



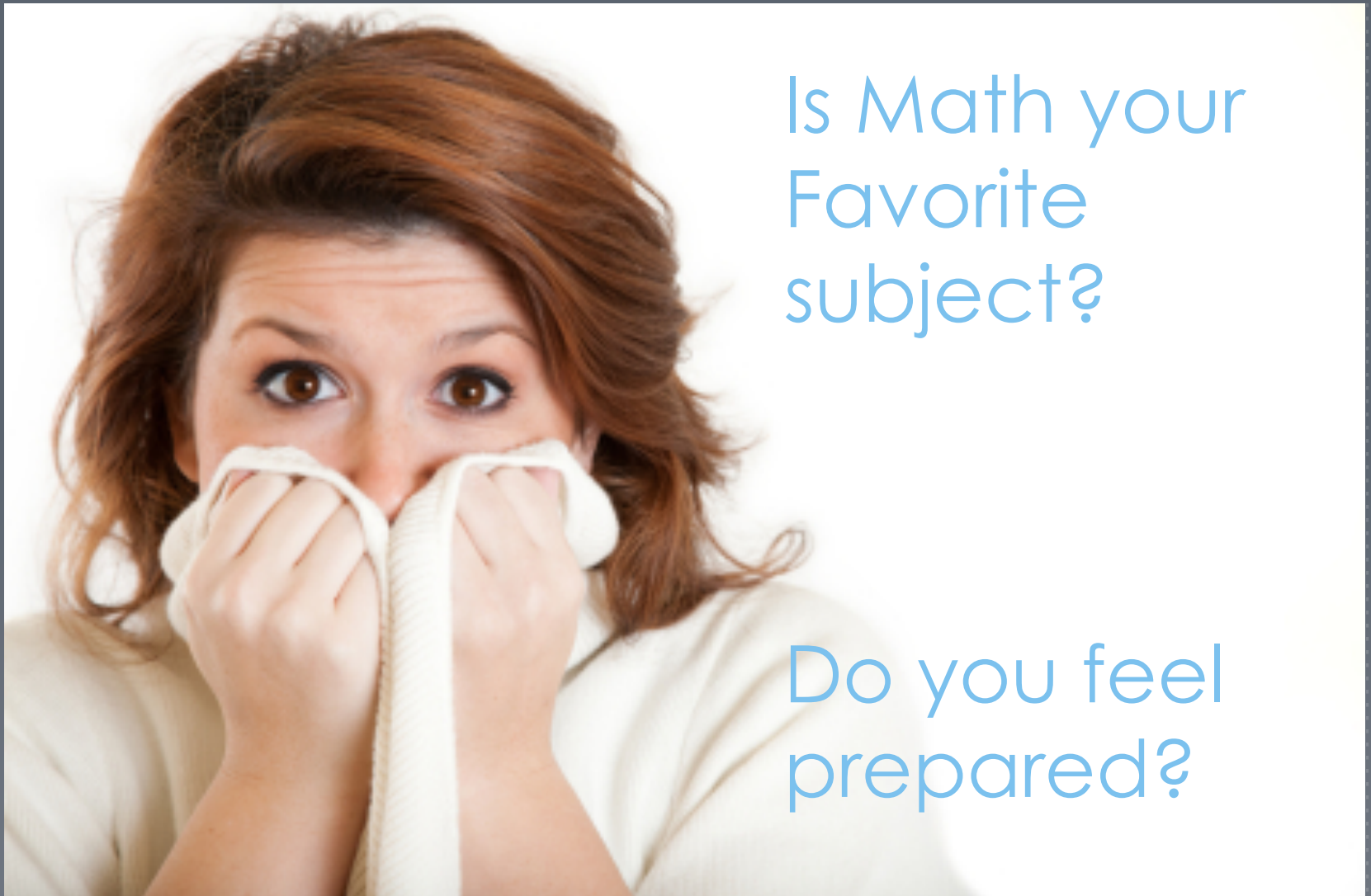
Math, Manipulatives & Technology: A Powerful Trio

Gail Lovely

Gail@GailLovely.com

<http://LovelyLearning.com>

- ▶ Make math more **fun** and **engaging** for your first graders! Discover how to harness the power of **free tech tools** to **enhance** and **enrich** math teaching and learning in your classroom. Gail shares ideas for teaching content in a **range of ways** and **hooking reluctant** learners with **new approaches**.



