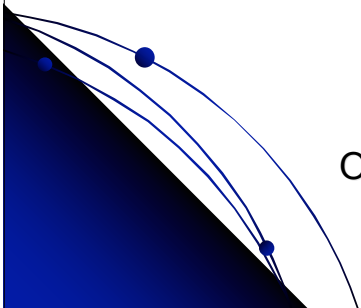


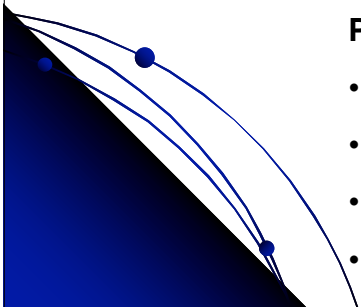
Welcome to the ...
North Carolina K-5
Mathematics Standard Course of Study
Revision Meeting

October 12, 2007



December 18, 2006

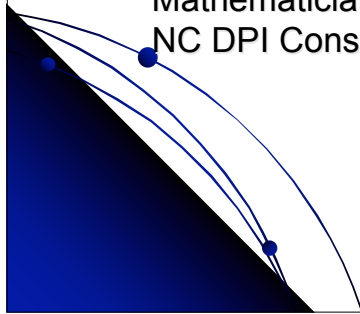
Mathematics Stakeholders Committee :

- 80 participants
 - K-12 teachers
 - Mathematicians
 - Mathematics Education Professors
 - Mathematics Supervisors
 - Math Lead Teachers
 - Parents
 - DPI Consultants
- 

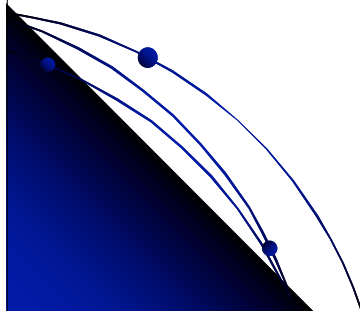
A Team Was Formed...

Consisting of:

Classroom Teachers
Mathematics Lead Teachers
Curriculum Specialists
Mathematics Specialists
Mathematics Education Professors
Mathematicians
NC DPI Consultants

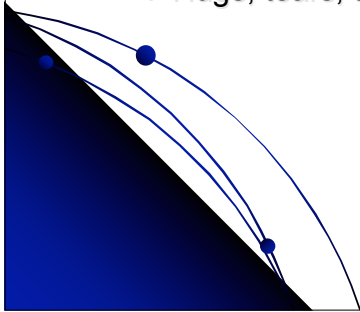


**Does the current
NC Mathematics Standard Course of Study
prepare students for the future?**



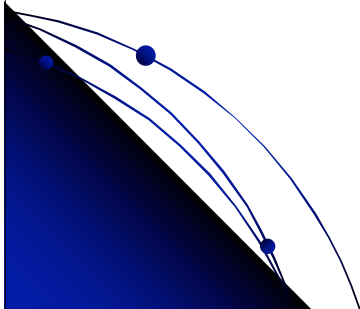
The Process Begins...

- λ Approximately 8,196 combined hours
 - ♣ Monthly meetings
 - ♣ Reading and documenting research
 - ♣ Writing and revising ... many, many times
 - ♣ Philosophical discussions
 - ♣ Hugs, tears, and ... prayers



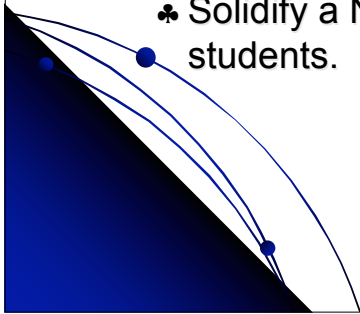
June 14, 2007 – Review of the Committees Recommendations

Approximately 50 educators from across the state came to review the proposed changes and to make recommendations on the first draft.



