

# How to Create and Maintain a Learner's Interest in STEM (Science, Technology, Engineering, Mathematics)

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0. **Background.** The transition from an industrial culture (modernity) to an information culture (postmodernity) has created a change in the way we think and communicate, from modernism to postmodernism. To communicate with postmodern learners, preferring storytelling to mediation, a change must be made from modern to postmodern science and mathematics - because they are not in the world as is technology and engineering, they are each one of several possible modern descriptions of the world that has established themselves as ruling disciplines (Foucault). To become postmodern they need to be deconstructed using the skeptical postmodern thinking of Derrida, Lyotard, Foucault and Bourdieu wanting to protect the threatened French republic from unwanted patronization, hidden in ungrounded words, political correct sentences, normalizing institutions and education designed to keep the ruling knowledge nobility in power.

1. **Deconstructing Education.** To be a republic, a country must change its line-organized educational system created to produce officeholders to the autocratic monarch to the block-organized educational system of the first republic, the US, wanting instead to uncover and develop the talent of the individual learner through daily lessons in self-chosen half-year blocks from Middle School and on.

2. **Deconstructing Physics.** Looking at a falling ball we see that in physics the basic concepts are matter housing forces pumping motion in and out of matter. The ruling discipline accepts matter and forces but not motion, instead it teaches energy which is not in the world but in a calculation ( $\frac{1}{2}mv^2 =$  anti-differentiation of  $mv$ , which is in the world as momentum). Consequently physics must be retold as a story about matter, forces and motion instead of about matter, forces and energy.

3. **Deconstructing Mathematics.** The invention of the self-referring and thus meaningless concept SET turned mathematics upside down to METAmatics defining its concepts from above as examples of abstractions instead of from below as abstractions from examples, and brought to education as 'New Math'. Postmodern Mathematics must turn this upside down so again Mathematics becomes what is was originally, a common label for two activities: Geometry, meaning earth measuring in Greek, and Algebra, meaning reuniting numbers in Arabic, so that once again mathematics becomes a natural science about the physical fact Many. That means that, as in science, all numbers have units as shown when writing them out fully:  $345 = 3 \times \text{bundle of bundles} + 4 \times \text{bundle} + 5 \times \text{unbundled}$ ; thus showing the 4 ways to unite: Plus, times, power and integration. With units, two kinds of numbers exist, unit-numbers and per-numbers, and the formulas in STEM are almost all pre-number formulas, which can be united through integration. So Calculus is nothing else than adding locally constant per-numbers.

The MATHeCADEMY.net is designed to teach teachers to teach MatheMatics as ManyMatics, i.e. as a natural science about the physical fact Many.

Operations Unite <i>split into</i>	Variable	Constant
<b>Unit-numbers</b> <i>m, s, \$, kg</i>	$T = a + n$ $T - a = n$	$T = a \times n$ $T/n = a$
<b>Per-numbers</b> <i>m/s, \$/kg, %</i>	$T = \int a \, dn$ $dT/dn = a$	$T = a^n$ $\log_a T = n, \sqrt[n]{T} = a$