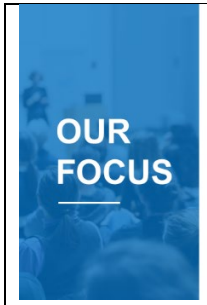
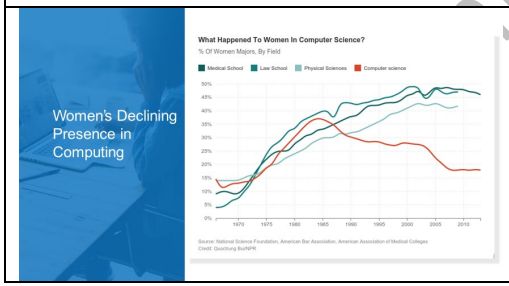
This presentation shares results from the Student Research Foundation's Fall 2018 survey of high school students in STEM classes. The analysis is based on responses of more than 18K students nationwide. Consider this our movie trailer for the upcoming Gender and Computing report we will be releasing soon. If you want to see more, invite us back to share more with you later this fall after the report is released.

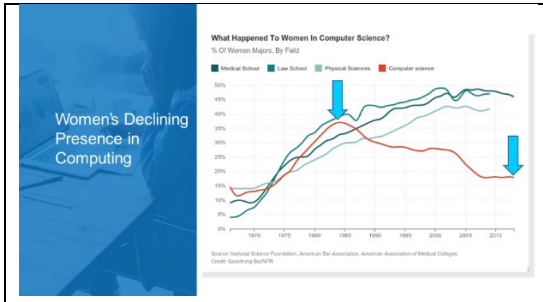
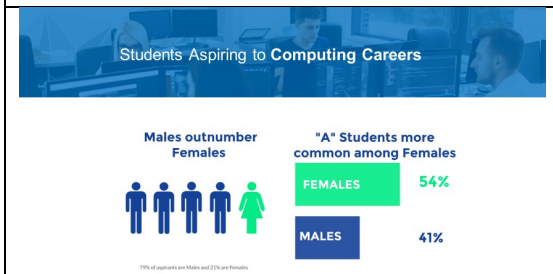


The goals today are two:

- First, to better understand similarities and differences between students who aspire to careers in computing/ IT and other STEM sectors.
- Second, to Identify what is needed to attract more girls to computing/ IT – a STEM sector forecast to have the above average job growth.

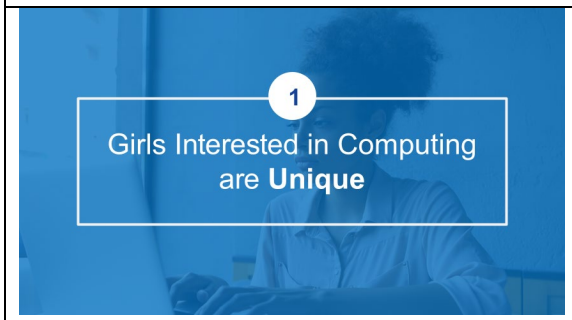
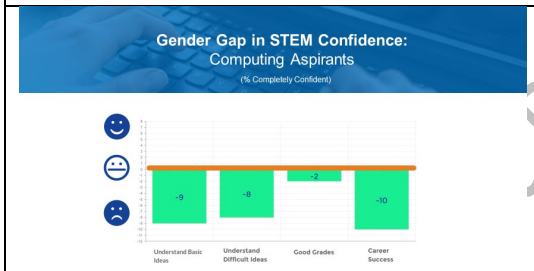


Computing is particularly important to understand:

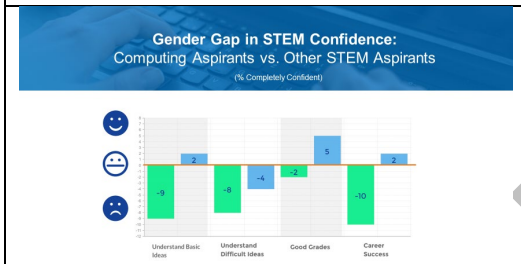
	First, in contrast to physical science (as well as medicine and law), women are a lower proportion of the field than they were in the mid-1980s.
	Second, based on SRF's Fall 2018 student survey, absent large-scale, evidence-based, effective interventions, women's presence in the field will not improve. For every four high school males aspiring to a computing career, only 1 female does. (However,

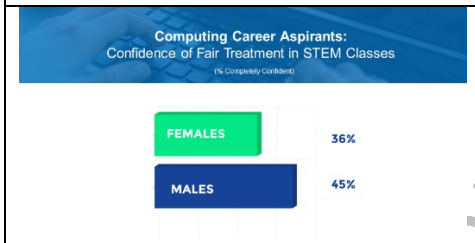
	note the girls who aspire to computing have higher GPAs overall than the boys. 54% of the female computing aspirants compared to only 41% of the male computing aspirants report they are “A” students. PLEASE KEEP THIS IN MIND – it will be important context for some of the information I present later.)
	Third, jobs. Almost half of STEM jobs are in the computing/IT sector. Moreover, job growth is expected to be higher in

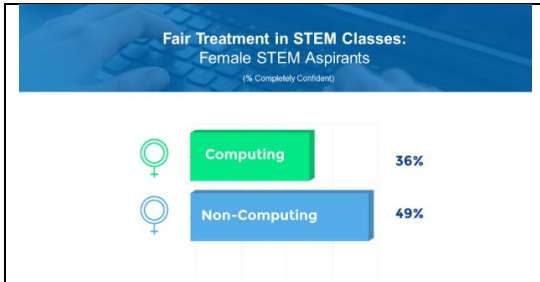
	computing/IT than in other STEM fields. The underrepresentation of women will increasingly have consequences. First, STEM jobs pay much better than non-STEM jobs. Secondly, the growth of Artificial Intelligence means the absence of women and racial/ethnic groups historically underrepresented in STEM may magnify biases of the white males who write the algorithms that make life-altering decisions.

	The data point to three insights that can inform effective interventions to promote gender diversity.
	**Girls interested in computing are uniquely lacking in STEM confidence** – whether the focus is on understanding STEM concepts or expectations of success.
	We measured STEM confidence using 4 items -- 2 tapping understanding and 2 tapping expectations of success. Then we computed gender gap in STEM

	confidence by subtracting the percentage of males completely confident on a measure from the percentage of females completely confident on a measure. Any color below the orange line (the point where girls and boys would be equally confident) is bad news for girls. **On all four measures of STEM confidence – confidence they can understand basic ideas in STEM classes, confidence they can understand the more difficult concepts in STEM, confidence with**

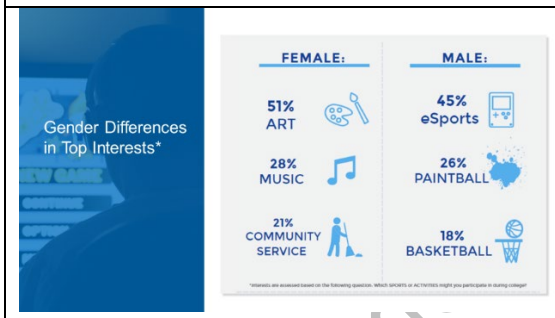
	will make good grades in STEM, and confidence they could have a successful career in STEM -- girls who aspire to computing are less confident than boys. **This is not about gender and STEM – it is about gender and computing.**
	I say that because the story is very different among students aspiring to other STEM fields. The blue bars represent the gender gap on these items among non-computing STEM aspirants. In contrast to computing

	aspirants, in 3 out of 4 cases the gender gaps among these students aspiring to STEM careers outside of computing actually favor girls. And they tend to be small. But there is more working to the disadvantage of girls aspiring to computer careers.
	Among computing career aspirants, females are less likely than males to be completely confident they will be treated fairly in STEM classes.

