

Dr. Mackie's View on Science, Technology, Engineering, and Mathematics (STEM):
STEM is a Way of Being

When students are young, they participate in hands-on STEM activities every day. Whether they are building a dam in the sand, flying a kite, or playing a computer game, students are applying principles of science, technology, engineering, and mathematics, commonly referred to as STEM.

Today, many people are talking about STEM as the skill set needed to remain competitive in the 21st century. As a nation, we are failing. The Organization for Economic Cooperation and Development, a group that represents the world's richest countries, showed U.S. 15-year-olds heavily trailing in math and science scores. The average science score of U.S. students lagged behind those in 16 of 30 countries; math had the U.S. trailing counterparts in 23 countries. School systems are hurriedly allocating resources to increase student achievement in STEM courses and increase student participation in STEM as a career choice. The problem is, not all students are buying into it. In order to increase STEM participation, we need to design programs that make STEM a way of being.

Students are social beings and respond when they are engaged personally. The STEM community is committed to selling kids on STEM as a career choice, but has not done an effective job marketing ourselves as STEM professionals.

Professionals in the sports and entertainment industries have consciously developed personal brands and have actively marketed themselves to young people. They have branded themselves in a way that is very glamorous and attractive. As a result, students want to grow up to be athletes and entertainers. They see the luxury lifestyle and believe those careers are the only way to be successful. For the last twenty years, I have been speaking to kids and promoting myself as an example of a STEM professional. Students see what I have achieved and how I live my life. Without fail, kids buy into me. They become more interested in STEM because they see me as a role model and they aspire to a successful lifestyle patterned on mine. We have to develop a cadre of STEM professionals who can similarly address, engage, motivate and inspire kids. In other words, we need an army of people to STEM-ulate student interest in the benefits of STEM!

STEM is not just a profession. It is a way of being. Students need something or someone to inspire them to embrace STEM. Medicine has *Gifted Hands* and *The Pact*, inspiring stories by successful individuals that reach children and set them on the road to becoming doctors. STEM does not have a nation "spokesperson." We have astronauts, scientists, and engineers, but we have not developed a Martha Stewart of STEM – someone who has defined the brand and become associated with these values in the media. We need a household name with the ability to address anyone, anytime, and inspire them to pursue STEM as a profession.

The masses respond to people, not technology. The STEM movement must be heart-to-heart, not technology-to-head-to-heart. We must therefore follow a three-step process to guide our youth towards a lifetime of STEM participation:

1. You get their attention.
2. You get their hearts.
3. You get their minds.