Is Math your
Favorite
subject?

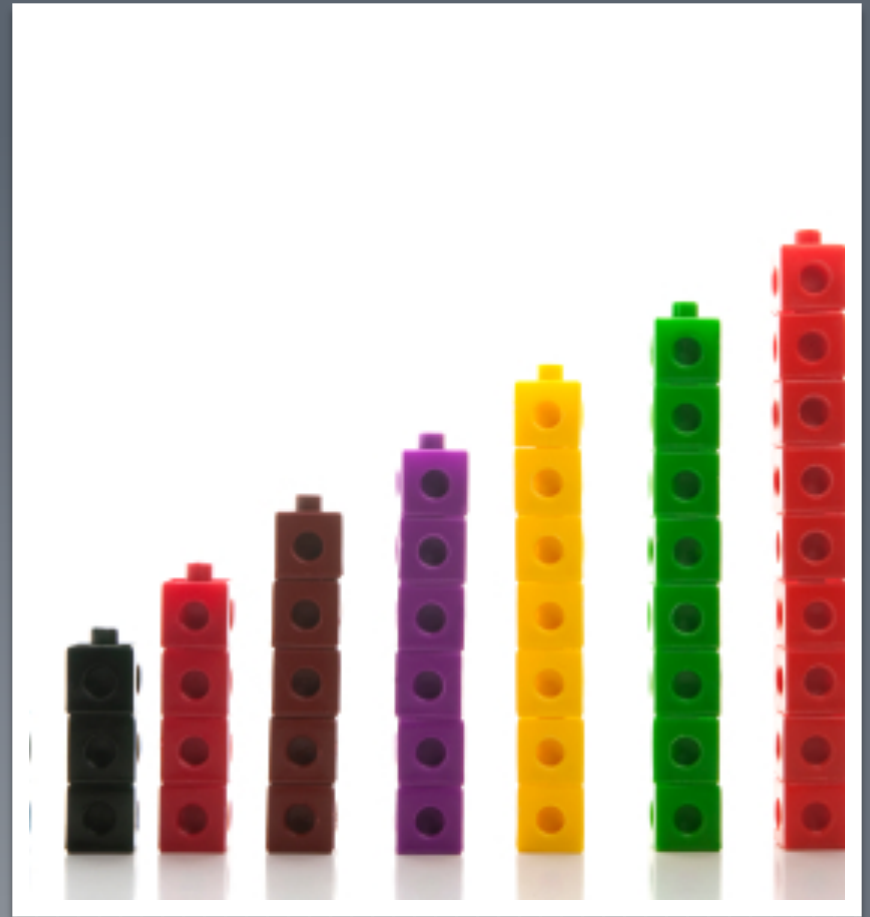
Do you feel
prepared?

<http://blogs.scientificamerican.com/budding-scientist/2012/07/13/math-teachers-feel-theyre-poorly-prepared/>

THE U.S. HAS A PROBLEM

Math

What are the parts of Math which you or your students struggle with ?



Manipulatives

What manipulatives
do you already use?
Wish you could use?



Technologies

What technologies do you have? Wish to have?



Methods

HOW do we do
this?





MANIPULATIVES AND TECHNOLOGY

Using manipulatives WITH technology

- ▶ To annotate or collect examples
- ▶ To create models
- ▶ To demonstrate



Capture the Knowledge



<http://audioboo.fm/boos/519321-facts-of-nine>

Document the process of inquiry

► <http://vimeo.com/36059002>



Inquiry into large numbers.

