

Math + Technology = Student Success

**Closing the Gap
Minneapolis, MN
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Math + Technology = Student Success



Introduction


- Main
- Manipulatives
- Windows Tools
- Microsoft Office
- Software
- Hardware
- Resources
- Contact Info

Many students have difficulty with math.


The following technologies may help students access the math curriculum.

- Virtual and tangible manipulatives
- Tools built into Microsoft Windows and Microsoft Office
- Software programs that support math
- Hardware that supports math

Internet and bibliographic resources can also provide support for students, teachers and parents.



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Manipulatives

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- Windows Tools
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Both virtual and hard manipulatives can be utilized to support students in learning mathematical concepts.

Virtual Manipulatives


(click on the links below to open websites in a new window)

- [Archytech](#)
- [BBC Math Games](#)
- [National Council of Teachers of Mathematics](#)
- [National Library of Virtual Manipulatives for Mathematics](#)
- [Middle School Math](#)
- [Visual Fractions](#)

Tangible Manipulatives

(click on the links below to open websites in a new window)

- [Abacus](#)
- [Attainment Company](#)
- [ETA Cuisenaire](#)
- [Mathline](#)
- [Learning Resources](#)
- [Wikkistix](#)



❖ **Virtual Manipulatives Internet Resources**

- <http://www.arcytech.org/java> - Archytech Educational Java Programs
- <http://www.bbc.co.uk/education/mathsfie/index.shtml> - BBC Math Games
- <http://www.best.com/~ejad/java/patterns> - Pattern Blocks, Fractions, Shapes
- <http://www.cut-the-knot.org/front.shtml> - Cut the Knot Math and Puzzles
- <http://www.explorelearning.com/> - Explore Learning Gizmos
- <http://standards.nctm.org/document/eexamples> - NCTM manipulative applets
- <http://matti.usu.edu> - Utah State University National Library of Virtual Manipulatives
- <http://www.kenton.k12.ky.us/TR/msmath.htm> - Middle School Math
- <http://www.tangram.ip.com> - Tangrams
- <http://www.visualfractions.com> - Visual Fractions

❖ **Tangible Manipulatives Internet Resources**

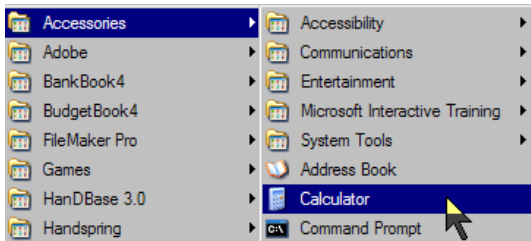
- http://www.howbrite.com/products/tools/intermediate_tools.asp - MathLine
- <http://www.hatchstuff.com/> - Slide Abacus, Bead Frame Abacus
- <http://etacuisenaire.com/> - Algeblocks and many other manipulatives
- <http://www.onionmountaintech.com/Kit.php?id=15> - Low Tech tools for Inclusive Education- Math
- <http://www.leaningresources.com/> - Manipulatives and games
- <http://www.wikkistix.com/> - Wikkistix waxed string manipulative, use with geometry and graphing
- <http://www.pfot.com/> - Raised line paper (turn horizontal to assist with alignment)
- <http://www.pcicatalog.com/> - Various math products (Hot Dots Flash Cards)

❖ **Calculator Directions**

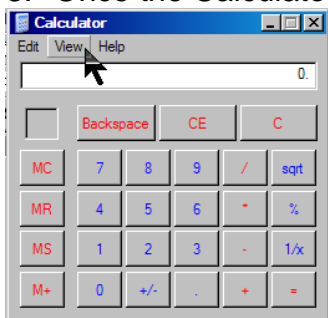
1. Click on the Start Menu and mouse up to click on Programs



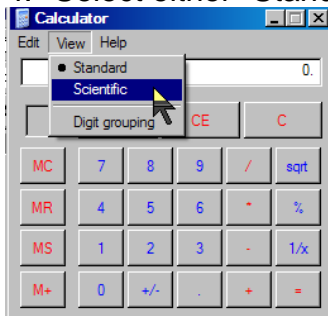
2. Click on Accessories and then click on Calculator



