

***Center for Gifted Education***  
***College of William and Mary***

**Math Curriculum Extensions: Using the Web**

by Dana T. Johnson

Page 1

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As part of a Javits-funded project at the Center for Gifted Education, we developed a set of criteria for reviewing mathematics curriculum materials for high ability learners. We then used the criteria to review existing curriculum materials for grades K-8. In general, textbooks do not address all the needs of high ability learners. The guide identifies some resources that can be used to supplement the basal materials already in use. It also invites the reader to use the criteria to review other materials that may be under consideration for use with gifted learners.

Among the resources that are recommended in the guide are a number of math websites. Why are these sites appropriate for the mathematically gifted? I will examine this question by looking at some of the criteria for appropriateness for high ability learners that were identified by the project.

- The materials contain a high level of sophistication of ideas. Topics such as infinity are explored.
- Opportunities for extensions that challenge the most able learners are present. Gifted learners use up resources faster than other students. There are countless challenging problems and ideas for lessons on the web.
- Potential exists for tailoring content to individual needs of high ability learners. There is something for many different levels, interests, and backgrounds. Age is not a gatekeeper for activities, projects, and problems.
- Use of higher order thinking skills. There are a number of projects and problems that promote reasoning and problem solving.
- Materials have less emphasis on basic skills once mastery level has been demonstrated. Most websites go beyond what the textbooks do. They do not duplicate textbook style activities.
- Opportunities for student exploration based on interest are included. If students have access to the web directly, they can find a wealth of rich topics and problems for exploration.

You might want to get started on the web, so here are some good beginning points.

One of the best sites on the web is the Math Forum at Swarthmore College. It is an NSF funded project that can be found at <http://forum.swarthmore.edu>. The Forum has created a master collection of hot links to some powerful sites. At the bottom of the home page, select "Quick Reference" for a convenient listing of interesting sites. Among the numerous choices are:

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Page 2

- Dr. Math -- students may write to Dr. Math and ask questions. Old questions and answers are archived and are interesting to read. Topics are wide-ranging but include pentominoes, magic squares, and how to use an abacus.
- Mathmagic -- teams of students communicate to solve problems.
- Geometry Project of the Month
- Elementary Problem of the Week --Classic problems are presented to students. Correct solutions are recognized.

Another rich website is Mega-Math at <http://www.c3.lanl.gov/mega-math>. It includes projects and problems on map coloring, knots, graphs, algorithms, and infinity.

Websites are not formal curriculum. They give ideas but will need to be adapted to your classroom. Some of these websites are of interest to teachers as a source of ideas for classroom instruction and activities. However, many are accessible and interesting for students to explore independently. Once you get into one of these sites, you will discover many other hot links to other great resources. A trip to the web will not be the same experience for any two people nor will it be the same each time you visit.