

K-5 Math and Technology Resource Links

This list of resources has a "CC BY" license and may be copied and freely distributed. However, the individual links within the list may vary in license types. Use and distribution of individual links are restricted to the license as/when indicated by the source.

1. Foundations of Mathematics

Common Core Georgia Performance Standards for Mathematics

- **Mathematics K-5**

Explanation of K-5 performance standards' domains

<https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx>

High Quality Math Instruction

- **High Quality Mathematics Instruction: What Teachers Should Know**

A video explanation of high-quality math instruction including teaching conceptual understanding of math and the ability to make connections between math topics

<http://iris.peabody.vanderbilt.edu/module/rti-math/challenge/>

- **Evidence-Based Practice Summaries**

A collection of evidence-based research studies on instructional strategies and intervention effectiveness for specific age groups

http://iris.peabody.vanderbilt.edu/ebp_summaries/

National Council of Teachers of Mathematics (NCTM)

- **Teaching Math: A Video Library K-4**

A video demonstration of NCTM standards being implemented in elementary classrooms across America

<http://www.learner.org/resources/series32.html>

Constructivist Theory

- **Constructivism and Education: A Shopper's Guide**

Introduction of Constructivism and a brief overview of its influential thinkers and relation to science and technology Studies

<http://www.math.upatras.gr/~mboudour/articles/constr.html>

Sociocultural Theory

- **Sociocultural Theory**

Explanation of Sociocultural Theory and its history and educational implications

<http://www.education.com/reference/article/sociocultural-theory/>

- **Vygotsky Sociocultural Development**

A video describing Vygotsky's Sociocultural Development focusing on the interactions between people and the period of life called the Zone of Proximal Development

https://www.youtube.com/watch?v=-p_-0n2f35o

2. Problem Solving

Problem Solving Process

- **Polya's Problem Solving Techniques**

Overview of George Polya's four basic principles in problem solving

<http://math.berkeley.edu/~gmelvin/polya.pdf>

Problem Solving Strategies

- **Classroom Cognitive and Meta-Cognitive Strategies for Teachers**

A report on research-based strategies for mathematical problem-solving by understanding the problem, devising a plan, implementing a solution, and then reflecting on the problem

[http://floridarti.usf.edu/resources/format/pdf/Classroom%20Cognitive%20and%20Metacognitive%20Strategies%20for%20Teachers Revised SR 09.08.10.pdf](http://floridarti.usf.edu/resources/format/pdf/Classroom%20Cognitive%20and%20Metacognitive%20Strategies%20for%20Teachers%20Revised%20SR%2009.08.10.pdf)

- **Word Problems Solving Strategies**

Example word problems and step by step explanations of how to solve them

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

- **The Singapore Maths Teacher: Problem Solving Strategies**

Video demonstrations of alternative math problem-solving strategies such as draw a picture, look for a pattern, guess and check, and logical reasoning.

<http://thesingaporemaths.com/stratf.html>

- **Teaching Channel: Problem Solving Tools**

Video of a math teacher's strategies for solving math problems

<https://www.teachingchannel.org/videos/math-problem-solving-strategies>

Example of Problems

- **Interpreting a Two-Step Word Problem**

An interactive tool demonstrating two-step word problems with teacher's notes on how to walk students through approaching and solving each word problem

https://learnzillion.com/lesson_plans/335

Problem-Based Lessons

- **Elementary School Lesson Plans: Pre-K–5 grades**

Database of problem-based lessons plans for Pre-K–5 grades

http://www.gulfcoast.edu/pbl/elementary_school/ElementarySchoolLessonPlans.htm

- **Resources for Teaching Math**

List of various lesson plans for teaching math topics such as counting, subtraction and addition

[http://illuminations.nctm.org/Search.aspx?view=search&type=ls&kw=problem based &st=na&gr=Pre-K-2 3-5](http://illuminations.nctm.org/Search.aspx?view=search&type=ls&kw=problem%20based%20&st=na&gr=Pre-K-2%203-5)

