

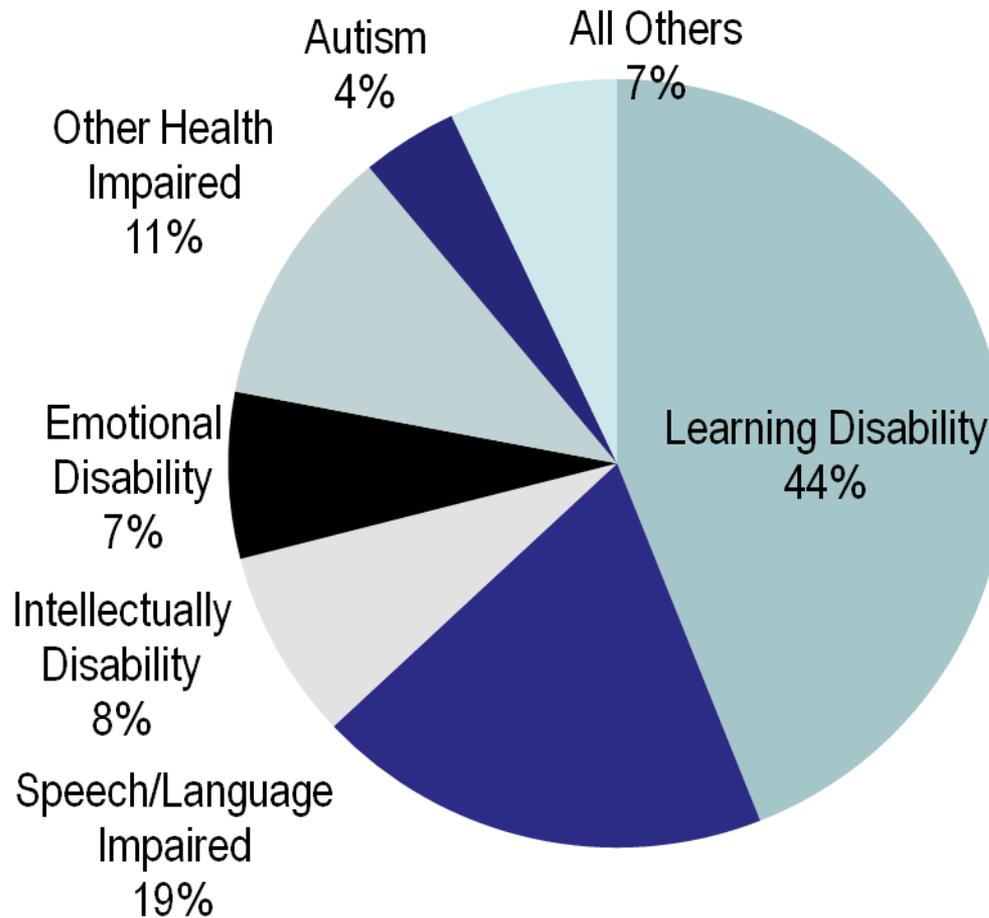


# Building Blocks of Mathematics: Remember to see it from their perspective.

**Georgia Department of Education**  
**Divisions for Special Education Services and Supports**  
**1870 Twin Towers East**  
**Atlanta, Georgia 30334**

*"We will lead the nation in improving student achievement."*

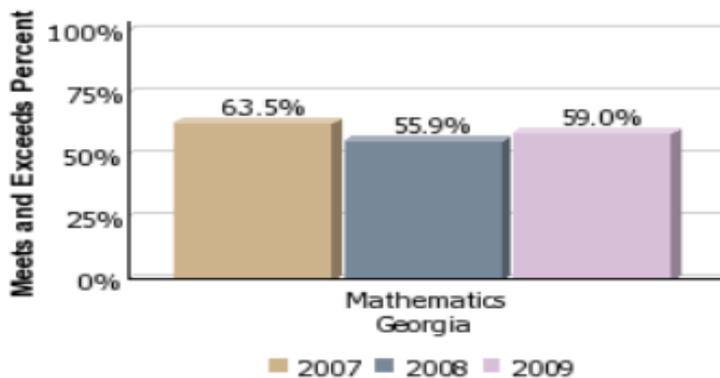
# Georgia Special Education Students by Disability Category



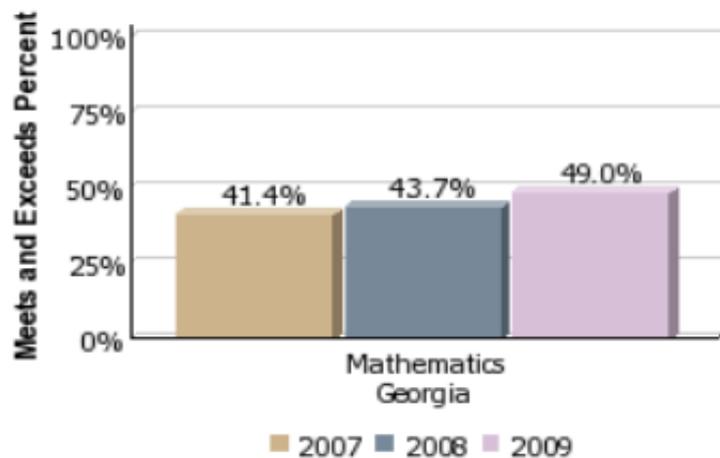
*"We will lead the nation in improving student achievement."*

# CRCT - Mathematics

Grades 1-5

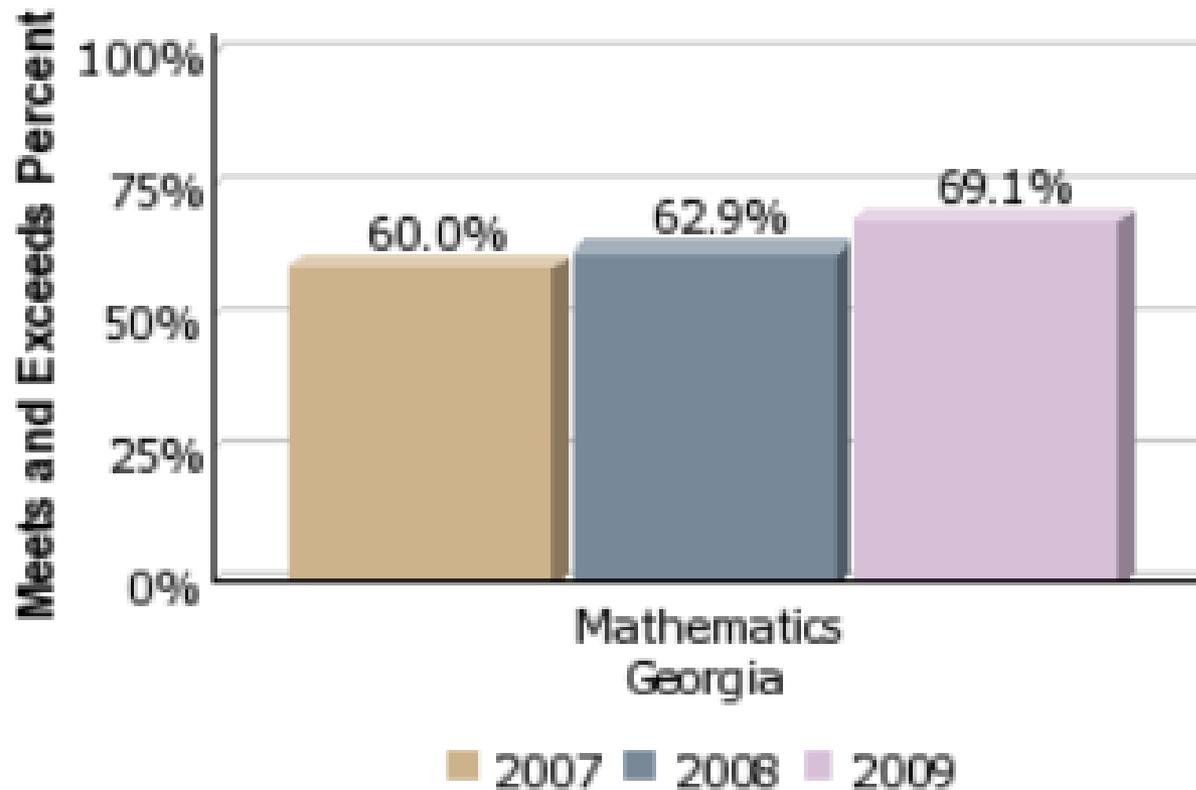


Grades 6-8



*"We will lead the nation in improving student achievement."*

# GHSGT - Mathematics



*"We will lead the nation in improving student achievement."*

# APR - CRCT and Enhanced GHSGT

Percentage of Students Meeting  
or Exceeding Standards

Georgia

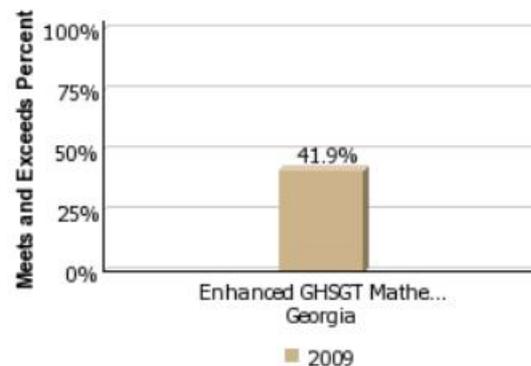
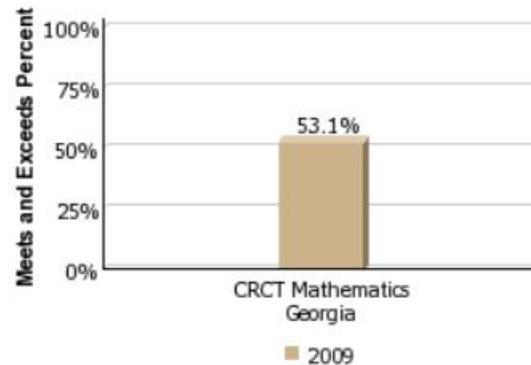
2009

CRCT Mathematics

53.1%

Enhanced GHSGT Mathematics

41.9%



*"We will lead the nation in improving student achievement."*



# Students with Disabilities?

*“We will lead the nation in improving student achievement.”*



# The Essential Questions

- A. What's behind the struggle?
- B. Why does acceleration work?
- C. How can we best transform SWD into capable math students?
- D. What resources are available?