Create Audience and Purpose for Math

► Using VoiceThread

- <http://voicethread.com/#q.b456753.i3848830>
- <http://voicethread.com/#q.b163901.i873468>

► Using Titanpad

- <http://lovely.titanpad.com/6> (use letmein for the password)

► Using Global Projects


- <http://www.projectsbyjen.com/index.htm>

Picture Problems

► <http://problempictures.co.uk/examples/op06.htm>

**problem
pictures**

PREVIOUS ABOUT NEXT



problem
pictures
the first CD-ROM of
photographs with activities
for mathematics teaching 1

This picture is taken from the [Problem Pictures](#) CD-ROM of photographs with activities for mathematics teaching.


Patchwork quilt

This beautiful patchwork quilt has quite a complex design.

Try to see the basic units from which it is constructed.

Can you see any right angles here?

K04



Extending from Actual to Virtual

► <http://nrich.maths.org/primary-lower>

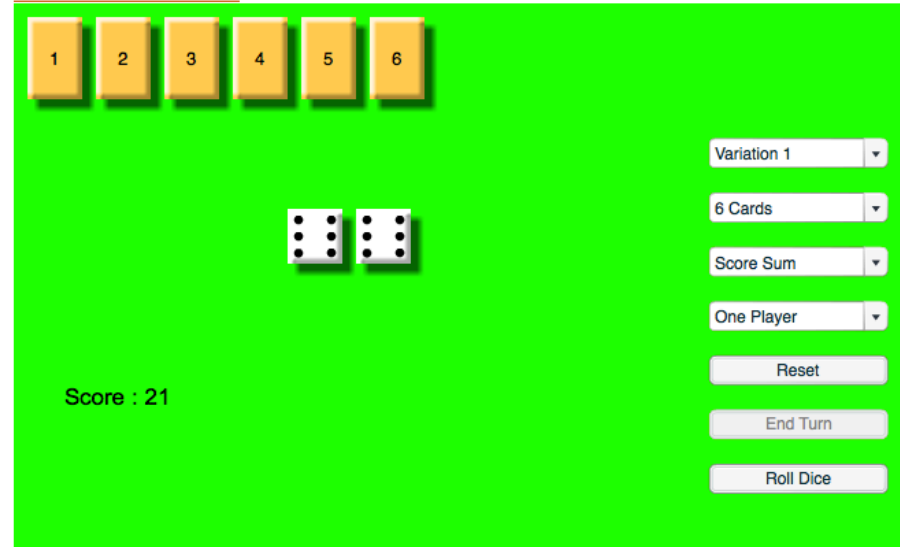
Shut the Box

Stage: 1 ★

Here is a game that uses two dice and cards with the numbers 1 to 12 on them. The aim of the game is to turn over all the cards. You can turn over the cards that match the numbers on the dice.