3. Assessment

Types of Assessment in Mathematics

- **Games that could be Used as Assessments**

Website of interactive games for teaching math on various mathematical topics

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

- **Internet Mathematics Library**

Database of resources on various mathematical topics

<http://mathforum.org/library>

- **Assessment Rubrics: Math**

A collection of rubrics from standards-based math rubric to Pre K-K rubric

<http://www.exemplars.com/resources/rubrics/assessment-rubrics>

- **Rick Wormeli: Formative and Summative Assessment**

Video of Rick Wormeli explaining the difference between Formative and Summative Assessments and how the Formative Assessment helps you to offer better feedback to students

https://www.youtube.com/watch?v=rJxFXjfB_B4

Feedback on Assessment in Mathematics

- **Using Common Formative Assessments to Help Teachers Reflect on Their Practice**

Video of Kenneth Williams discussing use of common formative assessments and how it helps teachers to reflect on their practice

www.youtube.com/watch?v=FldnHUgiTcM

- **Effective Feedback and Formative Assessment**

Video discussing how Formative Assessment can be used to obtain effective feedback in order to improve student outcomes

www.youtube.com/watch?v=1Tihrg7nBos

Student Self-Assessment in Mathematics

- **Exemplars K-12 Tools for Students: Peer- and Self-Assessment**

List of peer and self-assessment resources such as rubrics, checklists, and guidelines

<http://www.exemplars.com/resources/formative-assessment/tools-for-students-peer-and-self-assessment>

- **Google Search of Student Self-Assessment in Math**

A Google search for math self-assessments

https://www.google.com/?gws_rd=ssl%20-%20q=student+self-assessment+in+math#q=student+self-assessment+in+math

- **Capacity Building Series: Student Self-Assessment**

Report on the importance of student self-assessment and how it can be used to raise student achievement

<http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/studentselfassessment.pdf>

- **Scotch Plains-Fanwood Public Schools: Student Self-Assessment**

List of self-assessment examples and an article explaining purpose of self-assessments

<http://www.spfk12.org/Page/5960>

- **Student Math Survey**

An example student survey for gaining feedback on a math class

http://www.bc.edu/research/intasc/PDF/opd_bat_StudentPost_fall06.pdf

4. Equitable Teaching of Mathematics

Student with Special Needs in Mathematics

- **Response To Intervention (RTI): Mathematics**

Staff at Lyle Elementary School focused on using high-quality mathematics techniques and wondered if RTI can make a positive difference on students' interest and motivation in math

<http://iris.peabody.vanderbilt.edu/module/rti-math/challenge/>

- **Effective Mathematics Instruction - How Disabilities can Affect Math Achievement**

Explanation of learning disabilities and how that can impact learning math

http://www.parentcenterhub.org/wp-content/uploads/repo_items/eemath.pdf

- **Mathematics Instruction for Students with Learning Disabilities or Difficulty Learning Math**

Report on strategies and recommendations on how to teach students with learning disabilities or students with mathematical learning difficulties

<http://www.centeroninstruction.org/files/Mathematics%20Instruction%20LD%20Guide%20for%20Teachers.pdf>

English Language Learners and Mathematics Instruction

- **Regular Classroom Modifications for ELL Students**

Check list of regular classroom modifications for ELL students

<http://www.gustine.esc14.net/users/0001/docs/Accommodations%20Checklist%20from%20TEA%20from%20TELL-IT.pdf>

- **Suggested Accommodations for Bilingual/ESL Students**

A numbered list of suggested accommodations for bilingual/ESL students

<http://gtpdx.wikispaces.com/file/view/accommodations%20ESL.pdf/378926664/accommodations%20ESL.pdf>

- **Supporting ELLs in Mathematics**

List of resources "to illustrate how Common Core aligned math tasks can be used to support math instruction and language development for ELLs" in elementary, middle, and high school

http://ell.stanford.edu/teaching_resources/math

- **Improving Mathematics Problem Solving Skills for English Language Learners with Learning Disabilities**

