OCTOBER 2025

Valuing STEM

Do girls think science values what they value?

actüa

Youth · STEM · Innovation
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Girls' Voices in STEM: Exploring Values, Priorities and Possibilities

Actua is building a Canada where every child has the skills and confidence to reach their full potential. Girls and young women bring unique values, priorities and perspectives that are vital to the future of science, technology, engineering and mathematics (STEM[1]). Yet persistent gender inequities mean fewer women than men pursue STEM education and careers, particularly in areas like engineering and computer science. To better understand what matters most to girls and how their aspirations align with the opportunities STEM provides, Actua launched a national survey exploring their values and perceptions of STEM.

Past efforts to explain and address the gender gap in STEM have identified numerous barriers. The issue is multi-faceted, nuanced and complicated. While targeted initiatives have made progress, significant gaps remain. Actua's research provides new insights into what might be holding girls back, highlighting differences across gender and age groups and pointing to ways to support their engagement in STEM.

Actua's mission is to unlock the potential of youth and break down the barriers they face in entering and thriving in STEM, with a strong focus on girls and equity-deserving youth. For over 25 years, Actua's National Girls Program has empowered girls to see and fulfill their unique and essential role in STEM. Each year, Actua reaches 25,000 girls in all-girl programs and 225,000 more in other co-ed programs. A national network of university and college members delivers these programs through camps, clubs, workshops and events led by women and gender-diverse instructors, and supported by inspiring role models. Together, we're building lasting connections, challenging stereotypes and creating supportive spaces where girls can design, build, experiment and grow their confidence in STEM.

By listening to girls and capturing their perspectives, our research offers fresh insights into how to close persistent gender gaps in STEM. What emerges is a clearer picture of how girls relate to STEM today and how their values and priorities might shape STEM engagement tomorrow.

[1] While the participant data in this specific survey largely reflects responses from youth identifying as girls and boys, Actua's programs and inclusive engagement efforts use the term "girls" to encompass gender-diverse youth who face barriers in STEM. This includes, but is not limited to, cis girls, trans girls, non-binary youth, gender non-conforming youth, and gender queer youth.

What We Did

Actua commissioned Abacus Data to conduct a national survey to collect insights about what Canadian youth value and their perceptions of what matters in science, as well as what their parents and caregivers think about their children's values and priorities. The survey was conducted in two parts to capture the views of 1,000 youth (aged 12 to 18, from all regions, with a balanced gender distribution) and their parents and caregivers (n=1,000).[2]

We asked respondents about:

- what values and activities matter to them personally (or what parents and caregivers think matters to their children);
- what values and activities they think matter in science;
- which school subjects are their favourites, and which STEM courses they plan to take in the coming school year;
- which careers or career fields are most and least interesting to them; and
- whether they had ever been encouraged or discouraged to pursue STEM education or careers.

To simplify the survey for youth respondents, we used the more accessible term "science" (rather than STEM) where we could, while using the more encompassing term "STEM" (science, technology, engineering and math) when doing so was necessary. As a result, the paper sometimes reports on "science" and sometimes on "STEM", depending on how a specific question was worded.

[2] The survey was conducted online from July 31 to August 12, 2025. Respondents were drawn from a panel of Canadians Abacus Data has identified as willing to complete surveys. The margin of error for both youth and parent/caregiver samples are +/- 3.1% 19 times out of 20. Margins of error differ by and are higher for subsamples (e.g., girls/boys, age cohorts, household income). We indicate whether differences across subsamples are significant as appropriate throughout the report. Only three respondents self-identified as non-binary which is too few to report patterns in their responses with any statistical significance.

Highlights

- Actua wanted to explore whether a mismatch between what matters to girls personally and what they think matters in science can help explain why some are less likely to pursue STEM education and careers.
- Actua commissioned a survey of youth (aged 12 to 18) to hear their thoughts on what matters to them personally, what they think matters in science, and their interest in STEM education and careers generally.
- Most girls and boys are interested in STEM.
    - **69 percent of girls** and **78 percent of boys list** one or more STEM subjects as among their favourites in school.
- But they differ on which specific STEM subjects and careers they find most interesting.
    - Boys are more likely than girls to be interested in **computer science** (44 percent boys vs. 22 percent girls) and **engineering** (32 vs. 17 percent).
    - Girls are more likely to be interested in **healthcare** (36 percent girls vs. 15 percent boys), and **psychology/psychologist** (30 vs. 11 percent) careers.
- When asked what matters to them personally, girls point to **creativity** (75 percent), **knowledge and knowing things** (74 percent), and **helping others** (72 percent) as their top values – values they also think matter in science.
- On other values, there are mismatches between what matters to girls and what they think matters in science, which might help explain why some girls do not pursue science education and careers.
    - 69 percent of girls personally value **fairness and social justice**, but only 54 per cent believe these values matter in science – a 15-point gap.
    - 71 percent of girls say **making money or pursuing business** is important to them, but only 49 percent believe this matters in science – a 22-point gap.

- 71 percent of girls prioritize **health and fitness**, but only 50 percent think this matters in science – a 21-point gap.

- Girls might be rejecting STEM because they perceive a lack of fit between what matters to them and what they think matters in science. In some cases, the gap may be real. In other cases, more effort may be needed to help girls see that there are STEM pathways that align with their core values and interests.

Most Youth Are Interested in STEM...

but specific fields of interest differ by gender

While some think that girls' and women's underrepresentation in STEM education and careers may be a result of lower interest, our data reveals a nuanced picture of how girls feel about and relate to STEM. Interest in STEM among both girls and boys is high. Where we see differences are in the reasons why they find STEM interesting and the specific fields and careers to which they are drawn.