*"We will lead the nation in improving student achievement."*

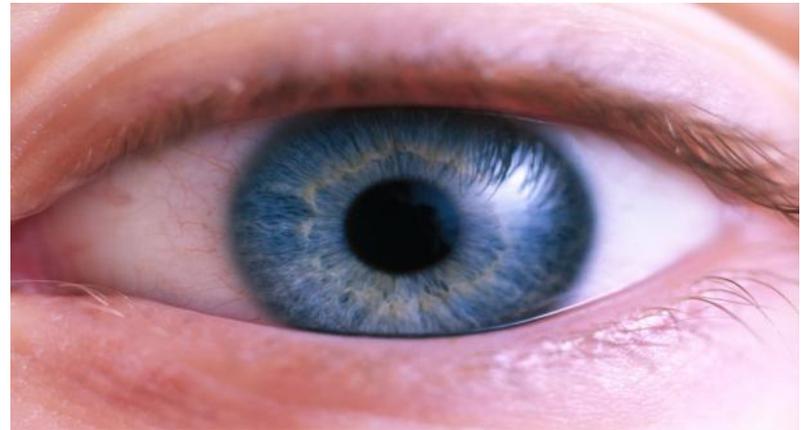
# Processing

- **Processing Deficits** are problems with the processes of recognizing and interpreting information taken in through the senses.
- The two most common areas of processing difficulty associated with learning disabilities are **visual** and **auditory perception**.
- Other processing difficulties are **memory** (working, factual, and procedural), **distractibility**, **attention**.

*“We will lead the nation in improving student achievement.”*

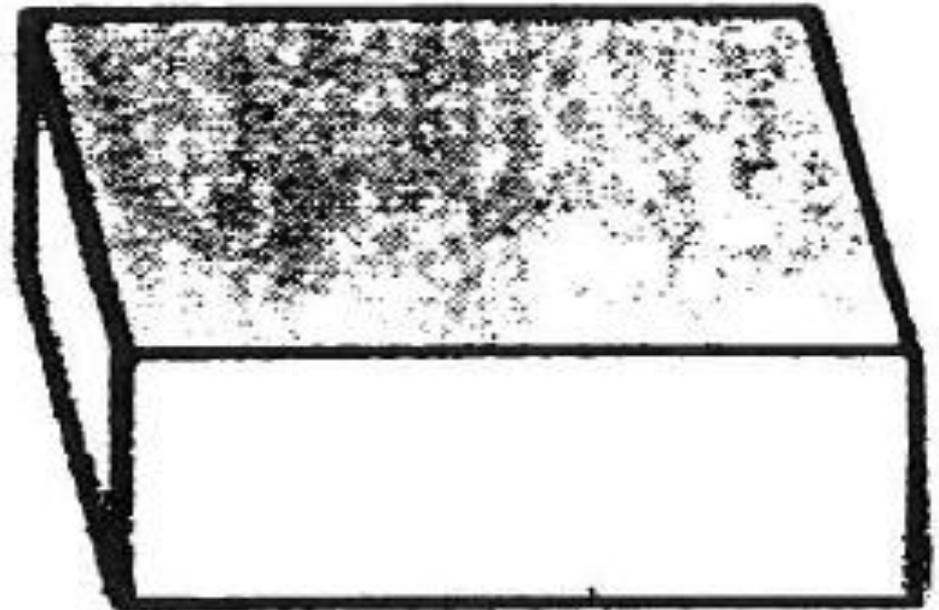
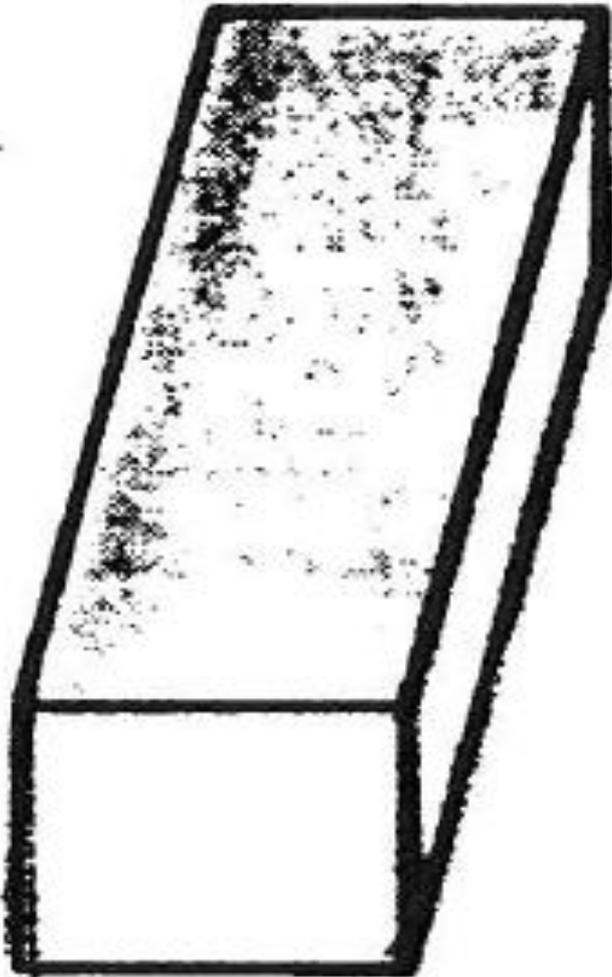
# Visual Processing Disorder

- Spatial relation
- Visual discrimination
- Visual closure
- Visual agnosia
  - (object recognition)
- Whole/part relationships
- Visual motor integration



*“We will lead the nation in improving student achievement.”*

# Which block has the larger dimension?



*we will lead the nation in improving student achievement.*

Which letter is it? Which number is it?

b d p q

14 1 4 41

4 + 1

*"We will lead the nation in improving student achievement."*

# Activity

- Misunderstood Minds
  - Spatial activity
  - <http://www.pbs.org/wgbh/misunderstoodminds>

*“We will lead the nation in improving student achievement.”*

# Auditory Processing Disorder

- Phonological awareness
- Auditory discrimination
- Auditory memory
- Auditory sequencing
- Auditory blending



*“We will lead the nation in improving student achievement.”*

# Got Memory?

- Working Memory
- Factual Memory
- Procedural Memory



*"We will lead the nation in improving student achievement."*

# Try This

- 6 5 8 7 4 5 6 8 4
- 3 2 1 9 5 6 4 2 1
- 6 5 1 5 1 3 2 3 5

- A. Multiply the third number in the first row by the seventh number in the third row.
- B. Add this result to the fifth number in the second row.
- C. Add to this total ten times the fourth number in the third row.
- D. Subtract the eighth number in the first row from the result.

[www.pbs.org/wgbh/misunderstoodminds](http://www.pbs.org/wgbh/misunderstoodminds)

*"We will lead the nation in improving student achievement."*

# Distractibility vs Attention

- Distractibility
  - Visual distractibility
  - Auditory distractibility
  - Tactile distractibility
- Attention

*“We will lead the nation in improving student achievement.”*

# Activity

- Misunderstood Minds  
visual  
auditory

<http://www.pbs.org/wgbh/misunderstoodminds>

*"We will lead the nation in improving student achievement."*

# Got the Vocabulary?

93%

of teachers assume if you read the word in the passage you will understand the paragraph.

## COMPREHENSION

*"We will lead the nation in improving student achievement."*

# Foundations for Success

National Mathematics Advisory Panel  
Final Report, March 2008

- Children’s goals and beliefs about learning are related to their mathematics performance.
  - Children’s beliefs about the relative importance of effort and ability can be changed.
  - Experimental studies have demonstrated that changing children’s beliefs from a *focus on ability* to a *focus on effort* increases their engagement in mathematics learning, which in turn improves mathematics outcomes.

*“We will lead the nation in improving student achievement.”*

# Motivational Research Indicates

- “...the beliefs that individuals create and develop and hold to be true about themselves...are vital forces in their success or failure at school.”

Frank Pajares, *Self-efficacy Beliefs in Academic Contexts*, 2002

*“We will lead the nation in improving student achievement.”*

# Self-efficacy & Tasks

- “...those who feel self-efficacious about learning or performing a task competently are apt to participate more **readily**, **work harder**, **persist longer** when they encounter difficulties, and achieve at higher levels.”

Schunk & Meece, Self-Efficacy Beliefs of Adolescents, 2005

*“We will lead the nation in improving student achievement.”*

# Foundations for Success

National Mathematics Advisory Panel

Final Report, March 2008

- Scientific Knowledge on Learning and Cognition Needs to be Applied to the classroom to Improve Student Achievement:
  - To prepare students for Algebra, the curriculum must **simultaneously** develop conceptual understanding, computational fluency, factual knowledge and problem solving skills.
  - Limitations in the ability to keep many things in mind (working memory) can hinder mathematics performance.