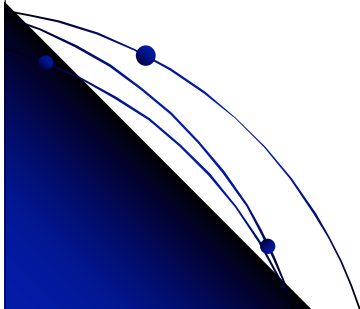
All led us to this point...

- Your input and guidance are needed to
 - ♣ Identify possible gaps, holes, and overlaps
 - ♣ Check for developmental appropriateness
 - ♣ Provide clarification
 - ♣ Solidify a NC Mathematics SCOS for our students.

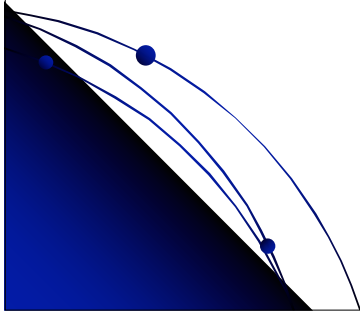


Something new...

Descriptors



K-5 Number & Operations

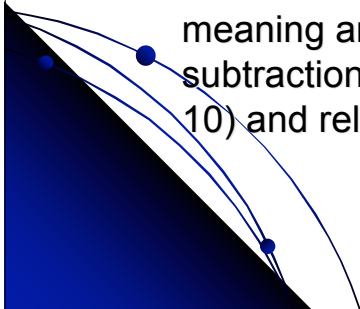


Develop Number Sense

Main focus for grades K-3

Kindergarten: Whole numbers 0 through 10;
rote count forward and backwards to 30
and beyond.

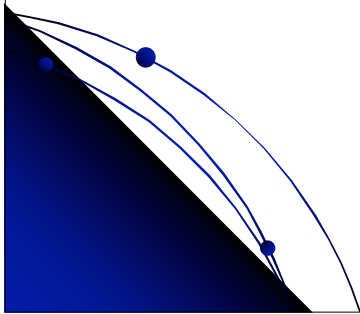
First Grade: Whole numbers to at least 100;
meaning and use of addition and
subtraction; basic addition facts (sums to
10) and related subtraction facts.



Develop Number Sense

Main focus for grades K-3

Second Grade: Whole numbers to at least 1000; strategies for efficient recall of addition facts (sums to 18) and related subtraction facts.

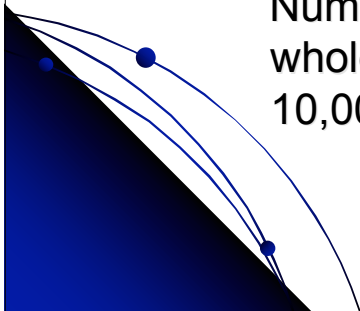


Operation Sense

Main focus at grades 3 - 5

Third Grade: Fluency with multiplication facts for 1's, 2's, 5's, 10's, 0's and strategies for 3's, 4's, 6's, 7's, 8's, 9's; and related division facts.

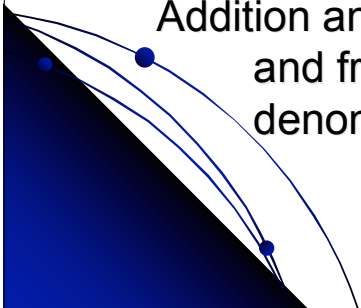
Number sense for fractions and whole numbers up to at least 10,000.



Operation Sense

Main focus at grades 3 - 5

Fourth Grade: Fluency and flexibility with multiplication and division (0-12); two-digit by one-digit multiplication & division.

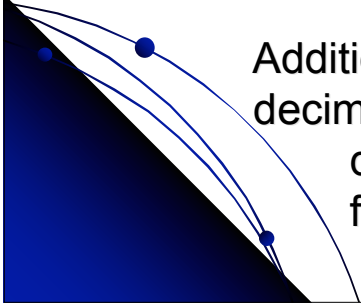


Addition and subtraction of decimals and fractions with like denominators.

