

RESOURCES FOR DEVELOPMENTAL MATHEMATICS AND ADULT BASIC EDUCATION INSTRUCTORS

A Kellogg Practicum Project
Hildreth A. Davis
February 2009 (revised December 2009)

This compilation of resources for developmental math educators is not intended to be exhaustive. Rather, I hope it will provide a “jumping off point” for you to find interesting and useful materials for lessons, enrichment, and extension, as well as some sites to which students can be directed to help them become self-directed in learning and study. If you have additional sites or resources, and would like to add them to this compilation, please email them to me at hadavis2006@yahoo.com.

All links are operational at this time, December 2009. However, given the nature of The Net, and the way websites are updated, some will, no doubt, become nonfunctional. Some of the links work best when cut and pasted to a search bar, others will perform as “hot links.” Links to PDF documents take a while to download, so please be patient. I hope you will use the existing information to conduct a Web search to locate the material at a new site if a link has become nonfunctional.

NOTE: The information and sites contained in this practicum project are not endorsed by the National Center for Developmental Education, neither is the NCDE responsible for changes in the site content.

Table of Contents	Page
Online Resources	2
Sites for Students	7
Math Manipulative Sites	8
Lesson Plans	9
Online Publications & Articles	10
Study Skills/ Math Anxiety	12
Books	12
Video	15
Programs	17
Professional Organizations	18

Online Resources

Algebra2go™

<http://www.saddleback.edu/faculty/Lperez/Algebra2go/>

Algebra2go™ was created by Larry Perez of Saddleback College, Mission Viejo, CA. This math resource contains video lectures, video worksheets, topic quizzes, study guides, class notes, templates, web tools, contextualized math modules (allied health and computer science), and exam preparation that can be used by students independently or linked to classroom instruction. The Algebra2go™ site provides support for math learners from high school to college level. The video portions are engaging.

Adult Education Teacher's Page

<http://mathforum.org/teachers/adult.ed/>

This Math Forum site is specific for Adult Education with links to Teaching, Issues/Strategies, Special Contexts, & Adult Education in the Math Forum online library. Articles related to: Adult Numeracy Network (ANN); Adults Learning Mathematics (ALM); GED Math Instruction; Numeracy; etc. are located under the Adult Education link.

Ask Dr. Math

<http://mathforum.org/dr.math/>

Ask Dr. Math is a question and answer service (part of Math Forum) for students and teachers that utilizes a searchable database organized by topic and level. There is a FAQ section, a Problem of the Week (for different math areas), and a Math Puzzles link.

EAI Education.com

<http://www.eaieducation.com/>

This is an online catalog for educational materials including math manipulatives and games.

Figure This!

http://www.figurethis.org/about_ft.htm

Math Challenges for Families

<http://www.figurethis.org/index.html>

These two sites contain fun and engaging math activities to get the entire family involved in math outside school hours. These activities can be adapted to classroom use as daily math challenges, group activities, mental math, etc. The math is “middle school” level.

FREE: Federal Resources for Educational Excellence

http://free.ed.gov/subjects.cfm?subject_id=33

The *FREE* website links to other sites, and provides teaching and learning resources from federal agencies. Math topic areas include Algebra, Data Analysis, Geometry, Measurement, Number & Operations, and Other Math. Examples of specific areas useful to developmental math teachers (both are located under the Number & Operations tab):

Math Tools: “Offers hundreds of online tools, lesson plans, and learning activities for teaching and learning math”

Intermath: “Designed to help middle school teachers deepen their understanding of math concepts. More than 200 "recommended investigations" are offered for teachers to solve and then modify for use with students.” Since middle school math is the content for many basic math courses, this site is rich in suggestions and materials.

Florida Smart

<http://www.floridasmart.com/subjects/math.htm>

Mathematics links to Student Topics, Math for Parents, Teacher Resources, Math Directory. Some of the links on this site are no longer active, but the ones that are (mostly located in the Student Topics section) provide lessons and other topic specific information useful for teachers. The site is not designed as an independent learning resource for students.

Icebreakers

<http://www.kimskorner4teachertalk.com/classmanagement/icebreakers.html>

This site contains numerous icebreaker activities that can be adapted to get a class acquainted and working together. They are not specifically “math” focused, but some can be adapted to math and all can be used to overcome initial shyness and hesitancy in a classroom setting. *Who am I?* could be adapted by using operations, geometric figures, or formulas rather than other identities.