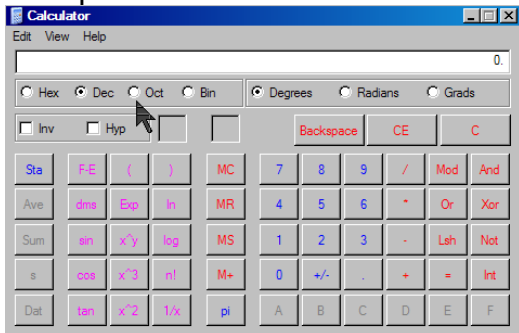
3. Once the Calculator is open, click on View



4. Select either "Standard" or "Scientific"




5. Open the Scientific calculator and select Hex, Dec, Oct or Bin



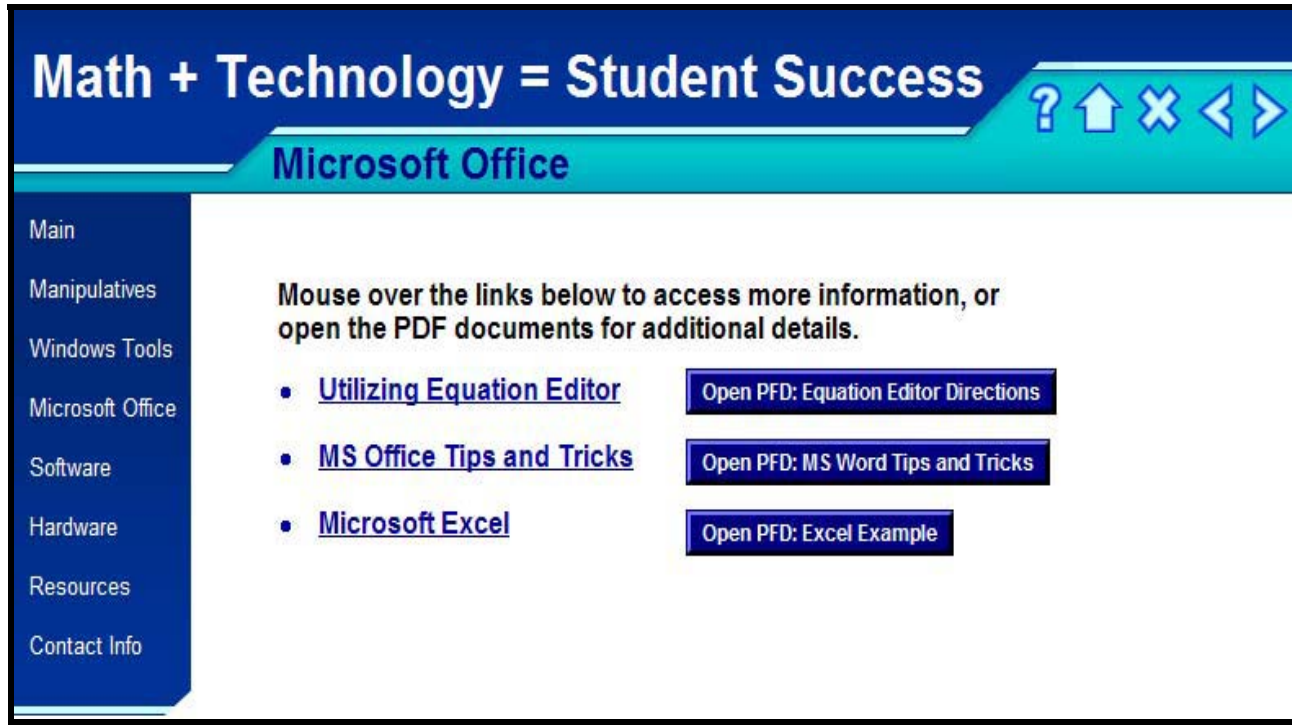
❖ **Narrator Directions (Text to Speech)**

Reading Options

- To turn Narrator on, press  <Windows>+U
- To read an entire window, click the window, then press <Ctrl>+<Shift>+<Spacebar>
- To get information about a current item, press <Ctrl>+<Shift>+<Enter>
- To get a more detailed description of an item, press <Ctrl>+<Shift>+<Insert>
- To read the title bar of a window press <Alt>+<Home>
- To read the status bar of a window, press <Alt>+<End>
- To read the contents of an edit field, press <Ctrl>+<Shift>+<Enter>, or use the arrow keys
- To silence the speech, press <Ctrl>