Operation Sense

Main focus at grades 3 - 5

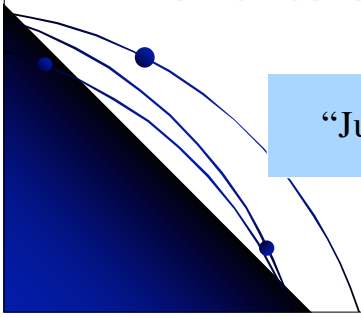
Fifth grade: Fluency and flexibility with all whole number operations (including standard algorithms); three-digit by two-digit multiplication and division.



Addition and Subtraction of decimals and fractions with unlike denominators (within fraction families).

Overall Goals

- λ Identify big ideas of number development
- λ Target big ideas to build deeper understanding
- λ Provide a logical and smooth development of number concepts



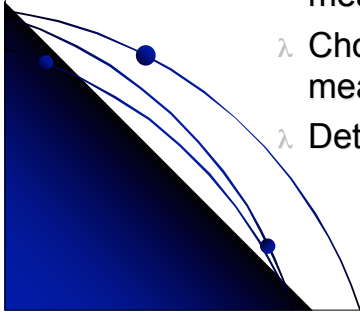
“Just because they can, should they?”

K-5 Measurement



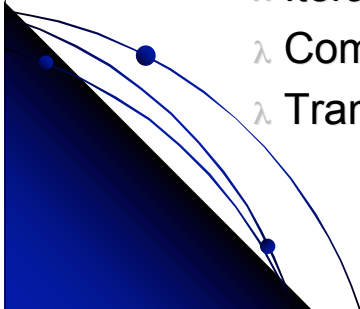
Measurement

- λ Focus is on the process of measurement & the components of learning to measure
- λ Process of Measurement:
 - λ Select an attribute of object to be measured
 - λ Choose an appropriate unit of measurement
 - λ Determine the number of units



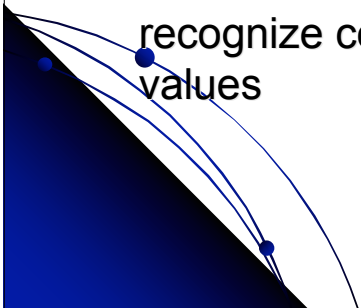
Measurement

- λ Components:
 - λ Benchmarks
 - λ Partitioning
 - λ Iteration
 - λ Compensatory Principle
 - λ Transitivity



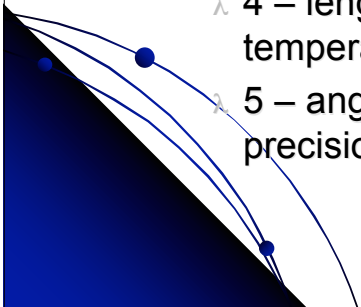
Measurement

λ Non-standard

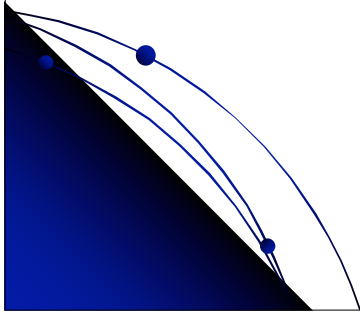
- λ K – length, mass, and sequencing
 - λ 1 – length, mass, capacity, and time
 - λ 2 – refine non-standard;
recognize coin value and compare
values
- 

Measurement

λ Standard

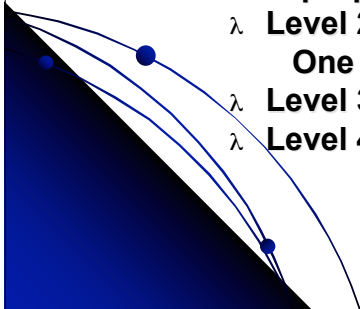
- λ 2 – begin standard with length (in & ft)
 - λ 3 – length, mass, capacity, time, &
temperature (Customary); create coin sets
 - λ 4 – length, mass, capacity, time, &
temperature (Metric) & conversions within
 - λ 5 – angles, elapsed time, & measurement
precision
- 

