



Using Assistive Technology to Support Math Success

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

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Assistive Technology Definitions and Current Focus

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Definition of Assistive Technology

Assistive technology device



- Any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities.
- **EXCEPTION.** The term does not include a medical device that is surgically implanted, or the replacement of such device.

Individuals with Disabilities Education Improvement Act of 2004

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Definition of Assistive Technology

- **Assistive technology devices for math include a range of tools ranging from low technology to high technology that are used to support calculation, visual-spatial, organizational, and problem solving skills.**

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Current Educational Focus

- **The way in which special education and related services are provided to students with high incidence disabilities has changed as a result of recent legislative mandates.**
 - **Increased inclusion** in the general education curriculum.
 - **Increased academic demands** for all students.
 - Required **accountability** for student progress.



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Current Educational Focus

- **The change in focus is due to recent legislative mandates including:**
 - No Child Left Behind Act of 2001
 - Individuals with Disabilities Education Improvement Act of 2004



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No Child Left Behind Act of 2001



- **State and local education agencies are responsible for developing academic standards that are utilized to develop high quality instructional programs for all students.**
- **Students with disabilities must have access to the same standards-based curricula as their general education peers. The student's Individual Educational Program also determines educational programming.**

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No Child Left Behind Act of 2001

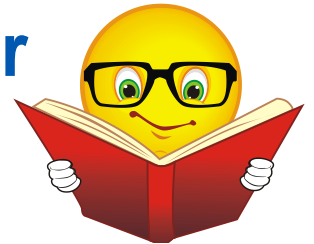
- **Students with disabilities must participate in testing to assess their progress in meeting these standards.**
 - Students with the most significant cognitive disabilities may participate in testing based on alternate achievement standards. The number of students participating in the alternate assessments must not exceed 1% of all students in the grades tested.



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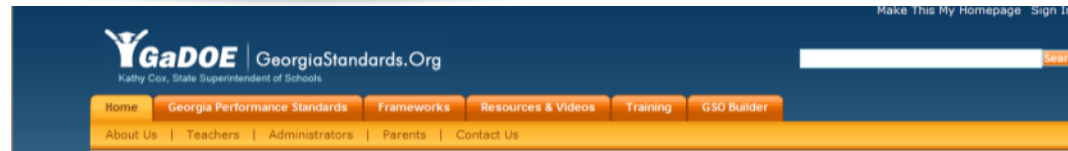
Individuals with Disabilities Education Improvement Act of 2004

- Children with disabilities should achieve to high academic standards developed for all students.
- Students should be provided with appropriate assistive technology devices and services as well as accommodations and modifications to assist them in making progress in their educational programs.
- School systems must be accountable for student achievement for all students.



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Georgia Performance Standards



- The Georgia Department of Education has established academic standards across core content areas.
- These standards are referred to as the Georgia Performance Standards and are available at <http://www.georgiastandards.org>
- Students with disabilities must have access to the standards-based general education curriculum.

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Math Difficulties and Supports

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Types of Math Difficulties

- **Persons experiencing difficulty with math may have problems in one or more of the following areas:**
 - Calculation
 - Visual-spatial skills
 - Organization
 - Problem Solving
- **To provide appropriate supports, we must determine the types of difficulties the student is experiencing.**

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Types of Math Difficulties

- **Many students require special education support, accommodations, modifications, and/or assistive technology to be able to make progress in a standards-based curriculum.**



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Research-based Strategies

- **Use mnemonic strategies - STAR**
 - Search, Translate, Answer, Review
- **Think Aloud**
 - Students with disabilities benefit from this strategy because it provides them with a model that enables them to break down complex concepts into meaningful chunks of information that they can understand.
- **Teach using concrete, moving to abstract – CRT - Concrete, Representational, Abstract**

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Research-based Strategies

- **Use graphic organizers** - They enable students to conceptualize abstract concepts and aid in their understanding of mathematical concepts.
 - *Hierarchical diagramming* involves having a main branch for the overall concept or information, followed by connected sub branches of supporting information or details.
 - *Sequence charts* represent a sequence of events or procedures to solve a math problem.
 - *Compare and contrast* charts highlight differences and similarities across two or three ideas or sets of information.

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Hierarchical Graphic Organizer

Polynomials

Monomial (polynomial of one term)	Binomial (polynomial of two terms)	Trinomial (polynomial of three terms)
5	$5a + 5b$	$5a + 6c + 12d$
x	$10h + 10i$	$x^2 + 2x^2 + 4x^3$
5b	$10 + 12i$	$4x^2 + 3x^2 + 6x$ (non-example)
1/5	$7y - 2x$	$3 + 4x + x^2$
10/2	$3x - 4x$ (non-example)	
$5a + 5a$		

Sequence Chart

Polya's Four Problem-Solving Steps

1. Understand the Problem

(What is the goal? Draw a representation)

2. Devise a Plan

(Is there a similar problem I can relate to this?)

3. Carry out the Plan

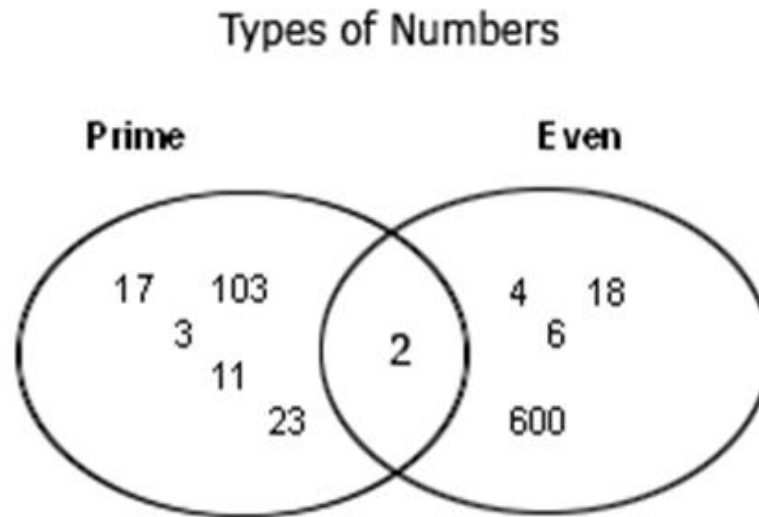
(Carry out plan and check each step)

4. Look Back

(Check answer)

Adapted from Polya, 1957

Compare and Contrast Venn Diagram



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Research-based Strategies

- **Peer Coaching**

- Use peer tutoring to increase academic motivation, increase time on task and build number concepts, math vocabulary, and measurement skills. Giving a student with difficulties the opportunity to teach or coach another will help that student learn the concept that he/she is teaching because he/she has to understand it in order to teach it.

- **Formative assessment**

- Students with mathematics disabilities have marked increases in mathematics performance when they receive frequent formative assessment coupled with specific feedback that highlights students' next steps. (NCTM)

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Research-based Strategies

- **Technology**

- Both assistive technology and accessible instructional technology have increased the availability of instructional materials in digital formats and have proven to address more learning needs of students with reading disabilities.
- Technology has been beneficial in building computation fluency, converting symbols, notations and text, building conceptual understanding, etc. (National Center for Technology Innovations, October 2004)



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Non-Endorsement Statement

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Technology Supports for Math

- **Assistive technology for math is used to:**
 - Remediate deficits
 - Compensate for deficits
- **Generally think of AT as Compensatory tools**
 - Used to enhance access to and success in completing instructional tasks which require students to demonstrate understanding of math concepts.