Keyboard Options

- To switch to another program, press <Alt>+<Tab>
- To go to the next button or tool, press <Tab>
- To select an item from a drop down list, use the arrow keys
- To select a checkbox or option button, press <Spacebar>
- To open Utility Manager, Press +U



The screenshot shows a web application interface. At the top, a blue banner contains the text "Math + Technology = Student Success" and navigation icons (question mark, up arrow, close, left arrow, right arrow). Below the banner is a teal bar with the text "Microsoft Office". On the left is a blue sidebar menu with links: Main, Manipulatives, Windows Tools, Microsoft Office, Software, Hardware, Resources, and Contact Info. The main content area has a heading "Mouse over the links below to access more information, or open the PDF documents for additional details." followed by three bulleted links, each with a corresponding "Open PFD" button:

- [Utilizing Equation Editor](#) Open PFD: Equation Editor Directions
- [MS Office Tips and Tricks](#) Open PFD: MS Word Tips and Tricks
- [Microsoft Excel](#) Open PFD: Excel Example

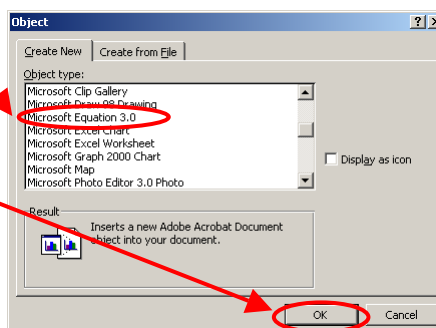
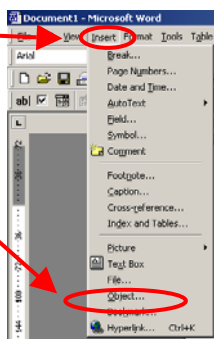
Equation Editor Directions

1. Click on <Insert>

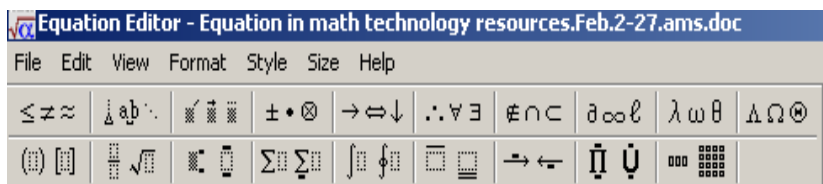
2. Select <Object>

3. Select <Microsoft Equation>

4. Select <OK>



5. An equation toolbox will appear. Utilize “click and drop down” to access math symbols and tools. Click in your MS Office document to paste the equation.



$$24x^2 + 26x + 6 = 0$$

❖ Equation Editor Internet Resources

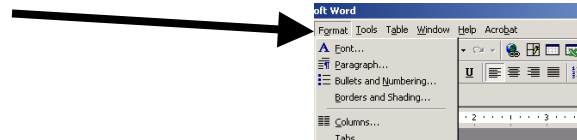
- <http://www.indezine.com/products/powerpoint/addin/eqeditor.html> - Tips on how to integrate Equation Editor into PowerPint
- <http://ist.uwaterloo.ca/ec/equations/equation.html> - University of Waterloo- Equation Editor info, tutorials including video
- <http://www.spot.pcc.edu/~ssimonds/thisandthat/msword.htm> - general tutorial
- <http://www.dessci.com> - MathType is for-purchase software that is a powerful extension of Equation Editor
- http://www.dessci.com/en/products/ee/ee_tips.htm- Equation Editor Tips and tricks and examples
- <http://www.mathtalk.com>- MathTalk is a voice activated math support software program by Metroplex Voice Computing

Microsoft Office Tips and Tricks

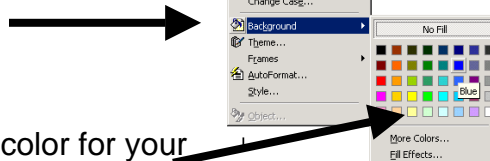
❖ Create a template that uses a high contrast foreground/background

1. Format the background color

a. Select <Format>



b. Select <Background>



c. Select the background color for your document.