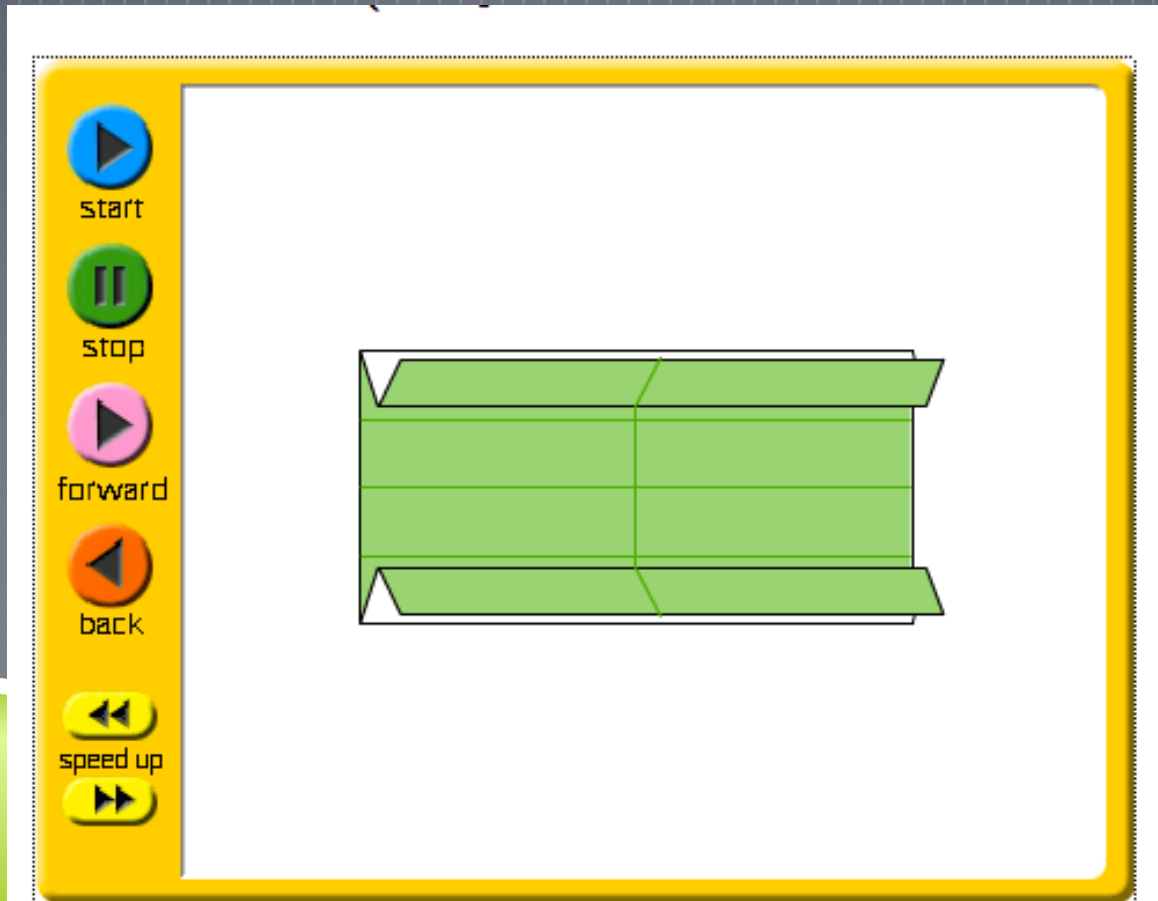


[Full screen version](#)



Provide Support in real time

► <http://en.origami-club.com/>



Too many
Ads for
student use...