K-5 Geometry



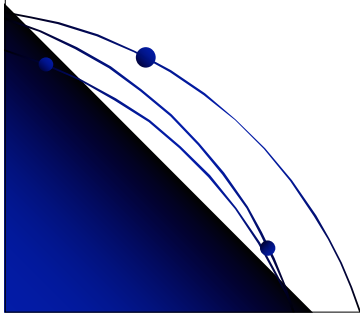
van Hiele Levels of Geometric Thinking

- λ **Level 0: Visualization**
The objects or shapes are what they 'look like.'
- λ **Level 1: Analysis**
Figures are classes of shapes, though properties are not necessarily ordered.
- λ **Level 2: Informal Deduction**
One property follows from another.
- λ **Level 3: Deduction**
- λ **Level 4: Rigor**



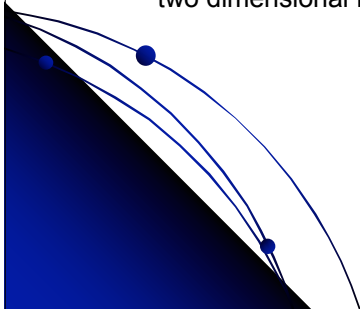
Progressing Through van Hiele Levels of Thought

- λ **Levels are not age dependent.**
- λ **Levels are sequential (except for the highly gifted).**
- λ **Movement from one level to another requires experience involving active exploration, communication, and observation.**



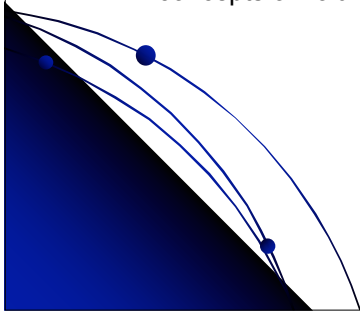
Geometry Big Ideas

- K - Identify, describe, compare, model, and sort two dimensional and three dimensional shapes; spatial reasoning.
- 1 - Identify, describe, compare, model, and sort two dimensional and three dimensional shapes;
decomposing and composing two dimensional shapes.
- 2 - Relate the shapes of the faces of three dimensional objects to two dimensional figures; congruency.

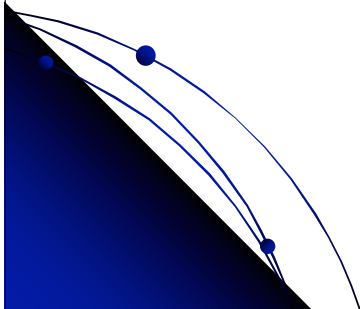


Geometry Big Ideas

- 3 - Properties of two dimensional shapes, including sides and angles; rectangular coordinate system; parallel and perpendicularity.
- 4 - Rotational and line symmetry, transformations, area, perimeter.
- 5 - Properties of two dimensional shapes, including diagonals; interior angles; analyze three dimensional shapes. Explore the concepts of volume and surface area for rectangular prisms.



K-5 Data Analysis and Probability



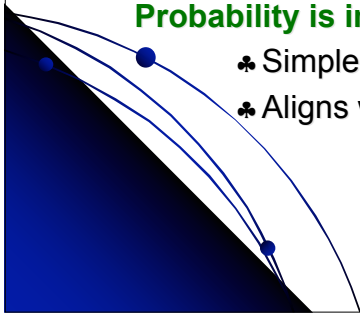
Data Analysis and Probability

Focus is on the Process of Statistical Investigations

- ♣ Pose the question
- ♣ Collect the data
- ♣ Analyze the data
- ♣ Interpret the data

