ASHBROOK INDEPENDENT SCHOOL

To Nurture and Challenge Academically Capable Students

From the Office of the Head of School, Dr. Christopher A. Schoberl

Is it Monday, Yet? is my once monthly attempt to address developmental and topical issues we confront as we "challenge and nurture" our children. The topics I cover will be drawn from developmental and cognitive psychology, current research, and my own parenting and school administrator experience, and could just as easily be a response to local, national, or world events that have parenting implications. Keep your eyes on ClassTag at this time each month, and if you have any great ideas about future topics, please shoot me an email or text me... or, better yet, kick it old school and give me a call.

Is it Monday Yet? 10/28/22

Our Lego Robotics program is off to a fantastic start, and we owe great thanks for this to the energy and vision of Zhuqing "ZZ" Zhang (mom of Jin Yamashita, '25) and Erin Scheessele (mom of Simon, '24) volunteers who are helping our students "Explore Extraordinary" at Ashbrook!

This year we will concentrate on building a strong team. The two teams we have formed will compete against each other, in house, using the FLL challenge for this year and working to simulate what competition will be like against other schools in the future. Thanks are also due to the Scheessele family who generously donated an additional FLL table so we could split our roster of eight into two separate teams for "more touches on the ball," in coach-speak.

When ZZ presented me with the team roster, I was both delighted… and disappointed. I was delighted that we had so much interest in this STEM based program, but disappointed by… well, you tell me: does anything "disappointing" jump off the page when YOU peruse our roster?

Arlo (7th)
Simon (7th)
Jin (6th)
Mirabelle (6th)
Neil (6th)
Arin (6th)
Teddy (6th)
Viktor (6th)

I am hoping you were quicker than I was (and I was pretty quick) noticing that only a single girl signed on to the team (which, in my book, makes her even more awesome than I thought she was before I saw the roster).

To be clear, my disappointment with the roster was not generated so much by the list itself, per se, as much as it was by the larger forces at play… and (maybe more critically) NOT in play, that led to the list: where are our girl coders?

If we were NOT in the business of doing EXTRAORDINARY at Ashbrook, we might subscribe to the low bar of our national numbers of women in technology fields, and not be too disappointed in our performance, but even by this weak standard, I suspect there is more girl interest out there than this roster reflects (even using the lowest national numbers as a target, we are still short about two girls!), so what is happening at Ashbrook? How can we respond? And how can we do our part to make sure that our national numbers improve, for the sake of our girls AND for the sake of our country competing in an increasingly higher-stakes global technology market?

Although the national numbers tell us that we have started to close gender gaps in access to education, equal opportunities in certain career fields, and compensation, we still have a lot of work to do. In particular, electrical engineering and computer and data sciences have historically been male dominated fields. Indeed, women still only comprise slightly more than 15% of computer science majors and just over 20% of engineering undergraduates. The numbers are even more disappointing if you factor in race, at 2.9% of Black women, 3.6% of Latinas, and 4.8% of Asian women earning STEM related degrees in the US. So what is at play, and how can we trouble those waters a bit for the longer term future of our country AND, more immediately, to get more girls to sign up for Robotics?

This question becomes even MORE pressing when we consider the fact that "although interest and aptitude in STEM courses is about equal for both genders in lower grades, by the time kids hit high school, the National Science Board (NSB) reports that male students take Engineering, Computer Science and Advanced Placement (AP) Computer Science classes in much larger percentages than female students," and this gap only increases later in life. What is happening in the lower grades that we need to find a way to perpetuate through the upper grades?

The data at the center of the NSB report suggest that the reason for this is because girls *actually buy into* the stereotypes about the sort of people who work in these fields and do not see themselves as qualified according to the images they conjure when thinking about these stereotypes; they do not "see themselves" doing the work. As they get older, they are more inclined to buckle to these stereotypes through peer pressure, implicit bias from adults, and an absence of models to emulate. Alerting our young girls to the relatable models of women in STEM fields present in their everyday lives, will help a great deal. In this respect I am encouraged by the fact that our young science students are led by a staff of three very strong female scientists comprising 100% of Asnbrook's Science Program, and one woman mathematician comprising 50% of our Mathematics Department.