Let’s Play Math

<http://letsplaymath.wordpress.com/>

This is a blog and math site created by a woman who home-schools and loves teaching math. There are many interesting resources linked to the site as well as materials that can be adapted to traditional classroom teaching. There is also an online “store” with various math books for all ages and levels, both students and teachers. As an example of the creative integration of math with writing and story-telling, the link below will take you to a recent blog (September 2008) that is the beginning of a math story dealing with Pythagorean pebbles. The protagonist in this series of stories is a girl, Alexandria Jones.

<http://letsplaymath.wordpress.com/2008/04/12/puzzling-pythagorean-pebbles/>

MarcyCookMath.com

<http://www.marcycookmath.com/>

This site contains information to preview and order math teaching tools. Task cards and Tiles problems to engage students in learning and really understanding mathematical concepts – an excellent alternative to drill-and-kill.

Massachusetts Adult Basic Education Curriculum Framework for Mathematics & Numeracy

<http://www.doe.mass.edu/acls/frameworks/mathnum.pdf>

This is the Massachusetts Curriculum Framework for Math & Numeracy. It contains comprehensive benchmarks, required knowledge and skills, and real-world application spanning beginning adult numeracy, ABE, GED, and the bridge to college standards in a clear and easy to

use table format. Also includes appendices with suggested readings, sample instructional units, and instructional resources and materials.

Math Forum

<http://mathforum.org/>

<http://mathforum.org/mathed/index.html>

“The Math Forum @ Drexel: People learning math together”

This online resource focuses on improving math learning, teaching, and communication. It includes problems, puzzles, online support for both students and teachers, links to research, team collaboration for problem solving, professional development, and technology. Easy linking tabs to different topical areas: Math Help, Problems & Puzzles, Math Talk, Resources & Tools.

<http://mathforum.org/teachers/adult.ed/>

“The Math Forum @ Drexel: Adult education teacher’s page”

The Math Page

<http://www.themathpage.com/index.html>

Created by Lawrence Specter, Borough of Manhattan Community College, CUNY, this website contains complete courses in basic arithmetic and algebra. It is very like a textbook on line. Some students might be able to use the material to supplement classroom instruction, or teachers could use ideas from this site to present/explain items in class. This site requires that students be able to read and follow an instructional sequence “down the page.” Students will need paper & pencil to work out the problems, and answers are provided to check work.

The Math Page: Skill in Algebra

<http://www.themathpage.com/alg/algebra.htm>

This site provides clear, step-by-step sequence with practice problems. Students must be able to read well enough to follow the lesson “down the page.” Students will need paper & pencil to work out problems, answers are provided to check work.

MathStories.com

<http://www.mathstories.com/>

“Math for the Internet Generation,” this site contains math word problems (stories) aligned with state standards. This program is licensed and available by subscription (individual or school district pricing). Examples of the different types of problems and solving strategies are available on the web site.

New South Wales Adult Literacy and Numeracy Council

<http://www.nswalnc.uts.edu.au/about.htm>

Affiliated with the Australian Adult Education Resource & Information Service (ARIS), this organization promotes and supports basic educational skills and professional development.

PBS Teachers.Math

<http://www.pbs.org/teachers/math/>

The PBS Teachers educational site has lesson plans arranged by grade level and topic. There are also links for professional development, and other subject areas.

Soft Math.com

<http://www.softmath.com/>

The *Algebrator*™ is a software program for students and teachers. It solves algebra problems and shows all steps. This program is not free, but does have options for multiple user agreements.

The Math Playground.com

<http://www.mathplayground.com/index.html>

This site is designed for elementary and middle school math students, however, it focuses on developing the very skills many developmental and adult basic skills math students lack, and contains games to help students practice those math skills.

The Millennium Maths Project

<http://mmp.maths.org/>

The Millennium Maths Project is based at Cambridge University in England and is an education initiative designed to engage students (age 5 -19) and the general public in math enrichment activities and develop math skills.