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Technology Supports for Math

- Remediation tools
 - Strategies and skill based instruction to improve the skills in area of deficit
 - Technology provides opportunities for:
 - Customization to student's level of instruction
 - Independent practice
 - Reinforcement
 - Accurate reporting and assessment

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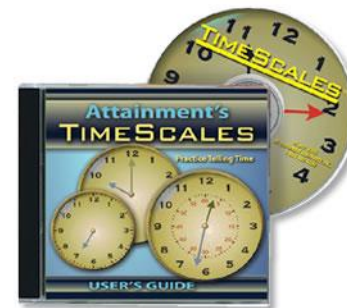
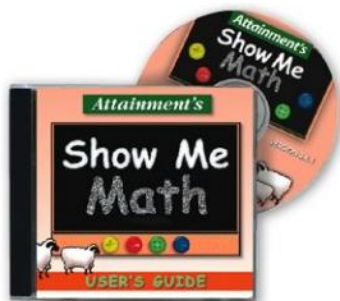
Technology Supports for Math

- Examples of remediation tools
 - Software
 - [National Library of Virtual Manipulatives](#)
 - [A Maths Dictionary for Kids - Jenny Eather](#)
 - [Coolmath4kids.com](#)
 - [The Ruler Game](#) – (RSInovative.com and Ricky Spears)
 - [Create A Graph](#) – NCES Kids' Zone

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Technology Supports for Math

- Reinforcing Math Software – (Attainment Company)



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National Library of Virtual Manipulatives

Haz clic aquí para ver este sitio web en español

Utah State UNIVERSITY

Virtual Library About eNLVM Buy Now! Search

Download New Free Trial Version 3.0!

Index	Pre-K – 2	3 – 5	6 – 8	9 – 12
Number & Operations				
Algebra				
Geometry				
Measurement				
Data Analysis & Probability				



A Maths Dictionary For Kids

2008



by Jenny Eather

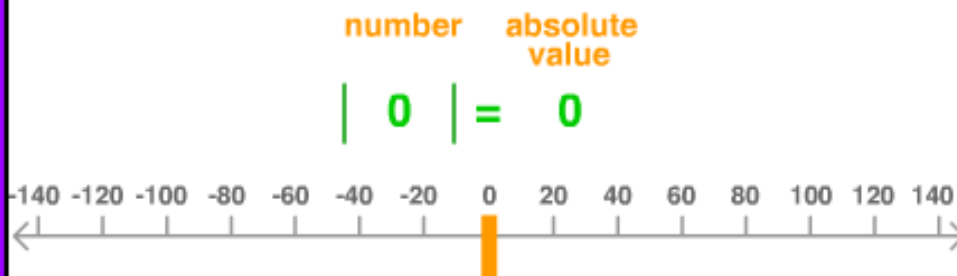
Aa Bb
 Cc Dd
 Ee Ff
 Gg Hh
 Ii Jj
 Kk Ll
 Mm Nn
 Oo Pp
 Qq Rr
 Ss Tt
 Uu Vv
 Ww Xx
 Yy Zz

abacus
 abacus - Chinese
 absolute value
 abundant number
 acre
 acute angle
 acute triangle
 addend
 add, addition
 additive identity
 adjacent
 algorithm
 align
 altitude
 altitude (triangle)
 algebra
 a.m.
 amount
 analogue clock
 angle
 angle of rotation
 annual, annually
 annulus
 anti-clockwise
 apex
 approximate
 arc
 area
 arithmetic
 arms (of an angle)
 array
 ascending order
 associative law
 asymmetry
 attribute
 average
 axis

absolute value

- the absolute value of a number (x or -x) is just the value of the numeral, ignoring the sign,
- that is, the distance the number is from zero on the number line.
- written as $|x| = x$ or $|-x| = x$

EXAMPLES:



Drag the yellow bar
 along the number line
 to see the numbers and
 their absolute value.

Symbol: | |



other Sites

▶ RainForest Maths
 ▶ Writing Fun

▶ help

▶ feedback

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lessons / practice

geometry / art

math games

puzzles

other fun

teachers

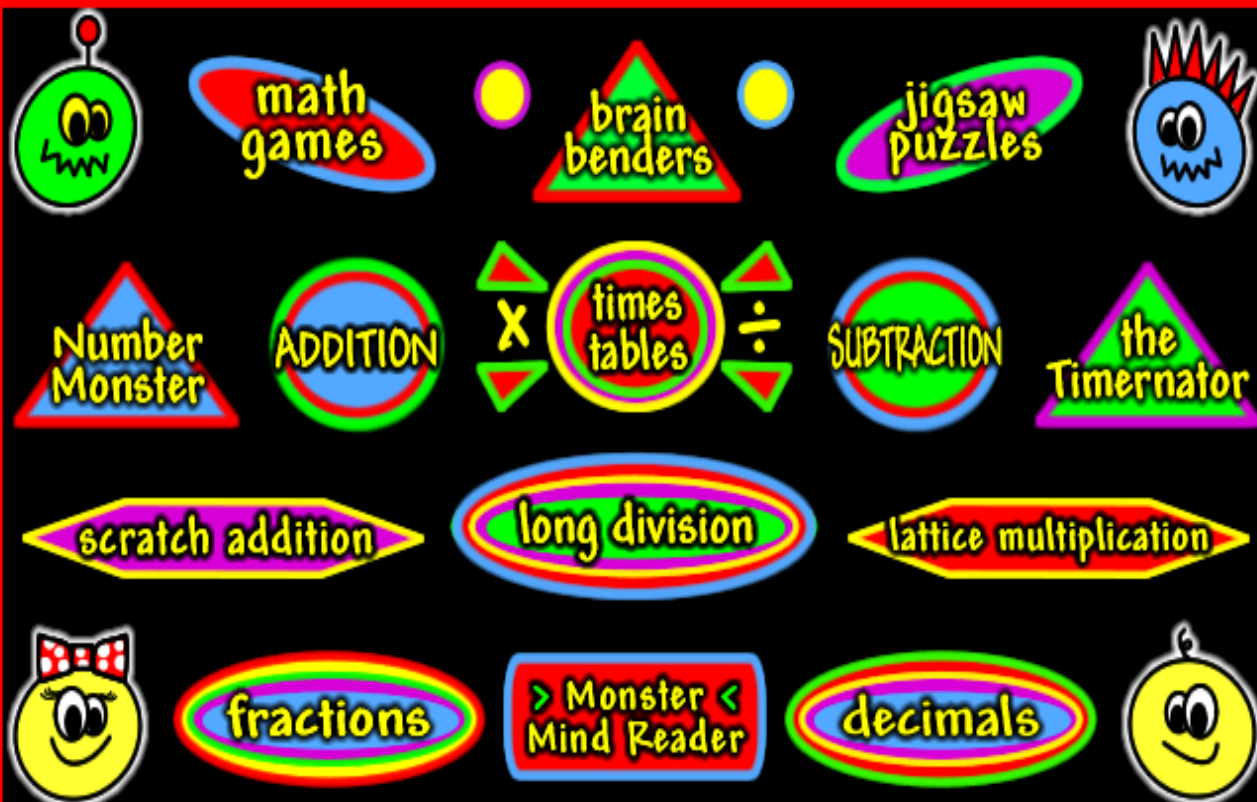
parents

spike's games

Coolmath.com

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monster

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THE RULER GAME

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[Ruler Reading](#)

[Ruler Tape](#)

[Measurement Tape](#)

Score:

Timer On
Sixteenths

Strikes:

Level:

Timer:



Click on:

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New Open Reel, Enclosed Case Steel Fiberglass Measuring Tapes & Rulers

[EngineerSupply.com](#)

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[www.AskToolTalk.com](#)

[Measuring Ruler](#)

Everything to do with Measuring Ruler items.

[Yahoo.com](#)

[Big Yellow Ruler](#)

Rulers, knives, cutting mats, velcro, foam board hangers, etc.

[www.bigyellowruler.com](#)



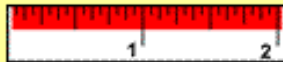
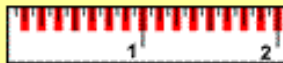
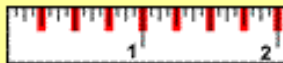
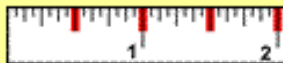

Ads by Google

Why Learn to Read a

Preferences

Timer: On Off

Increment Level:

-  Sixteenths
-  Eighths
-  Quarters
-  Halfs
-  Wholes

CREATE A GRAPH

Help



Graphs and charts are great because they communicate information visually. For this reason, graphs are often used in newspapers, magazines and businesses around the world.

Examples

NCES constantly uses graphs and charts in our publications and on the web. Sometimes, complicated information is difficult to understand and needs an illustration. Graphs or charts can help impress people by getting your point across quickly and visually.

Here you will find five different graphs and charts for you to consider. Not sure about which graph to use? Confused between bar graphs and pie charts? Read our:



[Create A Graph Tutorial](#)

Bar



Line



Area



Pie



XY



Please select a graph type to begin

New to creating graphs? Then try...