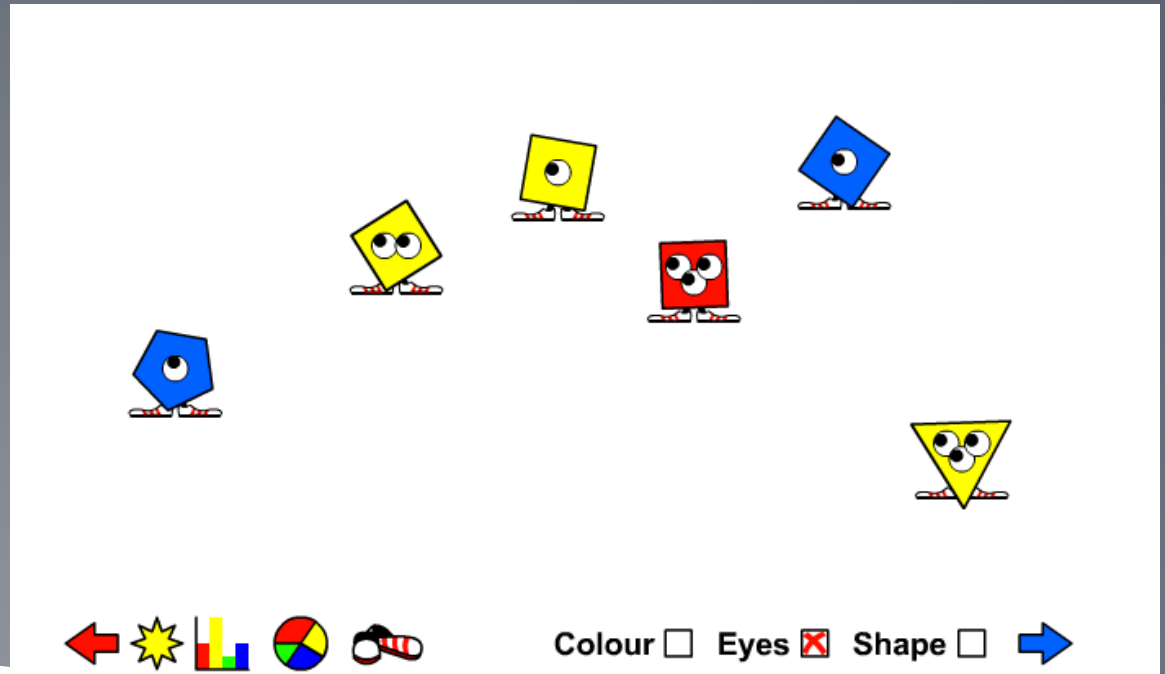


TECHNOLOGY-BASED MANIPULATIVES

Graphing

► Furbles:

<http://www.ptolemy.co.uk/furbles/furbles03>



More graphing....

- ▶ Tool:
- ▶ <http://nces.ed.gov/nceskids/createagraph/default.aspx>

The screenshot shows the 'CREATE A GRAPH' web application interface. At the top center is the logo 'CREATE A GRAPH' in a stylized, colorful font. Below the logo is a large green rectangular area containing various graphing options and settings. On the left side of this area is a vertical sidebar with buttons for 'Help', 'Examples', 'Design', 'Data', 'Labels', 'Preview', and 'Print / Save'. The 'Examples' button is currently selected, displaying a list of example graphs under three categories: Education Examples, Fun Examples, and Statistics Examples. The 'Design' button is also visible, showing a preview of a bar graph and various customization options like Direction, Shape, Style, Grid Color, Grid Lines, Appearance, and Legend.

CREATE A GRAPH

Examples

Education Examples:

- [U.S. Public School Student Membership](#)
- [Number of Postsecondary Institutions](#)

Fun Examples:

- [Star Shape with Data](#)
- [International Per Capita Consumption of Turkey](#)

Statistics Examples:

- [U.S. Average Price of Gasoline](#)
- [Percentage of students who reported being bullied at school](#)
- [Airline On-Time Statistics and Delay Causes](#)
- [Air Passenger Travel Arrivals in the United States](#)

