OH, NO! MATH!

http://tinyurl.com/lrxng7k

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\[ \left( \frac{\sqrt{2+4}}{6 \frac{1}{2}} + 9 \right) (1+2^2) = 50 \]
Nothing sends fear into the resolve of an AT specialist like a student's need for AT in the area of math, especially MS and HS math. When low tech solutions aren’t enough, we struggle because answers are not clear and upper level math is difficult for us to remember how to do. Today, we will trial “math processors” - PC software, apps (iOS and Android), and Chrome apps that enable you to type math. You will leave with some examples that you can use to demo the programs for the students and math teachers you work with.
If we all do our jobs …

- As a result of this activity, the participant will be able to identify several math processors that are appropriate for middle school students.
- As a result of this activity, the participant will be able to demonstrate the use of the presented math apps using the provided templates.
- As a result of this activity, the participant will be able to list the important features in a digital math application.
This Session’s Target Population

- Possibly students who struggle with:
  - math’s basic skill sets (\( \times, \div, x^2 \))
  - the writing components of a task
  - the reading component of the math tasks
  - getting to the task at hand

- Possibly students who can experience greater independence when given learning supports

- ?
Universally Important Components

- Product needs to be in an accessible format most of the time
  - Text reader – are there enough words to matter?
  - Space adjustable
  - Have the option to include useful annotations

- Need a way to get students to the task quickly
  - Templates for routine tasks: x-y axis, number lines
  - Student product must be accepted – digitally or printed

- Staff have to be fluent to offer it to students
  - Easy to get started with and not slow the process
Universally Important Components

- Digital reduces “copying” from teacher presentation method—
  - Copying is trouble for those with attending issues, motor involvement, and visual perceptual issues
  - Classroom pace may be too fast for understanding the new concepts and getting the information “written down”
  - Most current materials start out digital anyway
Routine Procedures

- Concepts presented using computer/LCD
- Worksheets, notes and study guides are posted
  - Paper handouts - a thing of the past?
  - Scanned and uploaded handwritten docs (Mobi)
  - Uploaded screenshots of sample problems
  - Edmodo posts
  - Shared Google docs
  - Teacher websites with word docs or format of the “program” teachers want students to use
What can help?

- Post all materials before the class begins
- Try to have typed rather than handwritten docs
- Try to have all explanations by ECS staff (color) coded and typed rather than handwritten
- Post recordings, not just docs – Mobi, Livescribe, etc.
- Allow notebooks with sample problems, reference charts, etc.
  - From class notes, QuickMath, website tutorials
Let’s get on the same page

What is the trouble with typing math?
- Most word processors treat math as an after-thought; if they have any provision at all.
- If math symbol sets are present, you really can’t do anything more than crudely type the equations with poor symbol alignment.
- `wysiwyg` – (what you see is what you get) rather than “wysisym” – (what you see is what you mean).

What is needed to work problems digitally?
- Symbol palette – that are easy to use
- Logical way to “type” math with the needed symbols in a logical column alignment
- Combination of text and math symbols
Imbedded in MS Word, an old familiar friend

Document does permit typing word and mathematical symbols.

For typing and printing only—doesn’t transfer nicely

Interfaces with more sophisticated programs like MathType
PC/Mac and apps: Adobe Reader

- Content is fixed, but additions are possible
- Adobe Reader XI provides good mix of reading and writing supports across platforms
- It is a “standard tool” — familiar to all, available everywhere, and we need only teach a few toolbar items, not the whole program
- Available on all platforms
.... Adobe Reader

- Familiar and free
- Easy to layer TTS in PC
- Easy for staff to add support

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**Section 1**

Section 1 of this test has thirty questions. Choose the best answer for each question. Fill in the circle in the spaces provided for questions 1 through 30 on your answer sheet.

1. What is the sum of $\frac{1}{2} + \frac{1}{4}$?
   - a. $\frac{1}{4}$
   - b. $\frac{1}{2}$
   - c. 4
   - d. $\frac{3}{4}$

2. A dice teacher is choosing picking a dice number for 10 minutes. The teacher marks:
   - 6 dice for 10 minutes, will an equal number of dice on each turn. How is this to make a pyramid way to divide the 10 points between two students.
   - a. 2 dice with $\frac{1}{2}$ dice on each
   - b. 2 dice with $\frac{1}{2}$ dice on each
   - c. 4 dice with 6 dice on each
   - d. 8 dice with 8 dice on each

3. Which of the values of $x$ in $x = 3$ and $y = 7$?
   - a. 2
   - b. 3
   - c. 5
   - d. 7

4. Use this ruler to make pairs of fractions $(x, y)$. $\frac{y}{x}$
   - a. (1, 1)
   - b. (2, 7)
   - c. (3, 8)
   - d. (10, 2)

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**Fractions on Number Lines**

- A = $\frac{1}{8}$
- B = $\frac{4}{8}$
- C = $\frac{7}{8}$
- D = $\frac{3}{8}$
Lurch is a free math word processor with the ability to check the steps of your proofs and calculations in many areas of mathematics, from calculus to logic.

- Contains full symbol palettes
- Will check the equations for accuracy — great for homework
- Difficult for non-math nerds
iOS – MathPaper by Panther

- Digital paper feel
- Ability to adjust the appearance to better match the user and math being done
- Pretty easy to get started
- Contains full symbol palettes
Math 42 – iOS
- helps students from the 5th to the 12th grade with math — starting with homework to the preparation for tests — by (1) presenting intelligent recommendations, showing how to solve a problem, by (2) giving detailed, illustrated step by step solutions, and (3) a Training and Test Mode that allows you — thanks to statistics — to evaluate your progress and improve yourself.

Digits
- Provides the edit abilities of a spreadsheet with the simplicity of a calculator.
- It has a calculator “tape” which lets you review the steps in the solution.
- Enables you to tap any portion of the “tape” to edit your entries.
Android

Blog.laptopmag.com/best-math-apps

- Graphing Calculator by Mathlab (Free-Android)
- WolframAlpha android and iOS
- Dewalt mobile Pro for construction
- MyScript Calculator (free android) (androidpolice.coms/2012/07/10/myscript-calculator-lets-you-write-equations-on-your-screen from Google play)
- MyScript stylus beta –turns handwritten marks into letters and number, entries are editable
Chrome App – Daum Equation Editor

- Practical, well designed equation editor
- Full symbol palettes
- Multiple ways to save your work
When you want someone to fully understand...

- You can tell them about it.
- You can show them.
- But THEY have to experience it to internalize and make it their own.

So teachers can’t just be told to change.

- They are more likely to understand and adopt/adapt it if they experience it.
- Then they begin to think about the mechanics of “what that felt like”.
- Then they can begin to imagine that environment in their classroom.

Mary Ann Lasseter, Griffin UDL conference 2-2014
Questions to ask ourselves …

- What do we do when standard low tech classroom materials are not enough?

- How do we decide which instructional technology tools will support learning in a new way …provide “added valued” and not just another way to do the same task?
  
  - Example: Android tablet to access an online calculator vs. using a handheld or on your phone
  
  - Paper vs. Word doc vs. Daum Equation Editor

- How do we determine what to try when these items are not enough to support a struggling learner?
Questions and Comments

- Did we discuss learning supports that can be trialed with your students?
- Did a particular student ever come to mind?
- Did we discuss any tools, programs or apps that you would like additional information about?
- Did the discussion affirm your beliefs, teaching habits and choices of materials?
The usual mantra is to try harder. Trying harder is impossible when you're already trying as hard as you can. But you can always try DIFFERENT. -- Seth Godin
One last analogy....

Remember this?
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