2. Format the text color, size, and font using the formatting toolbar.

a. Select a font

b. Select the size

c. Select the color



If you don't find the "formatting toolbar" in your toolbars, go to "View" then to "Toolbars", then select "Formatting"

❖ Creating lined paper using the keyboard

+ Enter:



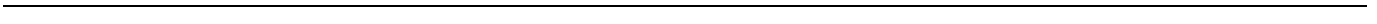
*** + Enter:



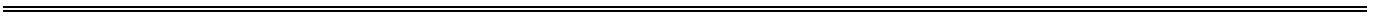
___ + Enter



---+ Enter:



= = =+ Enter:



~ ~ ~ + Enter: ~ ~ ~ ~



❖ Creating lined and shaded paper using Tables

- Select <Table> – <Insert> – 1 Column - ## Rows
- To adjust the line thicknesses select <Format> – <Borders & Shading> - <Borders Tab> - select thickness from thickness drop down menu
- To highlight rows select – <Format> – <Borders & Shading>

| |
|--|
| |
| |
| |
| |

❖ **Creating graph paper using Tables**

Option 1:

- Select Table – Insert - ## columns - ## rows
- Adjust line thickness – Format – Borders & Shading
- Highlight cells – Format – Borders & Shading
- Change cell heights/ widths – Table – Table properties

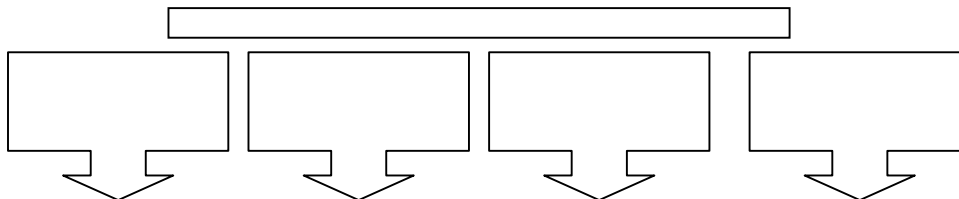
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Option 2:

- From MS Word, go to <Format> and select <Background>
- Select <Fill Effects>
- Select <Pattern>
- There are three graph background options: Large Solid Line, Large Dotted Line, Small Solid Line
- Choose a back ground
- Save as a template


❖ **Create a graphic organizer**

- Select <View> – <Toolbars> – <Drawing> – <autosshapes>
- Right click on the shape to bring up the menu to format background colors, text wrapping, add text, etc.



❖ **Creating forms**




Select <View> – <Toolbars > – < Forms >

 Use for fill in the blank responses



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-  Use for checkbox multiple-choice responses
-  Use for dropdown list multiple-choice responses
-  Use to lock the form. Once locked, the form cannot be altered unless you unlock the form.

Ex: Spelling test (fill-in-the-blank)

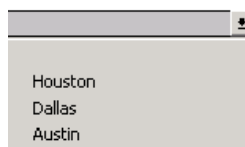
- 1.
- 2.

Ex: Multiple choice (checkbox)

1. What is the capital city of Texas? ☐ Houston ☐ Dallas ☐ Austin

Ex: Multiple choice (dropdown list)

1. What is the largest city in Texas?



Microsoft Excel

❖ Adjust the visual display

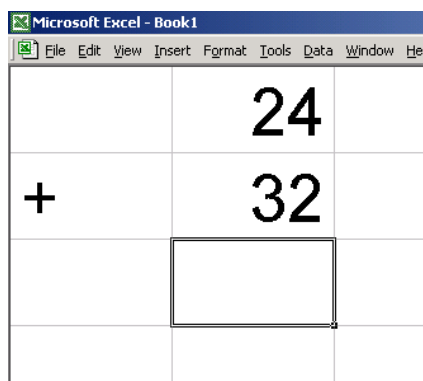
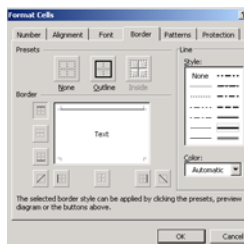
Enlarge the view – View – Zoom – 200% or type in custom enlargement

Enlarge the font – Select the table – Format – Cells – Font

❖ Create a Math worksheet

1. Hide the toolbars and select full screen to increase work area.

2. Add a line or box under the equation



3. Create an auto text for a division sign. Borrow from Microsoft Word > shortcut alt+0247 or Insert- symbol > locate the division symbol > insert into document > copy > paste into excel sheet > in excel select Tools > autocorrect > replace insert d > with paste in division symbol.