CREATE A GRAPH
Classic

Access Tools for Math

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Access Tools for Math

- **In order to produce quality work, the student must have an appropriate environment and access to the proper tools to compensate for difficulties that they are experiencing.**
 - While these tools may not specifically address math skills, they are considered necessary for some students to provide them with access to the curriculum.
 - In some cases, these tools may be the only assistive technology students will need to complete their math tasks.

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Positioning Aids

- **Helps maintain posture and stabilizes student's books and paper**
 - Teacher made slant boards (3" binders)
 - Book stands, Dycem or non-slip shelf liner (Sammons Preston Rolyan)
 - Slant boards (Pocket Full of Therapy)
 - Page and copy holders (office supply store)
 - Clip boards (office supply store)



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Adapted Writing Utensils

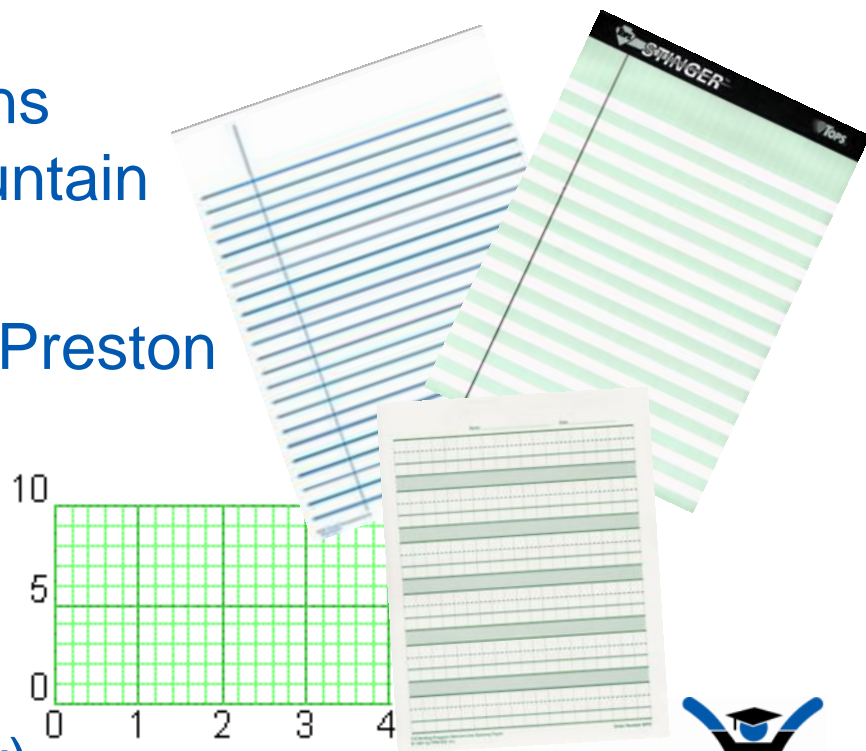
- Assists with maintaining grip for writing
- Improves legibility
- Delays fatigue and increases comfort
 - Adapted pens/pencils (Sammons Preston Rolyan, Onion Mountain Technology)
 - Pencil grips (Sammons Preston Rolyan, Onion Mountain Technology)



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Adapted Paper

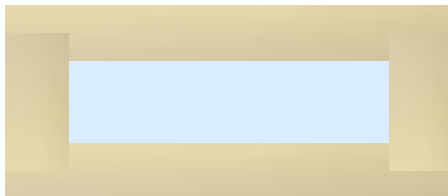
- **Improves spacing and alignment of student work**
 - Raised line paper (Sammons Preston Rolyan, Onion Mountain Technology)
 - Bold line paper (Sammons Preston Rolyan, Onion Mountain Technology)
 - Highlighted Paper (Onion Mountain)
 - Graph Paper (Office Supply)



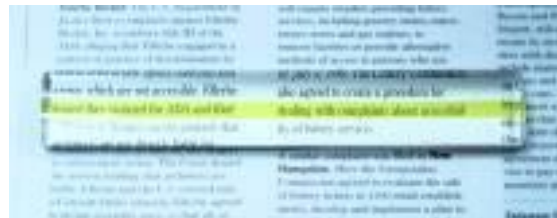
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Tracking Aids

- Enables students with visual tracking difficulties to maintain their place in the text or on a worksheet
 - Reading Window (Teacher Made)
 - Bar Magnifier (Independent Living Aids)
 - EZC Reader/ Reading Helper (Really Good Stuff)



[Click for Demo](#)



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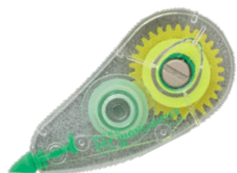
Contrast Aids

- Alters the foreground-background contrast to promote visual access to text
 - Highlighters
 - Highlighting Tape
 - Acetate Report Covers
 - Color Overlays (National Reading Styles Institute or Onion Mountain Technology)
 - E.Z. Reader (Really Good Stuff)

www.dyslexiacure.com

www.irlen.com

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Contrast Aids

- **Students needing contrast aids may display symptoms such as:**
 - Rubbing eyes
 - Complain about eyes hurting or headache
 - Difficulties with tracking
 - Not wanting to read aloud
 - Fidgeting
 - Acting out



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The bog
saw caxo

Without Overlay

Some students perceive letters as reversing, doubling, and even moving off the page, making it very difficult for them to read.

[Click here to see the difference](#)



The dog
was cute.

With Overlay

The correct colored overlay placed over a printed page can help many students to perceive letters more accurately, and to read the words with greater ease.

Distortion Effect - River

We all see things the same way. We see words in groups or phrases. The print is more dominant than the background. The print shows no movement. The printed letters are evenly black. Black print on white paper gives the best contrast for everyone. White background looks white.

We all see things the same way. We see words in groups or phrases. The print is more dominant than the background. The print shows no movement. The printed letters are evenly black. Black print on white paper gives the best contrast for everyone. White background looks white.

Distortion Effect - Swirl

We all see things the same way. We see words in groups or phrases. The print is more dominant than the background. The print shows no movement. The printed letters are evenly black. Black print on white paper gives the best contrast for everyone. White background looks white.

Distortion Effect - Halo

We all see things the same way. We see words in groups or phrases. The print is more dominant than the background. The print shows no movement. The printed letters are evenly black. Black print on white paper gives the best contrast for everyone. White background looks white.

Distortion Effect - Seesaw

We all see things the same way. We see words in groups or phrases. The print is more dominant than the background. The print shows no movement. The printed letters are evenly black. Black print on white paper gives the best contrast for everyone. White background looks white.

Distortion Effect - Blurry

We all see things the same way. We see words in groups or phrases. The print is more dominant than the background. The print shows no movement. The printed letters are evenly black. Black print on white paper gives the best contrast for everyone. White background looks white.

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Color Contrast Examples

Common contrast aids include colored overlays/filters, highlighter tape, colored light bulbs, and choosing appropriate background and text colors when using the computer for reading and writing tasks. Colored filters or overlays are available in many different colors and sizes. Colored light bulbs are also available commercially (they are sometime called party lights). Some students use these lights in study lamps. Most word processing programs, text reading software, and other computer based reading aids provide the option of changing font and background colors. Students are often better able to focus and attend to text that is presented to them on the computer by choosing background and font colors that make their eyes 'feel comfortable'.