This is to say nothing of all of the moms, guardians, grandmoms, aunts, and sisters out there who are involved in Corvallis area tech, healthcare, and academic research in STEM and related fields, who can act as mentors. Exemplars such as these help our young girls "see themselves" in these fields, and by leveraging these relationships by talking openly to our youngest girls about the actual career choices made by these women, we can continue nudging the needle in the right direction. Parent/Guardian involvement in programs outside of school such as *Take your Daughter to Work Day (Thursday, 4/27, 2023)*, *Girls who Code*, or *Girl Scouts of the USA*; or in Ashbrook STEM related programs such as MathCounts, Rube Goldberg Machine Challenge, and Lego Robotics will nudge the needle further.   And if we are to be guided by the data from the NSB, STEM moms and other family females' involvement in a young girl's schooling, as early as possible, is the ticket!

Aside from these steps, what else is important for parents and teachers to know that might help our young STEM minded girls *see themselves* in these fields? Below are some excerpts that say it much better than I could, gleaned from the variety of sources I read to write this article; each of them is worth a full read, and I provide the links for this purpose:

From Forbes: *How to Increase Female Representation in STEM Field*
Understand that Bias Matters. The first step towards making conditions in STEM more equitable for women is recognizing there is a problem and understanding the role of implicit bias. It starts with the pipeline. There are disparities in how many women enter the STEM field and implicit bias that occurs during the schooling process plays a part. Studies indicate, for example, that there is a bias that favors male students among science faculty members. When comparing male and female students with the same credentials vying for the same campus laboratory job, male candidates were chosen over female candidates. More training and workshops must take place on countering bias in this industry. The first steps toward positive changes is an awareness of the problem and our contributing role to the existence of the problem.
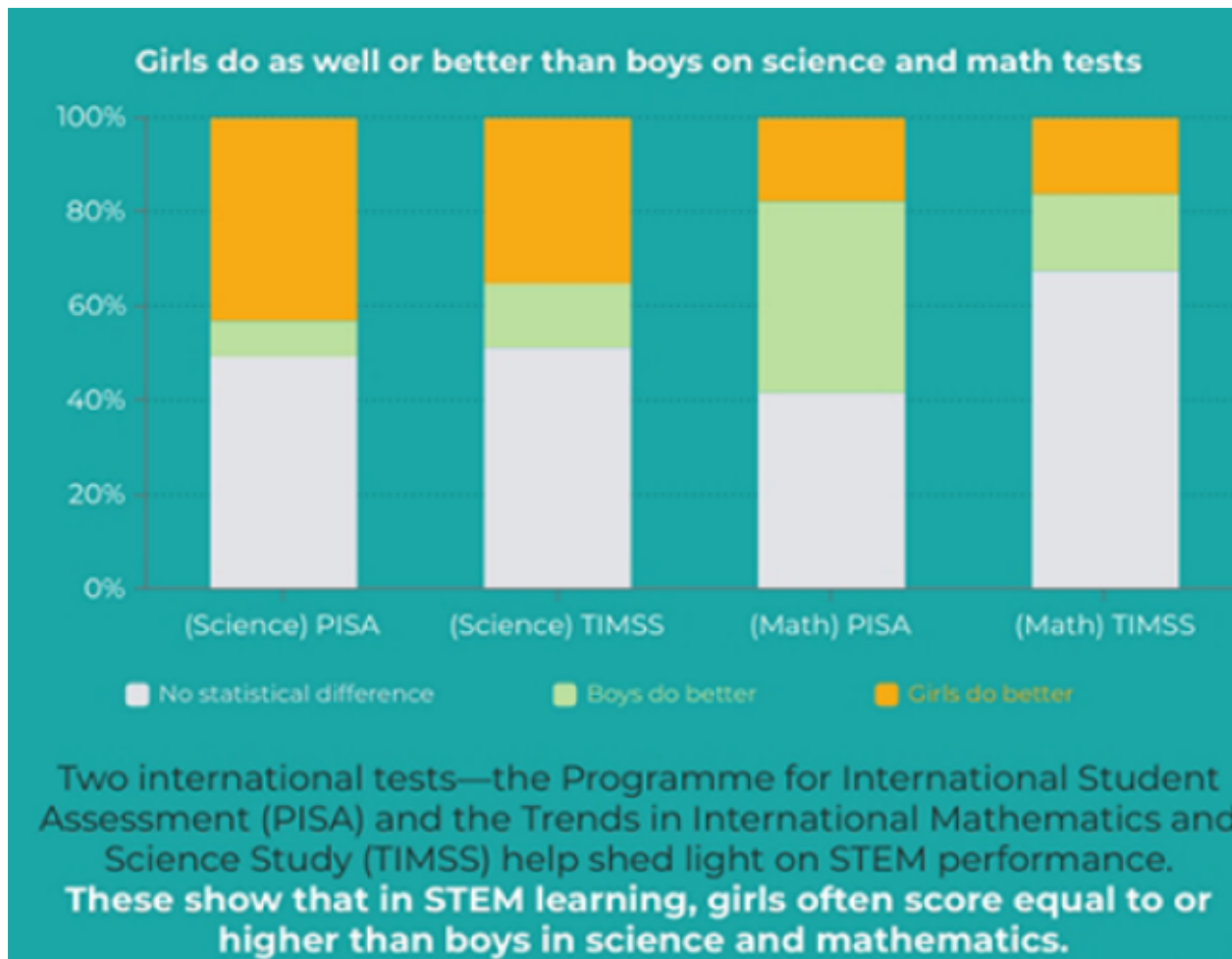
From Girl Scouts: Generation STEM- Full Report