*“We will lead the nation in improving student achievement.”*

# The challenge is...

- To create an environment that fosters math self-efficacy, support processing deficits while utilizing instructional strategies that maximize math potential.

*“We will lead the nation in improving student achievement.”*

# So? Where do we start?

- “You see, in life, lots of people know what to do, but few people actually do what they know. Knowing is not enough! You must take action.”

Anthony Robbins

- “Too often we give our children answers to remember rather than problems to solve.”

Roger Lewis

*“We will lead the nation in improving student achievement.”*

# Critically Important

These gaps have to be closed in tandem:

1. Self-efficacy
2. Processing deficits
3. Math knowledge
4. Strategies



*"We will lead the nation in improving student achievement."*

# Acceleration can close both gaps

- Students move forward, not backward
- Gaps in math education filled in context while moving forward
- The largest indicator of student success is self-efficacy, not I.Q. Acceleration builds success!
- Scaffolding, vocabulary, & remediation “Just in time,” not “Out of Context”
- Two days ahead, not years behind
- Remediation in context when they need the skill, rather than in isolation.

*“We will lead the nation in improving student achievement.”*

# Characteristics of an Environment that Builds Self-Efficacy

- Choices (Provides a sense of autonomy & control)
- Non-competitive (evaluated on task, not compared to other students.)
- Accommodate processing deficits (Stimulate all the senses , but not necessarily all at once)
- Descriptive, quick feedback
- Builds success early
- Promote an active participant rather than a passive observer.

*“We will lead the nation in improving student achievement.”*

# Co-Teaching

- General Educators have knowledge of the curriculum
- Special Educators have knowledge of instructional processes for students who learn atypically

Blending Co-Teaching structures  
with Research based Instruction

*“We will lead the nation in improving student achievement.”*

# What makes Co-Teaching SPECIAL?

- Collect student data, monitor and support student behavior
- Jigsaw instruction
- Think-out-louds
- Explicit instruction – Solve It! Program.
- CRA
- Cover, Copy, Compare technique
- Visual Mnemonic technique

*“We will lead the nation in improving student achievement.”*

# Research shows the biggest gains with the following strategies:

1. Systematic and explicit instruction (large effect)
2. Student think-alouds (large effect)
3. Visual and graphic depiction of problems (moderate effect)

Effect size of .80 = Large

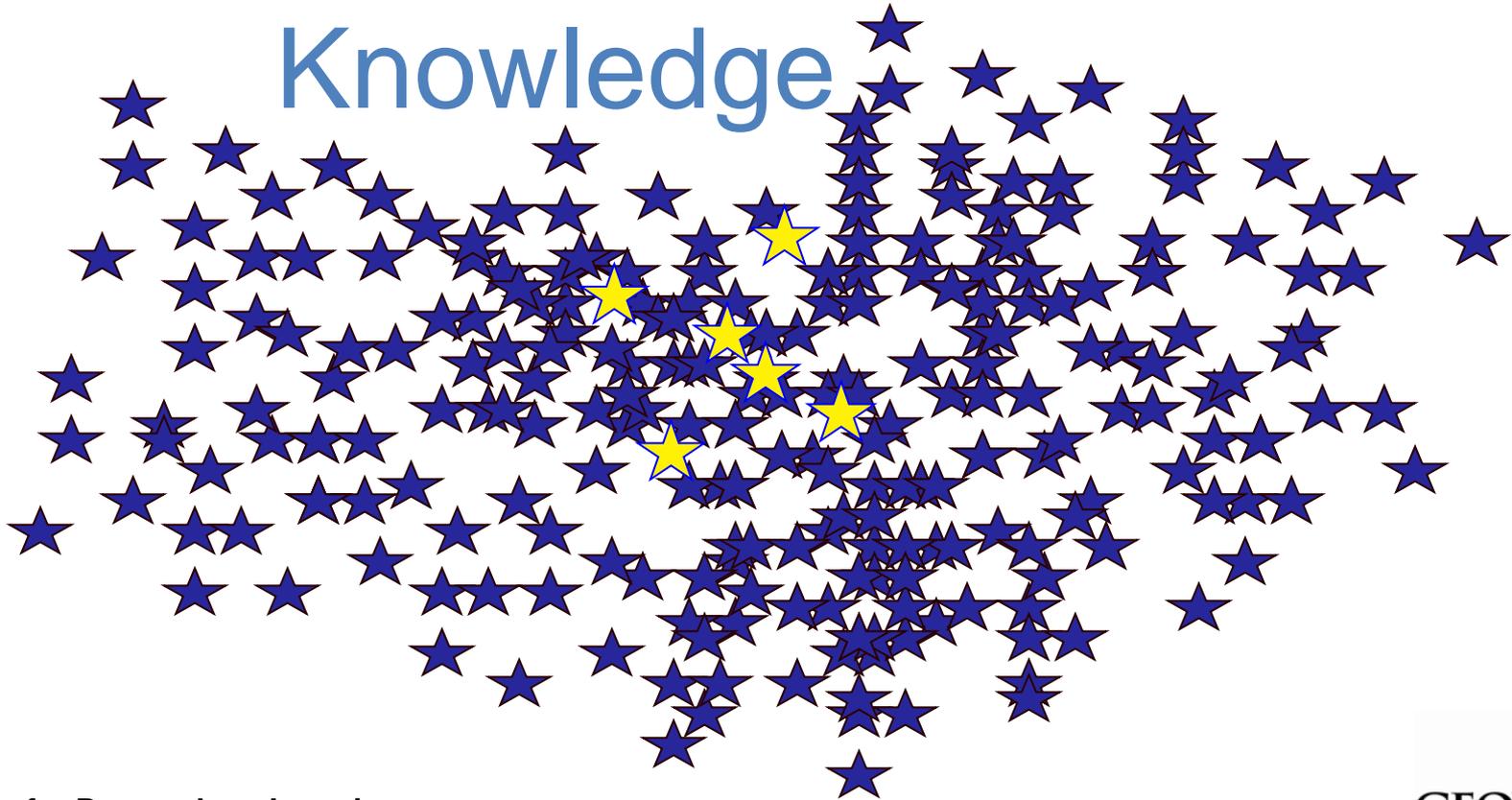
Effect size of .50 = Moderate

Effect size of .25 = Small

*"We will lead the nation in improving student achievement."*

# Thinking about the curriculum:

## Knowledge



Center for Research on Learning

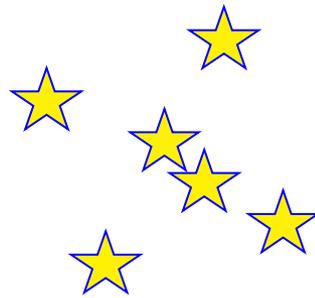
*"We will lead the nation in improving student achievement."*