Design

Bar

Line **Area** **Pie** **XY**

Direction: ☐ Vertical ☒ Horizontal ☐ True 3D
☐ Stacked ☐ Stacked

Shape: ☐ Rectangle ☒ Cylinder ☐ Triangle
☐ Rhombus ☐ Pattern

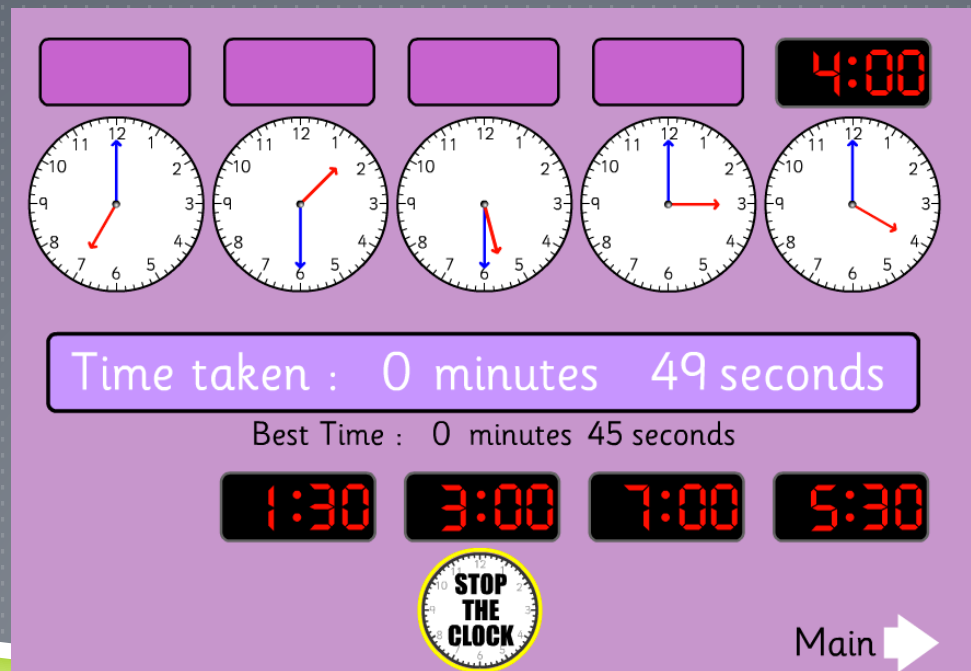
Style: Background Color:
Grid Color: Grid Lines: 6
Appearance: Shadow Legend: - no legend -

What to graph?

- ▶ <http://www.canteach.ca/elementary/numbers13.html>
- ▶ <http://www.kinderpond.com/graphing.html>
- ▶ <http://michellef.essdack.org/sites/michellef.essdack.org/files/Graphing%20Questions.pdf>

Telling Time

- <http://www.oswego.org/ocsd-web/games/StopTheClock/sthec1.html>



More time....





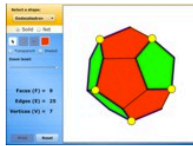



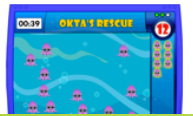

- ▶ <http://www.time-for-time.com/swf/myclox.swf>
- ▶ <http://www.timemonsters.com>
- ▶ <http://www.harcourtschool.com/activity/willy/willy.html>

Gails go-to sites...

- ▶ Stable
- ▶ Clear interface
- ▶ Valuable TOOLS
- ▶ Not just drill...

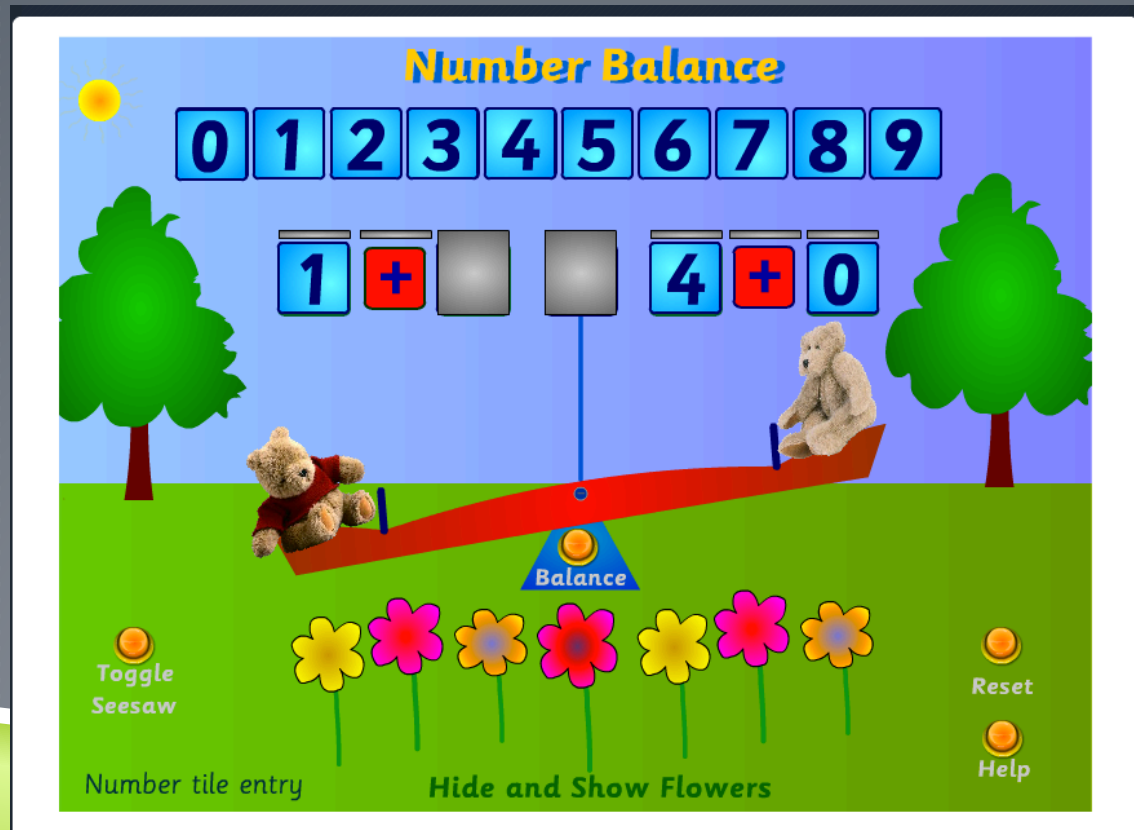
NCTM (of course)