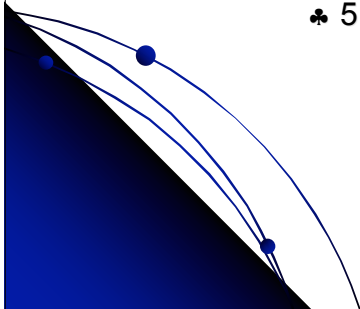
Probability is included in grades 3-4

- ♣ Simple probability only
- ♣ Aligns with NAEP by grade 4



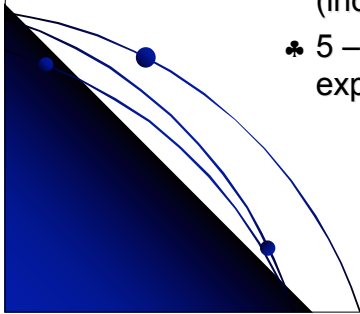
Types of Graphs

- ♣ K –concrete, pictorial
- ♣ 1 – pictorial, line plots
- ♣ 2 – Venn, and above
- ♣ 3 – tables, bar graphs
- ♣ 4 – line graphs and analyze circle graphs
- ♣ 5 – stem-and-leaf plots

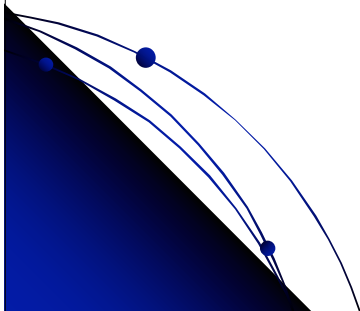


Describing Data

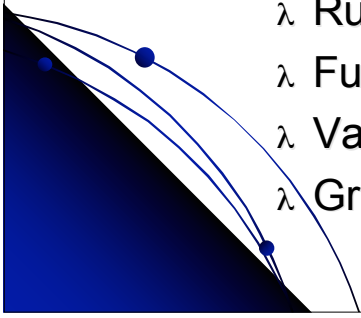
- ♣ K-1 – did the data answer the question?
- ♣ 2 – begin distinguishing between values and frequencies
- ♣ 3 – mode and variability
- ♣ 4 – mode, median, and variability (including unusual data)
- ♣ 5 – mode, median, variability, and explore concept of mean



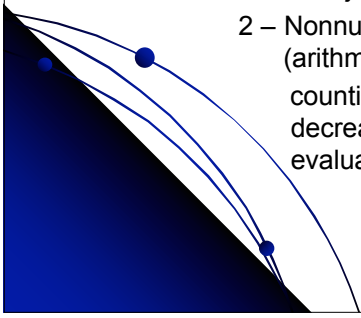
K-5 Algebra



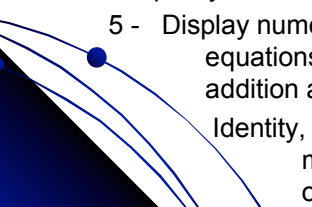
Important Algebraic Ideas

- λ Sorting and Classifying Attributes
 - λ Patterns
 - λ Equality
 - λ Rules and Relationships
 - λ Functions
 - λ Variables
 - λ Graphing
- 

Algebra

- K - Classify objects by one attribute; repeating patterns; relationships between part-part-whole and the concept of equality.
 - 1 - Classify objects by two attributes; extend and translate repeating patterns; model write and evaluate simple number sentences to develop an understanding of equality.
Determine and justify the value of the unknown.
 - 2 - Nonnumeric repeating and growing patterns (arithmetic sequences); odd and even numbers; counting by 2's, 5's and 10's; increase and decrease by ten from any given number. Write and evaluate number sentences; find the unknown.
- 

Algebra

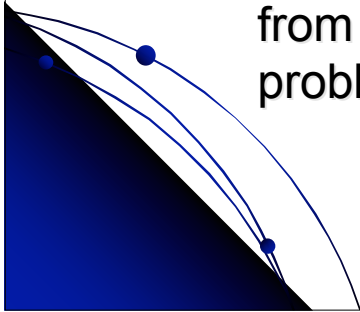
- 3 - Analyze and explore functional relationships; growing patterns; model, write and evaluate simple multiplication and division problems; identity and commutative properties for addition and multiplication.
 - 4 - Analyze numeric and nonnumeric growing patterns; model, write and evaluate whole number equations, equality and inequality; order of operations.
 - 5 - Display numeric results using coordinate graphs; write equations with symbolic rules; equations involving addition and subtraction of decimals and fractions. Identity, associative, distributive properties of multiplication and addition; apply order of operations..
- 