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Text Enlargement Technology

- **Allows for controlled enlargement of text to the magnification level needed**
 - Bar, page, pocket and stand magnifiers (Maxi-Aids, Independent Living Aids, LS&
 - Closed Circuit Television Systems (Telesensory)



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Word Identification Aids

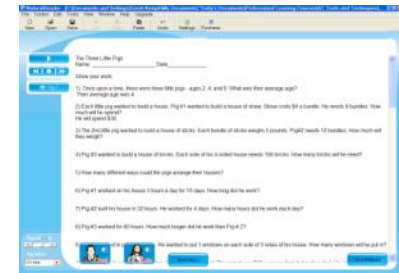
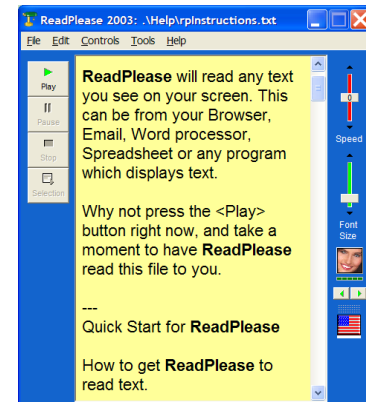
- Offers portable solution for reading difficult words in math texts and worksheets
 - Speaking Electronic Dictionaries (Franklin Electronic Publishers)
 - Reading Pen (Wizcom)



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Text Readers

- **Text-reading computer applications that provide a bimodal presentation of the document being read aloud**
 - ReadPlease Free (ReadPlease)
 - Natural Reader (NaturalSoft)
 - Etext Reader (Premier Programming)
 - TextAloud (NextUp)



GEORGIA
DEPARTMENT OF
EDUCATION

Kathy Cox, State Superintendent of Schools

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PDF Readers

- **Visual and auditory**
 - **PDF Readers provide speech access to unlocked PDF files**

- Adobe Reader (Adobe)
- Advanced Reading Aids
 - Kurzweil 3000 (Kurzweil)
 - WYNN (Freedom Scientific)
 - Read and Write Gold (Text Help)
 - » PDF Aloud



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Screen Readers

- Allows for controlled enlargement of text to the magnification level needed
- Will read all text on the computer screen
 - JAWS (Freedom Scientific)
 - MAGic (Freedom Scientific)



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Numpads

- **Assists with math processing input**
 - Standard keyboard numpad (Windows or Macintosh)
 - Standalone Numpad (InfoGrip)



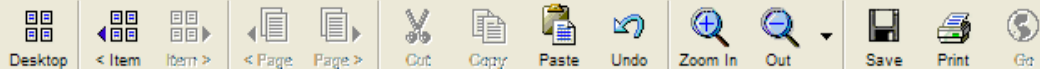
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Electronic Worksheets and Tests

- Provides a way for worksheets and tests to be scanned into electronic format
 - Paper Port (Nuance)
 - OmniForm (Nuance)

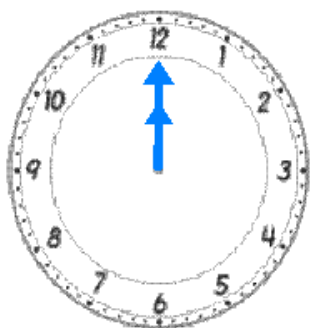


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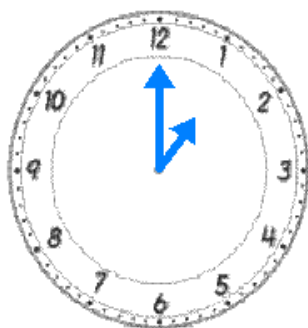


What time is it?

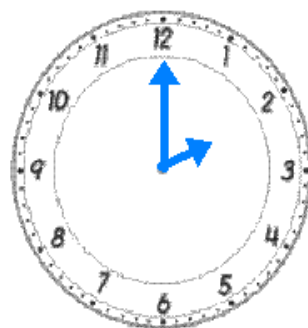
Draw the hour hand and the minute hand on the clock.



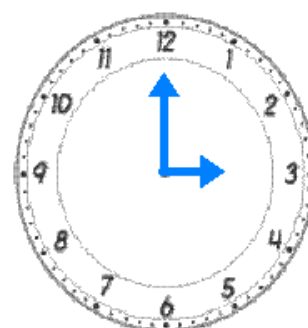
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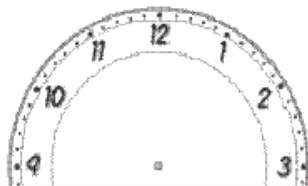
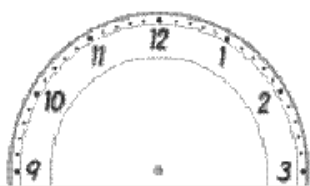
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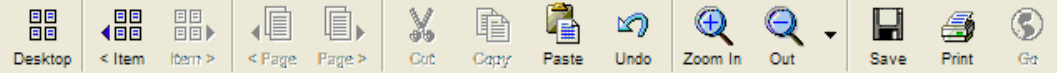


2:00



3:00



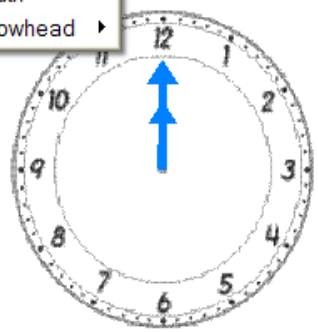


What time is it?

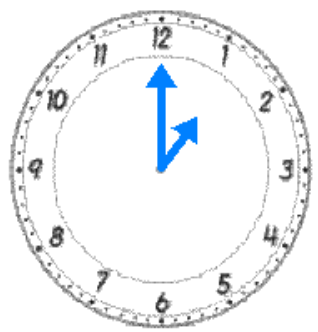
Draw the hour hand and the minute hand on the clock.



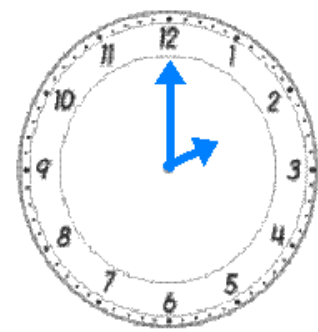
- Color...
- Line Width ▶
- Line Arrowhead ▶



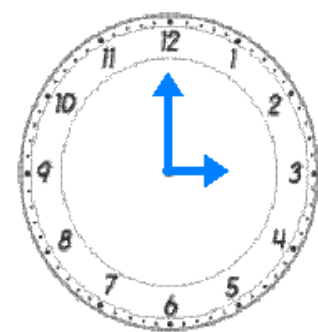
12:00



1:00

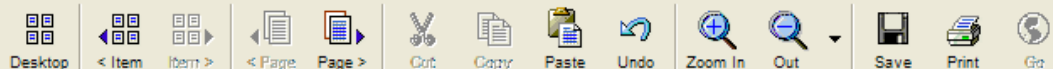


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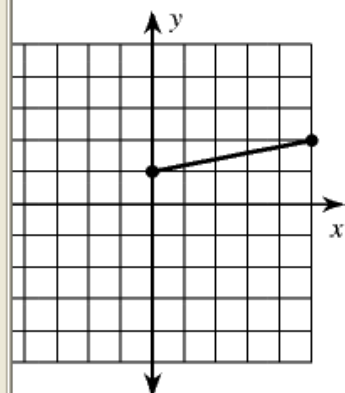
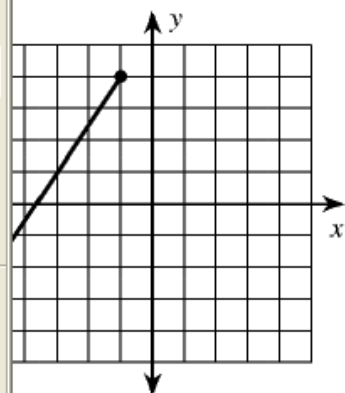


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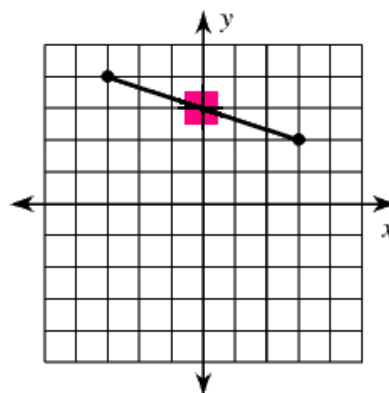




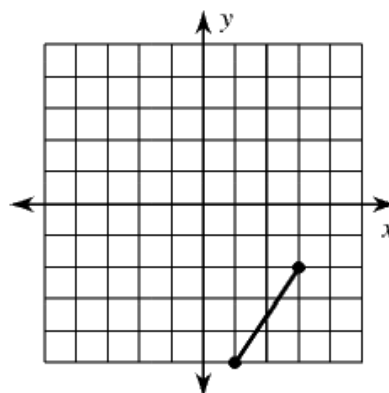
the midpoint of each line segment.