# Thinking About the Curriculum...

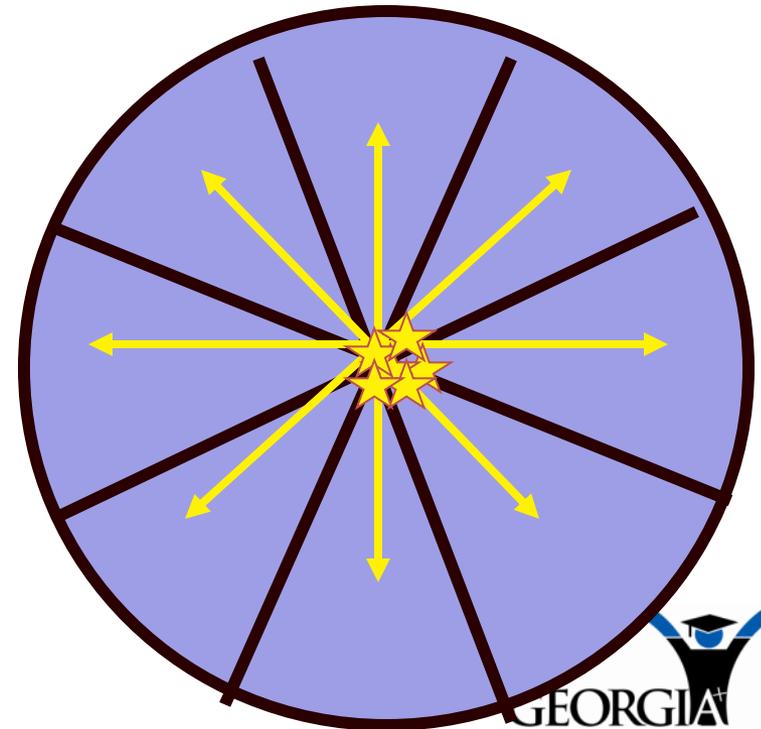
Knowledge



Critical Content



Course

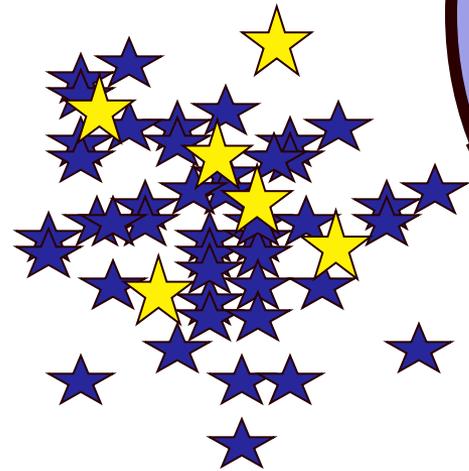


Center for Research on Learning

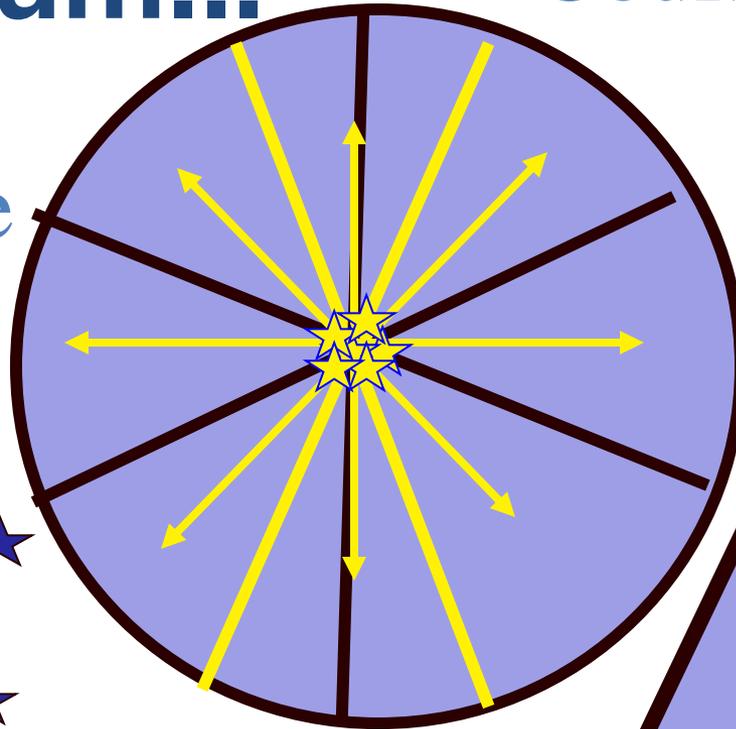
*"We will lead the nation in improving student achievement."*