SITES for STUDENTS

Algebra2go™

<http://www.saddleback.edu/faculty/Lperez/Algebra2go/>

Algebra2go™ was created by Larry Perez of Saddleback College, Mission Viejo, CA. This math resource contains video lectures, video worksheets, topic quizzes, study guides, class notes, templates, web tools, contextualized math modules (allied health and computer science), and exam preparation that can be used by students independently or linked to classroom instruction. The Algebra2go™ site provides support for math learners from high school to college level. The video portions are engaging.

PurpleMath.com

<http://www.purplemath.com/>

“Need help with algebra? You’ve found the right place!”

Created by Elizabeth Stapel, Western International University, Phoenix, Arizona, this site provides specific lessons in Basic Math, Beginning, Intermediate, & Advanced Algebra, and Solving Word Problems. Links for lessons, site reviews (links to other sites & resources), homework guidelines, and a study skills self-survey. The lessons are in text form and presented in a clear format that is easy to follow.

Ask Dr. Math

<http://mathforum.org/dr.math/>

Ask Dr. Math is a question and answer service (part of Math Forum) for students and teachers that utilizes a searchable database organized by topic and level. There is a FAQ section, a Problem of the Week (for different math areas), and a Math Puzzles link.

The Math Playground.com

<http://www.mathplayground.com/index.html>

This site is designed for elementary and middle school math students, however, it focuses on developing the skills many developmental and adult basic skills math students lack, and contains games to help students practice skills. Students can use this site independently and play the math games to gain mastery.

MATH MANIPULATIVE SITES

Arcytech: Improving Education Through Technology.

<http://arcytech.org/java/>

Bulaevsky, J. (2001). *Educational Java™ Programs*.

This site contains lessons using Java™ applets “as tools to help and enhance the [math] education of children.” However, these simple lessons will be useful in the Adult Basic Skills or developmental math classroom as well. The site contains lessons on money, time, pattern blocks, base 10 blocks, integer bars, and fraction bars. NOTE: You will need to download the Java™ software to run applets <file://localhost/- http://java.com/en/download/index.jsp>. Request “key” to operate the lesson applets at the Arcytech home page <http://www.arcytech.org/>.

Computing Technology for Math Manipulatives

http://www.ct4me.net/math_manipulatives.htm

Deubel, P. (2008). *Math Manipulatives*.

This is a “virtual manipulative” site. The purpose is to help students interact with math online. It also contains information on calculators and how to use them effectively. The site contains a list of other online math manipulative sites (click on the link “Manipulatives on the Web.”)

Math Cove: Teaching and Learning Mathematics with Java.

<http://oneweb.utc.edu/~Christopher-Mawata/> (home page)

Mawata, C. (1998). *Uses of Java Applets in Mathematics Education*.

<http://oneweb.utc.edu/~Christopher-Mawata/instructor/tsukuba1.htm>

This article discusses the use of Java™ applets in math instruction. NOTE: You will need to download the Java™ software to run applets - <http://java.com/en/download/index.jsp>.

Mrs. Glosser's Math Goodies™

<http://www.mathgoodies.com/articles/manipulatives.html>

Curtain-Phillips, Marilyn. (n.d.). *Manipulatives: The Missing Link in High School Math*.

International Education Software (IES,Inc.): Math Education and Technology.

<http://www.ies.co.jp/math/java/>

Manipula Math with Java™

This site contains over 200 math applets to help students understand many math concepts.

NOTE: You will need to download the Java™ software to run applets -

<http://java.com/en/download/index.jsp>

LESSON PLANS

The Educator's Reference Desk

<http://www.eduref.org/index.shtml>

This is the home page for the Educator's Reference Desk. Access the Lesson Plans tab to find a wealth of lesson plans. The lesson plans are in print-friendly format for many different levels of instruction.

Math Tools (linked from Federal Resources for Educational Excellence (*FREE*))

http://free.ed.gov/resource.cfm?resource_id=1044&subject_id=182&toplvl=33

This site contains many online tools, lesson plans and activities.

ONLINE PUBLICATIONS & ARTICLES

+ *Plus* magazine: Living Mathematics

<http://plus.maths.org/index.html>

An Online math magazine. Part of the Millennium Mathematics Project: Bringing Maths to Life (UK).

Impractical Maths.

+ *Plus* magazine (5.5.2008).

<http://plus.maths.org/latestnews/may-aug08/concrete/index.html>

This article takes the position that math taught using only “real world” concrete examples does not allow students to make broader applications of math knowledge. It references the work of Jennifer Kaminski and researchers at Ohio State University Center for Cognitive Science.

