

Canadian Youth Science Monitor

Prepared for the Canada Foundation for Innovation

Final Report

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1. Background and Objectives

The Canada Foundation for Innovation is an independent corporation created by the Government of Canada, with the mandate to strengthen the capacity of Canadian universities, colleges, research hospitals, and non-profit research institutions to carry out world-class research and technology development that benefits Canadians. Part of this mandate rests on a commitment to science education and literacy amongst Canada's youth, whose relationship with scientific research is vital to the future of science and innovation in Canada.

In order to shed light on the relationship of Canada's youth to science, CFI commissioned Ipsos Reid to conduct a Youth Science Monitor that would examine scientific literacy, understanding of research, the importance of scientific education, and information needs and trust with regard to science amongst Canadian youth. This information will help to inform policy makers, educational institutions, and other stakeholders as they work to encourage scientific advancement in Canada.

This research was inspired by the Wellcome Trust Monitor, a study from the United Kingdom conducted in 2008 that was designed to expand on the existing knowledge base in this area, to enable its more effective use in informing and influencing policy making and public funding decisions. While not a replication of the Wellcome Trust Monitor, the Canadian Youth Science Monitor explores a similar range of issues with an audience of Canadian high-school-aged youth (12 to 18 years old).

2. Research Methodology

The Canadian Youth Science Monitor was conducted as an online survey among n=2,605 Canadian youth 12 to 18 years of age. The respondents were identified among the Ipsos Household Panel. In each case, the respondents' parent or guardian was contacted and asked several demographic questions before permission was asked to have their 12 to 18 year old child complete the full survey. The surveys required approximately 20 minutes to complete and were conducted between January 13 and February 1, 2010.

The sample was stratified by census division and the survey data were weighted to ensure the sample's age and gender composition reflects that of the actual 12-to-18-year-old Canadian population according to Census data.

The table below indicates the sample sizes by region along with the associated margins of error. Please note that statistical margins of error do not formally apply to online surveys, since the panel-based sample is not conducted using probability sampling. The margins of error indicate those that would apply were the survey conducted as a probability samples in which the entire population of Canadian youth 12 to 18 years of age had a theoretically equal opportunity to respond.

Audience	Total Sample Size	Associated Margins of Error
British Columbia	325	±5.4
Alberta	314	±5.5
Saskatchewan/Manitoba	203	±6.9
Ontario	992	±3.1
Quebec	567	±4.1
Atlantic Canada	204	±6.9
Total Canada	**2,605**	±1.9

During this research we identified n=121 respondents not born in Canada and analyse the results of this population throughout the research. Please note that due to the small sample size among this audience, these findings should be interpreted cautiously.

Note on the questionnaire

During the questionnaire respondents were read several statements about science from prominent scientists as follows:

Here are some ways that other people have described science.

Equipped with his five senses, man explores the universe around him and calls the adventure Science. ~Edwin Powell Hubble, The Nature of Science, 1954

An experiment is a question which science poses to Nature, and a measurement is the recording of Nature's answer. ~Max Planck, Scientific Autobiography and Other Papers, 1949

Science is a way of thinking much more than it is a body of knowledge.
~Carl Sagan, Broca's Brain.1986

At the heart of science lies discovery which involves a change in worldview.
~John Polanyi, Canadian Nobel Laureate (Chemistry)

We have indicated whether or not questions were asked after being provided this information throughout the report.

3. Executive Summary

Views on learning, intelligence and success

- Majorities of Canadian youth say they like learning new things (77% agree), consider themselves to be intelligent (78%) and think their friends would say that they are smart (69%). Most are confident that they will be successful in life (75%) and most say they try their best to succeed at whatever they do (73%). A minority (27%) say they are worried about their future.
- Those whose parents are more involved are much more likely to express positive attitudes towards learning and intelligence and are more apt to say they know what they want to do with their lives.

Attitudes towards school

- Overall, Canadian youth express positive attitudes towards school. Majorities agree that they go to a good school (73%) and that good grades are important to them (70%). With respect to their teachers, most agree their teachers praise their efforts when they work hard (61%) and take time to fully explain things (56%) and, also, that students get along well with teachers in their school.
- While Canadian youth are much more likely to agree than to disagree that they like school (49% agree, 19% disagree), they are more likely to view school as boring than not (38% agree while 30% disagree).

Role of parents

- Nearly all Canadian youth (99%) say it is important to their parents that they succeed in school (including 80% who say it is very important).
- Canadian youth were asked whether their parents often, sometimes, rarely or never take part in a range of activities related to schooling, future plans, or their work ethic.
- Among the activities tested, majorities of Canadian youth say their parents often ask about what they are learning in school (67%), discuss their child's interests (60%), and check on whether they have done their homework (57%).
- Fewer than half say their parents often discuss their child's future career plans (49%), require their child to do work or chores (46%) or help them to select courses or programs at school (43%). About three in ten (29%) say their parents help with their homework.
- Several statements touch on privileges or limitations from their parents. About one in three says their parents often limit the amount of time they spend going out with friends on school nights (34%). A similar proportion (33%) says their parents give them privileges for good grades. Fewer say their parents often limit the amount of time they spend watching television or playing video games (26% say their parents often do, 34% say their parents never do) or that their parents limit privileges because of poor grades (16% say their parents often do, 45% say their parents never do).
- By grouping respondents who indicate that their parents "often" take part in a certain number of the developmental activities tested, it is possible to create an index of parental involvement as follows:

- 24% of respondents have parents who are **very involved,** meaning that they often take part in seven or more activities;
- 40% of respondents have parents who are **moderately involved,** meaning that they often take part in four to six activities;
- 31% of respondents have parents who are **less involved,** meaning that they often take part in one to three activities;
- 5% of respondents have parents who are **least involved,** meaning that they often take part in none of the tested activities.

