Tech employers are complaining that there are not enough workers with the required set of skills to fill the available jobs they have. This has increased the popularity of STEM and STEAM programs, which aim to prepare students for these fields. What exactly is STEM and why is there now a similar program called STEAM? Do either of these actually help prepare our kids for employment in the modern world?

In case you don’t know, the STEAM acronym stands for Science, Technology, Engineering, Art, and Mathematics. So first, why did they add Art to the already popularized acronym STEM? Art was added as a way to pull in the interest of kids who do not think of themselves as math/science kids. It was a way of showing that the tech field can also be a creative field. Ultimately the hope was that by adding Art/Design to STEM, more students would be interested and remain engaged in the subject.

Some disagree with adding Art, saying it takes time and attention away from the original purpose of STEM. So, what was the original purpose? According to Education Closet (educationcloset.com), the purpose is to teach inquiry, dialogue, and critical thinking. The subjects in the acronym are being used as vehicles or access points to
accomplish those goals. Those goals are the things people in tech careers want to see in applicants. I don’t know about you, but I already focus on getting my kids to ask questions, have conversations, and to think. A lot of homeschoolers already focus on those things or simply just make the time for them. What is more natural than a student asking a question? It is only when they have been trained to stop asking questions that we need to specifically focus on re-teaching what seems to be an innate human skill. Are these subjects especially useful in the above goals? First, I would have to say that mathematics is probably the number one best way to teach kids how to think critically. Having conversations and asking questions also get critical thinking rolling. A good conversation can challenge pre-formed opinions and reveal to students how much they have yet to learn. It also teaches them how to communicate, which is a vanishing skill in our culture. Will science, technology, engineering, and art help directly with inquiry, dialogue, and critical thinking? I doubt they have any more merit in being able to teach these things than English and History do, but English and history are just no longer seen as valuable skills or knowledge to possess. Some people believe we don’t need more English teachers, we need more computer programmers, more crypto analysts, and more IT guys. But, as homeschoolers, we may have a deeper appreciation for English and History than the population at large. Embracing those loves will not mean our students are not learning what they will need to succeed in the modern world of work. Because they can still be learning those underlying skills of inquiry, dialogue, and critical thinking. So, breathe easy if you can’t fit STEAM into your already full days. Focus on the foundations of inquiry, dialogue, and critical thinking. If your kid loves the fancy STEAM kits on the market, and you have a good budget for educational supplies, go ahead and get the kits. But you may want to read any sample lesson pages available and see if the program is really encouraging the child to ask questions, have dialogue, and think critically. The thing is, just because a box is shiny and contains gears and electronics does not mean it is truly designed to ignite the child’s brain with the deeper purposes of STEAM. Also, just because a project attempts to force your child to create/invent something, does not mean your child actually has the background knowledge necessary to be able to create or invent something. Creativity does not happen within a vacuum. Students need knowledge as a raw material to drive their creative forces. Many programs are just a shell of a program riding off the popularity of STEAM; educators and parents alike get excited to teach their kids these modern subjects. It is good to expose our kids to the basics of many different subjects, but only if we are taking time to develop the skills that will be needed in any area they choose to pursue as a career. Some of those universal skills are inquiry, dialogue, and critical thinking. (I know you really want me to stop listing those, but they are the heart of the matter, and so I hope you accidentally remember them.) However, there is another skill, perhaps even more important if we want our kids to be NASA-level geniuses in whatever they choose to undertake. The research is out, and it shows not only do NASA scientists possess this critical skill, rarely found in the general adult population, but also, that young children naturally have this skill, and it is often schooled out of them. Of course, as homeschoolers, we can choose not to school this skill out of our children. The skill is divergent thinking. Divergent thinking is where you start with one thing, and you think of a million possibilities from that starting point. The ideas grow. One example: how many ways can you use a fork? This is opposed to convergent thinking. Convergent thinking is when we take those million ideas, Divergent thinking is where you start with one thing, and you think of a million possibilities from that starting point.

### Questions to Ask Before You Buy:
- Does it encourage dialogue or conversation?
- Does it direct your child to ask questions?
- Does it teach how to think critically?
- Bonus: Does it require divergent thinking?

If it does all of the above, you have a solid product, whether or not it is labeled STEM or STEAM.
and figure out which one is best. The ideas shrink. The fork is best used for eating certain types of food. Convergent thinking is important. But divergent thinking is the base. To find the best idea we often need to fearlessly generate many ideas. Judgment, criticism, and censoring are only useful after the divergent thinking has done the work of producing possibilities.

School focuses a lot on convergent thinking and very little on divergent thinking. Kids' natural inclination to have crazy ideas needs to be encouraged. Let them list all the ways they can think of to use a fork. You can even use the list to start a dialogue of conversation about the ideas and get onto some nice critical thinking about the pros and cons of using a fork in some unusual ways. And maybe situations where a fork may be the best choice, even though it is not the ideal tool.

Young children are idea-generation machines. We need to figure out how to keep them running smoothly. Part of this can be as simple as valuing divergent thinking and talking to your kids about their crazy ideas, instead of just shutting them down.

When we attempt to think divergently and convergently at the same time the neurons in our brain actually start fighting one another, diminishing the power of the brain. Our brain does not want to combine these ways of thinking, because convergent thinking causes us to judge, criticize and censor the very ideas that divergent thinking encourages.

Creativity fires up more of the brain than logic or reasonable thinking.

Creativity fires up more of the brain than logic or reasonable thinking. Einstein had it right when he said, “Imagination is more important than knowledge.”

We live in an exciting time, when a child's most valuable asset is their mind. To prepare them for the modern workforce, including all those tech-heavy jobs, all we need to do is nurture that mind. The vehicles (subjects) we use to nurture those minds are less important than the quality of our instruction and the power of knowing the underlying skills needed for success.

About Marla

Marla Szwast lives in Marietta, Georgia with her husband and six children. She has written multiple articles for The Old Schoolhouse® Magazine. She is the author of a semester-long fifth grade science course and the history course, Stepping Through History: Starting With You! Both are available at SchoolhouseTeachers.com. She writes about homeschooling, child development, neuroscience, and the history of education on her blog at: www.jumpintogenius.com. You can also follow her on Facebook @jumpintogenius, or Twitter @MarlaSzwast.

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