How to Solve a Problem Like Mathematics.

+ *Plus* magazine (6.6.2008).

<http://plus.maths.org/latestnews/may-aug08/education/index.html>

This article discusses math education in the UK and asks the question: Has relevance replaced rigor?

Pi Appears in Crop Circles.

+ *Plus* magazine (1.7.2008).

<http://plus.maths.org/latestnews/may-aug08/cropcircles/index.html>

This article discusses the phenomenon of crop circles and Pi. It contains interesting graphics and might be an engaging way to extend interest and instruction on the concept of Pi.

Distance Education: Is a Virtual Classroom for You?

<http://www.collegeboard.com/student/plan/high-school/47337.html>

This College Board article contains information regarding distance learning and the “Virtual Classroom.”

Education Alliance.org

<http://www.educationalalliance.org/>

The Educational Alliance is a nonprofit education fund that links each public school in West Virginia with a business partner. It is the only statewide school-business alliance in the U.S.

<http://educationalalliance.org/Downloads/Research/TeachingMathematics.pdf>

Closing the Achievement Gap: Best Practices in Teaching Mathematics.

This report by the Education Alliance discusses math reform, the importance of standards-based math instruction, characteristics of standards-based teaching and classrooms, best-practices in mathematics education, professional development, and contains a chart with the instructional elements and corresponding practices.

The Institute for Figuring

<http://www.theiff.org/main.html>

This Web site contains fascinating information to promote understanding of figures – from snowflakes, to fractals, to hyperbolic geometry, to paper folding. This site could contain something to spark an interest in math where one least expects. Appropriate as enrichment information for all levels of math.

Mathematical Association of America

<http://mathdl.maa.org/mathDL/>

This is the MAA Mathematical Sciences Digital Library. It contains mathematical current events and articles.

Using Posters in Case Studies: The Scientific Poster as a Teaching Tool.

<http://ublib.buffalo.edu/libraries/projects/cases/posters.html>

This article discusses the use of posters as teaching tools.

STUDY SKILLS/ MATH ANXIETY

Google™ “Math Anxiety” – you will find many links to different resources.

How to Study.org

<http://www.howtostudy.org/>

How to Study.org is a nifty little website with lots of engaging study skills, tips, and information for students. The first link is a jazzy video “*Why Study?*” This video does require a Flash Player and high-speed connection. The study skills required for many different subject areas are contained in the Resources link.

Math-Anxiety.com

<http://www.math-anxiety.com/index.html>

This is a math anxiety web site. It contains a link to *Math! A Four Letter Word*, a self-help book for those with math anxiety. The company also has an instructional video on math anxiety.

Purplemath.com

<http://www.purplemath.com>

The Purplemath.com site contains a "How do you really do this stuff?" link and a study skills self-survey to help students become more efficient in studying mathematics, as well as math homework guidelines (“How to suck up to your teacher”).

BOOKS

McKellar, Danica. (2008). *Math doesn't suck: How to survive middle school math without losing your mind or breaking a nail*. NY: Plume Books.

This book is written in the style of a teen magazine for girls. It is engaging and fun. The

“lessons” are clear and easy to understand, and could be adapted for direct classroom instruction. It should be available for students to checkout and enjoy on their own.

McKellar, Danica. (2008). *Kiss my math: Showing pre-algebra who's boss*. NY: Hudson Street Press.

This is the next level up, or sequel, to *Math Doesn't Suck*. Written in the style of a teen magazine for girls, it is lots of fun and the explanations of algebraic concepts are clear and easy to understand. This book should be available for students to checkout and enjoy independently.

Muschla, Judith A., & Muschla, Gary R. (1999). *Math starters: 5-to-10-minute activities that make kids think, grades 6-12*. San Francisco: Jossey-Bass.

This book contains many excellent starters and covers all the different areas in developmental math.

Nolting, Paul. (2008). *Winning at math: Your guide to learning mathematics through successful study skills (5th ed)*. Bradenton, FL: Academic Success Press.

This book is designed to be used as a classroom text. It could be located in the math lab where students could access it to complete specific assignments. Includes *How to Reduce Test Anxiety: Relaxation Techniques* CD. www.AcademicSuccess.com website contains student resources.