- According to Canadian youth, their parents assign the greatest importance to mathematics (90%), followed distantly by languages (45%) and literature (36%). The emphasis on mathematics is ironic given that the Canadian public is generally poor at math. Nevertheless, this finding is consistent with the Wellcome Trust Monitor which found that British youth also believe that their parents view mathematics as the most important subject to do well in.
- Fewer than one in five thinks any of the other subjects tested are viewed as most important by their parents, including the science courses tested: biology (15%) environmental science (14%), chemistry (12%) and physics (10%).
- By region, residents of Quebec are more likely to believe that their parents consider mathematics and languages to be important, but are much less likely to think that their parents consider literature, biology or chemistry to be important.
- Albertans are notably more likely to believe their parents consider chemistry to be an important subject of study.
- Older respondents (17-18 years) are more likely than younger respondents (12-13 years) to say their parents consider the study of biology, chemistry and physics to be important. The perception that their parents consider biology, chemistry and physics to be important coincides with a greater likelihood to study these subjects and to express interest in them among older students.
- When Canadian youth were asked how important their parents say it is for them to do well in scientific courses generally, nine in ten (90%) say their parents consider their performance in science courses to be either very (47%) or somewhat important (43%).

Meaning of science

- When asked, using their own words, what they think science means, Canadian youth most often make reference to study, learning or knowledge (43%). One in five says that science has something to do with how things work (21%). Others associate science with the world around us (16%) or with biological life (14%). One in ten mention research or experimenting (11%), while just fewer than one in ten associate science as a way of explaining or understanding why (9%).
- When asked to mention the first words or phrases that come to mind when thinking about science, respondents most often say “experiments” (11%), “boring” (8%), “difficult or hard work” (8%), or “interesting” (6%).
- When asked whether or not several terms describe science, over two in three (68%) agree that the word “important” describes science, while three in five (59%) say “interesting” describes science.

- Majorities also say the terms “complicated” (59%) and “difficult” (52%) describe science. Fewer than half say the terms “fun” (46%), “cool” (46%) or “inspiring” (39%) describe science. One in five (22%) say the term “boring” describes science.
- The proportion who agree (on a prompted basis) that science is boring (22%) is 14 percentage points greater than the 8% who volunteer the word “boring” to describe science on an open-ended basis. Meanwhile, the proportion who agrees that science is difficult (52%) exceeds the 8% who volunteer the words “difficult or hard work” to describe science by 44 percentage points.
- These results suggest that while boredom with science is strongly felt among a core segment (particularly the 8% who mention the term on an open-ended basis) this perception is not shared by a broad majority. Meanwhile the notion of science as difficult extends far beyond the 8% who mention it as a top-of-mind association to a majority (52%) who agree on a prompted basis that science is difficult.
- The difference between the two terms also suggests that while “boring” is an inherently negative association, “difficulty” is not. While very few of those who are interested in science would agree that it is boring (7%), nearly half (46%) agree that it is difficult. Even those who are not interested in science are more likely to agree that science is difficult (68%) than to agree that science is boring (52%). While boredom may be a matter of taste, this finding shows that the difficulty of science is accepted by many of those who are interested in science even as it deters those who are not interested.
- Age significantly impacts perceptions of the words that describe science. The perception of science as “interesting,” “fun,” “cool,” and “inspiring” all decline as respondents grow older, while perceptions of science as “complicated,” “difficult,” and “boring” all increase as respondents grow older. The sense of science as “important” does not greatly change with age.
- The increasing perception of science as “complicated,” “difficult,” and “boring” as students grow older coincides with the fact that they are more likely to study science subjects such as biology, chemistry and physics as they grow older.
- While this may appear to suggest that an increasingly difficult curriculum is to blame for more negative perceptions of the sciences as students grow older, there is also evidence that more exposure to the sciences in the curriculum tends to result in more positive views. Those who have studied biology, chemistry or physics (who tend to be older students, likely those who have made the choice to pursue scientific study) are less likely than those who have not studied any of these subjects to view science as “difficult,” “complicated” or “boring” and are more likely to view science as both “important” and “interesting.”
- Similarly, the amount of effort spent on science does not, in itself, appear to prompt negative perceptions of science. For example, those who spend zero hours per week doing math or science homework (20%) are more than twice as likely as those who spend four or more hours a week (8%) to strongly agree that science as “boring.”
- Between the genders, it is worth noting that older females (17-18 years) are more likely than older males to view science as “complicated,” “difficult,” and “boring.”

Interest in science

- When asked to rate the level of interest in science of themselves and others, two in three Canadian youth (68%) say that they, personally, are either very (28%) or fairly interested (40%) in science (31% say they are either not very, 22%, or not at all interested, 9%, in science).
- Canadian youth are more likely to think their teachers (85%) are interested in science than to say that they themselves are interested. They are less likely to think their father (62%), mother (59%), friends (49%) or siblings (45%) are interested in science than to say they themselves are interested.
- While similar proportions think their mothers and fathers are at least fairly interested in science, Canadian youth are more likely to say their fathers are *very* interested in science than they are to say that their mothers are very interested (26% compared to 18%). Considering their peers, only five percent describe their friends as *very* interested in science, as compared to their siblings (15%).
- Respondents who indicate that their friends are interested in science are themselves much more likely to be interested in science (87% compared to 68% among all respondents). Similarly, but not to the same extent, respondents who say their mother, father or siblings are interested in science are also more likely to express an interest in science themselves.
- Those who say their teachers are interested in science are not much more likely than average to say they are interested in science (71%). This apparent lack of influence by teachers is attributable to the fact that among Canadian youth the idea that their teachers are interested in science is nearly universal (85% say their teachers are very or fairly interested in science), whereas the perception that family and friends are interested in science is less common.
- While the interest of teachers in science is a given, the quality their teaching is not. Those who feel their teachers take time to fully explain things are 28 percentage points more likely than those who disagree to express an interest in science. Those who say their teachers praise hard work are 17 percentage points more likely than those who say their teachers do not praise hard work to express an interest in science.
- Along with the role of good teachers, parents who are very involved in their children's lives also lead to greater levels of interest in science. Those whose parents are very involved (74%) are much more likely to express an interest in science than are those whose parents are least involved (51%).
- Younger respondents (12 to 13 years of age: 78%) express higher levels of interest in science than do older respondents (17 to 18 years: 58%).
- Interest in science declines more rapidly among females between the ages of 14 to 16 and 17 to 18 (dropping by 11 points) than it does among males between the same age groups (dropping by 6 points). While the decline in interest in science between the ages of 12 to 13 and 17 to 18 is comparable between the genders (a 20 point decline among males and a 19 point decline among females), this finding suggests that declining interest in science may accelerate among females as they grow older.