Implications and tips for teachers teaching mathematical problem-solving skills to ELLs with learning disabilities

<http://www.colorincolorado.org/article/12907/>

Gender-friendly Mathematics Instruction

- **Gender Equity in Mathematics Education**

Report describing teachers' roles in addressing gender equity in mathematics including an activity sheet

<http://ncisla.wceruw.org/publications/articles/Gender.pdf>

Gifted Students and Math Instruction

- **Mathematically Gifted Students: How Can We Meet their Needs?**

Article discussing characteristics of gifted math students and challenges for school districts and teachers to differentiate instruction

http://www.davidsongifted.org/db/Articles_id_10514.aspx

- **Meeting the Needs of Gifted Students: Differentiating Math and Science Instruction**

Report on meeting the needs of gifted students by differentiating math and science instruction through identifying these gifted students and differentiating content, process, and learning environment

<http://educationnorthwest.org/sites/default/files/12.99.pdf>

- **Hoagies' Gifted Education Page**

List of resources for teaching mathematics to gifted students

http://www.hoagiesgifted.org/math_gifted.htm

- **Gifted Resources: Curriculum**

List of resources for teaching gifted students including lesson plans and math involving the use of a Rubik's Cube

<http://www.exquisite-minds.com/gifted-resources-lessons-and-curriculum/>

- **Differentiating the Curriculum for Elementary Gifted Mathematics Students**

Report discussing how gifted math students need a differentiated curriculum with example activities to use

http://www.soe.vt.edu/tandl/pdf/Wilkins/Publications_Wilkins_Differentiating_curriculum_Elementary_Gifted_Mathematics_students.pdf

- **Online Math Resources for Gifted Children**

List of resource materials for teaching math to gifted children including worksheets and word problems

<http://www.homeschoolmath.net/online/gifted.php>

Low-Achievers in Mathematics Instruction

- **Effective Math Instruction for Low Achievers**

Summary of studies completed demonstrating methods and techniques that work best for teaching students with low achievement

<http://www.ernweb.com/educational-research-articles/effective-math-instruction-for-low-achievers/>

- **Characteristics of High and Low Achievers**

Information for teachers about high and low achievers and effective study skill strategies to help students

<http://iris.peabody.vanderbilt.edu/module/ss1/perspectives-and-resources/q1/p01/>

5. Technological Tools for Mathematics

Calculators

- **Talking Calculator**

Interactive calculator that verbalizes user's interactions with the calculator

<http://pbskids.org/cyberchase/math-games/calculator/>

- **Cool math's Online Math Calculators**

Various math and financial calculators to help calculate annuity, loans, percentage problems, sales tax, etc.

<http://www.coolmath.com/calculators/index.html>

- **Math.com Online Calculators**

Several interactive calculators available for users such as calculators for solving basic, scientific, circle, percent, and quadratic equation functions

<http://www.math.com/students/calculators/calculators.html>

- **The Calculator Home Page**

An interactive scientific calculator with functions such as sin, cos, and tan

<http://www.calculator.org/jcalc98.aspx>

- **Online Calculator**

An interactive basic calculator for addition, subtraction, multiplication and division

<http://www.online-calculator.com/>

Digital Tools for Mathematics

- **Digital Tools for Mathematics: Web-Based Apps**

Interactive math apps to learn various topics such as telling time, fractions, and geometry

http://k-12.pisd.edu/currinst/elementary/math/SOL_2013/index.htm

Instructional Applications for Mathematics

- **Games and Interactives**

Links to webpages that hold many teaching resources such as interactive games and materials

<http://www.thinkport.org/ECE/technology/interactive.tp>

- **Podcasts and Mobile Downloads**

Links to webpages that hold teaching resources such as videos, podcasts, and mobile downloads

<http://www.thinkport.org/ECE/technology/apps.tp>

Guidelines for Selection of Technological Resources

- **10 Tips for Software Selection for Math Instruction**

Tips on software selection for math instruction to students with learning disabilities

http://www.ldonline.org/article/10_Tips_for_Software_Selection_for_Math_Instruction/6243