Among the youth we surveyed 69% of girls and 78% of boys listed **at least one STEM subject among their favourites in school.**

Among the youth we surveyed **69 percent of girls** and **78 percent of boys** listed at least one STEM subject among their favourites in school – a critical sign of interest in STEM. Specifically:

- **47 percent of boys** and **45 percent of girls** selected **general sciences** (biology, physics, chemistry) as one of their favourite subjects in school – the most frequently selected subject of all the options.

- **Boys (41 percent)** were only slightly more likely than **girls (34 percent**) to select **math** as a favourite subject.

In more applied STEM fields, noticeable gender differences emerge.

- **Boys (39 percent)** are nearly twice as likely as **girls (20 percent)** to select **computer science** as a favourite subject – a gap that widens to 28 percentage points among older boys (42 percent) and girls (14 percent) who completed the survey.

- **Boys (35 percent)** are twice as likely as **girls (17 percent)** to select **technology** (e.g., communications, automotive) as a favourite subject.

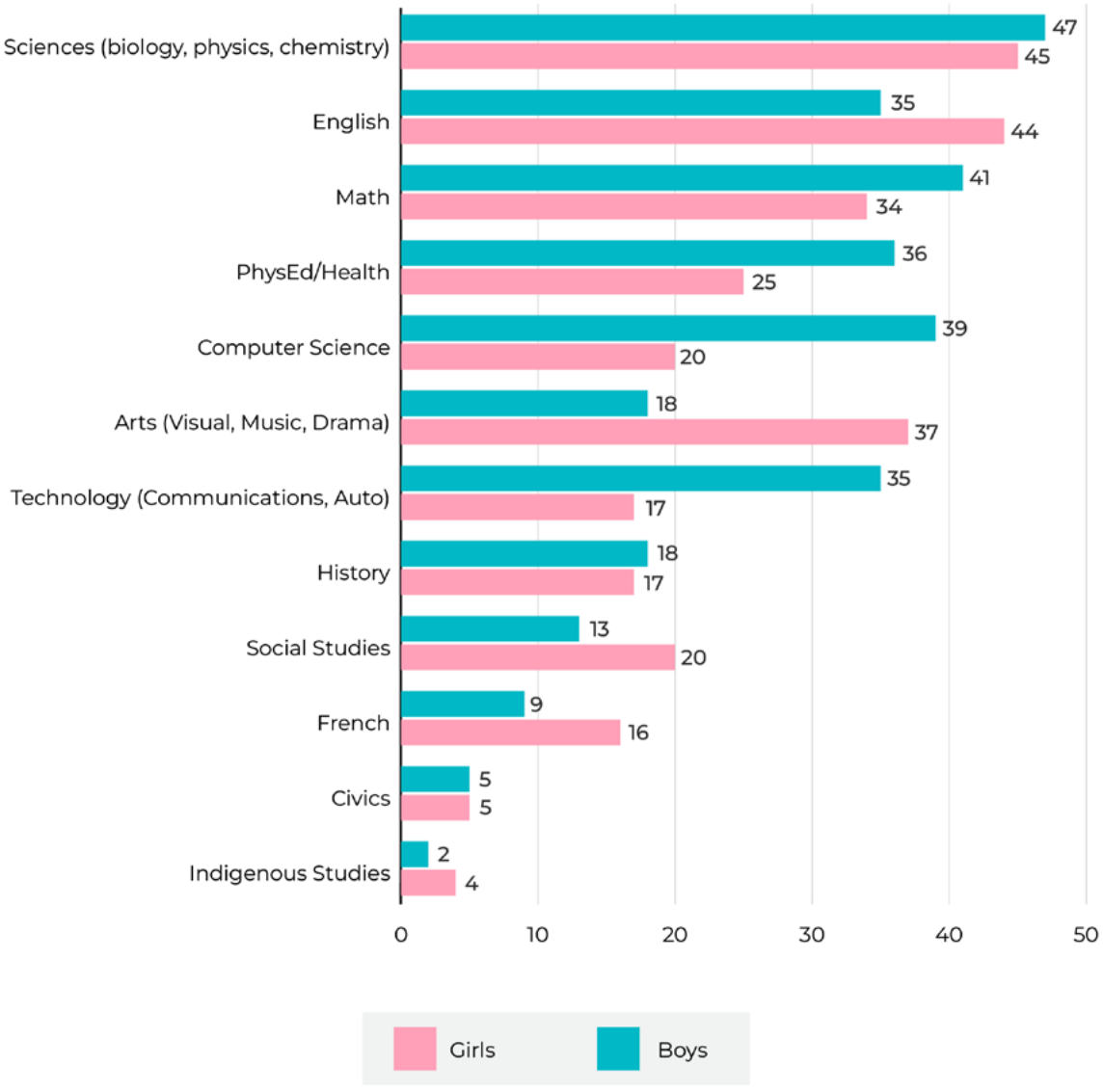
Meanwhile, girls are more likely than boys to select arts and languages as favourite subjects:

- **Girls (37 percent)** are twice as likely as **boys (18 percent)** to select **arts** (visual, music, drama) as a favourite subject.

- Girls are somewhat more likely than boys to select **English** (44 percent girls versus 35 percent boys) and **French** (16 percent girls versus 9 percent boys) as favourite subjects.

Favourite sujects in school

% (select all that apply)



DOES YOUTH INTEREST IN STEM HOLD UP AS THEY AGE?

The aggregate interest in STEM is relatively high among the youth we surveyed, but we wondered about interest levels at different ages – and especially whether girls' interest begins to wane. While interest in STEM-related subjects remains strong overall, girls and boys develop different STEM interests as they age.