# Thinking About the Curriculum...

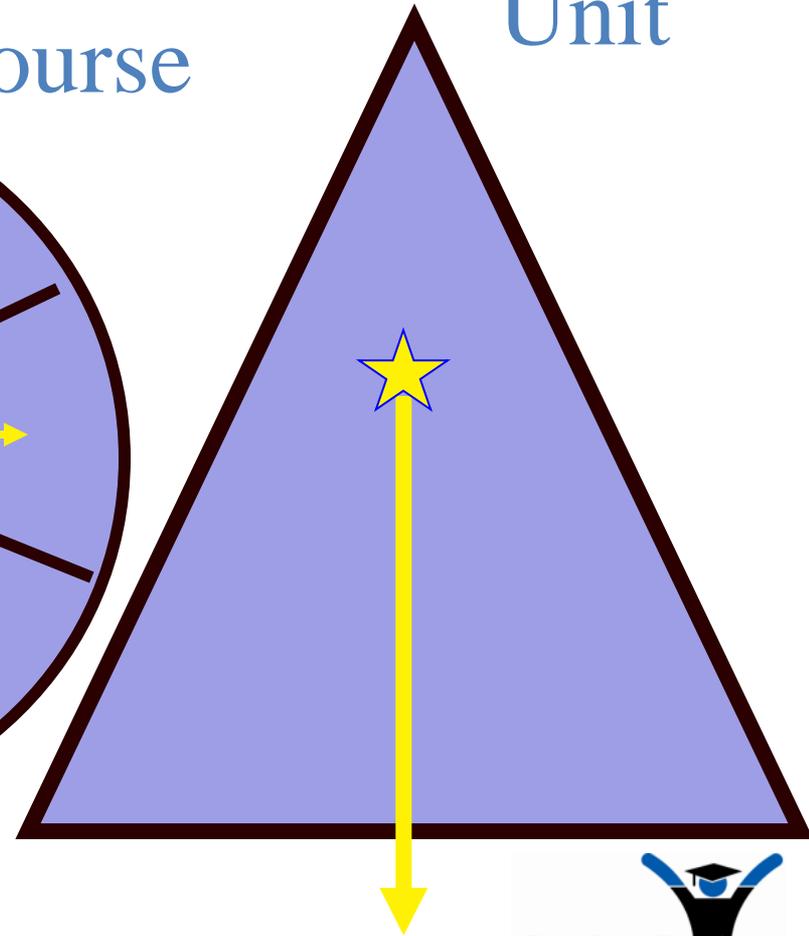
Knowledge



Course

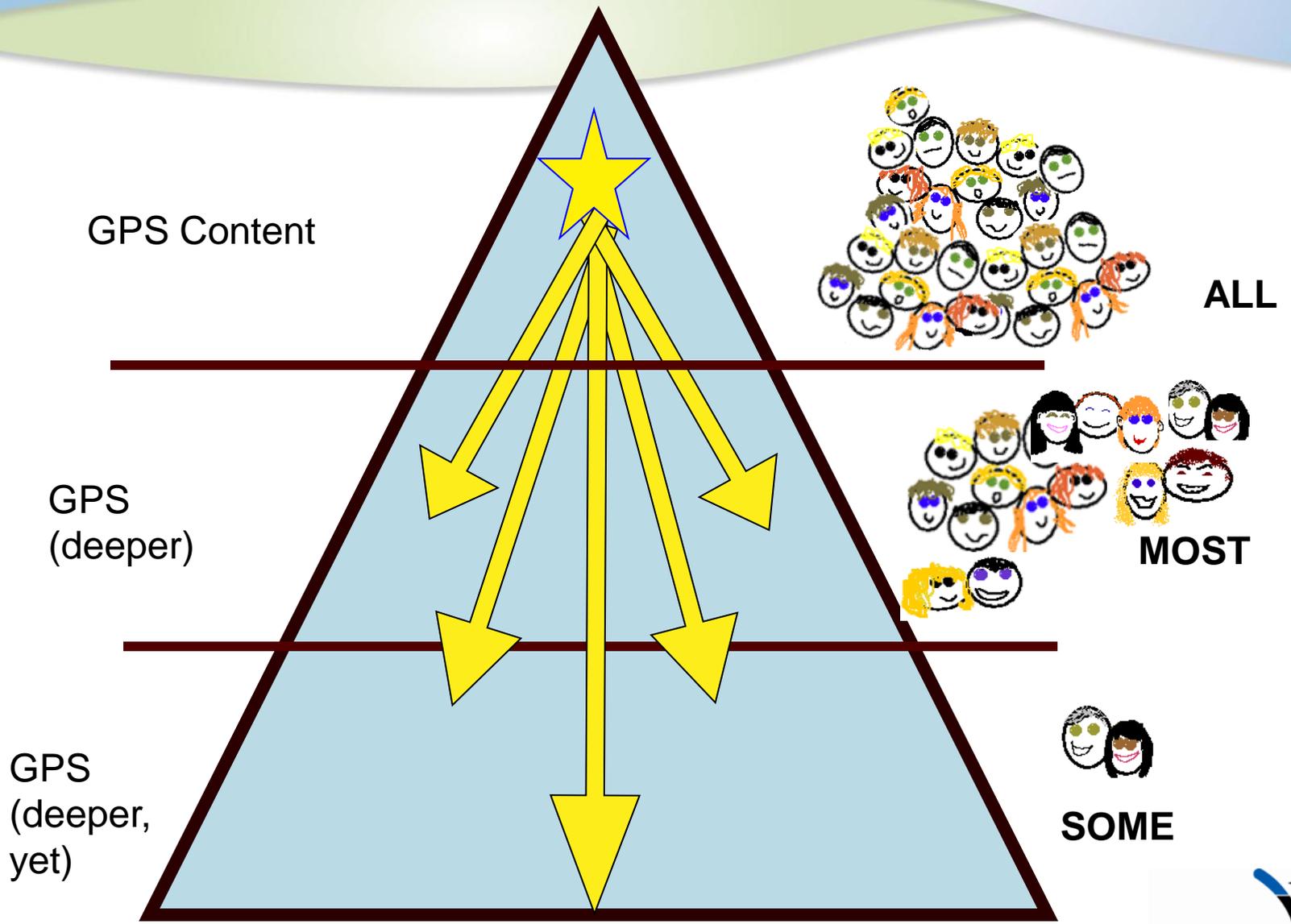


Unit



Center for Research on Learning

*"We will lead the nation in improving student achievement."*



Adapted from Center for Research on Learning

*"We will lead the nation in improving student achievement."*

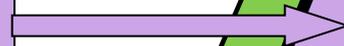
# A Unit

Thinking for  
Problem Solving &  
Generalization



ALL

Thinking for  
Manipulating  
Content

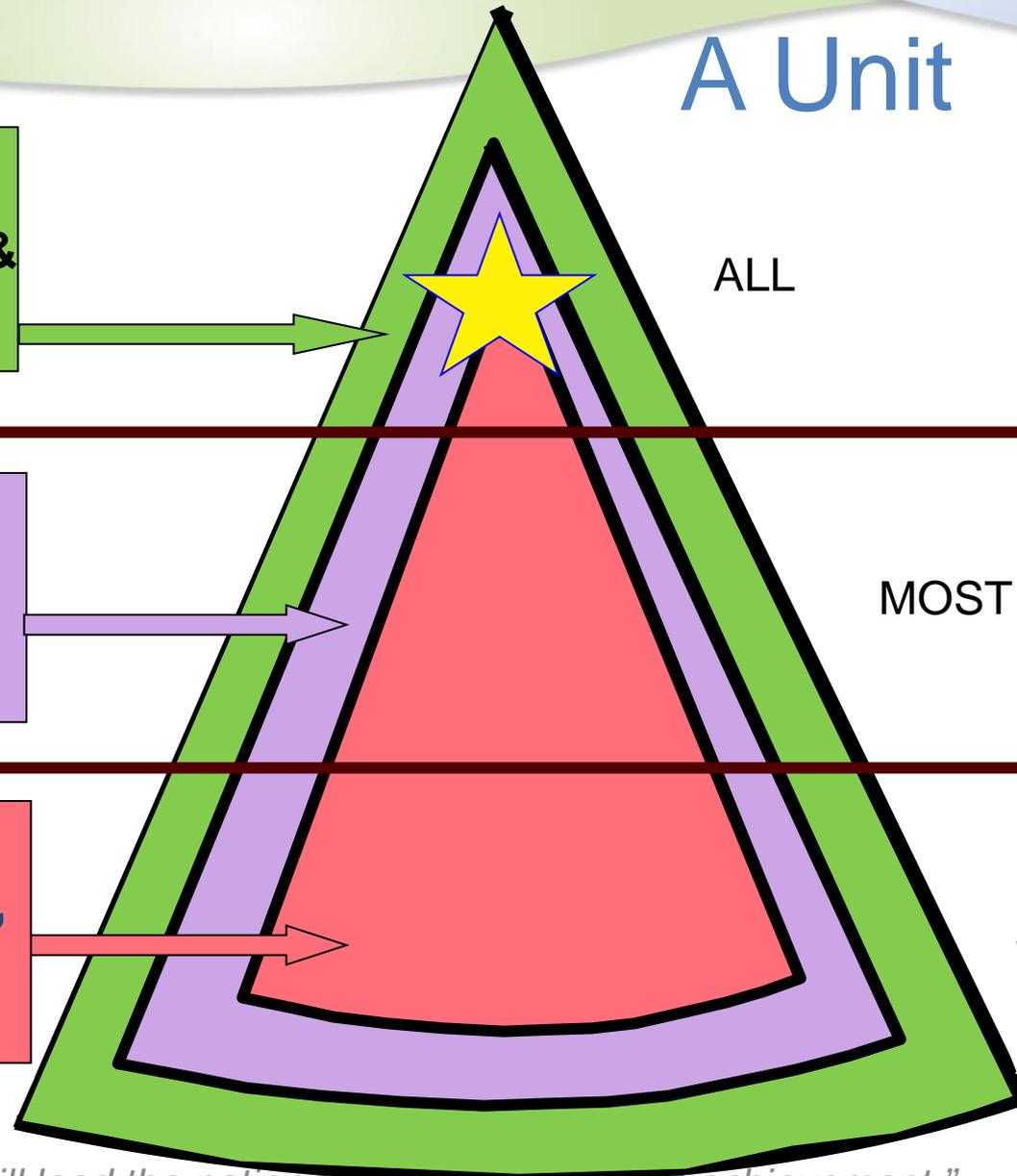


MOST

Acquisition of  
Concepts, Facts,  
Principles, &  
Propositions



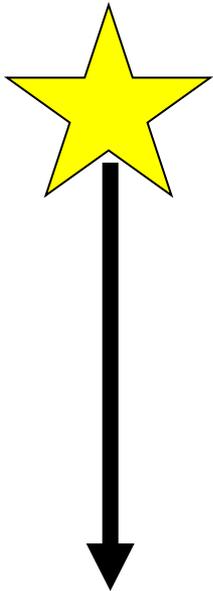
SOME



# Backward Design

*What is sufficient evidence for demonstrating understanding of the critical content?*

# ***Start with the end in mind***



- **Start with unit/lesson questions that are derived from standards and benchmarks.**
- **Design assessment procedures.**
- **Select/construct teaching devices, activities, and routines that ensure students meet assessment criteria.**

# Map the critical content

“If I stopped one of your students in the hallway as they left your class after taking the unit test and asked, “What was that unit about?” What would you want them to say?”



# RESOURCES

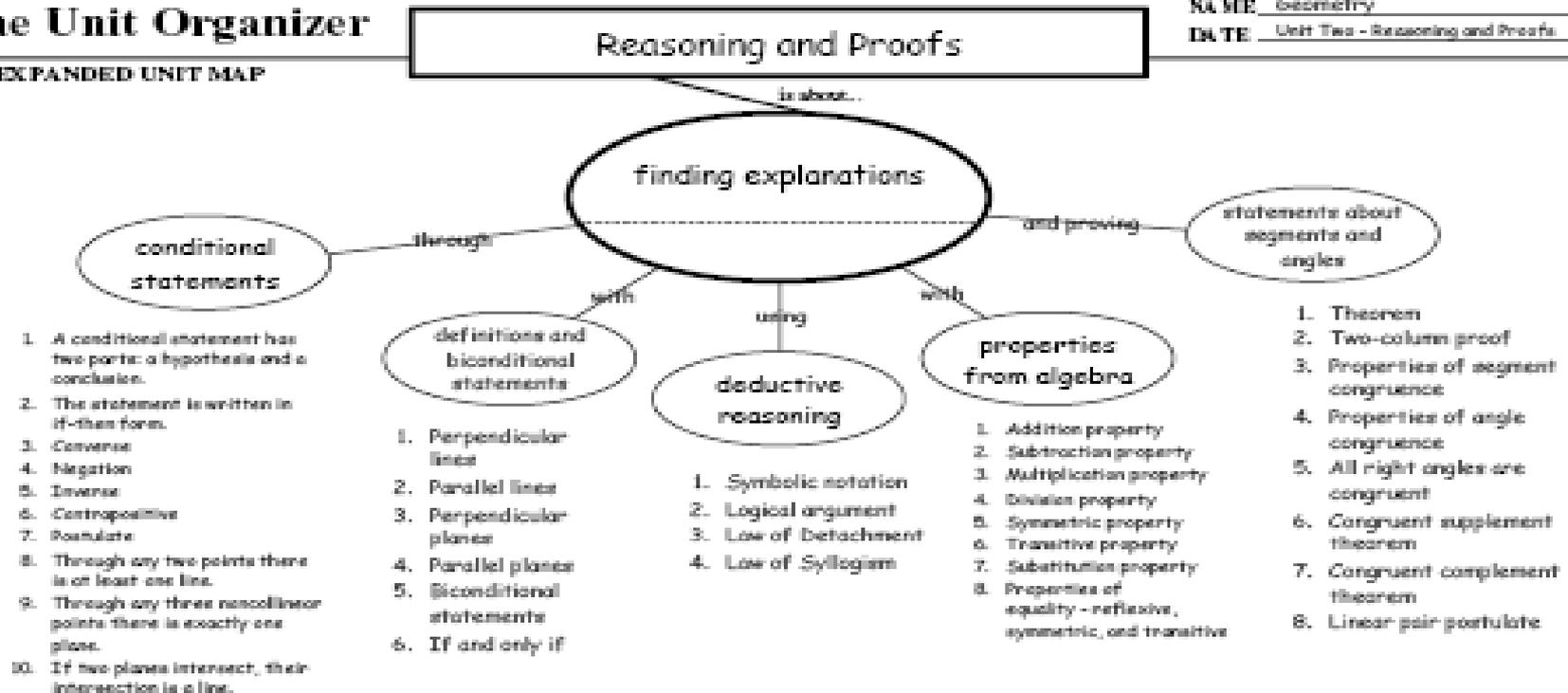
*"We will lead the nation in improving student achievement."*

# Graphic Organizers

## The Unit Organizer

NAME Geometry  
DATE Unit Two - Reasoning and Proofs

### 9 EXPANDED UNIT MAP



### 10 NEW UNIT SELF-TEST QUESTIONS

1. How do you use deductive reasoning to prove that lines are parallel or perpendicular?

# COMPARISON TABLE

② OVERALL CONCEPT

## Triangles

① CONCEPT

### Congruent Triangles

① CONCEPT

### Similar Triangles

③ CHARACTERISTICS

Corresponding angles are congruent  
 Corresponding sides are congruent  
 Logic  
 CPCTC  
 Four ways of proving the triangles are congruent: SSS, SAS, ASA, AAS, HL  
 Theory

③ CHARACTERISTICS

Corresponding angles are congruent  
 Corresponding sides are proportional  
 Scale Factor  
 Three ways to show the triangles are similar: SSS, AA, SAS (Similarity Theorems)  
 Applications  
 Find the measure of the missing side  
 Proportions

⑨ EXTENSIONS

FRAME : One proof and one measurement problem

④ LIKE CHARACTERISTICS

Corresponding angles are congruent

⑤ LIKE CATEGORIES

Corresponding angles

⑥ UNLIKE CHARACTERISTICS

Corresponding sides are congruent  
 Four ways to prove the triangles are congruent  
 CPCTC

Corresponding sides are proportional  
 3 ways to prove similar  
 Similarity Theorem

⑦ UNLIKE CATEGORIES

Sides  
 Ways to prove Theorems

⑧ SUMMARY

Congruent and similar triangles both have congruent corresponding angles, but they differ in their sides (congruent vs. proportional), ways to prove, and theorems.

Step 1: Communicate targeted concepts

Step 2: Obtain Overall Concept

Step 3: Make lists of known characteristics

Step 4: Pin down Like Characteristics

Step 5: Assemble Like Categories

Step 6: Record Unlike Characteristics

Step 7: Identify Unlike Categories

Step 8: Nail down a summary

Step 9: Go beyond the basics

# MATH FRAME

## Key Topic Deductive Reasoning

is about...

process of reasoning in which the argument supports the conclusion based on a rule  
(making conclusions based on known facts).