- **Preparing Teachers to Teach Mathematics with Technology**
Article discussing components related to preparing teachers to teach math such as type of technology use, attitudes, beliefs, and barriers
<http://www.citejournal.org/articles/v6i2mathematics1.pdf>
- **Differentiating in Math Using Computer Games**
A video on differentiation in math classrooms due to the use of technology
<https://www.teachingchannel.org/videos/differentiating-in-math>

Internet Resources for Mathematics Instruction

- **National Council of Teachers of Mathematics (NCTM)**
Website full of classroom resources for teachers teaching mathematics
<http://www.nctm.org/>
- **The Math Forum @ Drexel**
Website full of mathematical resources such as online mentoring, puzzles, and problem solving for teachers and students
<http://mathforum.org/>
- **PBS Learning Media**
Website full of resources for students and teachers alike
<http://www.pbslearningmedia.org/>

6. Numbers, Number Systems, and Operations

- **Numbers and the Number System: Place Value**
Webpage with lists of mathematical resources about numbers and the number system such as place value
<http://www.primaryresources.co.uk/maths/mathsB4.htm>
- **Teaching Math: A Video Library, K -4**
A video demonstration of NCTM standards being implemented in elementary classrooms across America
www.learner.org/resources/series32.html
- **Place Value Game**
An interactive game to help children learn about place value
<http://education.jlab.org/placevalue/index.html>

Early Number Concepts and Number Sense

- **The History of Numbers**
Information about the history and back ground of numbers
<http://www.vedicsciences.net/articles/history-of-numbers.html>

Addition

- **Addition with Manipulatives**
Interactive game helping children practice addition
<http://www.abcya.com/addition.htm>

Subtraction

- **Comparing Connecting Cubes**

List of various lesson plans helping students learn 5 models of subtraction such as balanced equations and the number line using connecting cubes

<http://illuminations.nctm.org/unit.aspx?id=6142>

Multiplication

- **All About Multiplication**

List of various lesson plans for teaching multiplication

<http://illuminations.nctm.org/unit.aspx?id=6099>

Division

- **Conceptualizing Division with Large Numbers**

Lesson plan teaching the strategies behind division and how the strategies can be translated into mathematical steps

<http://illuminations.nctm.org/Lesson.aspx?id=3807>

- **Illustrated Division**

Interactive game teaching division

http://nlvm.usu.edu/en/nav/frames_asid_193_g_1_t_1.html

Basic Math Facts

- **Math Fact Café**

Resource that enables math teachers to produce pre-made or customized math worksheets

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

- **Basic Math Facts**

Information about when students should have certain math skills

<http://everydaymath.uchicago.edu/parents/understanding-em/facts/>

- **Math Games and Learning Activities by Topic**

Interactive games for children on various math topics such as addition, fractions, and geometry

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

- **Sheppard Software: Interactive Math Games**

Interactive games for children on various math topics such as telling time, money, and percentages

<http://www.sheppardsoftware.com/math.htm>

- **Interactive Educational Games**

Provides many preschool and kindergarten activities that enhance their desire to learn

<http://www.sheppardsoftware.com/preschool/preschool.htm>

- **Play Free Math Games: Grades 1-5**

Enhance student's desire to learn with educational games. Select desired subject and grade level for appropriate math games.

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

Whole-Number Place Value Concepts

- **Building Sets of 19 and 20**

This resource allows students to explore building sets of 19 and 20. They count up to 20, construct and decompose sets up to 20, and record the decompositions.

<http://illuminations.nctm.org/Lesson.aspx?id=1788>

Computation

- **Planning a Trip to Disneyland or Disney World**

Use this source for students to collect data to plan a trip to a particular destination. Students will determine elapsed time and distance and use problem solving skills to calculate meals, lodging, and air travel.