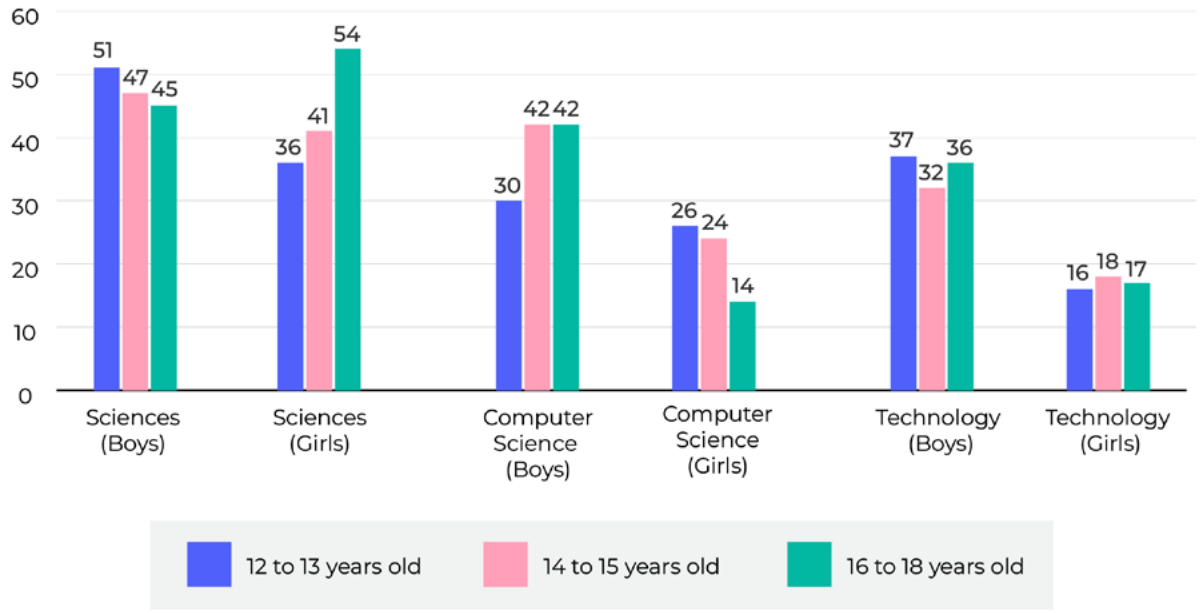
- **Interest in general science** is lower among boys aged 16-18 (45 percent) than those aged 12-13 (51 percent), while it is much higher among girls aged 16-18 (54 percent) than girls aged 12-12 (36 percent) – effectively reversing the gender gap evident among the youngest cohort.

- Interest in **computer science is higher among older boys** (30 percent among 12-13 year olds versus 42 percent among boys aged 16-18), while it is **lower for older girls** (26 among 12-13 year old girls versus 14 percent among girls aged 16-19) – widening the gap from 4 percentage points among the younger cohort to 28 percentage points among the older cohort.

- Interest in **technology classes remains fairly stable** as youth age, leaving the gender gap at about 20 percentage points.

Do favourite subjects change with age?

% selecting favourite subject, by age and gender



STEM CLASS ENROLMENT

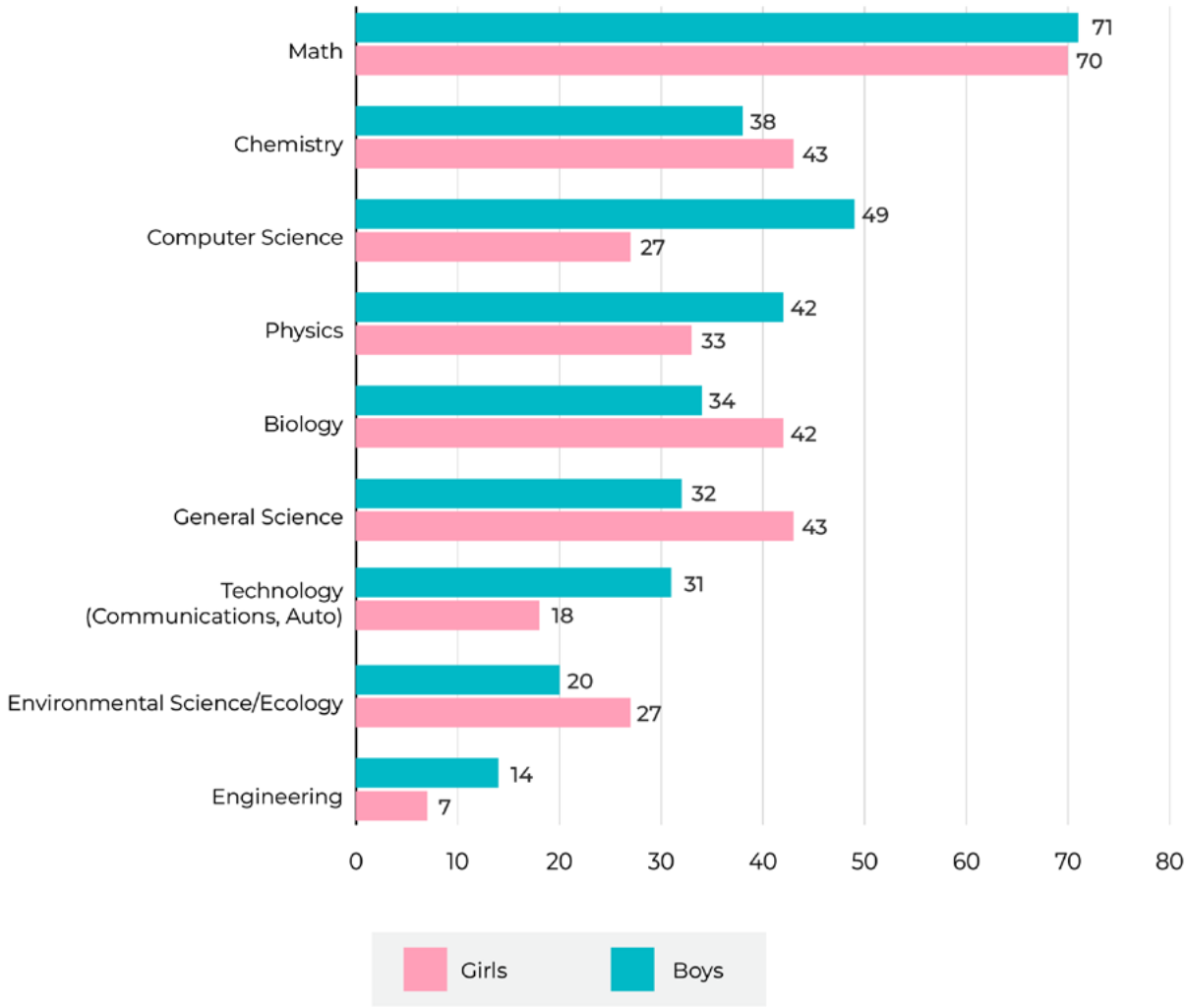
Are the patterns we see in youth interest in STEM subjects also reflected in actual course enrolment? We presented youth with a list of STEM subjects and asked if they will have classes in these areas in the coming school year. Enrolment among both boys and girls is strong, but there are a few differences that track gender.