Main Idea

Symbolic notation

Essential details

conditional statements  
 $p \rightarrow q$   
converse  $q \rightarrow p$

$\sim$   
negation  
 $\sim p$

biconditional statements  
 $p \leftrightarrow q$

$p$  is hypothesis  
 $q$  is conclusion

Main Idea

Logical argument

Essential details

using if-then statements

using givens

using algebra concepts  
and properties

using postulates and  
theorems

Main Idea

Law of Detachment

Essential details

if  $p \rightarrow q$  is a true statement and  
 $p$  is a true statement, then we  
can conclude that  $q$  is true.

Example: If Jon gets 2 weeks  
of vacation, he will go to Europe.

He gets 2 weeks of  
vacation.

Therefore, we can conclude  
that Mark is going to Europe.

Main Idea

Law of Syllogism

Essential details

if  $p \rightarrow q$  and  $q \rightarrow r$  are both  
true, then we can conclude that  
 $p \rightarrow r$ .

Example: If Susan earns  
her course credits, she will  
graduate.

If she graduates, she  
will go to college.

Therefore, if Susan earns her  
course credits, she will go to  
college.

So What? (Whats important to understand about this?)

When we use deductive reasoning, we can make logical arguments in geometry.

# Paul Riccomini

- Workshops
  - Building Strategies to Help Students with Disabilities Graduate: Improving Academic Success in Math (SPDG)
  - Strategies for Making AYP for Math (SPDG)
- Elluminates
  - Error Analysis Procedures
- Video

*“We will lead the nation in improving student achievement.”*

# Eluminates

- ❖ **Teacher Talk** (Talking about Learning and Kids)
  - Grade level
  - Math Support I bi-monthly talks
- ❖ **Special Education with General Education**
  - 10-15-08 Improving Academic Performance of SWD's for Elementary Mathematics
  - 11-12-08 Improving Academic Performance of SWD's for Secondary Mathematics
  - 01-14-09 SIA Mathematics Vocabulary & Interleave Strategies
  - 02-11-09 SIA Mathematics 1 and Mathematics Support, Space Learning
  - 03-18-09 SIA Mathematics: Graphic representation & Flexible groups (PAL)

*"We will lead the nation in improving student achievement."*

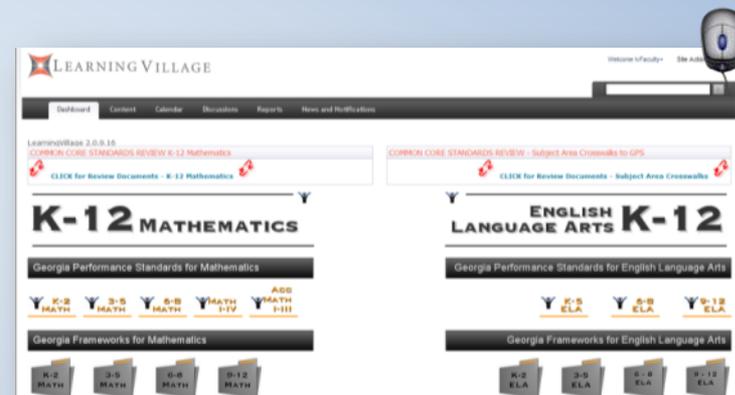


# LEARNING VILLAGE

Learning Village, a resource in alignment to the Georgia Performance Standards, has been designed to achieve a balance among concepts, problem solving, and skill development in Georgia's Mathematics classrooms. This resource stresses rigorous concept development, presents realistic and relevant tasks, and keeps a strong emphasis on computational skills.

*This website includes:*

- standards
- REVISED framework units
- classroom and training videos
- mathematics parent letters
- vertical alignment charts
- webinars
- middle school mathematics webcasts
- PowerPoint unit overviews (coming soon)



*“We will lead the nation in improving student achievement.”*

# GeorgiaStandards.org...

Kathy Cox, State Superintendent of Schools

Home | Georgia Performance Standards | Frameworks | Resources & Videos | Training | GSO Builder

About Us | Teachers | Administrators | Parents | Contact Us



teachers administrators parents

**Please Pardon Our Progress**

The Advanced Search feature has been temporarily disabled. Any search currently performed on this site will not return relevant results, including use of the search engine above. We apologize for any inconvenience this may cause. Please review these helpful links:

- How to Access Standards
- How to Access Frameworks

**Quick Links**



**Announcements**

- NEW CTAE Middle School Instructional Resources
- NEW Lexile Framework for Reading in Action
- NEW Fine Arts Performance Standards
- NEW Health Education Standards
- Proposed REVISED Performance Standards for Eight High School CTAE Courses
- Proposed NEW Science Performance Standards

*"We will lead the nation in improving student achievement."*

# Accessing Learning Village

The screenshot shows the MyGaDOE website interface. At the top, it identifies Kathy Cox as the State Superintendent of Schools. A navigation bar includes links for Home, Georgia Performance Standards, Frameworks, Resources & Videos, Training, and GSO Builder. Below this is another bar with links for About Us, Teachers, Administrators, Parents, and Contact Us. The main content area features a 'MyGaDOE' header, a 'Please Log In' section with fields for Username and Password, and a 'Login' button. A link for 'I forgot my passphrase!' is also present. To the right, a 'Helpful links' section lists various resources like the MyGaDOE Online Guide, GaDOE Public Website, Information Systems, AYP & NCLB, Georgia Standards, Data Collections, Financial Reports, and Report Card. A message at the bottom states 'This website requires JavaScript enabled in your browser.' A callout bubble points to the 'Or sign up for an account' link, explaining that users without a login should click there to gain access to Learning Village. The footer includes the Georgia Department of Education logo and the slogan 'We will lead the nation in improving student achievement.'

Kathy Cox, State Superintendent of Schools

Home | Georgia Performance Standards | Frameworks | Resources & Videos | Training | GSO Builder

About Us | Teachers | Administrators | Parents | Contact Us

Please Pardon Our Progress

## MyGaDOE

### Please Log In

Username:

Password:

[I forgot my passphrase!](#)

[Or sign up for an account](#)

#### Helpful links

- ◆ [MyGaDOE Online Guide](#)
- ◆ [GaDOE Public Website](#)
- ◆ [Information Systems](#)
- ◆ [AYP & NCLB](#)
- ◆ [Georgia Standards](#)
- ◆ [Data Collections](#)
- ◆ [Financial Reports](#)
- ◆ [Report Card](#)

This website requires JavaScript enabled in your browser.

ments | Feedback

Copyright

**LEXILE**

**OAS**  
Georgia's  
Online Assessment System

**GEORGIA**  
DEPARTMENT OF  
**EDUCATION**  
Kathy Cox, State Superintendent of Schools

*"We will lead the nation in improving student achievement."*

# Dashboard of Instructional sources ...

LearningVillage 2.0.9.16

COMMON CORE STANDARDS REVIEW K-12 Mathematics



[CLICK for Review Documents - K-12 Mathematics](#)



COMMON CORE STANDARDS REVIEW - Subject Area Crosswalks to GPS



[CLICK for Review Documents - Subject Area Crosswalks](#)



## K-12 MATHEMATICS

Georgia Performance Standards for Mathematics

 K-2 MATH

 3-5 MATH

 6-8 MATH

 MATH I-IV

 ACC MATH I-III

Georgia Frameworks for Mathematics

 K-2 MATH

 3-5 MATH

 6-8 MATH

 9-12 MATH

## ENGLISH LANGUAGE ARTS K-12

Georgia Performance Standards for English Language Arts

 K-5 ELA

 6-8 ELA

 9-12 ELA

Georgia Frameworks for English Language Arts

 K-2 ELA

 3-5 ELA

 6-8 ELA

 9-12 ELA

*"We will lead the nation in improving student achievement."*

# Revised Elementary Frameworks

## Revised frameworks include:

Updated Standards

Differentiation

Essential Questions

Updated Tasks

Background Knowledge

The collage displays four pages from the Georgia Department of Education's Grade 1 Mathematics Frameworks. The top-left page is the title page for 'Grade 1 Mathematics Frameworks', Unit 3: Shapes and Fractions. The middle-left page is a performance task titled 'Graphing Attributes' with a small illustration of a person climbing stairs. The top-right page shows standards for 'Area' and 'Perimeter' with associated essential questions. The bottom-right page shows standards for 'Area' and 'Perimeter' with associated essential questions.

*"We will lead the nation in improving student achievement."*

# Revised Middle School Frameworks

## Revised frameworks include:

Teacher's Edition

Student Edition

Essential Questions

Updated Tasks

Background Knowledge

**M A T H E M A T I C S**

Grade 8  
Mathematics  
Frameworks

Unit 2  
The Powers That Be

Teacher's Edition

**M A T H E M A T I C S**

Grade 8  
Mathematics  
Frameworks

Unit 2  
The Powers That Be

Student Edition

**GEORGIA**  
DEPARTMENT OF  
**EDUCATION**  
Kathy Cox, State Superintendent of Schools

**Task: A Few Folds**

**ESSENTIAL QUESTIONS**

- "What are exponents used and why are they important?"
- How do I simplify and evaluate algebraic expressions involving integer exponents and roots?"

**TASK COMMENTS**

In this task, students will explore with integer exponents to describe and continue patterns. Students may want to create and use a table to organize their work and findings. Allow students time to explore, discover, and generalize the properties of exponents and practice simplifying expressions with integer exponents.