- Overall interest in science is significantly lower among respondents whose parents have lower levels of education and income than among those whose parents have higher levels of education and income.
- Respondents who say they were not born in Canada (74%) are more likely than those who say they were born in Canada (67%) to express an interest in science.
- By ethnicity, similar proportions of Caucasians (68%) and non-Caucasians (68%) express interest in science; however, East Asians (75%) are more likely to express an interest in science.
- Respondents living with both parents in a single household (69%) or with both parents in separate households (73%) are more likely than those who live in a single parent household (60%) to express an interest in science.
- Canadian youth who described themselves as very or fairly interested in science most often say they are interested in science because they enjoy learning about the world or about how things work (36%). One in four says it is because they consider science to be cool, fun or interesting (24%). Just over one in ten say simply that they like science (12%), while others say they like experiments, building things or the hands-on activities associated with science (11%).
- Canadian youth who described themselves as not very or not at all interested in science say it is because science is boring or uninteresting (31%), followed by one in four who say science is difficult, complicated or hard to understand (24%). Fewer than one in five say simply that they don't like science (14%).
- Canadian youth are much more likely to say they are more interested in science now than in the past (35%) than to say that they are less interested in science (9%). The majority of Canadian youth believe that their interest in science is about the same now as it was in the past (57%).
- Putting aside their personal interest in science either as a school subject or a future career choice[1], nearly four in five (78%) consider it to be either very (24%) or fairly important (54%) to have an understanding of science. Fewer than one in five (18%) say it is not very (16%) or not at all important (2%) to have an understanding of science.

Exposure to and interest in aspects of the curriculum

- When asked whether they had ever studied a variety of subjects commonly taught in school, nearly all respondents say they had studied mathematics (99%) and physical education (99%). Over nine in ten also say they had studied history (94%) and geography (93%), while just fewer than nine in ten say they had studied languages (88%) or art (88%).

[1] This question was asked after participants were provided several different quotes describing science.

Considering scientific courses, three in four say they have studied environmental sciences (76%), while three in five say they have studied biology (60%). Fewer than half say they have studied chemistry (48%) or physics (40%).

- The study of mathematics remains constant (and nearly universal) among each of the three age groups. The study of environmental science is somewhat higher among those 12 to 13 years of age than among older respondents. Meanwhile, the proportions who have studied biology, chemistry and physics increase significantly as respondents grow older.
- On average, over one in three respondents (36%) say they are either very (14%) or somewhat interested (22%) in the five scientific subjects tested.[2] The average expression of interest in the 10 non-scientific subjects tested (37%) is similar to interest in the scientific subjects (36%).
- Interest in the five scientific subjects tested is highest with respect to mathematics (47% very or somewhat interested) and environmental science (44%) followed distantly by biology (35%). Respondents are more likely to express disinterest than interest in chemistry (31% are not interested while 29% are) and physics (33% are not interested compared while 23% are).
- Interest in the scientific subjects tested declines in the same order as experience studying the subjects. Interest is higher with respect to mathematics and environmental science, which respondents are much more likely to say they have studied, than with respect to biology, chemistry or physics which have less often been studied.
- While overall interest in biology, chemistry and physics is lower, those who have studied biology, chemistry or physics are more likely to express interest in each of these subjects than those who have not studied them.
- By subject, interest among males declines across all five scientific subjects tested, including the traditionally male subjects of interest, physics and chemistry. However, males both start out (at 12-13 years of age) and end up (at 17-18 years of age) more interested than females are in both of these subjects. The decline in interest among males in physics is particularly mild (declining by 4 points compared to the 14 point decline in interest among the sciences overall).
- Females are less interested in each of the science subjects tested than males in each of the science subjects apart from biology. At 17 to 18 years of age (39%), females are seven points more interested in biology than they were when they were 12 to 13 years of age (32%). Females are also become slightly more interested in physics, but interest in this subject remains essentially constant (and, as noted, is lower than among males). Excluding biology, interest in the remaining science subjects declines at a similar rate among females (dropping by 12 points) as it does among males (dropping by 15 points).
- When asked whether their school has an optional or special program of study that focuses on science, one in four (25%) say their school does offer such a program, while 75% say their school does not offer a science stream (36%) or don't know whether or not it does (39%).

[2] Mathematics, environmental science, chemistry, biology and physics.

- About half of those who say their school offers a specialized science stream (51%) say they either are currently enrolled in the science stream (29%), plan to enroll in it (16%) or would like to enroll but cannot do so (6%). One in three (34%) say they would *not* like to enroll in the science stream offered at their school. Sixteen percent don't know whether or not they would enroll in the science stream offered by their school.
- Among those who say their school does not offer a science stream, or who don't know whether or not it does, just over one in five (22%) say they would plan to enroll in a science stream if it were offered at their school. Just over one in four say they would be interested in it, but probably not enroll (26%), while the same proportion (26%) say they would not be interested and would not enroll in the science stream if offered. An additional one in four (26%) say they don't know.