2)



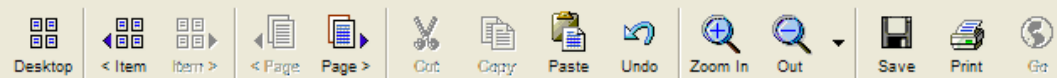
4)



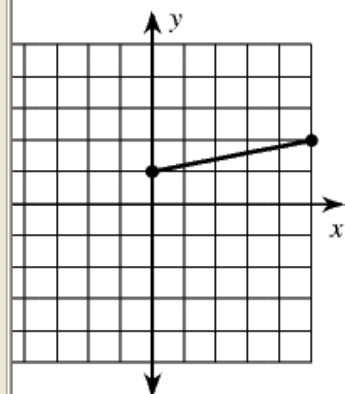
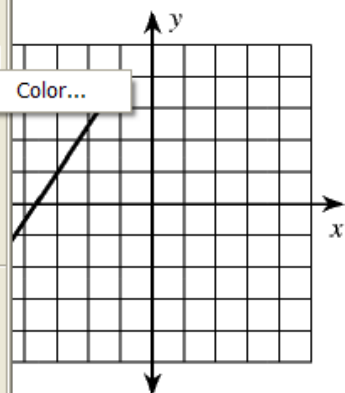
the midpoint of the line segment with the given endpoints.

1), $(-2, 5)$

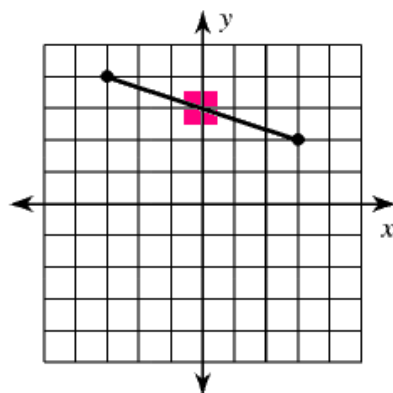
6) $(4, 3), (-1, 6)$



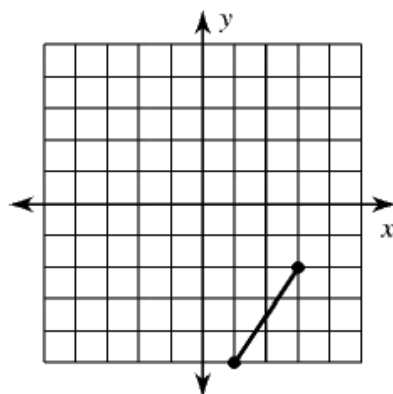
the midpoint of each line segment.



2)



4)



the midpoint of the line segment with the given endpoints.

1), $(-2, 5)$

6) $(4, 3), (-1, 6)$

Voice Input

- **Allows the student to complete math tasks on the computer through voice dictation**
 - MathTalk (MetroPlex Voice Computing)
 - Can be used with basic operations, using MathPad, up to graduate level math, using Scientific Notebook.



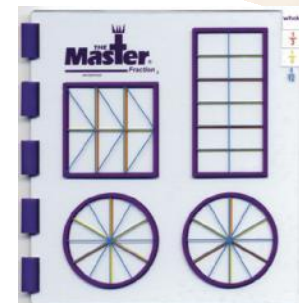
“We will lead the nation in improving student achievement.”

Calculation and Problem Solving Tools

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

Manipulatives

- Provides concrete materials that can be used when performing math tasks
 - BarCulator (mathfun.com)
 - PieCulator (mathfun.com)
 - Master Fraction (Onion Mountain Technology)
 - MathLine (Onion Mountain Technology)

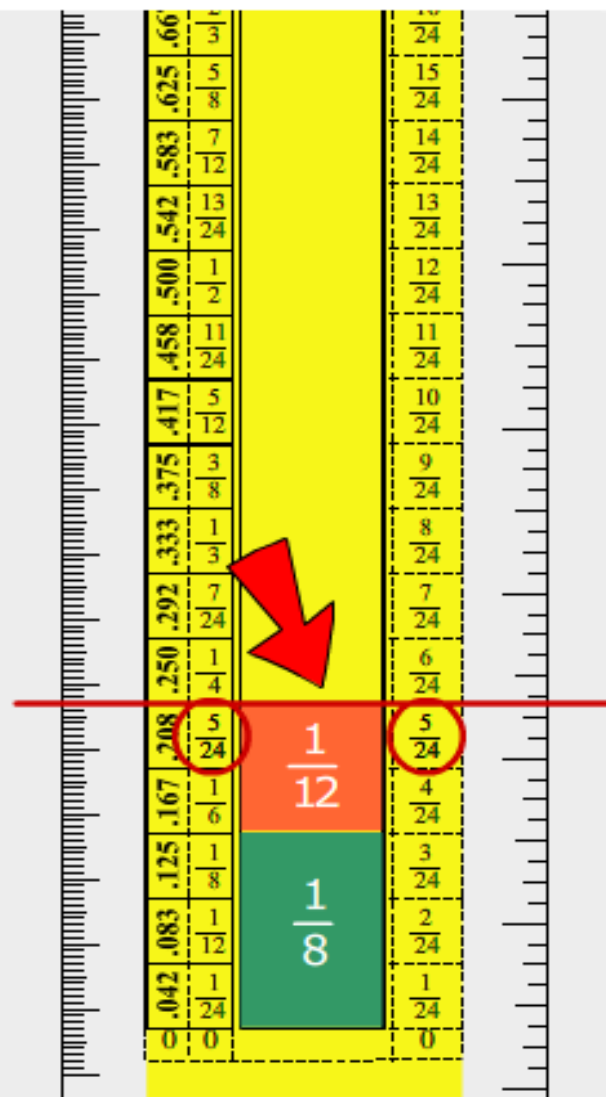


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Addition:

$$\frac{1}{8} + \frac{1}{12} = \frac{5}{24}$$

$\frac{1}{24}$



Back

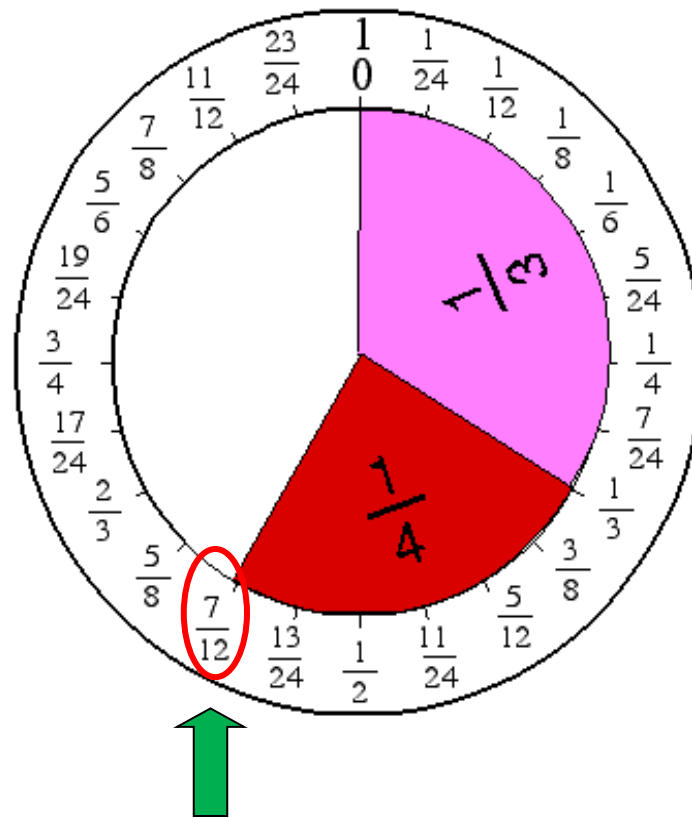
Repeat

Next

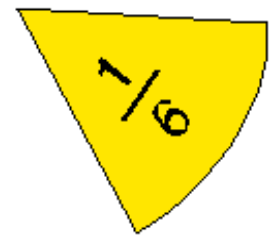
PieCulator



Click [here](#) for more information




$$\frac{1}{3} + \frac{1}{4} = \frac{7}{12}$$




Virtual Manipulatives

- **Allows for access to electronic manipulatives**
 - IntelliMathics (Intellitools)
 - National Library of Virtual Manipulatives (<http://nlvm.usu.edu/en/nav/>)

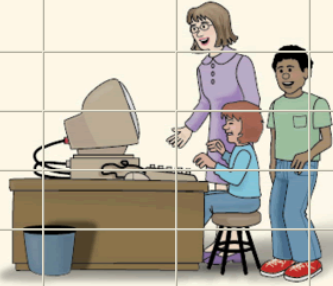


 National Library of Virtual Manipulatives for Interactive Mathematics

 Utah State UNIVERSITY

Home Virtual Library Site Guide Project Info Buy CD! Search

Index	Pre-K – 2	3 – 5	6 – 8	9 – 12
Number & Operations				
Algebra				
Geometry				
Measurement				
Data Analysis & Probability				



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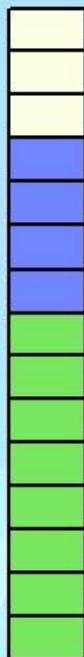
Customize

Publish

Adding Fractions with Common Denominators



$$\frac{8}{15} + \frac{4}{15} = \frac{12}{15}$$



- | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |



24

$\frac{1}{3} = \frac{8}{24}$

24

$\frac{3}{8} = \frac{9}{24}$

Rename $\frac{1}{3}$ and $\frac{3}{8}$ so that the denominators are the same. Then check your answer.

