

The #MAKERED MANIFESTO

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[The maker movement](#) celebrates curiosity, resourcefulness, empathy, and problem-solving, all in service to the act of creation. Not coincidentally, “creating” sits atop [Bloom’s Taxonomy](#) of learning objectives. (On the lowest rung of objectives: “remembering.”)

When you step inside a classroom filled with makers, you enter a whirl of noise and motion: students exploding with gloriously unfeasible ideas and honing them into concrete plans. Plans become prototypes. Prototypes fail and designs change. It’s true this can feel like chaos to some. It can feel like losing control. But, that is precisely the point. In this open-ended, process-driven environment -- one with no expected endpoint -- students discover how to learn to love the process of discovery. Here are five reasons to consider maker education.

REASON NUMBER 1: A MINDSET IS A TERRIBLE THING TO WASTE

As it turns out, telling children they are smart... is not. This kind of praise reinforces what Stanford University psychologist [Carol Dweck](#) calls a fixed mindset, the notion that our talents are an innate and unchanging part of us. Dweck argues that having a “growth mindset”-- the belief that through hard work we can achieve success-- is the best indicator of ultimate accomplishment. A [growing body of research](#) supports the idea that effort, not IQ, leads to success. Making fosters a growth mindset because no single intellectual or physical skill drives the process more than sheer effort. We see children working during lunch, after school and on weekends out of an intrinsic determination that simply can’t be duplicated in a traditional school setting. Once you see a child exhibit grit and resilience to construct, for instance, a model hoverboard of her own design, you stop wondering why you don’t see that kind of effort on a grammar worksheet.

The convergence of determination and a sense of identity that comes from growing a skill in fabrication, is often referred to as the “[Maker Mindset](#).”

Through their actions, children discover that making and fixing has the power to make a change in their world.

REASON NUMBER 2: STEAM POWERED EDUCATION

Maker educators are often asked, “In a maker environment, where is the content?” Quite simply, it is everywhere. The most obvious, explicitly taught content is the scientific method: question, research, hypothesize, test, analyze, communicate.” (The question, supplied by the student, suits the needs of the project, not a pre-set curriculum.) All of the STEAM skills come into play. Each child will learn different content, at different times, in different ways, often by looking it up themselves. Here’s a good maker example: A group of fifth graders worked on a “funnel device to make returning whiteboard markers more fun.” The device has a slope, which

requires geometry not normally encountered in math class until eighth grade. But in this context, the kids figured out the slope as just another problem to be solved. They also looked up science content and used technology for the design, and finally employed artistry to make it beautiful. Makers are less likely to forget what they learn, because their knowledge is [forged in the brain](#) with the emotional experience of working on a project they care about.

REASON NUMBER 3: STUDENT CHOICE

There is overwhelming evidence that when children have a say in their education, [they are happier and learn more](#). What is the nature of this choice? Often, students are said to have choice when they pick among a few options predetermined by the teacher. Making has the potential to be as teacher driven or as student driven as needed. It's an excellent avenue to practice [negotiated curriculum](#) with your learners.

In a maker environment, students literally construct their learning. The benefits extend into one of the thorniest issues in education: inclusivity. How do we get more minorities and women into STEM fields? By capturing their interest and nurturing their skills in school. A recent study suggests that interest in STEM in 8th grade is a stronger indicator of a future STEM career than any other factor.

[Ask a kid, what do you want to make?](#) or what problem do you want to solve with your invention, and you will see the kind of engagement that leads to lifelong interest in STEAM, regardless of race, ethnicity, social status or gender.

REASON NUMBER 4: WE'RE MAKING ASSESsments OF OURSELVES

Educators today teach amidst a tidal shift toward the [learner-directed classroom](#). This brings up a serious question: When the teaching becomes less standardized, where does standardized assessment fit in? Although this remains a largely unanswered question, making in the classroom offers promising [new ways to assess learning](#). We have seen encouraging results coming from the students themselves, through self reflection and peer assessment. Additionally, maker portfolios offer precisely the 360 view of a student that tests and grades lack. Portfolios help students, parents, and yes, admissions officers see proof of thinking and learning.

REASON NUMBER 5: OUR FUTURE DEPENDS ON MAKING and DOING

The [genius of humanity](#) is our ability to learn and change as we interact with our environment. We evolved in a rich social community, changing the world with our bare hands and sharing knowledge. Schools should mimic that process. Yet our school system-- [designed in response to the Industrial Revolution](#)-- has been slow to adapt to our rapidly evolving world. Today, success is increasingly defined by [entrepreneurial innovation](#), the

kind of agile thinking and acting promoted in maker education. It sounds extreme to place such emphasis on process only because we have been entrained to think memorization of content is learning itself. But maker education has moved from the fringe to the center.

The White House hosts its own [Maker Faire and President Obama](#) has emphasized STEM and making education to enhance America's economic standing in the world. Top research institutions including [Carnegie Mellon](#), [Harvard](#), [M.I.T.](#), [Tufts](#) and [Stanford](#) have recognized the wide range of educational benefits of making in education, and have launched their own studies to show it. Moreover, the [National Science Foundation](#) has officially endorsed maker education.

Consider the stakes: Our future in all likelihood will be defined by a [scarcity of resources and challenges](#) about which we can [only speculate](#). Solving problems in this new environment will require the adaptive power of our ancestors and the DIY, reduce-reuse-upcycle spirit of the young makers emerging in our schools today. Making encourages self-reliance and makers see themselves as people who can-- and will -- forge a better future.