Weekly Activities

- Among a list of activities, Canadian youth say they spend the most time sleeping (on average 51.7 hours per week, or 7.4 hours per day) and going to school (30.4 hours per week, or about 6.1 hours per each of the five work days). Apart from the 30.4 hours spent attending school each week, Canadian youth say they spend 8.2 hours per week doing homework or studying.
- Canadian youth spend a substantial amount of time using a computer (13.6 hours), using the Internet (12.2 hours) and text messaging (10.4 hours). They spend 12.5 hours per week listening to music, 11 hours watching TV and 5.2 hours listening to the radio.
- They spend 5.5 hours per week reading books, 2.9 hours getting news online, 1.9 hours reading newspapers offline and 1.9 hours reading magazines offline. They spend 11.5 hours with friends and 3.7 hours talking on the phone.
- They spend 11.3 hours working for pay and 3 hours doing family chores. They spend 6.2 hours doing physical activities.
- When asked how many hours they spend per week doing homework in several different subject areas, Canadian youth say they spend the most time doing homework for mathematics (2.0 hours per week), followed by homework for languages or literature courses (1.6 hours), science courses (1.4 hours), and homework for history, politics and geography courses (1.3 hours).
- Those who are interested in science spend more time doing science homework than those not interested in science (1.7 hours per week versus 0.9 hours among those not interested). This suggests that if the prospect of difficult or hard work deters those who are not interested in the sciences, those who are interested embrace longer hours of study in the subject.
- Older respondents (17-18 years) are more likely than younger respondents (12-13 years) to say they spend four or more hours per week doing homework in the sciences (15% versus 5%) and mathematics (19% versus 11%).

Exposure to science outside of school

- Among several extra-curricular activities related to science, respondents most often say they had visited a science museum or science centre in the past 12 months (46%). Over one in three say they had visited a zoo (37%) or nature reserve (35%). Three in ten say they attended a science fair (29%), while about one in five say they visited a

working laboratory (20%) or visited a planetarium (18%). Respondents least often say they participated in a science club (11%).

- Those who are interested in science are more likely than those who are not interested to say they have done each of the tested extra-curricular activities related to science at least once in the past 12 months.
- Older respondents (17-18 years) are less likely than younger respondents to say they have visited a science museum, zoo, science fair or planetarium or participated in a science club in the last 12 months than are younger respondents. Males are less likely than females to say they have visited a planetarium, zoo or science fair in the past 12 months.
- When asked how often they use several science-related media, a majority of respondents say they regularly watch a television show related to science (61% say they do so either daily, at least once a week or at least once a month). One in three (34%) say they regularly visit a website to learn about science. Seventeen percent say they read a science magazine regularly.
- Older respondents (17-18 years) and males are more likely than younger respondents and females to say they read watch science related TV shows, visit websites to learn about science and watch television shows related to science.
- When asked on an open-ended basis what website they would visit if they were to use the Internet to learn something about science, respondents most often say they would use Google (24%). The website of the Discovery Channel, also known as the Daily Planet (9%), and Wikipedia (8%) follow in a distant second and third place.
- Younger respondents (12-13 years) are somewhat more likely than older respondents (17-18 years) to say they would visit the website of the Discovery channel (11% versus 7%) or Wikipedia (11% versus 7%). Older respondents are somewhat more likely than younger respondents to say they would use Google (25% versus 20%).

Considering science as a career

- Respondents were asked how important they think studying science will be to the career they eventually pursue.[3] Just over half (52%) think studying science will be at least somewhat important to the career they eventually pursue, while two in five (39%) say studying science will not be important to their future career. Canadian youth are much more likely to say that studying science will be very important (24%) to their future career than to think it will not be important at all (13%). One in ten (9%) don't know whether or not the study of science will be important to their future career.
- The perception that science will be important to the career they eventually choose declines dramatically with age (from a high of 57% among those 12 to 13 years of age to 40% among those 17 to 18 years of age).
- The declining perception that science will be important to their future career coincides with both a general decline in interest in science and an increase in certainty with respect to the career they will pursue (which grows from 39% among12 to 13 year olds to 56% among those 17 to 18 years of age). In other words, as respondents become

[3] The questions in this section were asked after participants were provided several different quotes describing science.

more certain of what they plan to do with their lives they become both less interested in science and less apt to view science as an important part of their future plans.

- Despite the fact that most (52%) view science as important to the career they may eventually pursue, Canadian youth are much less apt to prefer a career in science. When asked how interested they would be in working in a scientific field, about two in five Canadian youth (38%) say they would be at least fairly interested, while the majority (53%) says they would not be interested. Those who say they are not at all interested in working in a scientific field (21%) significantly outweigh those who say they are very interested in doing so (15%).
- Similar proportions of males (40%) and females (36%) say they would be either very or fairly interested in pursuing a scientific career. Young males (12-13 years) are much more likely than young females to express an interest in a scientific career (47% versus 38%, respectively. However, interest in a scientific career declines more sharply with age among males than among females. Among males 17 to 18 years old, 33% express interest in a scientific career (representing a decline of 14 percentage points). Among females of the same age, 31% express interest in a scientific career (representing a decline of 7 percentage points).
- Respondents who say they are very or fairly interested in pursuing a scientific career were asked why. On this basis, one in five (22%) say that science is a pre-requisite to the career they hope to pursue. Fourteen percent say that while the study of science may interest them, what they ultimately expect to pursue as a career may differ. Thirteen percent say they are interested in pursuing a scientific field because it's fun, cool or interesting to them, while 10 percent say it is because they enjoy learning about the world or about how things work. Just fewer than one in ten (8%) say they have not decided what they want to do in the future.
- Respondents who are not very or not at all interested in pursuing a scientific career say it is because they prefer a subject or field of interest other than science (44%). Others say it is because they don't like science (15%) or find it to be boring or uninteresting (14%). Only six percent say it is because they find science to be too difficult, complicated or hard to understand.
- Although only two in five (38%) of Canadian youth say they themselves are interested in a scientific career, the majority (62%) think that science would be a good field for young people to go into as a career. Very few (4%) say science would not be a good field to go into, while one in three (34%) say they don't know.
- While interest in pursuing a scientific career declines with age, there is no similar decline in the view that science is a good field for young people to pursue.
- Females (66%) are more likely than males (57%) to say that science would be a good field to go into as a career.
- Respondents who consider science a good field for young people to go into were asked which of several reasons provided best explains why. Among the possible reasons provided, these respondents most often indicate that a scientific career provides opportunities to make new discoveries (74%). About two in three selected the notions that a scientific field offers lots of different types of jobs (69%), is interesting (65%) or provides an opportunity to make a useful contribution to society (65%). About three in five opt for the reason that a scientific career is well paid (59%). Fewer than half indicate that a scientific career would be a good field to enter because it is

personally satisfying (44%) or because it is a well-respected, high-status career (42%). The notions that a scientific career affords a good work-life balance (28%) or offers job security (24%) rank lowest among the list of reasons for pursuing a scientific career.