> **71% of boys**
> **70% of girls**
>
> **say they will be taking a math course in school.** This robust result is almost certainly due to requirements to take math classes up to a certain grade.

- **Boys are more likely than girls to be enrolled in:**
  - **computer science** (49 percent boys versus 27 percent girls);
  - **technology** (31 percent boys versus 18 percent girls);
  - **physics** (42 percent boys versus 33 percent girls); and
  - **engineering** (14 percent boys versus 7 percent girls).
- While the gaps are smaller, **girls are more likely than boys to be enrolled in**:
  - **chemistry** (43 percent girls versus 38 percent boys);
  - **biology** (42 percent girls versus 34 percent boys),
  - **general science** (43 percent girls versus 32 percent boys); and
  - **environmental science/ecology** (27 percent girls versus 20 percent boys).
- **71 percent of boys** and **70 percent of girls** say they will be taking a **math** course in school. This robust result is almost certainly due to requirements to take math classes up to a certain grade.

STEM class enrolment

% who will take a class in subject this year



ARE YOUTH INTERESTED IN STEM CAREERS?

Youth exhibit interest in a wide array of careers. While both girls and boys are interested in STEM-related careers, there are significant differences in terms of the specific fields they find interesting.

- Nearly as many **girls (31 percent)** as **boys (38 percent)** are interested in a career as a **scientist** (e.g., biologist, chemist, physicist).
- Twice as many **boys (44 percent)** as **girls (22 percent**) indicate an interest in **computer science** careers.
- Nearly twice as many **boys (32 percent)** as **girls (17 percent)** indicate an interest in **engineering** careers.
- **36 percent of girls** (versus **15 percent of boys**) are interested in careers in **healthcare**.

- **30 percent of girls** (versus **11 percent of boys**) are interested in careers in **social services** (e.g., psychology/psychiatry, counsellor, advocate).
- More girls than boys also lean towards careers in:
  - **arts** (**24 percent girls** versus **11 percent boys**);
  - **education** (**21 percent girls** versus **9 percent boys**); and
  - **design** (**20 percent girls** versus **9 percent boys**).
- More boys than girls lean towards careers in:
  - **sports** (**22 percent boys** versus **14 percent girls**);
  - **gaming** (**23 percent boys** versus **7 percent girls**); and
  - **business/finance (15 percent boys** versus **10 percent girls**).

Youth Interest in Careers

% selecting career (select all that apply)

CAREER	BOYS (%)	GIRLS (%)	GENDER GAP
Science/scientist (biology, chemistry, physics)	38	31	+7 boys
Computer science/programming/coding	44	22	+22 boys
Engineer/engineering	32	17	+15 boys
Healthcare	15	36	+21 girls
Social services (psychology/psychiatry, counsellor)	11	30	+19 girls
Sports/athlete	22	14	+8 boys
Arts (writer, musician, actor, dancer, painter)	11	24	+13 girls
Gaming/gamer	23	7	+16 boys
Math/accounting/economist	16	15	-
Education/teaching	9	21	+12 girls
Trades	19	10	+9 boys
Design	9	20	+11 girls
Law/justice	10	16	+6 girls
Influencer	13	12	-
Business/finance	15	10	+5 boys

Do Values Explain Levels of Interest in Science?

How much of the difference between girls' and boys' interest and participation in STEM can be explained by differences in what matters to them and how they perceive what matters in science?

First, we asked youth survey respondents to rate how important certain values and activities are to them, and then asked what they think matters in science. We compared the results to see if there are any gendered patterns, and thus possible values-based explanations for gender gaps in STEM participation.