Nolting, Paul. (2008). *Math study skills workbook (3rd ed.)*. New York: Houghton Mifflin.

This workbook can be used as an individual text workbook, or located in the mat lab and accessed by students to complete sections as assigned by classroom teacher.

NOTE: The following books by Theoni Pappas contain enrichment topics that can be linked to the math curriculum used to stimulate intellectual and mathematical curiosity.

Pappas, Theoni. (1989). *The Joy of Mathematics: Discovering mathematics all around you*. San Carlos, CA: Wide World Publishing/Tetra.

The Joy of Mathematics is designed to enrich math instruction and develop a sense of wonder at the many and varied ways math is reflected in nature, science, music, art, architecture,

philosophy, history, and literature. Short topic sections stimulate intellectual curiosity.

Pappas, Theoni (1991). *Math Talk: Mathematical ideas in poems for two voices*. San Carlos, CA: Wide World Publishing/Tetra.

Clever poems on math topics that can be read by “two voices,” in a math Reader’s Theatre sort of format.

Pappas, Theoni. (1994). *The magic of mathematics: Discovering the spell of mathematics*. San Carlos, CA: Wide World Publishing/Tetra.

In this volume, Pappas explores mathematical ideas and unveils math in the least expected places. Math in everyday things, magical math worlds, math & art, numbers, nature, music, computers, architecture, math from the past, the mysteries of life, and games, logic, and recreation. Short sections that can be integrated into different math lessons, used as warmer activities, challenges, and “hooks” to engage student curiosity.

Pappas, Theoni. (1997). *The adventures of Penrose: The mathematical cat*. San Carlos, CA: Wide World Publishing/Tetra.

Twenty five stories of Penrose the cat encountering such topics as binary numbers, the Fibonacci sequence, the mathematics of soap bubbles, the mobius strip, and many more. Each story concludes with a Penrose challenge activity. Solutions and answers provided.

Pappas, Theoni. (2007). *Mathematical scandals*. San Carlos, CA: Wide World Publishing/Tetra.

Mathematics is not only logic, theorems, and formulas. In this volume Pappas presents the human side of mathematics in short fictional vignettes followed by factual explanation or elaboration on the concept.

Pappas, Theoni. (2008). *Mathematical snippets: Exploring mathematical ideas in small bites*. San Carlos, CA: Wide World Publishing/Tetra.

100 topics (packed in to 187 pages, plus solutions) that reveal the impact of mathematics on our daily lives and designed to peak curiosity and interest.

Scieszka, Jon, & Smith, Lane (1995). *Math Curse*. New York: Viking.

The impact of math anxiety revealed in a humorous story with wonderful illustrations.

This book appears to be a children's book, however it appeals more to adults who have math anxiety and can relate to the experiences of the protagonist.

VIDEO

Donald in Mathmagic Land (3 cartoons)

http://www.youtube.com/watch?v=P_ssR7M5Px0 (1 of 3)

http://www.youtube.com/watch?v=X_tyRPerr6c&feature=related

(2 of 3)

<http://www.youtube.com/watch?v=QifFucusbR4&feature=related>

(3 of 3)

These are Disney cartoon featurettes circa 1959. Lots of fun! They are also available in Spanish.

Factivation!™ for Multiplication

<http://www.factivation.com/>

This is a commercial site for an alternative method of teaching multiplication. The site has some free demo videos as well as different purchase options – both institutional (individual, group, site) and home license.

MrDuey.com

<http://www.mrduey.com/videos/>

Mr. Duey is a 7th grade teacher who uses Rap to engage students and promote learning. He was voted #1 Music Resource by Scholastic Bloggers. His rap math videos are quick and engaging. As community colleges enroll younger students through various Early College programs, these videos and the presentation style geared to younger students could be quite useful.

My Math Movie Picks

<http://www.math.unl.edu/~bharbourne1/MathInTheMovies.html>

This site, created by Brian Harbourne, Math Professor at University of Nebraska – Lincoln, gives a list of many films that have some sort of math content or references in the story-line – “math movies.”

TeacherTube.com Teach the World

<http://www.teachertube.com/>

Teacher Tube contains short instructional videos on a myriad of topics. Some are made by teacher and others by students. Choose Math in the subject menu and look for *Mrs. Burk’s Perimeter Rap*, *Abbott and Costello Math Problems*, *9 Multiplication Tables HipHop*, *School House Rock- Three is a Magic Number*, *Got Math?*, and many others.