- Respondents who do not view science as a good field to enter were asked which among several reasons explains why not. Among the possible reasons provided these respondents most often indicate that science would not be a good field to enter because it is boring (55%) or because too many qualifications are required (54%). Long hours (34%) and a limited range of job opportunities (31%) are selected by at least three in ten. One in four identifies the competition or difficulty getting into a scientific career (24%) and the difficulty for someone of their background to get into a scientific field (23%) as barriers. One in five respondents do not view science as a good career because it has a bad image or is uncool (21%). Those who do not view science as a good career least often believe it is because there is no real chance to make a difference (15%) or because it is poorly paid (12%).
- Presented with several statements about scientists, Canadian youth most often agree that scientists make a valuable contribution to society (88% agree, including 50% who strongly agree). Nearly three in four (72%) also agree that scientists come from a wide range of social backgrounds (only 8% disagree with this, while 19% say they don't know). A similar proportion (73%) agree that scientists can find jobs anywhere in the world (only 9% disagree, while 18% say they don't know). Nearly seven in ten (69%) agree that scientists have a wide range of jobs to choose from (again, disagreement is low at 9% while 21% say they don't know).
- Respondents are more likely to disagree than agree that there are few jobs for scientists in private companies (34% disagree, 24% agree) or that scientists are poorly paid compared to other jobs (41% disagree, 14% agree). With respect to both statements, respondents most often indicate that they don't know whether or not there are few jobs for scientists in private companies (43% don't know) or whether scientists are poorly paid compared to other jobs (45% don't know).

Scientific literacy

- Respondents were asked a series of nine, factual, multiple choice questions about the sciences, which were selected to include questions about the physical and natural sciences and to reflect a range of difficulty.[4]
- Of the nine questions asked, just over one in ten (12%) were able to correctly answer six questions or more. About three in five (58%) were able to answer between three and five questions correctly. Three in ten respondents (30%) were able to correctly answer two questions or fewer.
- On average, across all questions, three in ten (30%) answered don't know. Don't know responses were much higher than average with respect to two questions, both dealing with physics. Three in five (61%) said they don't know when asked about the difference between radio waves and visible light. A similar proportion, 58%, said they don't know when asked which of several terms are related to the Theory of Relativity.

[4] The questions were selected from among those included in a longer scientific literacy quiz, designed by James Trefil, a U.S. physics professor and noted author of science books intended for the general public.

- The overall results do not vary greatly either by age or gender (although respondents 17-18 years of age are somewhat more likely than those 12-13 years to have answered six or more questions correctly).

Summary of regional differences

Looking at responses by region we find that respondents from British Columbia are less apt to describe themselves as very interested in science, but are not much less likely to express an interest in a scientific career, to think that science will be important to the career they eventually pursue or to consider science a good career for young people to go into.

Residents of Saskatchewan and Manitoba are also less likely to describe themselves as very interested in science. Residents of Saskatchewan and Manitoba are also less likely to express an interest in working in a scientific field and to consider science a good field to go into, but are slightly more likely to feel that science will be important to the career they eventually pursue.

Residents of Quebec are about average in their interest in science generally and their interest in working in a scientific field, but are less likely to say science will be important to the career they eventually pursue and are less likely to consider science a good career for young people to go into. (One possible explanation for why Quebec residents are less likely to view science to be a good field to go into may have to do with the fact that Quebec residents are less likely to view a scientific career as interesting, personally satisfying or as a well respected, high status occupation.)

Atlantic Canadians are more likely to say they are interested in a scientific field, more likely to think science will be important to the career they eventually pursue and more likely to consider science a good career for young people to pursue.

	Total	BC	AB	SK/MN	ONT	QUE	ATL
% who describe themselves as very interested in science	**28%**	22%	26%	22%	28%	31%	32%
% who say they are interested in working in a scientific field	**38%**	34%	40%	33%	39%	39%	45%
% who say studying science in school will be important to the career they eventually pursue	**52%**	50%	56%	56%	55%	40%	61%
% who consider science a good career for young people to go into	**62%**	61%	63%	54%	67%	53%	68%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups. [5]

[5] The highlighted differences identify outlying results where statistically significant differences have been found and described in the narrative. For purposes of clarity not all statistically significant differences are highlighted.

Differences with respect to the meaning of science are relatively mild across the regions. However, Quebec residents are less likely to agree that the terms “important,” “fun” or “cool” describe science. Atlantic respondents are more likely to describe science as “fun.”

	Total	BC	AB	SK/MN	ONT	QUE	ATL
% who agree that each term describes science							
Important	**68%**	67%	71%	65%	72%	63%	72%
Interesting	**60%**	59%	60%	61%	60%	58%	63%
Complicated	**59%**	63%	54%	57%	61%	59%	56%
Difficult	**53%**	52%	49%	49%	54%	56%	46%
Fun	**46%**	43%	50%	45%	47%	41%	53%
Cool	**46%**	46%	48%	43%	48%	41%	48%
Inspiring	**39%**	39%	36%	35%	41%	36%	44%
Boring	**22%**	24%	20%	24%	22%	21%	16%
Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.							

Throughout this study we find that those whose parents and teachers are more engaged also tend to be more interested in science. So, it is interesting to note that British Columbia residents, who are less interested in science, are also less apt to say their parents consider it very important that they do well in science, to have very involved parents, or to believe that their teachers take time to fully explain things.