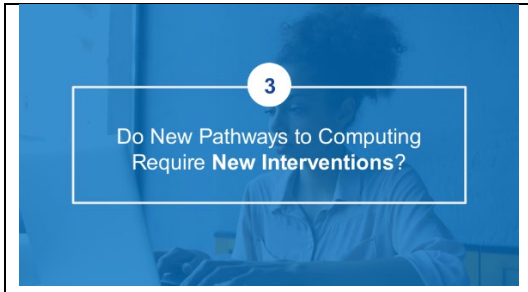
	Female STEM aspirants seem to have different classroom experiences depending on the STEM area they aspire to enter. Girls who aspire to computing careers are less likely than girls who aspire to non-computing STEM fields to be completely confident they will be treated fairly in STEM classes.
	Let's pause and re-cap what we have shown you. Thus far, female computing career aspirants are:

	• More likely than males to be "A" students. • A minority among high school students aspiring to computing careers. • Less likely than male counterparts to score high on STEM confidence and to expect fair treatment in STEM classes. So while girls interested in computing are better students than the boys, they are a minority and they may become an even smaller minority because they are

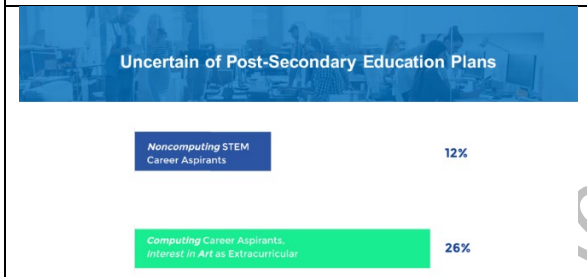
	less confident in their own abilities and are less likely than boys to expect they will be treated fairly in STEM classes. But there is another challenge. Many experts believe that to retain girls in computing and to attract more to the field, we have to show girls that computing can help them achieve “what matters.” What does “what matters?” mean?

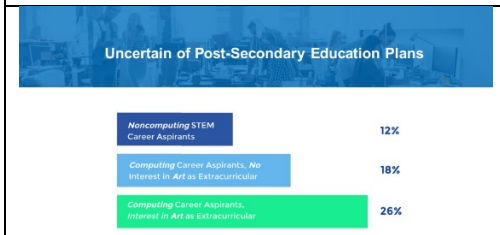
	Well, there is no set answer. It could be measured by what students want to do in their free time. So we looked at what students said they want to do as extracurricular activities in college.
	The contrasts are striking. Almost half of boys want to pursue eSports. In contrast, half of the girls who aspire to computing want to pursue art as an extracurricular.

	Leveraging this interest in art early may help attract more girls to computing, and may help them build computing skills that position them to go on to computing careers in AI, automation, or even art. That girls who aspire to computing are about 2-3 times more likely than other girls to be interested in art suggests STEAM is having an impact.



Art seems to have broadened the pathway to computing career interest. But can we retain them? The Bureau of Labor Statistics reports that 94% of STEM jobs require postsecondary training. Will computing aspirations survive the transition from high school to post-secondary education? One measure is whether high school students are thinking about postsecondary education.

	We use as our baseline girls interested in non-computing STEM careers. Only 12% of those girls are uncertain about their plans for post-secondary education. However, female computing aspirants interested in art,…
	… are twice as likely to be uncertain about postsecondary education. Their uncertainty makes it more likely they will be causalities of the leaky STEM pipeline. One important

	intervention, therefore, is to help girls who seem drawn to computing through art chart their next steps to make their aspirations for a STEM career a reality.
	As I mentioned, we will be releasing a report soon on gender and computing careers. In that report we provide more insight about the complementary roles that in-school and out-of-school educators play in nurturing STEM

	aspirations among high school students – as well as more insights that can help you increase the potential pool of female computing professionals. We will be happy to come back and share more with you later this fall.