Teacher Tube is associated with World Math Day (March 9, 2009) and is sponsoring a Math Video Contest. <http://www.teachertube.com/worldmathday>

Texas Instruments

<http://education.ti.com/educationportal/sites/US/homePage/index.html>

Texas Instruments site has areas for students, teachers, parents, and administrators all related to calculator choice and use.

Tom Lehrer This brilliant mathematician writes zany and delightful math songs.

New Math (two versions)

<http://www.youtube.com/watch?v=SXx2VVSWDMo&feature=related>

<http://www.youtube.com/watch?v=a81YvrV7Vv8&feature=related>

Calculus (3 songs)

<http://www.youtube.com/watch?v=GzVSXEu0bqI>

YouTube Math. *YouTube* has numerous short math videos that can be used to instruct, explain, and entertain. There are too many videos to list all links here. Each *YouTube* video has a side bar with “related videos” to scroll through for more examples. Google: YouTube Math.

YouTube Key Skills Numeracy- Multiplication

<http://www.youtube.com/watch?v=TXKM-RNkomk>

This video demonstrates a very clever technique to help adults learn long multiplication.

Teacher's Trade Secrets- Multiplication Tables

<http://uk.youtube.com/watch?v=bpuvWD9mV3c&feature=related>

This video uses Rap to teach the times tables. The students can create their own Rap songs.

The Secret to Math is Tell a story

<http://uk.youtube.com/watch?v=1L6zGstJk8g&feature=related>

This video shows how to tell the story “in math.”

Multiplication Tables Hip Hop

http://www.youtube.com/watch?v=j_ULPJ_tmTo&feature=related

Ms Robinson's class does a Hip Hop routine for the nines table.

PROGRAMS

Kellogg Institute

An advanced training and certification program for developmental educators. Four-week, residential program conducted in the summer. Appalachian State University, Boone, NC

<http://www.ncde.appstate.edu/kellogg.htm>

Virginia Tech

Center for Academic Enrichment and Excellence (CAEE) Programs and Services

<http://www.caee.vt.edu/programs.html>

College Transition Programs, Learning Assistance Programs, Academic Excellence Programs, Faculty Services.

“Project Success”

http://www.caee.vt.edu/programs/project_success.html

Offered thorough the *Center for Academic Enrichment and Excellence (CAEE)*, this is a program

to assist students on academic probation. Weekly meetings to learn organizational & study skills, overcome the tendency to procrastinate, stress management, how to work with faculty effectively, and campus resources. Team of peer and faculty/staff facilitators work w/ students.

CAEE Tutoring Program

<http://www.caee.vt.edu/programs/tutoring.html>

PROFESSIONAL ORGANIZATIONS

A comprehensive listing of mathematics professional organizations and journals is located on the Math Forum website.

<http://mathforum.org/mathed/mathed.orgs.journals.html>

AMATYC (American Mathematical Association of Two-Year Colleges).

www.amatyc.org.

“The American Mathematical Association of Two-Year Colleges was founded in 1974. It is the only organization exclusively devoted to providing a national forum for the improvement of mathematics instruction in the first two years of college.”

MAA (Mathematical Association of America) <http://www.maa.org>

“The Mathematical Association of America is the largest professional society that focuses on mathematics accessible at the undergraduate level. We invite all who are interested in the mathematical sciences to enjoy and benefit from our programs, publications, and resources.”

NADE (National Association of Developmental Educators)

<http://www.nade.net/>

“NADE seeks to improve the theory and practice of developmental education at all levels of the educational spectrum, the professional capabilities of developmental educators, and the design of programs to prepare developmental educators.”

NCDE (National Center for Developmental Education)

<http://www.ncde.appstate.edu/>

“The National Center for Developmental Education (NCDE) provides instruction, training programs, research, and other services consistent with the purpose of developmental education and the missions of Appalachian State University and the Reich College of Education. These services are provided to a national audience of professionals dedicated to serving underprepared and disadvantaged college students.”

NCTM (National Council of Teachers of Mathematics)

<http://www.nctm.org/>

“NCTM serves math teachers, math educators, and administrators by providing math resources and professional development opportunities.”