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4. Provide an automatic answer check

- =TRUE()*B3=B1+B2
- =TRUE()*E3=E1-E2
- =TRUE()*B8=B6*B7
- =TRUE()*E8=E6/E7

| | | |
|---|------|--|
| | 24 | |
| + | 32 | |
| | 56 | |
| | TRUE | |

| | | | | | |
|---|----|----|---|----|------|
| + | 34 | 24 | = | 58 | TRUE |
| - | 34 | 24 | = | 10 | TRUE |
| x | 3 | 4 | = | 12 | TRUE |
| ÷ | 15 | 3 | = | 5 | TRUE |

❖ Simplify the visual display

1. Hide toolbars – create a user specific toolbar if needed the same way as in Word.
2. Hide unnecessary columns and rows> Select the columns>Format>Columns>Hide
3. Hide the row/column headers>tools>options>view > deselect row/column headers
4. Hide gridlines>tools>options>view>deselect gridlines

❖ Lock the worksheet to create a form

1. On each cell where a user will input information>right click>format cells> protection>unselect locked.
2. Then protect the worksheet>tools> protection>protect sheet
3. Using the forms toolbar you can create the same checkbox and dropdown lists responses as in Word.

❖ Automatic calculations

Spreadsheets will allow students to build in automatic calculations much like you created the true/false formula. These formulas can allow students to analyze data, create charts and graphs with the data, etc.

❖ Excel Internet Resources

- <http://www.geol.pdx.edu/ComputerLab/ExcelFunctions.html> - Excel math/statistics/functions
- <http://www.willard.k12.mo.us/co/tech/Document/excel.pdf> - Excel tutorial
- <http://www.usd.edu/trio/tut/excel/> - Excel tutorial
- http://www.sabine.k12.la.us/class/excel_resources.htm - Resources, templates, tutorials
- <http://www.barasch.com/excel/xlformulas.htm> - Formulas
- <http://www.microsoft.com/education/?ID=InnovativeTeachers> - Microsoft- search for lessons
- <http://www.microsoft.com/education/?ID=Excel2002Tutorial> - Microsoft Excel tutorial
- <http://www.microsoft.com> - Excel “business” supports
- <http://www.lftechno.com/links/spreadsheets.html> - General info, tutorials, lessons
- <http://www.kn.pacbell.com/wired/fil/pages/listspreadshca.html> - Lessons, links
- <http://www.microsoft.com/education/?ID=codecrak#stepA> - Microsoft Excel Spreadsheet example- Code Crackers

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Software

- Main
- Manipulatives
- Windows Tools
- Microsoft Office
- Software
- Hardware
- Resources
- Contact Info

Click on the links below to visit vendor websites:

- [Riverdeep Software](#)- various titles; [examples](#) (mouse over to access)
- [Intellitools Software](#)-various titles; [examples](#) (mouse over to access)
- [MathType Software](#)- A powerful commercial product that is an extension of Equation Editor
- [MathTalk](#)- Voice Activated/Speech Recognition computer based calculator and other math program

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Hardware

- Main
- Manipulatives
- Windows Tools
- Microsoft Office
- Software
- Hardware
- Resources
- Contact Info

Click on the links below to visit vendor websites:

- Dana by [Alphasmart](#)- a portable word processor with Palm OS. It has a spreadsheet program included, and it can run any math oriented Palm PDA software
- Calcuscribe by [Calculuscribe](#)- a portable word processor with built-in math supports
- Coin Abacus, Money Calc and Coinulator by [Parentbanc](#)
- Calculators- see Barrier Free Education's [descriptive table](#) of Accessible Calculators and Accessories for information on:
 1. [large key calculators](#)
 2. [talking calculators](#)
 3. [graphing/scientific calculators](#)



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❖ Software and Hardware Math Internet Resources