	Total	BC	AB	SK/MN	ONT	QUE	ATL
% who say their parents consider it very important that they do well at science in school	**80%**	70%	85%	77%	82%	80%	84%
% whose parents are “very involved”	**24%**	19%	22%	25%	27%	20%	28%
% who strongly agree that teachers praise their efforts when they work hard	**29%**	26%	24%	26%	27%	36%	28%
% who strongly agree that they have good teachers who take time to fully explain things	**22%**	16%	19%	25%	22%	25%	20%
Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.							

While we find in this research that those who have studied sciences tend to express greater interest in science, it is interesting to note that respondents from British Columbia are more likely to say they have studied biology and chemistry.

British Columbians are less interested in science subjects on average, particularly mathematics and environmental science, but do not differ greatly with respect to biology, chemistry or physics.

	Total	BC	AB	SK/MN	ONT	QUE	ATL
% who say they have studied each subject							
Mathematics	**99%**	100%	99%	100%	99%	99%	99%
Environmental Science	**76%**	73%	70%	67%	76%	84%	75%
Biology	**60%**	70%	64%	59%	58%	57%	57%
Chemistry	**48%**	57%	63%	53%	48%	36%	39%
Physics	**40%**	42%	45%	38%	39%	44%	29%
% who say they are very interested in each subject							
Science Subjects (Average)	**14%**	10%	15%	12%	15%	14%	16%
All Other Subjects (Average)	**17%**	16%	17%	15%	18%	17%	17%
Mathematics	**22%**	14%	21%	22%	23%	24%	21%
Environmental science	**15%**	10%	14%	12%	16%	18%	15%
Biology	**13%**	10%	14%	13%	13%	10%	17%
Chemistry	**11%**	9%	15%	11%	12%	8%	16%
Physics	**8%**	7%	10%	4%	9%	8%	11%
Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.							

Comparisons to the Wellcome Monitor

This research was inspired by the Wellcome Trust Monitor, a study from the United Kingdom conducted in 2009 that was designed to expand on the existing knowledge base with respect to the study of science by young people. While not a replication of the Wellcome Trust Monitor, the Canadian Youth Science Monitor explores a similar range of issues with an audience of Canadian high-school-aged youth (12 to 18 years old).

Several comparisons between the two studies are made below. It is important to bear in mind that these comparisons may be influenced by factors beyond the basic international comparison; notably differences in the questionnaire, differences between the two samples (the Wellcome Trust Monitor interviewed 14-18 year old British youth, while our study interviewed 12-18 year olds) and the different data gathering methodologies (our study was conducted online, the British study was conducted through face-to-face interviewing).

Note: To enable a more direct comparison the summary below compares the results among 14 to 18 year old Canadian youth in the present study with results of the Wellcome study (which limited its sample to 14 to 18 year old British youth).

Interest in science

- Where the Wellcome Trust Monitor found that four in five British youth expressed an interest in science courses (81%), our research finds a lower proportion of Canadian youth (64%) are interested in science generally, and that the average level of interest in several different areas of scientific course work is considerably lower (the average

proportion who are interested in math, environmental science, biology, chemistry or physics is 34%). [6]

- As was found in the Wellcome Trust Monitor, young Canadian females also express somewhat lower levels of interest in science than men.

Influence of teachers

- The Wellcome Trust Monitor study identifies having a bad teacher as the most significant factor discouraging students from learning science. Similarly, our study finds that respondents who say their teachers do not fully explain things or do not encourage their efforts are consistently less likely to express interest in science and scientific subjects.

Exposure to science at school

- The Wellcome Trust Monitor indicates that the most prevalent scientific subjects of study at the A level are biology (57%), chemistry (40%) and physics (33%). This ordering is consistent with our finding among Canadian youth that 67% have studied biology, 56% have studied chemistry and 47% have studied physics. (It is important to note that the Wellcome study asked whether respondents are currently studying these subjects, whereas our study asks whether respondents have ever studied these subjects, which may explain why the Canadian proportions are higher.)

Participation in extra-curricular activities related to science

- In terms of participation in science-related activities outside school, the findings from both studies about the main types of activities are largely consistent. Our study shows that 32% of Canadian youth visited a science museum or a science centre in the last 12 months, 28% visited a zoo, and 22% visited a nature reserve. The Wellcome Trust Monitor finds that consistent proportions of British youth engage in these activities: 34% visited a science museum or a science centre in the last 12 months; 26% visited a zoo, and 15% visited a nature reserve.

Considering a scientific career

- The Wellcome Trust Monitor finds that 44 percent of British youth express an interest in pursuing a career in science. Our findings show that a somewhat lower proportion of Canadian youth (36%) are interested in working in a scientific field.
- Our research finds that younger respondents express more interest in a scientific career than older respondents (40% for respondents 14-16 years of age compared to 32% among respondents 17-18 years of age). These findings follow the trend of declining interest in a scientific career reported by the Wellcome Trust Monitor (49% among British youth 14-16 years of age compared to 39% among those 17-18 years of age).

[6] It is worth pointing out that the higher levels of interest found in the U.K. could result from the social desirability of indicating interest to the interviewer during a face-to-face interview, rather than an inherently greater level of interest in the sciences on the part of British youth.

- A majority (81%) of British youth consider science a good career for young people to go into. A lower percentage of Canadian youth (62%) perceive science as a good field to enter.
- When asked why science was considered a good career choice, British youth most often thought it was because a scientific career would be interesting (62%), because there are lots of different types of job available (55%) and because there are opportunities to make exciting new discoveries (53%).
- While our study finds that the same three main reasons seem to make science a good career choice for young people, the ordering differs. Canadian youth most often view a scientific career as a good field because there are opportunities to make exciting new discoveries (73%), followed by the sense that there are lots of different types of jobs available (71%) and because a scientific career would be interesting (63%).
- Canadian youth are also more likely than British youth to say that the opportunity to make a useful contribution to society is a reason why science would be a good area of employment (66% compared to 44% among British youth).
- Our study is consistent with the Wellcome Trust Monitor with respect to attitudes towards scientists and scientific work. Specifically, the majority of young people agree that scientists make a valuable contribution to society (93% among British youth; 89% among Canadian youth) and that scientists come from a wide range of social backgrounds (72% among British youth; 74% among Canadian youth).