Problem Solving and Reasoning: Process Strand



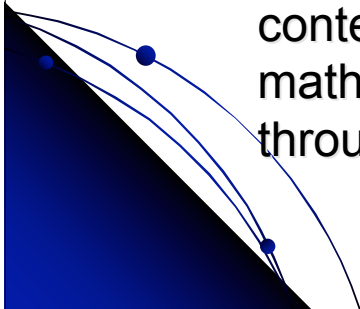
Essential Understandings

- λ Recognize and apply connections among mathematical ideas, connecting concepts and skills from different strands to solve problems



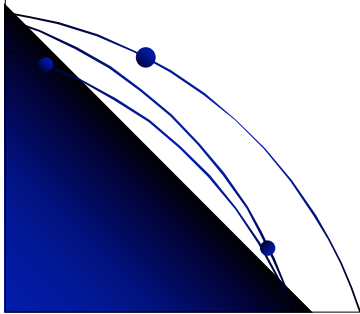
Essential Understandings

- λ Develop fluency in solving single and multi-step problems that arise in mathematics and in other contexts, building mathematical knowledge through problem solving



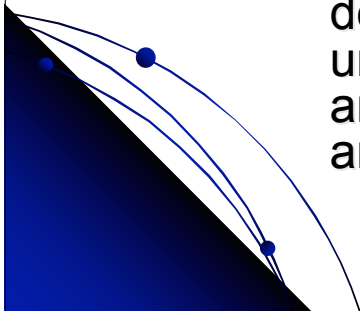
Essential Understandings

- λ Use reasoning to understand situations, reflect on mathematical problem solving, extend and refine thinking



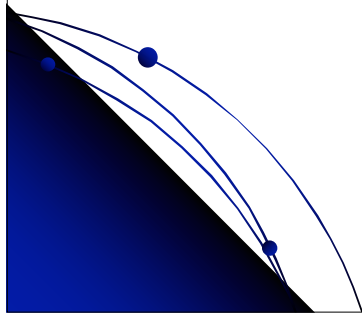
Essential Understandings

- λ Use the language and symbols of mathematics to communicate mathematical ideas demonstrating understanding of problems and results through oral and written explanations



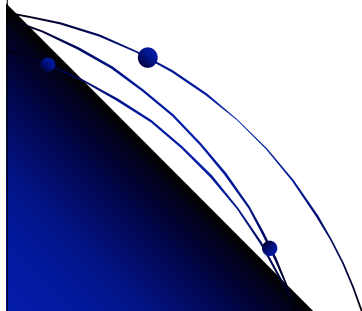
Essential Understandings

- λ Create and use representations to organize, record and communicate mathematical ideas



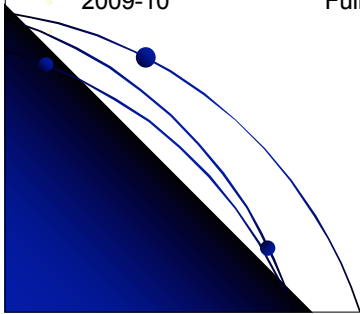
Your Opportunity for Input

<http://community.learnnc.org/dpi/math/>



Timeline for Revisions

- September 18, 2007 DRAFT 2 and Feedback Survey Available on-line
- October 30, 2007 DRAFT 3 Available-FINAL
- November 6, 2007 Present to SBE Subcommittee
- December 4, 2007 SBE: information and discussion
- January 2008 SBE: Vote
- 2008-2009 Transition Year (Both sets of Standards)
- Nov 2008 Textbook Caravan
- March 1, 2009 Textbook orders due from school systems
- Summer '09 Summer Institutes
- 2009-10 Full implementation of revised Standards
Planned Standards, Curriculum, Textbooks,
Instruction, Assessment, Testing aligned



Final Thoughts

