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Uplifting Mathematics for All

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TANTON'S TAKE ON ...

★ "BACK TO BASICS" ★

AGAIN!



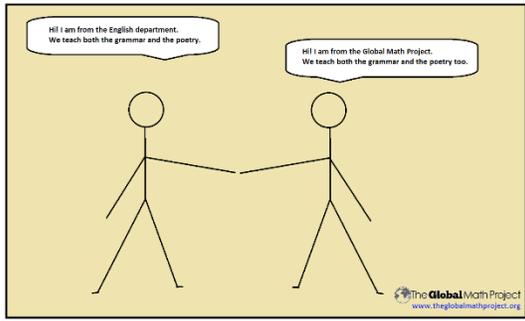
SEPTEMBER 2017

It's the start of the school year and a, what feels like age-old, debate is resurfacing. It comes in two forms: "Is Algebra II necessary?," a question aimed at pre-college and college education, and "Let's go back-to-the-basics," a call aimed at pre-high school education.

My stance on this matter for the higher grades is simple. If we teach upper-level mathematics without context, meaning, relevance, story, and joy, then I say we shouldn't teach it. I agree with Andrew Hacker on this: an unenlightened, joyless, bootcamp course in algebra is demoralizing and damaging. But I disagree with the premise of the question, that the algebra

experience is to be taught in a joyless, unenlightened, irrelevant way. Any human topic – poetry, the arts, philosophy, history, mathematics – holds its own beautiful human context. And we humans explore—and teach—each of these topics for the enlightenment, joy, and uplift they bring to our intellects. This includes Algebra II. Let's teach algebra with human joy! Math content with human, math context. Then algebra II is necessary, just in the same way that poetry, the arts, history, STEM all are.

Aside: The [Global Math Project](http://www.theglobalmathproject.org) seeks to teach mathematics just this way. See www.explodingdots.org, the FAQs there, and the end of this essay.



The mathematics taught at the K-6 level, however, does serve a double role for sure: to not only teach the joy of mathematics, but also its rigorous beginning structure and grammar for everyday necessity – basic number facts, number sense, and facility with arithmetic (plus the same for logical reasoning, geometry, problem-solving, and so on.) I am in awe of grade-school teachers who manage it all.

So what is this call to go “back to the basics” in earlier-grade teaching?

The articles I am seeing online nowadays do seem to be less emotionally charged and, thank heavens, now kind to our hardworking teachers, even calling to give them solid support.

But there is still a societal fear that our young students are being damaged by “discovery” or “inquiry” learning, that they are missing out on basic math learning, that something is just terribly amiss. What?

To be honest. I don’t know what.

As far as I can tell nothing is missing from the “new” curriculum. In fact, what I see is a careful attendance to math facts that are absolutely relevant to everyday math thinking and doing.

I suspect most people when they speak of going back-to-the-basics are calling to see traditional math algorithms front-and-center in the curriculum: long addition, long subtraction, long multiplication, and long

division (with multiplications memorized in earlier years to facilitate the rapid use of these algorithms). After all, these algorithms are absolutely vital for operating in the everyday world: for making change, for cooking, for measuring, and the like.

Really?

How do you actually make change in your everyday life? You buy an item for \$6.37, say, and pay with a ten-dollar bill. To work out the change you expect to receive do you whip out pencil-and-paper and quickly do a long subtraction problem? Do you expect a store clerk to do so?

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 \overset{9}{\cancel{10}}.\overset{9}{\cancel{00}} \\
 - 6.37 \\
 \hline
 =
 \end{array}$$

No! You just know that the change will be \$3 and some coins. And to see that it should be 63 cents in coins you probably reason: **3** cents to go from 37 to 40 and then **60** cents to go from 40 to a full dollar. The change to expect is \$3.63.

This is exactly how we expect shop clerks to make change. But we complain that shop clerks don’t know how to do this. And we are to only teach the traditional long-subtraction algorithm in school?

Another example: How many years ago was 1995? To answer this question, are you doing this?

$$\begin{array}{r}
 2017 \\
 - 1995 \\
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 =
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Or are you thinking $5 + 17 = 22$ years?

Let's teach math computations in all the ways we tend to do them in everyday life. Let's teach solid number facility in all contexts: the traditional, the flexible play of the traditional, the everyday practice, and the 21st-century-smart-phone-in-pocket reality. Let's do teach the basics! All good and correct mathematics is—surprise—good and correct!

Question: Which of the approaches below for computing $1005 - 787$ do you like best? Do you prefer another approach?

Math, including the act of computation, is yours and is for you to enjoy. Do it in the whatever way that works best for you! (This applies to our students too.)

$\begin{array}{r} \overset{991}{1005} \\ - 787 \\ \hline = 218 \end{array}$	$\begin{array}{r} 1005 \\ - 787 \\ \hline = 3-8-2 = 300-80-2 = 220-2 = 218 \end{array}$
$\begin{array}{r} 1005 \\ - 787 \\ \hline = \end{array} \quad \begin{array}{r} 1000 \\ - 782 \\ \hline = 8+10+200 = 218 \end{array}$	$\begin{array}{r} 1005 \\ - 787 \\ \hline = \end{array} \quad \begin{array}{r} 999 \\ - 781 \\ \hline = 218 \end{array}$
$\begin{array}{r} 1005 \\ - 787 \\ \hline = 3+10+200+5 = 218 \end{array}$	$\begin{array}{r} 1005 \\ - 787 \\ \hline = \end{array} \quad \text{My smartphone says 218.}$



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GLOBAL MATH PROJECT on social media:

Twitter: @globalmathproj
 #gmw2017
 #explodingdots
www.facebook.com/theglobalmathproject



Global Math Week is Oct 10-17. Our goal is to simply have the whole world take part in a common piece of joyous, uplifting, classroom-relevant piece of mathematics some time during that special week. Modest, eh?

The rollout topic for this year is *Exploding Dots*. See www.explodingdots.org for details.



Already tens of thousands of students from over 75 different countries have signed on. And it is easy for you to join in too.

Here's the four-step process:

1. Experience *Exploding Dots* for yourself.

See the FAQs on our site.

2. Register at our site.

Have you and your students count towards this global phenomenon!

3. Do some *Exploding Dots* with your students during Global Math Week.

One class period. Half a class period. Even 15-minutes will count! See the FAQs on our site to see how.

4. Share comments, photos, videos with the world on social media.

Be part of the global community.