Finding 2: The Creative and Problem Solving Aspects of STEM Draw Girls

Girls interested in STEM like to understand how things work (87% vs. 65% non-STEM girls), solve problems (85% vs. 70% non-STEM girls), do hands-on activities (83% vs. 56% non-STEM girls), and ask questions (80% vs. 54% non-STEM girls).

% WHO AGREE...	STEM	NON-STEM
I like to understand how things work.	87	65
I like puzzles and solving problems.	85	70
I like doing hands-on science projects.	83	56
I like asking questions about how things work and finding ways to answer them.	80	54
I like to understand how the natural world works.	79	57
I like building things or putting things together.	67	47
I like to understand how things are built.	66	47
I like doing math problems.	65	32
I think it would be fun to create an iPhone app or design a computer/video game.*	62	57

*significant only at 90% confidence level

Girls do as well or better than boys on science and math tests

Legend: No statistical difference · Boys do better · Girls do better

X-axis categories: (Science) PISA, (Science) TIMSS, (Math) PISA, (Math) TIMSS

Two international tests—the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) help shed light on STEM performance. **These show that in STEM learning, girls often score equal to or higher than boys in science and mathematics.**

And this one starts out in a weird place… but it's worth a full read if you read none of the others:

I'm Dr. Rob Garcia, a former high school dropout turned PhD. As a kid growing up poor in Humboldt County, I had no idea what Engineering was. No one ever took me aside and said, "Engineers create things and get paid a lot of money and have awesome lives." The only messages I got were, "The police came by looking for your uncle again, don't tell them anything."High school was awful for me. I lived in my hoarder grandmother's house, fell asleep listening to my cat eating mice alive, and thought about suicide often. I failed out, never took my SATs and ended up failing out of college twice. Through determination, the Air Force, and the sheer power of being awesome, I earned a Doctorate in Education, made it to my dream city (San Diego) and have a pretty cool The reason I'm sharing this is because I want great things for your children and I want to give you every resource to encourage your daughters to get high paying, successful STEM careers if that's their passion. I want you to teach them about facing challenges, standing up to barriers, and to NEVER give up on their dreams. (My doctoral dissertation was rejected three times).