**A Few Folds**

**Part 1:**

Repeatedly fold one piece of paper in half, recording the number of folds and the resulting number of layers of paper. Assuming that you could continue the pattern, how many layers of paper would there be for 10 folds, 100 folds,  $n$  folds? How do you know?

**Solution**

Number of folds	1	2	3	4	5	100	$n$
Number of layers of paper	2	4	8	16	32	1024	$2^n$
Number of layers of paper written using integer exponents	$2^1$	$2^2$	$2^3$	$2^4$	$2^5$	$2^{100}$	$2^n$

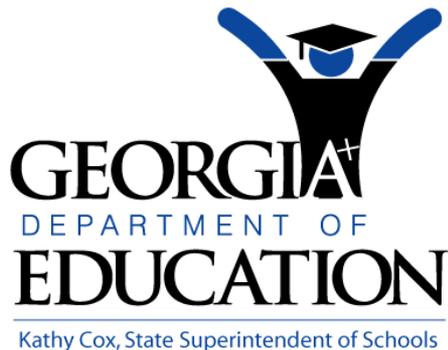
Students should see that each fold resulted in twice as many layers of paper as the previous fold.

**GEORGIA**  
DEPARTMENT OF  
**EDUCATION**  
Kathy Cox, State Superintendent of Schools

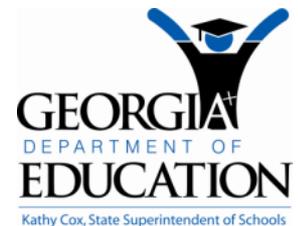
*"We will lead the nation in improving student achievement."*

# PBS TeacherLine

PBS TeacherLine is an online tool that offers low-cost, high-quality professional development classes to teachers so they can improve their abilities and earn the Professional Learning Units -- or PLUs -- they need to maintain their certification.



*"We will lead the nation in improving student achievement."*



# Mathematics Newsletters

## Mathematics Newsletters include:

Content Articles

Resources

Illuminate Calendar

Professional Learning  
Opportunities

Assessment Articles

Instructional Articles

**GEORGIA DEPARTMENT OF EDUCATION**

8-MONTHLY MATHEMATICS NEWSLETTER

# Mathematics

Issue 1 September 15, 2009

**In this Issue...**

- Assessment [P.1](#)
- Training [P.1](#)
- Learning Village [P.2](#)
- Featured GPS Classroom [P.2](#)

**Calendar**

September 15, 2009

- Math Supervisors webinar
- Mathematics I Support webinar

September 23, 2009

- Collaborative Math I & II webinar

October 1, 2009

- Grades 3-5 webinar
- Grades 6-8 webinar
- Mathematics I Support webinar

October 6, 2009

- Grades K-2 webinar
- Mathematics I webinar

October 13, 2009

- Mathematics I webinar

**MATHEMATICS TRAINING**

The Georgia Department of Education Mathematics Department, in collaboration with the Regional Education Service Agencies (RESA) and the Educational Technology Centers (ETC), will offer a one-day training session *Assessing for Mathematics EOCT Success: Part II* during the fall semester of the 2009-2010 school year.

This one day training session is built around the Mathematics I EOCT released items. Mathematics I and II teachers will be able to discuss and model the construction of test items, use Depth of Knowledge (DOK) in daily planning, and analyze results that will impact instruction in Tier 1 general classes and Tier 2 Mathematics Support classes.

Please remember that local school systems and/or RESA's will be responsible for managing the professional learning units (PLU) that may be connected with this session.

Registration is now open.  
Click [here](#) to register for *Assessing for Mathematics EOCT Success*.

**ASSESSMENT**

You may know that standardized tests are made up of items that reflect a variety of Georgia Performance Standards (GPS) for each grade level. But did you know that items also reflect different levels of cognitive complexity? Each item has a depth of knowledge (DOK) assigned to it in addition to a standard and element.

In assessing students, there are three possible DOK levels. Level 1 requires a student to recall information. Items may ask students to order, compute, estimate, or read from data displays. Level 2 requires a student to engage in mental processing beyond recall. Items may ask students to extend, solve, compare, explain, analyze, or construct data displays. Level 3 requires a student to reason using evidence and a higher level of thinking than Level 1 and Level 2. Items may ask students to predict, justify, convince, generalize, or translate knowledge into new context.

For more information on DOK levels, please click [here](#) and go to pages 24 and 25.

Click [here](#) to access Illuminate.

*"We will lead the nation in improving student achievement."*

# Mathematics Newsletters

To subscribe to the bi-monthly newsletter, send an email with no message to the appropriate email address listed below:

<mailto:join-mathematics-k-5@list.doe.k12.ga.us>

<mailto:join-mathematics-6-8@list.doe.k12.ga.us>

<mailto:join-mathematics-9-12@list.doe.k12.ga.us>

<mailto:join-mathematics-districtsupport@list.doe.k12.ga.us>

<mailto:join-mathematics-administrators@list.doe.k12.ga.us>

<mailto:join-mathematics-resa@list.doe.k12.ga.us>



*“We will lead the nation in improving student achievement.”*

# Parent Letters

## Mathematics Parent Letters include:

Each letter provides glimpses of the content investigated in class, suggestions for activities to explore at home, vocabulary used in the unit, grade-appropriate readings related to the math content, and links to websites that contain additional background information or practice opportunities for skills development.

**CSI Unit Diagram**

**Further Investigations**  
In this section, the reader can find activities that parents can do with their students at home to extend or enrich the learning from the classroom.

**Terminology**  
Vocabulary for the unit is defined in this section of the Unit.

**Book 'em**  
Non-math books (or chapters in higher grades) are listed in this section. These references provide pictures of the math content being used, or they suggest the need or usefulness of the mathematics.

**Classroom cases and Case closed-evidence**  
These sections provide sample problems or activities that might be investigated in class along with typical solutions or results.

**Clues**  
In the Clues section are hints for understanding and appreciating the mathematics. For example, this section tells the reader that circle graphs are often called pie charts.

**Related Files**  
If the user clicks on this section (or enters the address in his browser), he will be referred to links for student practice and background information for topics addressed in the unit.

**CSI: MATHEMATICS Curriculum Support Information**  
A mathematics resource for parents, teachers, and students

**Fractions and Decimals**  
Students will:

- Recognize that the denominator of a fraction and that it represents the total number of the set or whole.
- Recognize that the denominator is the bottom number of a fraction and that it represents the total number of the set or the whole.
- Explain the concept that the larger the denominator, the smaller the size of the piece.
- Compare circle fractions and help students to understand that two circles of equal size are not the same.
- Recognize halves, thirds, fourths, eighths, tenths using various fraction models.

**Classroom Cases:**

- Use a number line to represent  $\frac{3}{5}$ .

**Case Closed - Evidence:**

$\frac{3}{5} = \frac{6}{10} = 0.6$

- You have 18 balls in a game of the lot and you only get 5 in the bucket. Check a representation of your score and write your score as a fraction and a decimal fraction.

**Case Closed - Evidence:**

Fraction:  $\frac{3}{5}$       Decimal: 0.6

- If you cut it into two different size pieces with the denominator remaining the same, halves, thirds, fourths, and tenths will represent the pieces of each. (Draw pictures to represent your answer.)

**Case Closed - Evidence:**

Clues:

A circle fraction is just another name for a decimal fraction.

Circle fractions are used to understand the relationship between fractions and decimals. The whole is represented by the number 1.0. For example,  $\frac{1}{2} = 0.5$  and  $\frac{1}{10} = 0.1$ .

