curriculum #1

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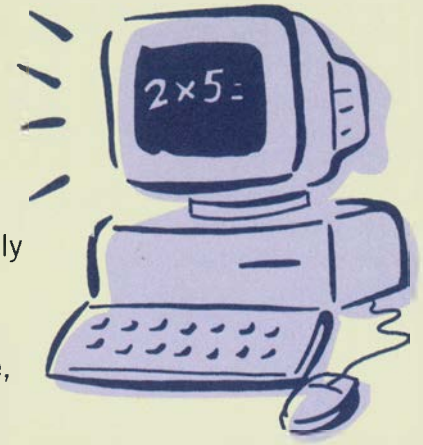
# Teaching mathematics in an internet world

Trevor Brown

**As teachers we are continually looking for innovative and exciting ways to motivate and stimulate our students to think mathematically. We would like them to see why some people study math and how it is used to solve a variety of problems.**




There are many technical questions which invariably arise in the mathematics classroom, questions such as: How many faces does a cylinder have? Is 1 a prime number? What is 0? When these arise, we are not always sure what the "right" answer is.

Sometimes we simply would like to see different ways of approaching a topic – different ways of teaching multiplication of integers, subtraction of fractions, tessellation, etc. When these situations arise we invariably consult the various math journals or guides to assist us. Now, we can use the internet to access answers to these questions quickly and efficiently.

The following sites are very useful in providing many valuable and worthwhile starting points for teachers in grades kindergarten to 8. These sites provide wonderful mathematical investigations for our students and answers to the many perplexing questions that invariably arise in the classroom. Although it would be hard to find a math task that wouldn't fit into the Ontario curriculum, the problems found on these sites present particularly rich mathematics tasks.

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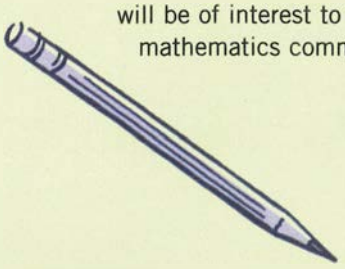
## NRICH

**www.nrich.maths.org.uk/**

This is a site well worth visiting. Here a teacher and student can find an amazing collection of rich mathematical tasks and mathematical games that will stimulate mathematical thinking and will engage your students for a significant period of quality time. The very extensive archive contains all of the problems presented to date. In addition to these features, there is a section where teachers can pose their own questions, and carefully written articles on various aspects of mathematics and editorial comments which will be of interest to the mathematics community.



## MATH CENTRAL

**http://mathcentral.uregina.ca**

This is a Canadian site originating from the University of Regina. There are many easy-to-use but by no means trivial lessons for elementary students posted at this site. There is an excellent unit on the teaching of probability. In addition to these lessons, teachers can visit the "Teachers' Place" where many pedagogical issues are discussed — questions like: What do you think of Kumon Math? How would you extend the Pythagorean Theorem?

## MATH FORUM

**http://www.mathforum.com**

This site in addition to posting weekly and monthly problems in the different areas of mathematics, has a very extensive archive. One of the many advantages of the archive that will be of interest to all teachers, is the students' written responses to past problems. There is a generic comment on the written responses for a given problem. Teachers can use these features to stimulate students to write and justify their thinking and compare their responses to the exemplars posted on the internet.

## ST. FRANCES XAVIER

**http: www.stfx.ca/special/math problems/**

Looking for some challenging problems for your students? This site has some engaging problems that will stretch your students. If you would like to bring "closure" to a set of tasks in a certain area of mathematics, then the problems listed here could stimulate some additional ideas. Many of the problems of this site are content specific — an added advantage.

## PBS

**www.pbs.org/teachersource/ math/**

There are many issues which are of paramount interest to teachers — assessment, evaluation, rich learning tasks, open-ended questions, etc. This site which is constantly expanding, identifies some of the significant educational issues and offers some carefully worded responses.

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## DR. MATH

**http://www.mathforum.com/dr.math**

Puzzled by questions such as: How many sides does a cube have? Why the order of operations? Find a number that has 13 factors. If you would like answers to these and many similar questions, then this site is for you. Here a teacher will find answers to the many questions that teachers and others have posed. Once you start reading the questions and the different responses you will find it very difficult to "sign off." Very contagious!