- ▶ <http://illuminations.nctm.org/> and
- ▶ <http://www.nctm.org/standards/content.aspx?id=24600>

| | | | |
|---|------------------------------------|---|--|
|  | <u>Coin Box</u> |  | Manipulating Coins using an Array Representation |
|  | <u>Dynamic Paper</u> |  | Creating Customized Activity Sheets for Your Classroom |
|  | <u>Geometric Solids</u> |  | Manipulating Various Geometric Solids and Investigating Their Properties |
|  | <u>Grouping and Grazing</u> |  | Counting, Adding, and Subtracting by Grouping Cows |
|  | <u>Okta's Rescue</u> |  | Counting and Subitizing by Playing a Game |

Every School


► <http://www.everyschool.co.uk/maths.html>



National Library of Manipulatives

► <http://nlvm.usu.edu/en/nav/vlibrary.html>

**National Library of Virtual Manipulatives**
Cliquez ici pour visiter ce site web en français



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| Index | Pre-K — 2 | 3 — 5 | 6 — 8 | 9 — 12 |
|-----------------------------|---|-------|-------|--------|
| Number & Operations |  | | | |
| Algebra | | | | |
| Geometry | | | | |
| Measurement | | | | |
| Data Analysis & Probability | | | | |

More, Many Student-made

► <http://www.amblesideprimary.com/ambleweb/numeracy.htm>

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

Make counters

Click and drag

Click to remove all counters

IDEAS

EXIT

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Textbook Companies...

- ▶ http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html
- ▶ http://www.everydaymath.com/EM_eToolkit_Demo/eTools_v1.html
- ▶ http://macmillanmh.com/math/mathtoolchest/mtc_online/
- ▶ <http://www.eduplace.com/kids/mthexp/g1/emanip.html>

WHAT ABOUT APPS?

Math Apps I like Right Now...

- ▶ Freefall Money (a little drill-ish)
- ▶ Math Doodles
- ▶ Tanzen (Tangrams)
- ▶ Counting Together (plus) \$
- ▶ Math Maniac \$
- ▶ Jellybean Count (teamwork!)
- ▶ Multitouch Math \$

Apps to use in Math right now...