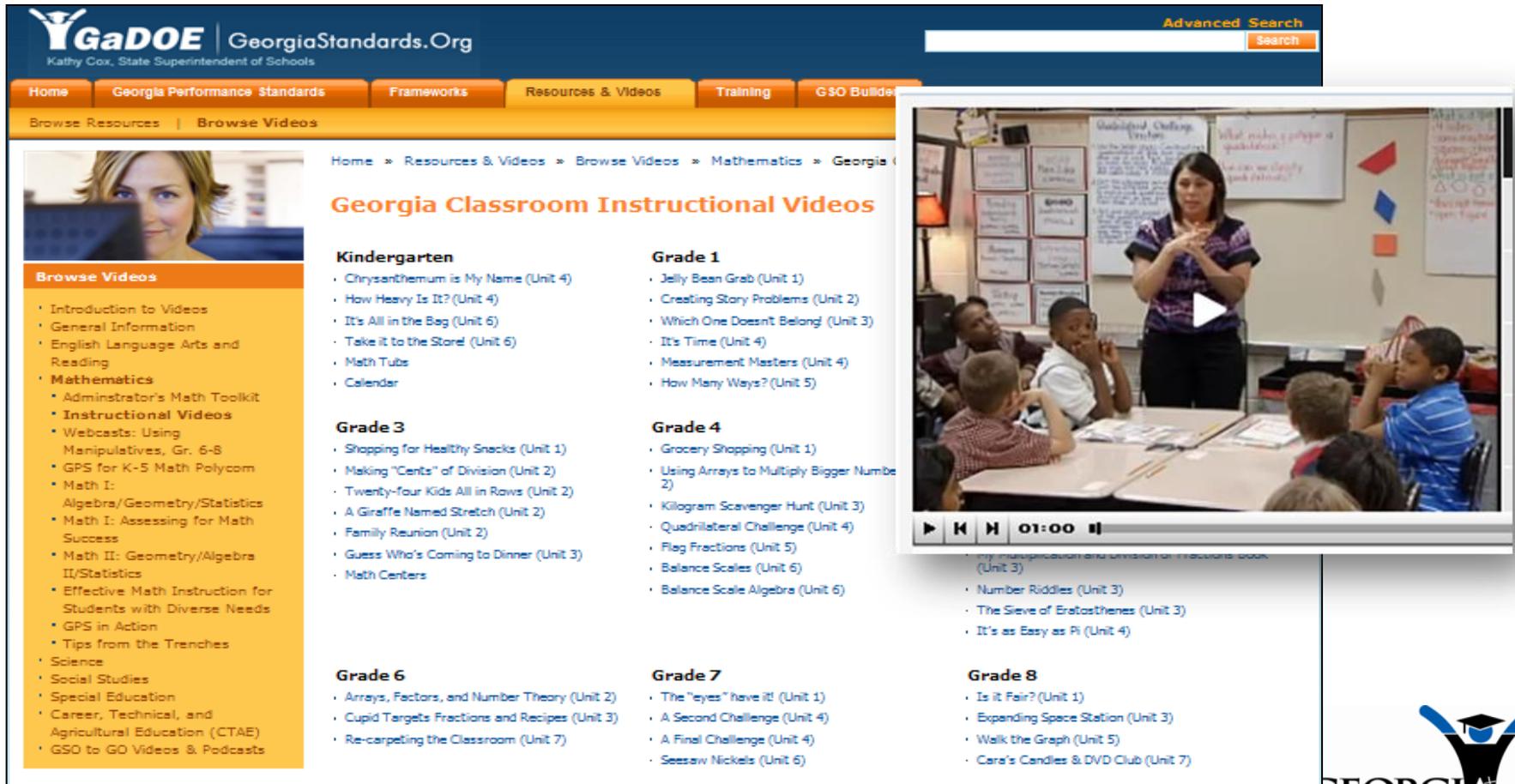
Students get confused when they see a fraction always written as a decimal. They don't always see that a fraction can be represented by a decimal. It is a good idea to show that a fraction and a decimal are the same.

**Related Files:**

[www.ccsde.org/math/units](http://www.ccsde.org/math/units)

*"We will lead the nation in improving student achievement."*

# GPS Mathematics Classroom Videos



**GaDOE** | GeorgiaStandards.Org  
Kathy Cox, State Superintendent of Schools

Advanced Search  
Search

Home | Georgia Performance Standards | Frameworks | Resources & Videos | Training | GSO Builders

Browse Resources | Browse Videos

Home » Resources & Videos » Browse Videos » Mathematics » Georgia Classroom Instructional Videos

## Georgia Classroom Instructional Videos

**Kindergarten**

- Chrysanthemum is My Name (Unit 4)
- How Heavy Is It? (Unit 4)
- It's All in the Bag (Unit 6)
- Take it to the Store! (Unit 6)
- Math Tubs
- Calendar

**Grade 1**

- Jelly Bean Grab (Unit 1)
- Creating Story Problems (Unit 2)
- Which One Doesn't Belong! (Unit 3)
- It's Time (Unit 4)
- Measurement Masters (Unit 4)
- How Many Ways? (Unit 5)

**Grade 3**

- Shopping for Healthy Snacks (Unit 1)
- Making "Cents" of Division (Unit 2)
- Twenty-four Kids All in Rows (Unit 2)
- A Giraffe Named Stretch (Unit 2)
- Family Reunion (Unit 2)
- Guess Who's Coming to Dinner (Unit 3)
- Math Centers

**Grade 4**

- Grocery Shopping (Unit 1)
- Using Arrays to Multiply Bigger Number 2)
- Kilogram Scavenger Hunt (Unit 3)
- Quadrilateral Challenge (Unit 4)
- Flag Fractions (Unit 5)
- Balance Scales (Unit 6)
- Balance Scale Algebra (Unit 6)

**Grade 6**

- Arrays, Factors, and Number Theory (Unit 2)
- Cupid Targets Fractions and Recipes (Unit 3)
- Re-carpeting the Classroom (Unit 7)

**Grade 7**

- The "eyes" have it! (Unit 1)
- A Second Challenge (Unit 4)
- A Final Challenge (Unit 4)
- Seesaw Nickels (Unit 6)

**Grade 8**

- Is it Fair? (Unit 1)
- Expanding Space Station (Unit 3)
- Walk the Graph (Unit 5)
- Cara's Candles & DVD Club (Unit 7)

**Browse Videos**

- Introduction to Videos
- General Information
- English Language Arts and Reading
- **Mathematics**
  - Administrator's Math Toolkit
  - Instructional Videos
  - Webcasts: Using Manipulatives, Gr. 6-8
  - GPS for K-5 Math Polycom
  - Math I:
    - Algebra/Geometry/Statistics
  - Math I: Assessing for Math Success
  - Math II: Geometry/Algebra II/Statistics
  - Effective Math Instruction for Students with Diverse Needs
  - GPS in Action
  - Tips from the Trenches
- Science
- Social Studies
- Special Education
- Career, Technical, and Agricultural Education (CTAE)
- GSO to GO Videos & Podcasts

*"We will lead the nation in improving student achievement."*

# Mathematics Videos

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

- Administrator's Mathematics Toolkit
- Georgia Classroom Instructional Videos
- Webcasts: Using Manipulatives, Gr. 6-8
- GPS for K-5 Math Polycom, March, 2009
- Mathematics I: Algebra/Geometry/Statistics
- Mathematics I: Assessing for Mathematics Success
- Mathematics II: Geometry/Algebra II/Statistics
- Effective Mathematics Instruction for Students with Diverse Needs
- Georgia Performance Standards In Action
- Tips From the Trenches

*"We will lead the nation in improving student achievement."*

# What is georgiamath.org?

From  
<http://www.gadoe.org>

Look for the calculator!

Or go directly to:  
[georgiamath.org](http://georgiamath.org)

The screenshot shows the Georgia Department of Education (GaDOE) website. The header includes the GaDOE logo and navigation links: Home, About GaDOE, State Board of Ed., School Improvement, Curriculum, and Data Reporting. A banner features the slogan "Shaping brighter futures." and a photo of Kathy Cox, State Superintendent of Schools. Below the banner is a search bar. The main content area is divided into several sections: "GaDOE Website HIGHLIGHT" with links to various departmental areas; "FEATURE" highlighting the "Strategic Plan.. Mission and Goals"; "Georgia Performance Standards" with a link to "GeorgiaStandards.Org"; "SCHOOL FINDER" with a map of Georgia; "STRATEGIC PLAN" with a link to "View Strategic Mission and Goals"; and "GEORGIAMATH.ORG" with a link to "GEORGIA MATHEMATICS PROGRAM" and a small calculator icon. A red arrow points from the text "Look for the calculator!" to the calculator icon in the Georgia Math Program section.

*"We will lead the nation in improving student achievement."*

# What can you find at the [georgiamath.org](http://georgiamath.org) page?

- ❖ Introductory Video by Kathy Cox
- ❖ Comparison of QCC and GPS Course Content
- ❖ Information about learners requiring acceleration and learner requiring support
- ❖ Resources for Parents, Teachers and Educators
- ❖ General Information
- ❖ Link to [GeorgiaStandards.org](http://GeorgiaStandards.org)

*“We will lead the nation in improving student achievement.”*

# Year 3

- Mathematics III
- Mathematics Support III (optional)

*“We will lead the nation in improving student achievement.”*

# Fourth Year Mathematics Courses

- Mathematics IV
- Advanced Mathematical Decision Making
- Advanced Mathematical Decision Making in Industry and Government
- Advanced Mathematical Decision Making in Finance
- AP Statistics
- AP Calculus AB/BC

*“We will lead the nation in improving student achievement.”*

State Board Rule 160-4-2-.20	Course Numbers
Mathematics Support III	27.04600
Advanced Mathematical Decision Making	27.08500
Advanced Mathematical Decision Making in Industry and Government	27.08600
Advanced Mathematical Decision Making in Finance	27.08700

*“We will lead the nation in improving student achievement.”*

# Thanks to:

Richard D. Lavoie     [How Difficult Can This Be? A Learning Disabilities Workshop \(1989\)](#)

Dr. Mel Levine     <http://www.pbs.org/wgbh/misunderstoodminds>

<http://www.eyetricks.com/illusions.htm>

Center for Research on Learning  
Kansas Content Enhancements

Sileo, Jane M and van Garderen, Delinda (2010) Creating Optimal Opportunities to Learn Mathematics: Blending Co-Teaching Structures With Research-Based Practices. *Teaching Exceptional Children*, Vol.42, No. 3, pp.14-21.

*“We will lead the nation in improving student achievement.”*

# Presenters

## **Donna Ann Flaherty**

Education Program Specialist for  
Divisions for Special Education Services  
[dflaherty@doe.k12.ga.us](mailto:dflaherty@doe.k12.ga.us)

## **Sharon Hooper**

Mathematics Education Program Specialist  
[shooper@doe.k12.ga.us](mailto:shooper@doe.k12.ga.us)

## **Sharquinta Tuggle**

Teacher on Special Assignment – Mathematics  
[stuggle@doe.k12.ga.us](mailto:stuggle@doe.k12.ga.us)

*“We will lead the nation in improving student achievement.”*

# Final Thought...

- “A man who doubts himself is like a man who would enlist in the ranks of his enemies and bear arms against himself. He makes his failure certain by himself being the first person to be convinced of it.”  
- Alexandre Dumas

*“We will lead the nation in improving student achievement.”*