What Matters to Youth

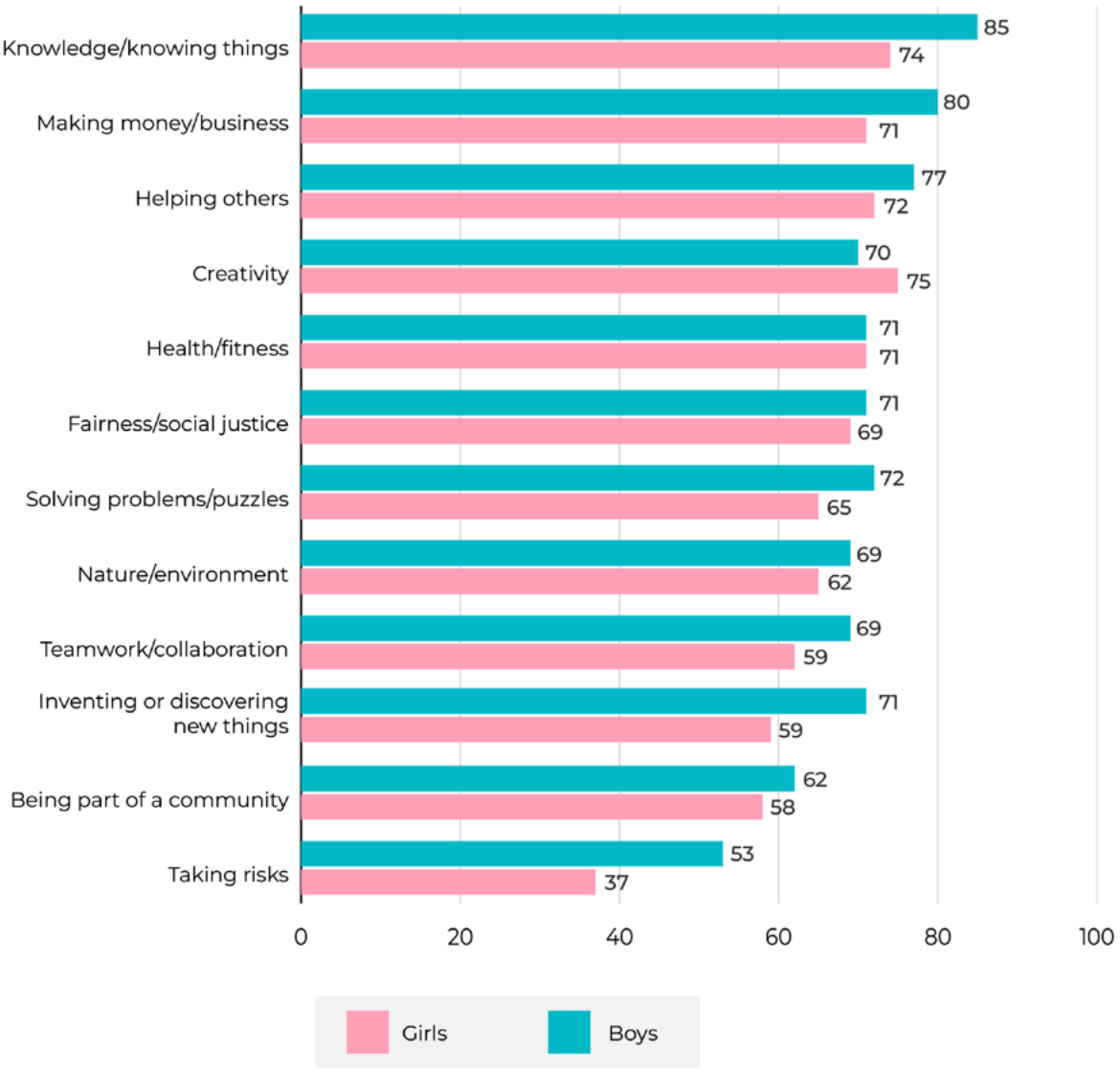
We asked youth to tell us what matters to them. While individual respondents prioritize different values and sets of values, a few stood out as especially prevalent.

- 75 percent of girls say that **creativity** is important to them – slightly more than the 70 percent of boys who say creativity matters to them.
- 74 percent of girls say **knowledge and knowing things** is important to them – somewhat lower than the 85 percent of boys who say this is important.
- 72 percent of girls say that **helping others** is important to them, versus 77 percent of boys who say this matters to them.

Fewer girls say that **inventing or discovering things** (59 percent) is important to them (versus 71 percent of boys). And just 37 percent of girls said that **taking risks** is important to them – lower than the 53 percent of boys who said this. Still, on almost all values we asked youth to rate, there were few glaring differences between girls' and boys' responses.

What is important to youth

% important + very important



How Youth View What Matters in Science

What values and activities do youth think matter in science? With only one notable exception, girls and boys generally agree on what they think matters in science.

- **83 percent of girls** and **91 percent of boys** say i**nventing or discovering new things** is important or very important in science.
- **84 percent of girls** and **89 percent of boys** say **knowledge or knowing things** is important in science.

The only substantial difference between girls' and boys' perceptions of what matters in science relates to the importance of **making money and business**.

- **82 percent of girls** and **84 percent of boys** think that **solving problems and puzzles** matters in science.