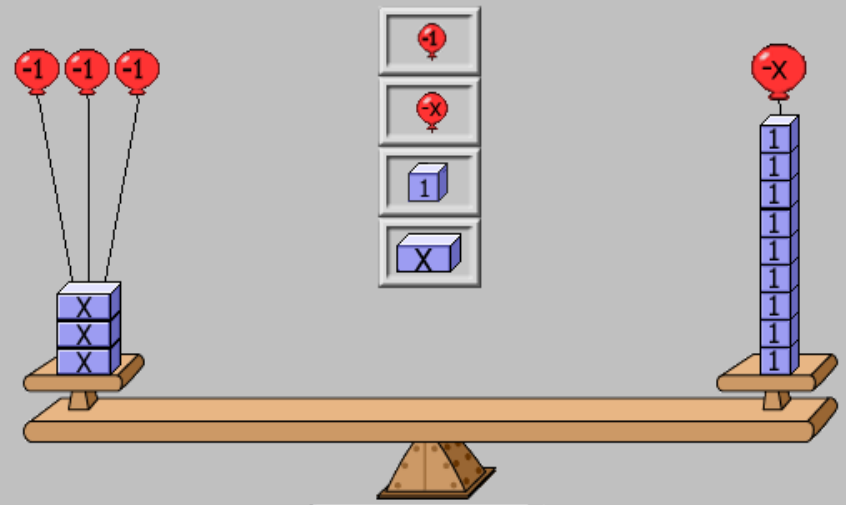
Difficulty: Easier Harder Hardest

[Download Free Trial Desktop Version](#)



Click and drag quantities from bins to balance beam pans to represent the equation.

$$3x - 3 = -x + 9$$



Continue

Clear

Create Problem

New Problem

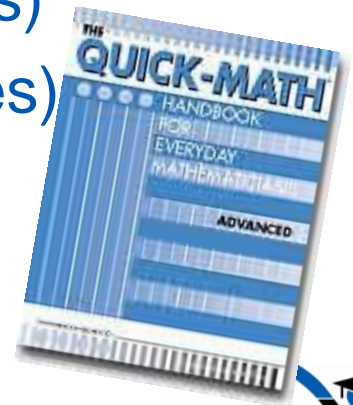
[Download Free Trial Desktop Version](#)

Click here if you cannot see the virtual manipulative.
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[Credits](#) | [Contact](#) | [Feedback](#) | **Language:**



Charts and Study Guides

- Booklets provide sample problems and references for solving common math problems
 - Flip charts, Quick Study guides (Amazon, www.flipperguides.com)
 - Quick Math Books (Curriculum Associates)
 - CliffNotes (www.cliffnotes.com, bookstores)
 - Flow chart, cheat sheets (Teacher made)



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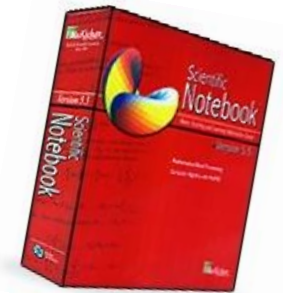
Charts and Study Guides

- **Applications provide sample problems and references for solving common math problems**

- Microsoft Math (Microsoft)



- Scientific Notebook (MacKichen Software)



- **Online Resources provide sample problems and references for solving common math problems**

- Ask Dr Math, Algebrahelp.com, Webmath.com

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Process Aids

- **Provide auditory prompts for solving multi-step problems**
 - StepPad (Attainment)
 - VoiceCue (Attainment)



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Calculators

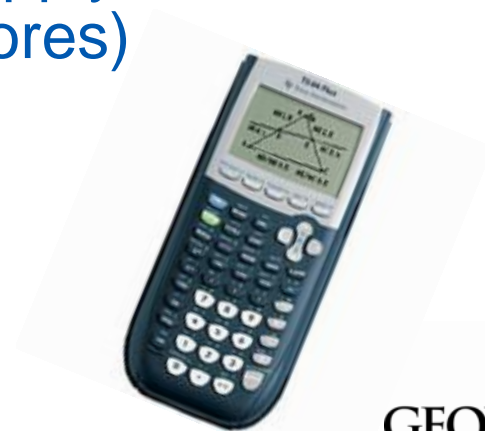
- **Large Button - Provide large buttons and/or large display for physical access**
 - Jumbo Display Folding Calculator (Independent Living Aids)
- **Talking Calculator – Provide speech feedback of numbers entered and numbers on display**
 - Desktop Talking Calculator (Maxi-Aids)



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Fraction and Graphing Calculators

- Provides calculation assistance for solving fraction problems
 - TI-15 Explorer Calculator (Onion Mountain Technology)
- Provides assistance in completing math tasks that require graphing
 - TI-84 Plus Silver Edition (Texas Instruments, office supply and discount stores)



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Talking Scientific Calculators

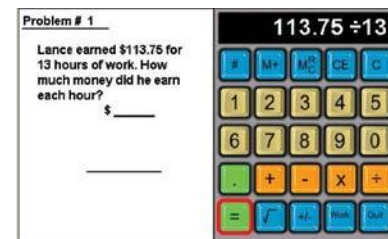
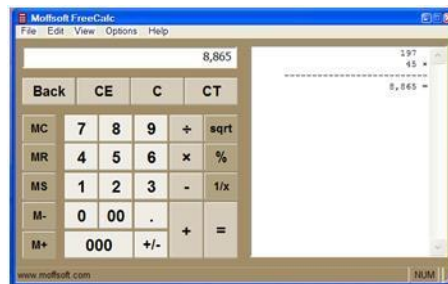
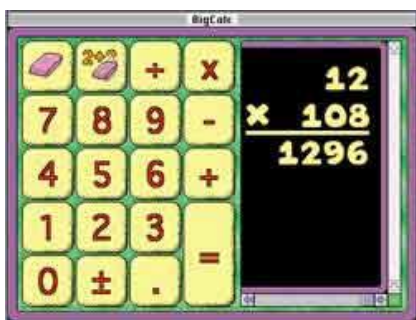
- Provides speech feedback for solving higher level math equations
 - Talking Scientific Calculator (Independent Living Aids)
 - Orion T136X Talking Scientific Calculator (MaxiAids)
 - TI-36X Solar (Independent Living Aids)



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On-screen Calculators

- **Provide on-screen calculation assistance**
 - Big Calc (EnableMart)
 - Windows based Calculators- standard and scientific
 - MoffSoft FreeCalc with tape (www.moffsoft.com)
 - CalcuScan (Mayer Johnson)



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My Documents GaDOE VPN Client

My Computer

9-4-08

Evaluation

My Network Places

Camtasia

Recycle Bin

Miscellaneous

GPAT Staff

Calculator [min] [max] [close]

Edit View Help

0.

<input type="checkbox"/>	Backspace	CE	C		
MC	7	8	9	/	sqrt
MR	4	5	6	*	%
MS	1	2	3	-	1/x
M+	0	+/-	.	+	=

Windows Calculator



Calculator [min] [max] [close]

Edit View Help

0.

