



Remarkable progress in the Information and Communication Technologies (both hardware and software) in the past decade or so has made it possible for teachers to access quality digital resources and use them either directly or indirectly in the classroom.

What makes it attractive for teachers are some unique features of these resources such as:

1. Extensive availability
2. Range of resources across topics and grades
3. Innovative ideas
4. Can be used on or offline
5. Resources in Mathematics from other countries / regions can easily be used / customized for our schools as Math is a universal subject
6. A large number of non-text resources like audio/video/applets etc.
7. Very low recurring cost
8. Increased penetration of ICT in schools – both urban and rural (including government schools)

Teachers have taken to this new idea with enthusiasm (is it because of novelty alone? Quite possible). Of course, there are critics who do not approve their usage. There are several studies to understand the effectiveness of using these resources in the classroom. Some of the data has provided useful insights and pointers. However, the results have not been conclusive and more research is needed in this critical area.

Digital resources can surely augment meaningful learning experiences of the child and can be specifically used for the following:

1. Introduction of to a new topic
2. Formation of key concepts
3. Repetitive practice (read drill)
4. Self relearning
5. Group work
and so on

Teachers can use them in their classes if they fit into their lesson plan.

The following list gives a rough idea of the range of digital resources (mostly free) available on the Internet. This is only indicative and by no means representative or comprehensive - to be used more as pointers- and the readers are requested to make their own judgments regarding their suitability to their work although I must add that I have found them very useful and enjoyable.

The resources have been grouped into a few (loose) categories to facilitate easy navigation and exploration.

Websites

General

The Mathforum@ Drexel University
(<http://www.mathforum.org>)

The Centre for Innovation in Mathematics Teaching (CIMT) (<http://www.cimt.plymouth.ac.uk>)

Math cats – Fun math for kids
(<http://www.mathcats.com>), Count on
(<http://www.counton.org>)

Illuminations – Resources for teaching maths
(<http://illuminations.nctm.org>) InterActivate
(<http://www.shodor.org/interactivate>)

Gadsden Mathematics Initiative
(<http://www2.gisd.k12.nm.us/GMIWebsite/IMathResources.html>)

Mathematical Interactivities - Puzzles, Games and other Online Educational Resources
(<http://mathematics.hellam.net>)

MathNet – Interactive mathematics in education
(<http://www.mathsnet.net>)

National Library of Virtual Manipulatives
(<http://nlvm.usu.edu/en/nav/vlibrary.html>)

NewZealand Maths (<http://www.nzmaths.co.nz>)

Primary Resources – Maths

(<http://www.primaryresources.co.uk/maths/maths.html>)

ProTeacher! Maths lesson plans for elementary schoolteachers

(<http://www.proteacher.com/100000.html>)

Maths activities

(<http://www.trottermath.net/contents.html>)

Maths powerpoints

(<http://www.worldofteaching.com/mathspowerpoints.html>)

Maths is fun – maths resources

(<http://www.mathsisfun.com>)

Middle school portal for maths and science teachers

(<http://www.msteacher.org/math>)

Maths games, maths puzzles and maths lessons – designed for kids and fun

(<http://www.coolmath4kids.com>)

Numbers

Magic Squares, Magic Stars & Other Patterns

(<http://recmath.org/Magic%20Squares>)

Number recreations

(<http://www.shyamsundergupta.com>)

Broken calculator – Maths investigation

(<http://www.woodlands-junior.kent.sch.uk/maths/broken-calculator/index.html>)

Calculator chaos

(http://www.mathplayground.com/Calculator_Chaos.html)

Primary School Numeracy

(<http://durham.schooljotter.com/coxhoe/Curriculum+Links/Numeracy>)

Quarks to Quasars, powers of 10

(<http://www.wordwizz.com/pwrsof10.html>)

Algebra

Algebra puzzle

(http://www.mathplayground.com/Algebra_Puzzle.html)

Algebra tiles

(<http://mathbits.com/MathBits/AlgebraTiles/AlgebraTiles>)

[MathBitsNew07ImpFree.html](http://mathbits.com/MathBits/AlgebraTiles/AlgebraTiles)

(<http://mathbits.com/MathBits/AlgebraTiles/AlgebraTiles>
[MathBitsNew07ImpFree.html](http://mathbits.com/MathBits/AlgebraTiles/AlgebraTiles))