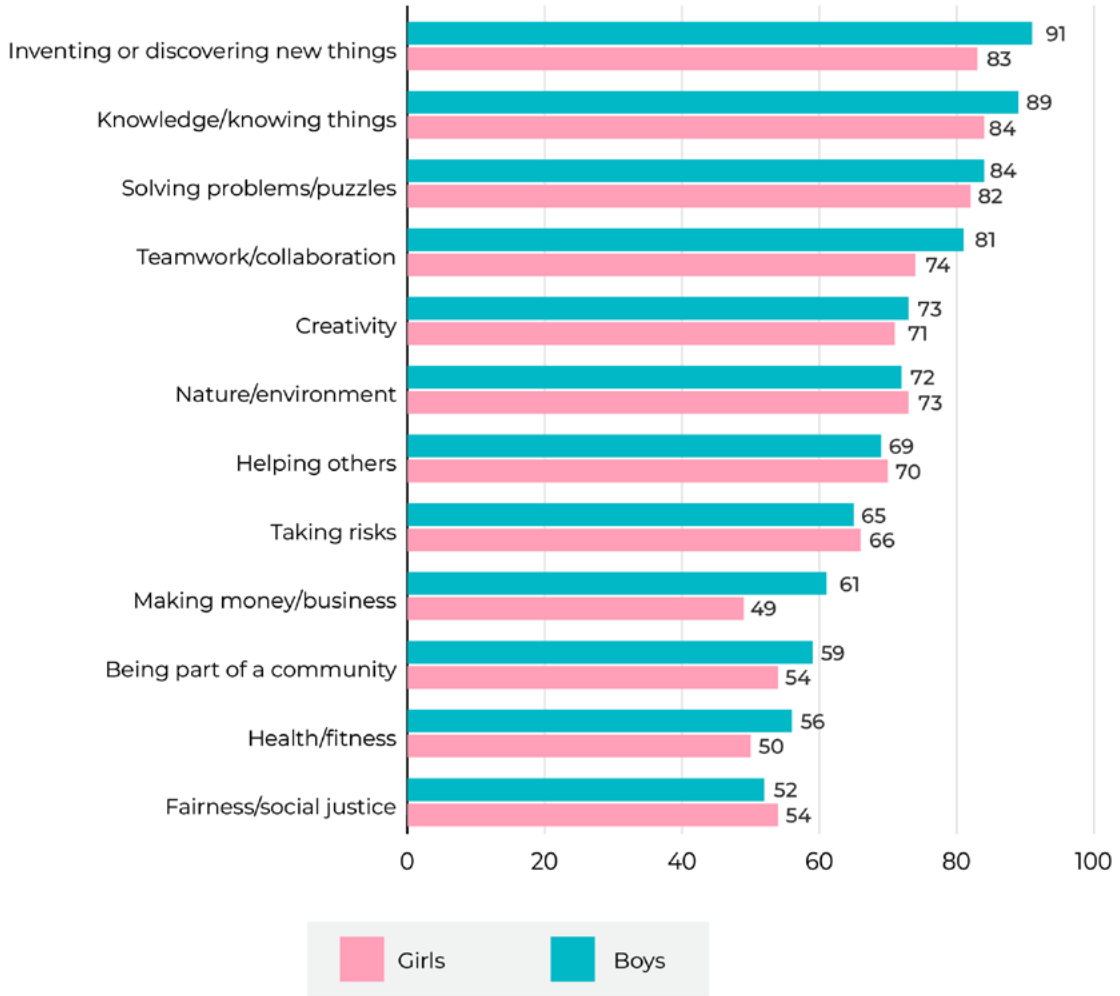
- **74 percent of girls** and **81 percent of boys** say **teamwork and collaboration** are important in science.

Relative to other values and activities, fewer girls and boys think **health and fitness** (50 percent girls and 56 percent boys) and **fairness and social justice** (54 percent girls and 52 percent boys) matter in science. However, it is notable that in both cases, half or more of the respondents indicated that these are important or very important in science.

The only substantial difference between girls' and boys' perceptions of what matters in science relates to the importance of **making money and business**. While 61 percent of boys say this is important in science, less than half of girls (49 percent) associate making money and business with science.

What matters in science?

% who say value is important + very important in science



Alignment Between Personal and Science Values Among Youth

Ultimately, what we want to understand is whether and to what extent there are differences between what youth say matters to them personally and what they think matters in science. And we want to examine whether the gaps – if there are any – track gender in ways that might help explain why girls and women are less likely to pursue STEM education and careers.

- Looking at the five things that matter most to girls, three of those are also thought by them to be most important in science. That is, there is little to no difference between personal values and perceptions of science with respect to **creativity**, **knowledge and knowing things**, and **helping others**. That is, girls who say that creativity, knowledge and helping others is important to them also think these values are also important in science.

> 71% of girls say that making money and business is important to them, **but just 49% think that this matters in science.**

- On two other priority values for girls, however, there are notable differences between personal importance and perceived importance in science:
  - 71 percent of girls say that **making money and business** is important to them, but just 49 percent think that this matters in science – a 22 percentage point difference.
  - 71 percent of girls say that **health and fitness** matter to them, but only 50 percent think that this matters in science – a 21 percentage point gap.
  - It may be the case that girls who are interested in making money and business, and health and fitness, might not see a way for them to pursue those interests in science.

When we look at the extent of value alignment for boys, we see the same basic pattern – which suggests that value misalignment might not explain gender differences in participation in STEM education and careers. For example:

- Boys see more or less the same alignment between science and their own values as do girls with respect to **creativity**, **knowledge and knowing things**, and **helping others** – three values that land among their top-ranked values.
- Moreover, boys exhibit similarly large gaps as girls between what science values and their interests in **making money and business** (19 percentage point gap) and **health and fitness** (15 percentage point gap)

COMPARING PERSONAL VALUES AND SCIENCE VALUES BY GENDER

	GIRLS			BOYS		
	Important to me (%)	Important to Science (%)	Difference (percentage points)	Important to me (%)	Important to Science (%)	Difference (percentage points)
Knowledge/knowing things	74	84	10	85	89	4
Making money/ business	71	49	22	80	61	19
Helping others	72	70	-	77	69	8
Creativity	75	71	4	70	73	-
Health/fitness	71	50	21	71	56	15
Fairness/social justice	69	54	15	71	52	19
Solving problems/puzzles	65	82	17	72	84	12
Nature/environment	65	73	8	69	72	-
Teamwork/collaboration	62	74	12	69	81	12
Inventing or discovering new things	59	83	24	71	91	20
Being part of a community	58	54	4	62	59	-
Taking risks	37	66	29	53	65	8

Cells shaded **green** indicate the three values cited most often by respondents (by gender) as important to them. Cells shaded **orange** indicate the two or three values cited least often by respondents (by gender) as important to them. (Only the bottom two are shaded for boys as there is no meaningful difference between the 3rd to 8th least cited values). Cells shaded **pink** highlight where differences between what matters to youth personally and what they think matters in science reach 15 percentage points or more.