## MEGAMATH

**www.c3.lanl.gov/mega-math/**

Looking for a site that can stimulate a lot of independent thinking and encourage students to mathematize? Then this site offers many possibilities – from investigating the four-colour map problem to exploring knots. For students who believe that math is uninteresting, this site will show them some very exciting areas of mathematics — areas not normally presented in the elementary classroom.

## MUSE

**http://www.musemag.com/musemag/**

Why are manhole covers round? What is the recycle logo? Answers to these and other intriguing math questions can be found at this site. The articles are very short and easy to read and can be used to stimulate mathematical thinking in the classroom.

## CENTRE FOR INNOVATION IN THE TEACHING OF MATHEMATICS

**www.ex.ac.uk/cimt/**

Would you like a collection of some exciting math "games" for your students? This site presents a wonderful rationale for using math games in your classroom and a significant collection of easy-to-use and friendly math games. In addition, there are puzzles, challenges and activities for teachers and students.

## ABACUS INTERNATIONAL MATH CHALLENGE

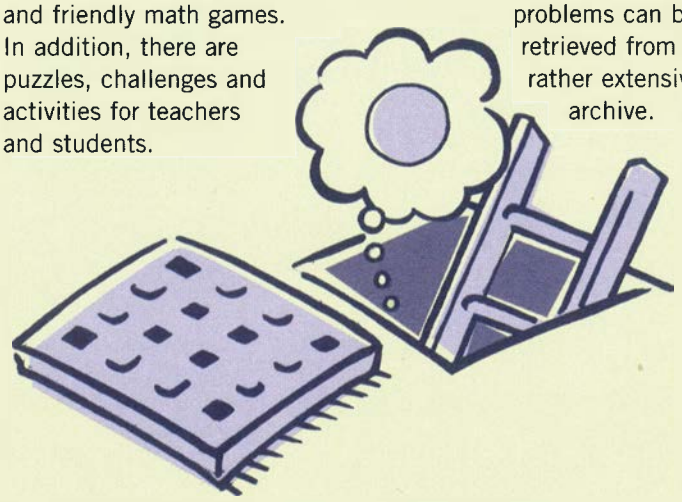
**http://www.gcschool.org/abacus.html**

This site offers a variety of challenging problems for students in grades 3-6. This is a very active site with new problems being added almost on a monthly basis. The previous problems are all stored in the archives. This is a site worth visiting.

## MATHMAGIC

**http://www.mathforum.com//mathmagic/**

This site has been around for some time. The sponsors encourage students to work together in solving the problems. There are some wonderful investigations here for students from K-8. Previous problems can be retrieved from the rather extensive archive.



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**Samples from the sites**

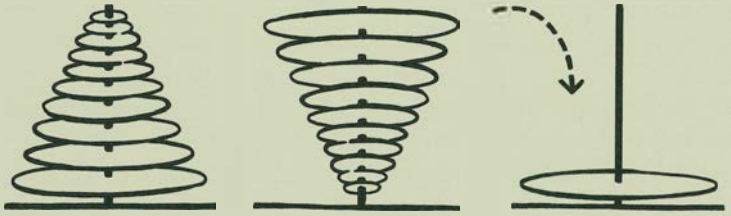
Here are some of the innovative math tasks available through the described sites:

**NRICH:**
**Counting Down**
The rules are simple. Start with any number of counters in any number of piles. Two players take turns to remove any number of counters (e.g. their choice of 1, 2, 3 or 4) from a single pile. The loser is the player who takes the last counter.

**MATH FORUM:**
**True or False**
I have four, two-digit numbers written on my paper. The sum of these four numbers is less than 100.

True or false: Each number is less than 25.

Bonus: If all the numbers on my paper are different, what is the largest number I could possibly have written?



*(fig.1)*

**ABACUS:**
**Rectangular Puzzle**
You have several 5 x 11 rectangles. Using only these rectangles, can you make:
A) a 39 x 54 rectangle?
B) a 39 x 55 rectangle?
(You have to use the small rectangles so that they cannot overlap each other, but you may not have space between them either.)

**MUSE:**
**Covering Up by Ivars Peterson**
Have you ever wondered why the cover of a manhole is nearly always round? Why couldn't it be oval or square?

**ST. FRANCIS XAVIER:**
**Minimum Moves** *(fig.1)*
Batman has been imprisoned by the Riddler. To escape he must find the quickest way to move the tower of plutonium disks from one post to another so that the disks have the same arrangement as on the original post. He may move only one disk at a time. What is the minimum number of moves he must make in order to move the ten disk tower and have it appear the same?

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