<http://illuminations.nctm.org/Lesson.aspx?id=1355>

7. Measurement

- **Measure Me!**

In this task, students work with partners to measure themselves. This lesson allows students to see why accurate measurements are important.

www.oercommons.org/courses/measure-me

- **Measuring Blocks**

Provides a lesson plan to highlight the importance of accurate measurements

www.oercommons.org/courses/measuring-blocks

- **Twizzler Measurement**

Provides a lesson plan that encourages students to use technology, hands-on interaction, and active participation to compare and measure different heights of objects

www.oercommons.org/courses/twizzler-measurement

- **Measurement Mania: Series of Measuring lessons**

Provides a series of lesson plans that actively involve students in several measurement activities in order to gain hands-on practice while working in small groups

www.oercommons.org/courses/measurement-mania

- **Group Activity of Measuring Non-standard Units**

Provides lesson plans for teachers in order to enhance students' understanding of non-standard unit of measurement concepts

www.oercommons.org/courses/measurement-centers

- **Quiz: Can You Measure?**

Provides many self quizzes for students divided into primary and post primary levels

www.oercommons.org/courses/can-you-measure-quiz

- **Measurement**

A measuring activity lesson plan for children to work with a partner to measure hands, feet, and smiles to the nearest inch and centimeter

www.oercommons.org/courses/measurement

- **Measurement & Geometry Activity Resources for Teaching Math**

Provides interactive and recent news related lessons for all age groups. Easily search lessons by NCTM Standards or Common Core Math Standards.

<http://illuminations.nctm.org/Search.aspx?view=search&type=ls&st=g&gr=Pre-K-23-5>

8. Geometry

- **Measurement & Geometry Activity Resources for Teaching Math**

Provides interactive and recent news related lessons for all age groups. Easily search lessons by NCTM Standards or Common Core Math Standards.

<http://illuminations.nctm.org/Search.aspx?view=search&type=ls&st=g&gr=Pre-K-23-5>

- **Dynamic Paper: Interactive App**

Create patterns, number lines, and many different shapes and convert to PDF for printing

<http://illuminations.nctm.org/Activity.aspx?id=3509>

- **Interactives: Geometry 3D Shapes**

Provides interactive ways to learn about three-dimensional geometric shapes. Provides lessons about terminology, calculating surface volume/area, and mathematical properties.

www.learner.org/interactives/geometry/index.html

- **Shape and Space in Geometry**

Provides geometry lessons using new instructive and practical ways of learning. Divides geometry into 2 simplified categories on “shape” and “space.”

www.learner.org/teacherslab/math/geometry

9. Data Analysis and Probability

- **Resources for Teaching Math**

Select appropriate grade level or age group in order to find lessons on many skills. Choose from activities age appropriate for students Pre-K through 12th grade.

<http://illuminations.nctm.org/Search.aspx?view=search&type=ls&st=d&gr=Pre-K-2-3-5>

- **Create a Graph**

Create many different types of graphs and charts. This source provides information as to which graph/chart to use for different types of data.

<http://nces.ed.gov/nceskids/createagraph/>

- **Data Grapher**

Can be used to analyze data with bar graphs, line graphs, pie charts, and pictographs

<http://illuminations.nctm.org/Activity.aspx?id=4098>

- **Advanced Data Grapher**
Can be used to analyze data with box plots, bubble graphs, scatterplots, histograms, and stem-and-leaf plots
<http://illuminations.nctm.org/Activity.aspx?id=3476>
- **Marble Mania!**
Interactive resource that uses marbles to illustrate probability
www.sciencenetlinks.com/interactives/marble/marblemania.html
- **Data Analysis and Probability: Grades Pre-K–5th**
Interactive simulations for grades Pre-K–12th
http://nlvm.usu.edu/en/nav/topic_t_5.html