4. Conclusions

This study is the first nationwide survey of the views of Canadian youth towards the sciences. It was inspired by the 2009 Wellcome Trust Monitor, a study of youth in the United Kingdom, which was designed to accomplish similar objectives: understanding how young people relate to the sciences, both in terms of how interested they are in the study of science and how interested they are in pursuing scientific careers.

The Government of Canada's science and technology strategy stresses that "scientific and technological innovations enable modern economies to improve competitiveness and productivity, giving us the means to achieve an even higher standard of living and better quality of life." It sets out a multi-year science and technology agenda, and establishes three different areas of focus, one of which is to have the best-educated, most-skilled, and most flexible workforce in the world. One of the means identified to achieve this is by seeking to increase the number of Canadians pursuing education and careers in S&T.

We know that Canadian youth perform well in the sciences relative to young people in other countries. The 2006 Programme for International Student Assessment (PISA) study found that of the 57 participating countries, only two countries (Finland and Hong Kong) performed better than Canadian youth on scientific questions.

Yet, ability in the sciences has not translated into an interest in pursuing it beyond high school. The 2009 OECD Scorecard finds that Canada ranks 24th out of 35 nations in the percentage of students graduating from university with a science or engineering degree. By way of comparison, the United Kingdom ranks 17th, the European Union countries (taken together) rank 19th, while the United States places behind Canada at 31st.

Why are young Canadians less likely to pursue and graduate from scientific programs of study than their counterparts in most other OECD nations?

The research points to a number of factors that affect interest in science:

Parental interest and involvement matter.

- Interest in science among students increases in tandem with parental involvement in their studies.
- Those who perceive that their parents (and siblings) are interested in science are themselves more interested.

Peers matter.

- Those who perceive that their peers are interested in science are themselves more interested.
- Those who say that their friends are very or somewhat interested in science are more than twice as likely to describe science as fun, cool and inspiring than are those whose friends are not interested in science.

Quality of teaching matters.

- Throughout the research we find considerably greater levels of interest and enthusiasm for the sciences among those who say their teachers reward hard work and take time to fully explain things.

Age and nature of exposure to science matter.

- The highest interest in school generally, and the sciences in particular, is found among younger respondents aged 12-13. Interest declines dramatically as students grow older. Yet, exposure to the sciences appears to be lower at this age (younger students are much less likely to say they have studied biology, chemistry or physics at the younger age levels).
- Younger respondents are more likely to describe science as cool, fun or inspiring than are older respondents. They are also more likely to say that the first word that comes to mind when they think of science is "experiments." They are more likely to report visits to science museums, zoos, science fairs and the planetarium or participation in science clubs.
- Those who are interested in science most often say it is because they enjoy learning about the world or how things work.

Perception that science will be useful to them in the future matters.

- The perception that science will be important to the career they eventually choose dramatically declines with age.
- The declining perception that science will be important to their career coincides with both a general decline in interest in science and an increase in certainty with respect to the career they will pursue. In other words, as respondents become more certain about what they plan to do with their lives, they become both less interested in science and less apt to view science as an important part of their future plans.
- At the same time, there were fairly high levels of 'don't know' responses to basic questions about the benefits or drawbacks of a career in the sciences, which point to a lack of information among respondents about the sciences as a career.

While these findings say a good deal about how Canadian youth view science and many of the factors that compel or deter their interest in science, the findings also raise a number of questions:

…about how the sciences are taught

- Do curricula provide enough exposure to the sciences to young students (aged 12 to 13) who are most likely to take an interest?
- Can some of the elements that make science cool, fun and inspiring to younger students be preserved in the curricula (interest in the sciences declines in tandem with the decline in reported visits to science museums, zoos, science fairs and the planetarium)? Could a more hands-on approach keep interest levels higher?
- Are Canadian children being streamed away from the sciences at too young an age based on their interest in future careers which do not include science?

- How does the quality of science education connect to interest in the sciences and in scientific careers?

…about how to leverage the influence of parents

- Parents play an important role in their children's attitudes towards science. How do parents view the role of science in their own lives? How do they view careers in the sciences? Future research should explore parental views.

Recommendations

The findings of the research seem to underline a window of opportunity for nurturing an interest in science among 12 to 13 year olds that is being missed. Efforts to promote interest and engagement in the sciences that take place in the latter years of secondary school education arrive too late; programs that seek to engage middle school students through a compelling, hands-on introduction to science, accompanied by high-quality teaching are likely to meet with greater success.

Efforts targeted to parents to promote science as an inherently valuable cornerstone of their children's education could serve longer term efforts to build a culture in which science is valued and prioritized, and increasingly chosen as a field of study beyond high school. This research suggests that young people who do not choose to pursue science studies often do not do so because their interest in other subjects is greater and not because of an aversion to science itself.

Ultimately, why would young people choose science? Our findings indicate a lack of information about scientific careers (with high proportions who cannot answer basic questions about the benefits and drawbacks associated with a scientific career). As compelling as programs in science targeted to young people may be, if young people do not clearly sense that the difficulty and complexity of science carries rewards in terms of career options that are plentiful, well-paid and interesting, they may remain unlikely to choose scientific studies.