Geometry

<http://www.cyffredin.co.uk/>

The Fractory: An interactive tool for creating and exploring fractals

(<http://library.thinkquest.org/3288/fractals.html>)

Tessellate

(<http://www.shodor.org/interactivate/activities/Tessellate>)

MathSphere – Free graph paper

(<http://www.mathsphere.co.uk/resources/MathSphereFreeGraphPaper.html>)

Paper models of polyhedral

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

Problem solving

Mathpuzzle <http://www.mathpuzzle.com/>

Puzzling world of polyhedral dissections

<http://www.johnrausch.com/PuzzlingWorld/contents.html>

Interactive Mathematics Miscellany and Puzzles

(<http://www.cut-the-knot.org>)

Puzzles and projects

(<http://www.delphiforfun.org/Programs/Indices/projectsIndex.html>)

10ticks Daily Puzzle Page

(http://www.10ticks.co.uk/s_dailyPuzzle.aspx)

Archimedes' Laboratory – Teachers' resource : Improve problem solving skills

(http://www.archimedes-lab.org/index_teachers.html)

Brain teasers

(<http://www.pedagonet.com/brain/brainers.html>)

Gymnasium for Brain

(<http://www.gymnasiumforbrain.com>)

Puzzles and games (www.thinks.com)

Miscellaneous

Mathematical imagery (<http://www.josleys.com>)

The MacTutor History of Mathematics archive
(<http://www-history.mcs.st-and.ac.uk/history>)

Math cartoons
(<http://www.trottermath.net/humor/cartoons.html>)

Math Comics
(<http://home.adelphi.edu/~stemkoski/mathematrix/comics.html>)

Mathematical quotation server
(<http://math.furman.edu/~mwoodard/mqs/mquotes.html>)

Wolfram Mathworld – The Web's Most extensive
Mathematical Resource (<http://mathworld.wolfram.com>)

Optical illusions and visual phenomena
(<http://www.michaelbach.de/ot>)

Optical illusions gallery
(<http://www.unoriginal.co.uk/optical5.html>)

Teachers' Resources Oline
(<http://www.cleavebooks.co.uk/trol/index.html>)

Interactivate : Activities
(<http://www.shodor.org/interactivate/activities/#fun>)

Maths articles (<http://www.mathgoodies.com/articles>)

Math words and some other words of interest
(<http://www.pballew.net/etyindex.html>)

Portraits of scientists and mathematicians
(http://www.sil.si.edu/digitalcollections/hst/scientific-identity/CF/display_results.cfm?alpha_sort=R)
Let $\epsilon < 0$ (<http://epsilon.komplexify.com>)

Grand illusions (<http://www.grand-illusions.com>)

Portrait gallery - Mathematicians

(<http://mathdl.maa.org/mathDL/46/?pa=content&sa=viewDocument&nodeId=2437&bodyId=2241>)

Maths teaching ideas
(<http://www.teachingideas.co.uk/maths/contents.html>)

e-books

Illustrated maths formulas – Salim
<http://www.arvindguptatoys.com/arvindgupta/mathformulas.pdf>

Ramanujan – the man behind the mathematician –
Sundaresan and Padmavijayam
<http://gyanpedia.in/tft/Resources/books/ramanujan.doc>

A Mathematician's apology – G.H.Hardy
<http://math.boisestate.edu/~holmes/holmes/A%20Mathematician%27s%20Apology.pdf>

Puzzle maths – G. Gamov and Stern
<http://www.arvindguptatoys.com/arvindgupta/puzzlemath.pdf>

1000 uses of a hundred square – Leah Mildred
Beardsley
<http://www.mediafire.com/download.php?detnojruje>

Geometry comic book – Jeane Pierre Petit
<http://www.mediafire.com/?ud0nnujzyy>

Elements – Euclid
<http://www.mediafire.com/?ud0nnujzyy>

How children learn mathematics
<http://gyanpedia.in/tft/Resources/books/mathsliebeck.pdf>

Suggested experiments in school mathematics –
J.N.Kapur
<http://www.arvindguptatoys.com/arvindgupta/jnkapur.pdf>

S.N.Gananath has been involved in the creation, validation and dissemination of resources relating to school mathematics for over two decades with the conviction that joy of learning and teaching can be achieved by innovative, effective methodologies and approaches in any subject and mathematics is no exception! He is the founder director of Suvidya – an Educational Resource Centre now based in Mysore. He can be contacted at sngananath@gmail.com