10. Algebraic Thinking and Patterns

- **Resources for Teaching Math**
Provides lesson plan ideas for Pre-K-12th grade for various mathematical topics, such as number & operations, algebra, geometry, and measurement for both NCTM Standards and Common Core Math Standards
http://illuminations.nctm.org/Search.aspx?view=search&type=ls&mp%3Bamp%3Bst=a&%3Bamp%3Bgr=Pre-K-2_3-5
- **Virtual Manipulatives for Algebra**
Interactive algebra simulations for Pre-K-12th grade
http://nlvm.usu.edu/en/nav/topic_t_2.html
- **Inside Mathematics**
“A professional resource for improving students’ math learning and performance”
<http://www.insidemathematics.org/>
- **Interactive Linear Equation**
Resource provides an interactive graph to illustrate the relationship between line equation and the graph
http://www.mathwarehouse.com/algebra/linear_equation/linear-equation-interactive-activity.php
- **Learning Math: Patterns, Functions, and Algebra**
Video and web-based course on basic concepts of algebra for K-8 grade teachers
www.learner.org/resources/series140.html
- **PBS Kids: Math Games**
Interactive games for students to apply mathematical skills
<http://pbskids.org/cyberchase/math-games>

11. Estimation

- **Teaching Elementary Mathematics: Estimation**
Brief explanation of estimation, how it can be applied, and also lists additional estimation resources
<https://mathteachingstrategies.wordpress.com/2009/04/02/big-idea-estimation/>

- **The Math Forum - Estimation**

Includes questions Gail Englert (T2T Associate) has responded to from elementary and middle school teachers, parents, and students

<http://mathforum.org/t2t/faq/gail/>

- **Estimation Unit of Activities and Games**

Provides a three day lesson plan for grades 3-4 to help students to learn how to strategically make estimates

https://www.nsa.gov/academia/files/collected_learning/elementary/arithmetric/reasonable_estimates.pdf

- **Estimation Introduction**

This resource provides a brief introduction to the importance of estimation and includes examples of situations where estimations are helpful

<http://www.mathsisfun.com/numbers/estimation.html>

- **Estimating Volume by Counting on Frank**

“In this lesson, students read the book ‘Counting on Frank’. They use information in the book to make estimates involving volume. In particular, students explore the size of humpback whales.”

<http://illuminations.nctm.org/Lesson.aspx?id=837>

12. Error Analysis/Error Patterns

- **Error Patterns in Computation**

This article discusses how to detect the systematic errors many students make when computing with paper and pencil

http://www.pearsonhighered.com/assets/hip/us/hip_us_pearsonhighered/samplechapter/0135009103.pdf

- **Misconceptions and Error Patterns**

This source discusses improvement of mathematic instruction through diagnosing the issue

http://ptgmedia.pearsoncmg.com/images/9780135009109/downloads/Ashlock_Ch1_MisconceptionsandErrorPatterns.pdf

- **Error Pattern Analysis**

Provides an explanation of the importance of error pattern analysis and a process for how to gather data to be analyzed

<http://www.specialconnections.ku.edu/~speconn/page/instruction/math/pdf/patternanalysis.pdf>

- **Error Analysis**

This resource provides a list of common errors and definitions concerning error analysis, as well as a step by step example of how to analyze data

<http://k6.boardofstudies.nsw.edu.au/wps/portal/go/mathematics/support-students-special-needs/assessment/error-analysis>

13. Mathematics Literature Connections

- **Math Literature Connections**

Resource listing books relating to mathematic topics, including worksheets to download
<http://mathwire.com/literature/literature.html>

14. Glossary for Mathematics Concepts and Terminology

- **Glossary for Math Terminology**

Resource that provides mathematic terms and simple definitions
<http://www.math.com/school/glossary/glossindex.html>

- **Illustrated Mathematics Dictionary**

Over 750 mathematic terms are included with definitions and illustrations
<http://www.mathsisfun.com/definitions/>

- **Math Dictionary**

A resource that organizes various mathematic terms and definitions in a searchable format
<http://www.didax.com/mathdictionary/>

- **Math Dictionary for Kids**

An animated, interactive online math dictionary for students which explains over 600 common mathematical terms and math words in simple language; also includes math charts covering a variety of mathematic topics
<http://www.amathsdictionaryforkids.com/>