- ▶ Explain Everything \$
- ▶ AudioBoo
- ▶ TableTots
- ▶ Zapd
- ▶ Any drawing tool, especially with voiceover
- ▶ Move and Match (create your own activities)

TECHNOLOGY GIVES ACCESS TO
MANIPULATIVES AND INFORMATION

Access to Ideas




<http://www.flickr.com/photos/robq/352962676/>

Learn from Others

- ▶ <http://pinterest.com/sharonhuxham/daily-5-math/>
- ▶ http://www.mathpickle.com/K-12/Videos_K-2.html
- ▶ <http://www.symbaloo.com/mix/lower-school-math-links>

Books for Math

► <http://www.livingmathbooklist.blogspot.com/>



Living Math Book List

...making math meaningful one book at a time

COUNTING BY 2s

Count on Pablo by Aileen Friedman

Eggs and Legs by Michael Dahl

Footprints in the Snow by Michael Dahl

How Many Feet in Bed? by Diane Johnston Hamm

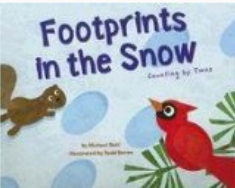
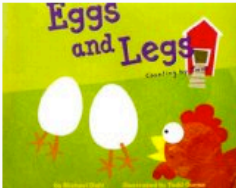
Pie for Piglets by Michael Dahl

Share

Search Categories

FAQs

- Addition
- Angles
- Area
- Calendars
- Capacity
- Combinations
- Comparisons
- Counting
- Counting by 10s
- Counting by 2s
- Counting by 5s
- Data Collection
- Division
- Doubling Numbers
- Equal Sets



TECHNOLOGY TO MAKE MANIPULATIVES (PRINTABLES AND FOLDABLES)

NCTM – Dynamic Paper (printables)

► <http://illuminations.nctm.org/ActivityDetail.aspx?ID=205>

The screenshot displays the NCTM Dynamic Paper interface for the 'Shapes' activity. The top navigation bar includes tabs for Nets, Graph Paper, Number Lines, Number Grids, Tessellations, Shapes (selected), Spinners, and Help. The 'Shapes' section is active, showing a 'Shape Type' list with 'Pattern Blocks' selected, and a 'Block Type' list with 'Square', 'Equilateral Triangle', 'Hexagon', 'Isosceles Trapezoid', 'Rhombus', and 'Small Rhombus' all checked. The 'Units' are set to 'inches' and the 'Side Length' is 1.25 in. The right panel shows a vertical stack of shapes: a square, an equilateral triangle, a hexagon, an isosceles trapezoid, a rhombus, and a small rhombus. The bottom of the interface features 'Download JPEG' and 'Download PDF' buttons, along with a set of navigation icons. The footer indicates 'Page 1/1' and '© 2013 National Council of Teachers of Mathematics'.

Nets **Graph Paper** **Number Lines** **Number Grids**
Tessellations **Shapes** **Spinners** **Help**

Shapes **Reset** **Add »**

Shape Type:
☒ Pattern Blocks
☐ Color Tiles
☐ Attribute Blocks

Units: ☒ inches ☐ centimeters
Side Length: in.

Block Type:
☒ Square
☒ Equilateral Triangle
☒ Hexagon
☒ Isosceles Trapezoid
☒ Rhombus
☒ Small Rhombus

example

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Download JPEG **Download PDF**

Printables

- ▶ <http://www.senteacher.org/Print/Maths/>
- ▶ <https://bingobaker.com/>
- ▶ [http://
www.k-5mathteachingresources.com/
math-resources.html](http://www.k-5mathteachingresources.com/math-resources.html)
- ▶ [http://www.amathsdictionaryforkids.com/
mathschartsIntro.html](http://www.amathsdictionaryforkids.com/mathschartsIntro.html)

Just in case you need more...

- ▶ <http://www.rockingham.k12.va.us/resources/elementary/soltechintegration.htm>
- ▶ <https://sites.google.com/a/myrichmondschool.org/k-5-technology-integration/1st-grade-math>
- ▶ <http://www.mathcats.com/explore.html>



Together we will make change!

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