- <http://www.dessci.com> -MathType Software- A powerful commercial product that is an extension of Equation Editor
- <http://www.mathtalk.com> - MathTalk Software - Voice Activated/Speech Recognition computer based calculator and other math program
- <http://www.intellitools.com> - Intellitools Software
 - Math Concepts 1 and 2: beginning math concepts and interactive game format
 - IntelliMathics: virtual manipulative, several formats (base, 10, fraction bars, tangrams, etc.)
 - MathPad: electronic worksheet for basic math, voice output
 - MathPAD+: electronic worksheet for fractions and decimals, voice output, virtual manipulatives
- <http://www.riverdeep.com> Riverdeep Software (search for products by name)
 - Tangible Math and Math Toolbox – grades 6-12
 - Mighty Math Series- basic concepts up to algebra and geometry
 - Destination Math- K-12
 - Millie's Math House- basic concepts
- <http://www.alphasmart.com> - Dana- Portable word processor with Palm OS software; utilize existing spreadsheet/ database software and/or down load commercial software math programs
- <http://www.calcuscribe.com> - Calcuscribe Portable word processor and interactive calculator that lets you do math (arithmetic, algebra and trig) in a word-processing environment

❖ Calculator Internet Resources

- <http://barrier-free.arch.gatech.edu/Tools/calc.html> - Barrier Free Education- descriptive table of various accessible calculators
- <http://www.parentbanc.com/> - Coinulator, Coin Abacus, Money Calc
- <http://www.viewplustech.com/> - Computer Graphing and Scientific
- <http://www.independentliving.com/> - Computer Graphing and Scientific
- <http://www.superproducts.com> - Talking Calculators
- <http://www.independentliving.com/> - Talking Calculators
- <http://www.maxiaids.com/Scripts/prodList.asp?idCategory=71> - Talking Calculators
- http://www.enablemart.com/products_detail.asp?id=369 - Large key
- http://www.enablemart.com/products_detail.asp?id=699 - Large key
- <http://www.sharpelectronics.com/products/ModelLanding/0,1058,923,00.html>

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Resources

- Main
- Manipulatives
- Windows Tools
- Microsoft Office
- Software
- Hardware
- Resources
- Contact Info


Technology Resources for Math (click on the links below, or open the PDF)

The **Technology Resources for Math** document contains extensive, additional resources and links beyond information covered in Math + Technology = Student Success.

[Technology Resources For Math PDF Document](#)

- [Web resources](#)
- [Bibliography](#)

Math + Technology = Student Success




Web Resources

- Main
- Manipulatives
- Windows Tools
- Microsoft Office
- Software
- Hardware
- Resources
- Contact Info

[Technology Resources For Math PDF Document](#)

- [AAA Math](#)- lessons and tutorials
- [Barrier Free Education](#)- info on accessing math and science curriculum
- [LD Online](#)- information about learning disabilities
- [LD Resources](#)- information about learning disabilities
- [Math Forum](#)- tutorials, examples, lessons
- [Mathsnet](#)- general information
- [Microsoft Math](#)- lessons, search by grade for math learning area
- [National Council for Teachers of Mathematics](#)- general information
- [Tangible Math and Math ToolBox](#)- subscription math lessons
- [Score Mathematics](#) - lessons and tutorials
- [SOS Math](#)- problems and examples for algebra and geometry



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❖ General Math Internet Resources

- <http://www.aaamath.com/> - AAA Math
- <http://www.aplusmath.com> - A+ math
- http://www.upbearguides.com/solve_x_.htm - Algebra Helper
- <http://barrier-free.arch.gatech.edu/index.html> - Georgia Tech Barrier Free Education
- <http://mathforum.org/> - Math Forum
- <http://www.dessci.com/en/products/mathplayer/> - Math Player
- <http://www.mathsnet.net/> - Mathsnet
- <http://www.nctm.org/> - NCTM
- <http://www.microsoft.com/education/?ID=LessonPlansResults&LearningArea1=mathematics> - Microsoft Math
- <http://www.ldonline.com> - LD Online
- <http://www.ldresources.com> - LD Resources
- <http://math.rice.edu/~lanius/Lessons/index.html> - Rice Math
- <http://www.resourceroom.net/math/index.asp> - Resource Room Math
- <http://score.kings.k12.ca.us/lessons.html> - Score Mathematics
- <http://www.sosmath.com/> - SOS Math
- <http://www.broderbund.com/product.asp?OID=4151249&SC=0190591081> - Tangible Math and Math Toolbox
- <http://www.touchgraphics.com/> - Touch Graphics
- <http://www.hyper-ad.com/tutoring/Default.htm> - Technical Tutoring- general information

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Thornton, Carol A. and Gutman, Deborah C. (1998). *Hands-On Teaching (HOT) Strategies for Using Math Manipulatives: Grades 6-9*. ETA Cuisenaire: Vernon Hills, IL.