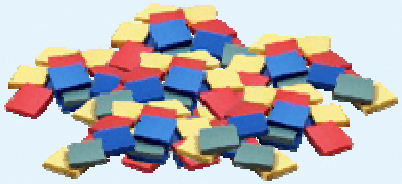
Riddle 2: A rectangle is 3/5 red. The rest is blue and yellow but not in equal amounts. What could the rectangle look like? Record.



# Fraction Riddle

Using color tiles and grid paper.

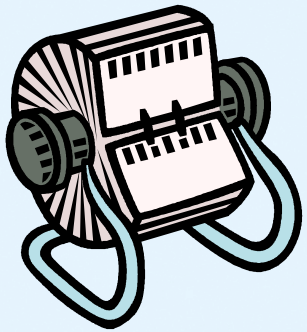
Riddle 3: A rectangle is 1/2 red and 1/3 blue. Also, it has one green tile and one yellow tile. What could the rectangle look like? What fractional part is green? Yellow? Record.



Try to make up your own riddle.

# What questions do you have?

# Contact Information



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**For all you do for our students!**