Hex Dec Oct Bin Degrees Radians Grads

Inv Hyp [] [] Backspace CE C

Sta	F-E	()	MC	7	8	9	/	Mod	And
Ave	dms	Exp	In	MR	4	5	6	*	Or	Xor
Sum	sin	x ^y	log	MS	1	2	3	-	Lsh	Not
s	cos	x ³	n!	M+	0	+/-	.	+	=	Int
Dat	tan	x ²	1/x	pi	A	B	C	D	E	F

Windows Scientific Calculator



My Documents GaDOE VPN Client

My Computer

9-4-08

Evaluation

My Network Places

Camtasia

Recycle Bin

Miscellaneous

GPAT Staff

Moffsoft FreeCalc

File Edit View Options Help

19.5

Back	CE	C	CT		
MC	7	8	9	÷	sqrt
MR	4	5	6	×	%
MS	1	2	3	-	1/x
M-	0	00	.	+	=
M+	000		+/-		

36
52 ×

1,872 =
78
4 ÷

19.5 =

www.moffsoft.com

Moffsoft Free Calculator
www.moffsoft.com

5488

7	8	9	C	CE
4	5	6	+	-
1	2	3	X	/
0	.	=	%	

Sensory Software Free
Talking Calculator

- My Documents
- My Computer
- My Network Places
- Recycle Bin

Calculator with Braille Input-Output

- **Allows Braille users to enter problems using Braille keystrokes and have embossed output**
 - Braille 'n Speak (Freedom Scientific)



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Graphing Software

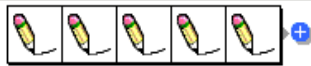
Software for Graphs and Charts

- **Allows students to create graphs on the computer**
 - Microsoft Word (Microsoft)
 - Microsoft Excel (Microsoft)
 - Graph Club (Tom Snyder)
 - TI Interactive (Texas Instruments)
 - Geometer Sketchpad (Key Curriculum Press)



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Untitled1:1 - Create



Pencil Length

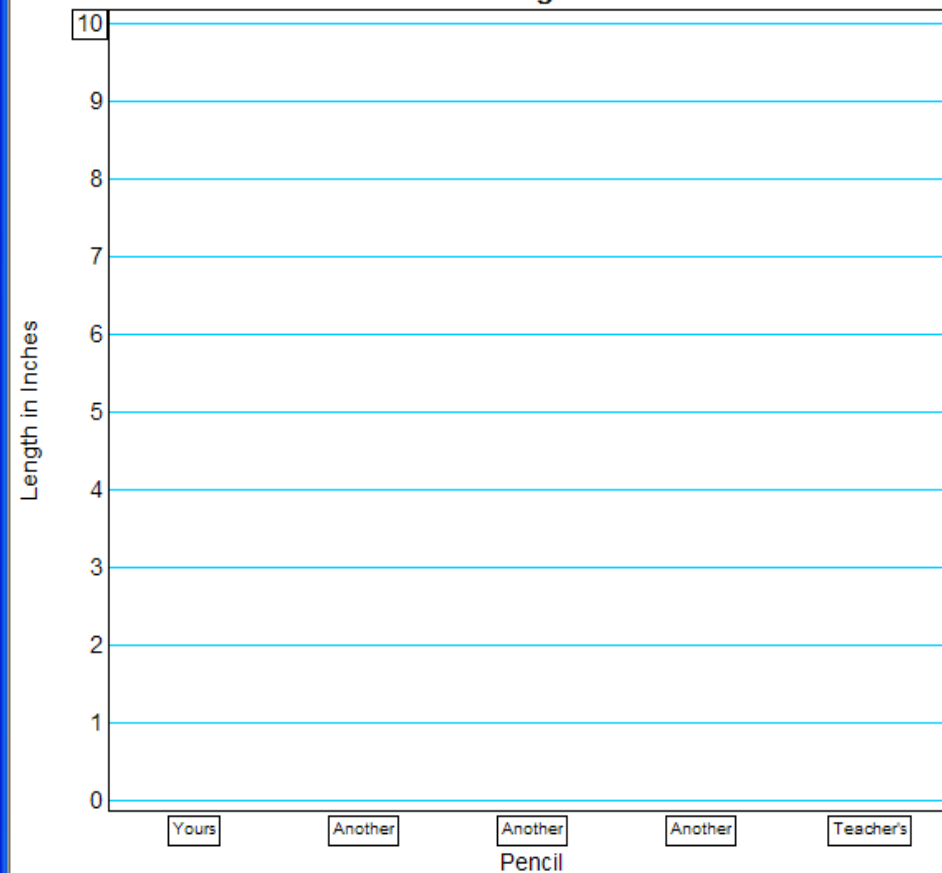
Pencil	Length in Inches
Yours	0
Another	0
Another	0
Another	0
Teacher's	0



Untitled1:2 - Create



Pencil Length



Untitled1 - Notebook



• Measure the length (in inches) of your pencil. Then measure the pencils of 3 friends and your teacher's pencil.

• Make a bar graph of the results. Then answer the following questions.

1. Who has the shortest pencil?

2. Whose pencil is the longest?

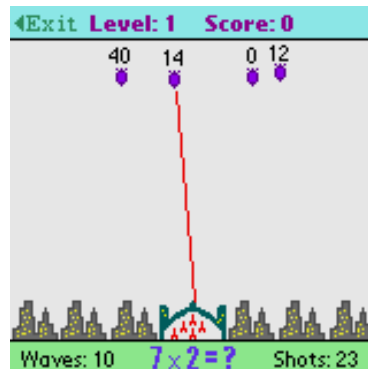
Type or record your answers in the notebook.



Portable Math Processors

- Provides a portable electric solution for solving math problems and practicing math skills
 - CalcuScribe (CalcuScribe)
 - Palm OS with Math Software (Handango, ImagiWorks)

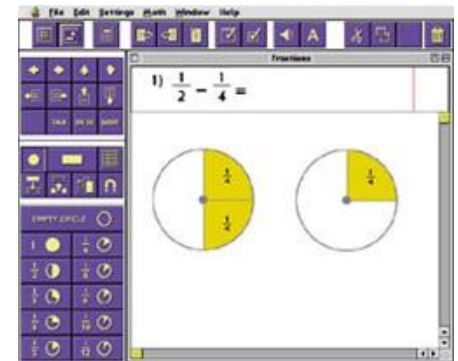
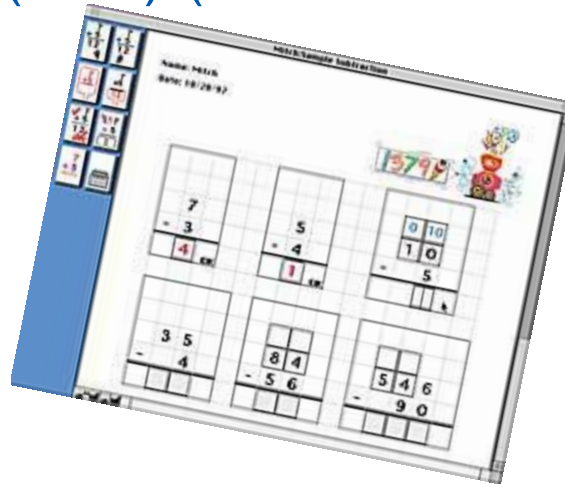
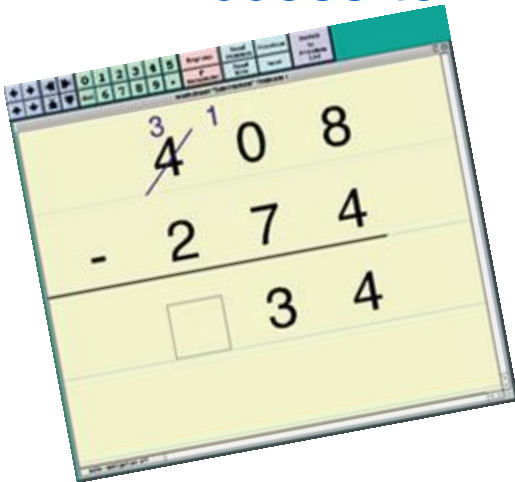
Missile Math 1.8



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Electronic Math Processing Software

- Allows for completion of basic math functions in an electronic format
 - MathPad (Intellitools)
 - MathPad Plus (Intellitools)
 - Access to Math (Mac) (Don Johnson)



