

Mathematical Modeling and Simulations
with Dynamic and Interactive Excel Spreadsheets

Webinar for the [Hampton Roads MODSIM Initiative](#)

[Scott A. Sinex](#)

Prince George's Community College

Learn to construct dynamic graphs in Excel for visualizing concepts in mathematics and science. This is accomplished using computational formulas and adding the interactive bells-and-whistles available in Excel. Engage your students through numerical experimentation and "what if" scenarios that brings critical thinking, algebraic thinking, and science process to your classroom.

Skill level: basic knowledge of Excel, can graph data and calculate using formulas (for a review or "learn to do this", see http://academic.pgcc.edu/psc/Excel_booklet.pdf)

Scott Sinex is professor and chair of physical sciences and engineering at Prince George's Community College. He works with the Maryland Virtual High School in enhancing modeling and visualization for high school teachers. He maintains the "Developer's Guide to Excelets" at <http://academic.pgcc.edu/~ssinex/excelets>.

Outline:

- Explore an Excelet or interactive Excel spreadsheet
 - interactive features tour
 - predict-test-analyze or "what if"
 - formula auditing and forms toolbars
 - to show the formulas in cells (use CTRL ~ to switch)
- Introduction to "Developer's Guide to Excelets" website
Go to <http://academic.pgcc.edu/~ssinex/excelets>
(or just Google: excelets)
- Build a simple "just add data" Excelet: Is there a relationship between stack height and the number of cookies?

[Investigating the Height of a Stack of Cookies](#)



- Build a more advanced Excelet to explore multivariable systems such as the quadratic equation: $y = ax^2 + bx + c$ or the ideal gas law: $PV = nRT$

[Exploring the Family of Quadratic Functions](#)

- Sizing Excelets to your screen and ZoomIt for LCD projection
To get ZoomIt - <http://technet.microsoft.com/en-us/sysinternals/bb897434.aspx>
(or just Google: zoomit)

Please feel free to contact me with any questions: ssinex@pgcc.edu

The following were provided as handouts:

[Investigating the Height of a Stack of Cookies Activity](#)

[To get the Forms Toolbar](#)

[Decimals and Negative Values for Spinners and Scroll Bars](#)

[How to add the interactive point for interpolation](#)

[To insert a comment box](#)

For further information and resources, see the [SC08 Education Program's K-12 wiki](#), which includes a summary of the Excelets workshops as [Excelets - A Simple, Rapid Deployment Computational Tool with Visualization and Pedagogical Powers for Middle and High School Teachers](#) with links to even more resources.