Girls' Values and Their Interest in STEM

To further understand the relationships between what girls value and how they perceive science, we compared the responses of girls who said that a STEM subject was among their favourites with those of girls who did not list a STEM subject as a favourite. For ease of comparison, we call the groups "girls interested in STEM" and "girls less interested in STEM."[3]

Interestingly, girls interested in STEM were more likely than girls less interested in STEM to rank all the values as important to them. On those values often associated with STEM, the differences are especially striking.

- **83 percent of *girls interested in STEM*** versus **66 percent of *girls less interested in STEM*** say that **knowledge and knowing things** is important to them – a gap of 17 percentage points.
- **75 percent of *girls interested in STEM*** versus **49 percent of *girls less interested in STEM*** say that **solving problems and puzzles** is important to them – a gap of 26 percentage points.
- **70 percent of *girls interested in STEM*** versus **46 percent of *girls less interested in STEM*** say that **inventing or discovering new things** is important to them – a difference of 24 percentage points.

69% of girls less interested in STEM say that fairness and social justice is important to them, **but only 44% think fairness and social justice matter in science.**

These differences appear to confirm the hypothesis that values and perceptions – and the gaps between them – play a role in girls' choice of STEM versus other education and career pathways. That is, girls whose personal values are more aligned with their perceptions of science – and, critically, more aligned with respect to values that are conventionally associated with STEM – are more likely to indicate an interest in STEM subjects than girls who exhibit wide gaps between their personal values and perceptions of STEM.

[3] The sample sizes among girls interested in STEM (n=310) and less interested in STEM (n=143) are smaller, which means that differences must be treated with caution. That said, the differences in some cases are so substantial that the smaller sample sizes do not diminish the overall message.

For those girls less interested in STEM, the survey results suggest that they simply do not see a fit between what matters to them personally and what they think matters in science. On a few core values, girls less interested in STEM think science cares less about what they care about:

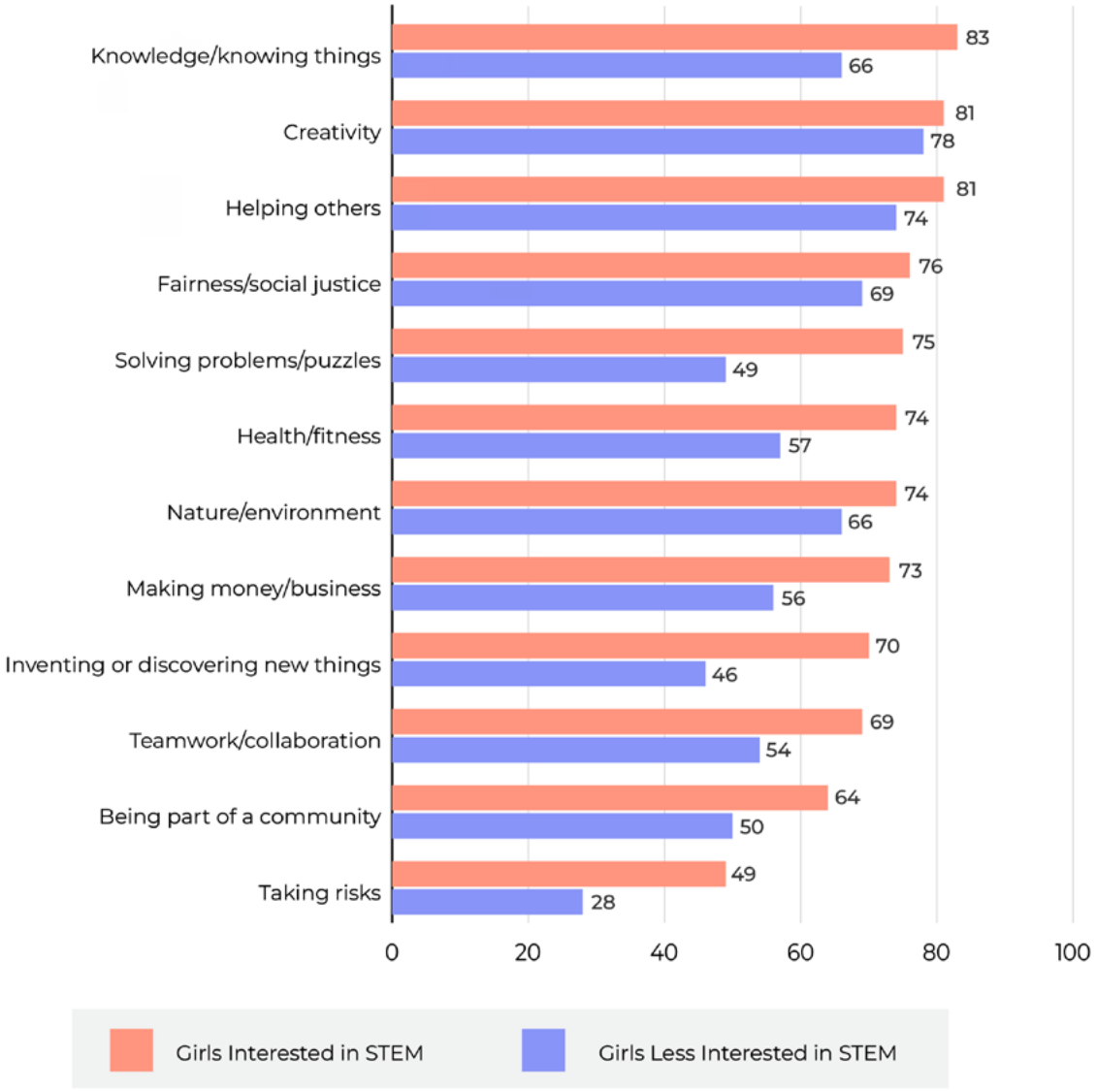
> The survey results suggest that at least some girls might be rejecting STEM **because they misperceive what kinds of values matter in STEM.**