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←	→	⏪	⏩	Del	0	1	2	3	4	5	Regroup	Read Problem	Prev	Reset Problem	Switch to Problem List
↑	↓	↕	↔		6	7	8	9	.	,	r Remainder	Read Row	Next		

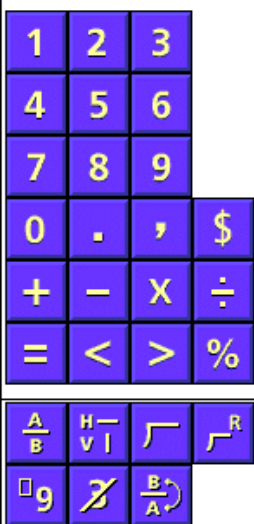
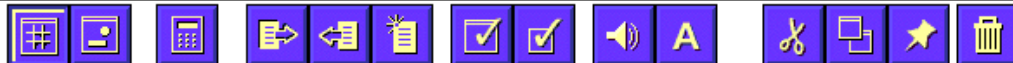
$$\begin{array}{r} 2 \\ 4 \\ 4 \ 5 \end{array}$$

$$\begin{array}{r} X \\ 5 \ 8 \end{array}$$

$$\begin{array}{r} 1 \\ 3 \ 6 \ 0 \end{array}$$

$$\begin{array}{r} + \ 2 \ 2 \ 5 \end{array}$$

$$\boxed{2} \ 6 \ 1 \ 0$$



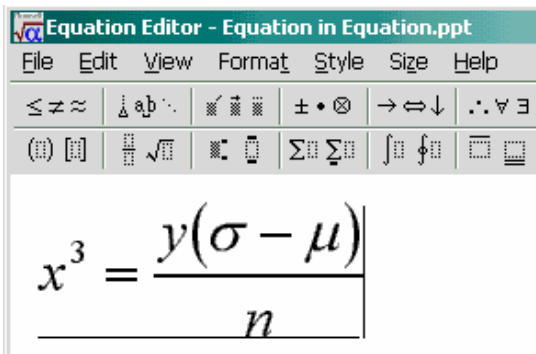
Word Problems Money (x. ÷)

- 2) Tom worked 4 hours in the neighbor's yard on Saturday. He earns \$6.45 per hour. How much did Tom make on Saturday?

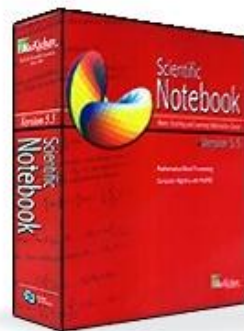
$$\begin{array}{r} 6.45 \\ \times 4 \\ \hline 25.80 \\ \square \end{array}$$

Electronic Math Processing Software

- **Allows for completion of higher level math functions in an electronic format**
 - Equation Editor (free download from MS Office CD)
 - Scientific Notebook (MacKichen Software)
 - Geometer's Sketchpad (Key Curriculum Press)



The screenshot shows the Microsoft Equation Editor interface. The title bar reads "Equation Editor - Equation in Equation.ppt". The menu bar includes "File", "Edit", "View", "Format", "Style", "Size", and "Help". The toolbar contains various mathematical symbols and functions such as \leq , \approx , $\frac{a}{b}$, $\sqrt{\quad}$, \pm , \cdot , \otimes , \rightarrow , \leftrightarrow , \downarrow , \cdot , \forall , \exists , \int , \oint , and $\frac{d}{dx}$. The main workspace displays the equation
$$x^3 = \frac{y(\sigma - \mu)}{n}$$



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Document1 - Microsoft Word

Equation Tools

Home Insert Page Layout References Mailings Review View Developer Add-Ins Design

Equation Tools

Professional Linear Normal Text

Tools

Symbols

Structures

Fraction Script Radical Integral Large Operator Bracket Function Accent Limit and Log Operator Matrix

$$\frac{3n - 2}{5} = \frac{7}{10}$$

$$10(3n - 2) = 35$$

$$30n - 20 = 35$$

$$+20 = +20$$

$$30n = 55$$

$$\frac{30n}{30} = \frac{55}{30}$$

$$n = 1.83$$

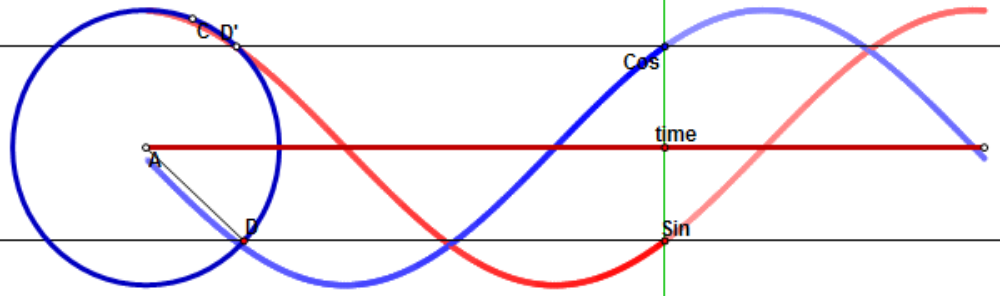


Sine/Cosine Tracer

Animate

As point **time** moves along the horizontal segment and point **D** moves around the circle, the point **Sin** traces out the sine of $\angle DAC$. To see this, select point **time** and point **D** and choose Animate from the Display menu. (Or click the **Animate** button.)

Point **D'** is the image of point **D** rotated 90° . Point **Cos** traces out the cosine of $\angle DAC$.



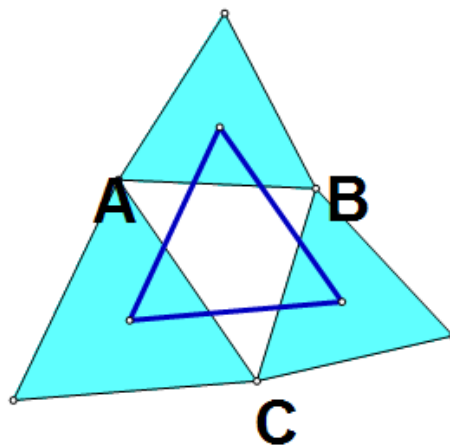
Napoleon's Theorem

The centroids of equilateral triangles mounted on the sides of any triangle ABC

form an equilateral triangle (shown with thick edges).

Drag A, B, or C to verify Napoleon's Theorem.

What happens when you reflect each centroid over the closest edge of your original triangle ABC? What is the difference in areas between the outer and inner Napoleonic triangles?





$$\frac{3x-2}{5} = \frac{7}{10}$$

$$10(3n - 2) = 35$$

$$30n - 20 = 35$$

$$30n = 55$$

$$n = 1.83$$



Manipulatives



Charts and Guides

Money

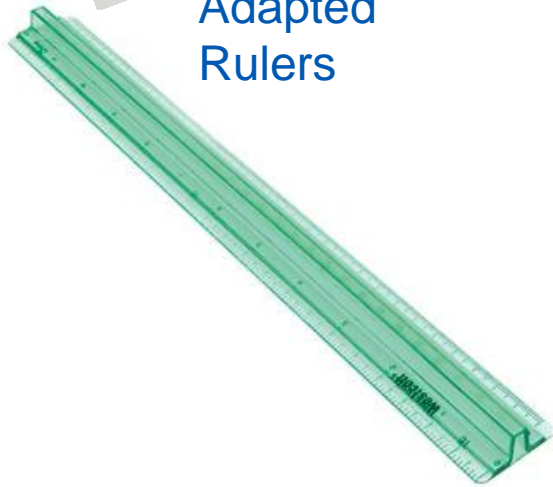


Money Calculators

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Adapted Rulers



Adapted Measuring Devices



Measurement

Adapted Tape Measures



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Manipulatives



Time



Watches



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Determining the Right Tool(s)

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Determining The Optimal Tool(s)

- Student abilities and needs
- Required tasks
- Available supports



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Benefits of Assistive Technology

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

Benefits of Math Aids

- Productivity
- Independence
- Achievement



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Things to Keep in Mind

- **Technology is no substitute for good instruction**
- **Technology should be used in conjunction with other available supports**
- **Technology use should be monitored and changes made as needed**

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Contact Information

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www.gpat.org

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

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