

# Using Technology to Enhance Algebra Instruction (7–12)

## Angela Newing

**Session Goals**

- ? Examine how on-line applets can be used to improve students' understanding
- ? Navigate through Internet resource guides in order to find interactive math applets, Internet-based lesson plans, technology projects, and math links
- ? Explore technology tools that can be used to help students better comprehend algebraic concepts
- ? Share tools found on the Internet with other participants

---

---

---

---

---

---

---

---

**Exploring Linear Relationships**


Linear Model

The general equation for a linear relationship is  $y = mx + b$ , sometimes written as  $f(x) = mx + b$ .

When you change the value of  $m$ , how does the graph change?

When you change the value of  $b$ , how does the graph change?

In your own words, explain what  $m$  and  $b$  tell you about a linear graph.



---

---

---

---

---

---

---

---

**Exploring Linear Relationships**


Linear Model

$m$  is called the slope of a line

Examine what happens to the line when the slope is a negative number and when it is a positive number. Describe what you notice.

$b$  is called the y-intercept

Examine what happens to the line when the y-intercept is positive and when it is negative. Describe what you observe.



---

---

---

---

---


---

---

---

The workshop presentations and materials from the U.S. Department of Education Teacher-to-Teacher Summer Workshops were developed by various individuals and are being provided as illustrative examples of what might be useful to teachers. The Department is not requiring or encouraging the use of any particular methods or materials in the classroom, and the use of the methods and materials in these sessions does not constitute an endorsement by the U.S. Department of Education.

## Using Technology to Enhance Algebra Instruction (7–12) Angela Newing

**Resource Guides** 

For information, resources, technology tools, and links that support the teaching and learning of mathematics visit:

<http://www.neirtec.org/math/>

and

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

---

---

---


---

---

---

---

---

**Focus Questions** 

- 1) Which website did you find most useful?
- 2) What source of information does it provide?
- 3) Describe how you could use the resource to help your students better understand algebraic concepts?

---

---

---


---

---

---

---

---

**Next Steps** 

- Identify the technology available at your school
- Decide the most practical format to conduct the activity (i.e. classroom demo, computer lab, small workstations)
- Identify technical support/assistance you might need, if any
- Start simple
- Have fun learning! Your students sure will.

---

---

---

---

---

---

---

---

The workshop presentations and materials from the U.S. Department of Education Teacher-to-Teacher Summer Workshops were developed by various individuals and are being provided as illustrative examples of what might be useful to teachers. The Department is not requiring or encouraging the use of any particular methods or materials in the classroom, and the use of the methods and materials in these sessions does not constitute an endorsement by the U.S. Department of Education.

## Algebra and Technology

As expectations in algebra continue to change, the use of technology should have an integral part in enhancing the way students learn and understand algebraic concepts. The web offers a plethora of free materials that can be used to support these efforts. Teachers can find interactive math applets, Internet-based lesson plans, and technology projects that can be utilized to create effective standards-based mathematics lessons.

<http://illuminations.nctm.org>

NCTM Illuminations website has several online resources that can be utilized by teachers. To find resources for a particular grade, first select the grade band and then click on the links: *i-Maths*, *SWRs*, *Lessons*, and *Tools*. The algebra contents under each link are listed below.

Grades 6 – 8	Grades 9 – 12
<p><b><i>i-Maths</i></b> - Learning about Rate of Change in Linear Functions - Understanding the Pythagorean Relationship</p> <p><b><i>SWRs</i></b> - Select Algebra. Various web sources will be listed.</p> <p><b><i>Lessons</i></b> - Building Bridges to Algebraic Thinking - Magic Squares - Orbiting Satellites - Printing Books - Revisiting a Difference of Squares - Tips for Teaching Cartesian Graphing - A Videotaping Project to Explore the Multiplication of Integers</p> <p><b><i>Tools</i></b> - Affine Recurrence Plotter, Spreadsheet - Expression Pan Balance - Now/Next Recurrence Table Generator - Proof Without Words: Pythagorean Theorem - Spreadsheet and Graphing Tool</p>	<p><b><i>i-Maths</i></b> - Investigating Linear Relationships - Shedding Light on the Subject - Using Algebra and Discrete Mathematics to... - Whelk-Come to Mathematics - Using Graphs, Equations, and Tables to Investigate....</p> <p><b><i>SWRs</i></b> - Select Algebra. Various web sources will be listed.</p> <p><b><i>Lessons</i></b> - Building Connections among Classes of Polynomial Functions - Generating and Analyzing Data - Iterating to Find the square root of 2 - Smokey the Bear Takes Algebra - Supply and Demand</p> <p><b><i>Tools</i></b> - Expression Pan Balance - A Geometric Investigation of <math>(A + B)^2</math> - Now/Next Recurrence Table Generator - Proof without Words- Completing the Square - Spreadsheet and Graphing Tool</p>

The workshop presentations and materials from the U.S. Department of Education Teacher-to-Teacher Summer Workshops were developed by various individuals and are being provided as illustrative examples of what might be useful to teachers. The Department is not requiring or encouraging the use of any particular methods or materials in the classroom, and the use of the methods and materials in these sessions does not constitute an endorsement by the U.S. Department of Education.

## Additional Resources

NEIR\*TEC

<http://www.neirtec.org/math/>

National Library of Virtual Manipulatives

<http://matti.usu.edu/nlvm2/nav/vlibrary.html>

The Math Forum

<http://mathforum.org/algebra/k12.algebra.html>

Educational Java Programs

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

Explore Math

<http://www.exploremath.com/activities/index.cfm>

<http://www.shodor.org/interactivate/elementary/index.html>

Project Interactivate provides numerous interactive Java-based courseware for exploring science and mathematics. To locate algebra resources, click on *Function and Algebra Concepts*.