- 69 percent of *girls less interested in STEM* say that **fairness and social justice** is important to them, but only 44 percent think fairness and social justice matter in science – a 25 percentage point difference.
    - By contrast, 76 percent of *girls more interested in STEM* say that fairness and social justice is important to them, and 62 percent think it is important in science – a 14 point difference.
- 78 percent of *girls less interested in STEM* say that **creativity** is important to them, but only 60 percent think it matters in science – an 18 point difference.
    - 81 percent of *girls more interested in STEM* say that creativity is important to them, and 75 percent think it is important in science – a 6 point difference.
- 57 percent of *girls less interested in STEM* say that **health and fitness** are important to them, but only 38 percent think it matters in science - a 19 point difference.
    - 74 percent of *girls more interested in STEM* say that health and fitness are important to them, and 58 percent think it is important in science – a 16 point difference.

Girls should pursue their interests wherever they may land, and society needs girls to pursue a wide range of non-STEM education and careers. Still, the survey results suggest that at least some girls might be rejecting STEM because they misperceive what kinds of values matter in STEM. Whether their perceptions of STEM have been shaped by media, education, peers, family or other influences, some girls might be unaware that fairness and social justice, creativity, health and fitness and other values do have a place in STEM.

Girls' STEM interest and personal values

% important + very important, by interest in STEM



WHAT MATTERS TO GIRLS WHO ARE LESS INTERESTED IN STEM

	Important to Me (%)	Important to Science (%)	Difference
Creativity	78	60	*18*
Helping others	74	70	-
Fairness/social justice	69	44	*25*
Nature/environment	66	64	-
Knowledge/knowing things	66	78	*12*
Health/fitness	57	38	*19*
Making money/business	56	49	*7*
Teamwork/collaboration	54	68	*12*
Being part of a community	50	60	*10*
Solving puzzles/problems	49	76	*27*
Inventing or discovering new things	46	76	*30*
Taking risks	28	58	*30*

Helping Girls See Themselves and Their Values in Science

To improve girls' interest and participation in science, our starting point is to understand what matters to girls personally – to put their values and interests at the centre of attention. Our research reveals that girls have different interests and priorities, and that some girls do not see a neat fit between what matters to them and what they think matters in science. At the same time, we see that most girls are interested in STEM and that the alignment between their personal values and perceptions of STEM are not much different than the alignment we see among boys.

There is room for better alignment. For example, there is a large group of girls and boys who say that making money and business are important to them but do not think that making money and business have a place in science. Similarly, there are many girls and boys who value health and fitness, but do not think that these things matter in science. Showing all youth that there are STEM careers that align with these values could improve interest in STEM generally.

What is less clear is whether and how to alter gender gaps in specific STEM pathways – such as healthcare (which is heavily favoured by girls), and computer science and engineering (which are heavily favoured by boys). Despite the majority of girls and boys indicating that values like helping others, knowledge/knowing things, and solving problems and puzzles matter to them, girls' STEM-related career preferences lean towards more "caring" occupations while boys lean towards more "technical" fields.[4]

This is a useful reminder that while value alignment is important, it is far from the only variable in play when explaining gender gaps in STEM. We also need to consider confidence, social norms and persistent systemic barriers – factors that Actua has been addressing for years.

[4] N. Merayo and A. Ayuso (2023).

Actua's National Girls Program

Actua's National Girls Program, now over twenty-five years old, inspires girls and young women to fulfill their unique and important role in STEM. These all-girl programs are led by instructors who serve as inspiring role models, mentors and allies breaking down long-standing stereotypes about women in STEM. They encourage girls and young women to explore areas of STEM, like science and technology, where we want more girls and young women to feel empowered. Network members deliver these programs in addition to regular co-ed programming through science clubs, day camps, overnight camps, conferences, career fairs and special events.

As part of our efforts to create inclusive, bias-free learning environments that advance gender equity, the National Girls Program welcomes gender-diverse youth, including but not limited to cis girls, trans girls, non-binary youth, gender non-conforming youth and gender queer youth. We also support gender equity and LGBTQ awareness training for all program instructors and general principles around inclusivity and creating a safe space for learning.

- 25,000 girls participate in Actua's National Girls Program annually, with another 225,000 girls reached through other co-ed programs.

- Girls who participate in Actua's National Girls Program report higher confidence in their skills, improved interest in STEM and stronger intentions to pursue STEM education and careers as a result of their experience.

To learn more about Actua's Girls Programs and to access resources, visit **actua.ca**.

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