5. Detailed Findings

Views on learning, intelligence and success

Canadian youth were presented with a series of statements about their views on learning, intelligence and success in life. For each statement, they were asked whether they agree or disagree on a scale of zero to 10, where zero means strongly disagree and 10 means strongly agree.[7]

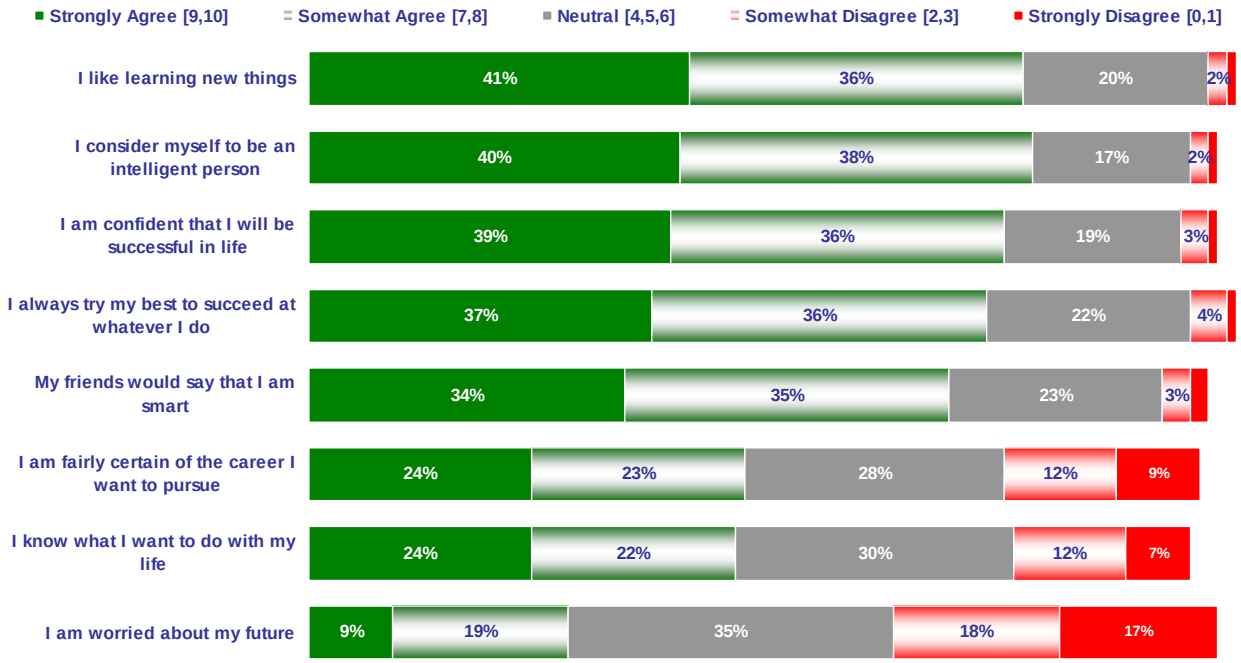
Most Canadian youth express confidence when asked whether they agree or disagree with several statements pertaining to learning, intelligence and success in life. Majorities of Canadian youth say they like learning new things (77% agree), consider themselves to be intelligent (78%) and think their friends would say that they are smart (69%). Most are confident that they will be successful in life (75%) and most say they try their best to succeed at whatever they do (73%). A minority (27%) agree that they are worried about their future.

While confident that they will succeed, there is less certainty about what they may end up doing. Fewer than half agree that they are certain of what career they would like to pursue (47%) or that they know what they want to do with their lives (46%).

[7] Throughout this research, 0 to 10 scales are analyzed as follows: ratings of 9 or 10 represent a positive extreme (in this case, strongly agree), 7 or 8 represent a positive response (in this case, somewhat agree), 4, 5 or 6 represent a neutral response, 2 or 3 represent a negative response (somewhat disagree) while 0 or 1 represent the negative extreme (strongly disagree). An overall positive response (the total who agree) includes responses of 7 to 10 on the scale, while an overall negative response (the total who disagree) includes responses of 0 to 3 on the scale.

Views on learning, intelligence and success in life

Please indicate how strongly you agree or disagree with each of the following statements, using a scale of 0 to 10, where 0 means disagree strongly and 10 means agree strongly. Some of these statements are about your experiences at school. If you are not currently enrolled in school, please think back to your most recent experience as a student



Base: All respondents n=2,605

Numbers may not total to 100% due to don't know responses.

Attitudes towards learning are fairly consistent across Canada's regions. However, British Columbians are less likely to strongly agree that they are intelligent, that they are confident they will succeed in life or that their friends would say they are smart.

% who strongly agree with each statement	Total	Region					
		BC	Alberta	Sask/Man	Ontario	Quebec	Atlantic
I like learning new things	**41%**	36%	37%	39%	41%	43%	46%
I consider myself to be an intelligent person	**40%**	34%	39%	42%	42%	40%	41%
I am confident that I will be successful in life	**39%**	30%	37%	39%	40%	41%	41%
I always try my best to succeed at whatever I do	**37%**	32%	37%	37%	38%	39%	33%
My friends would say that I am smart	**34%**	30%	34%	36%	35%	33%	34%
I know what I want to do with my life	**24%**	21%	21%	22%	22%	32%	22%
I am fairly certain of the career I want to pursue	**24%**	21%	23%	24%	25%	26%	28%
I am worried about my future	**9%**	9%	8%	11%	10%	8%	6%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups. [8]

Younger respondents (12 or 13 years of age) are more likely than older respondents to strongly agree that they like learning new things. Older respondents (17 to 18 years of age) are more likely to strongly agree that they know what they want to do with their lives and are certain of the career they want to pursue – but also, that they are worried about their future.

% who strongly agree with each statement	Total	Age		
		12-13	14-16	17-18
I like learning new things	**41%**	47%	37%	40%
I consider myself to be an intelligent person	**40%**	44%	39%	40%
I am confident that I will be successful in life	**39%**	40%	38%	39%
I always try my best to succeed at whatever I do	**37%**	41%	34%	37%
My friends would say that I am smart	**34%**	38%	32%	33%
I know what I want to do with my life	**24%**	22%	22%	29%
I am fairly certain of the career I want to pursue	**24%**	20%	22%	32%
I am worried about my future	**9%**	7%	8%	12%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

[8] The highlighted differences identify outlying results where statistically significant differences have been found and described in the narrative. For purposes of clarity not all statistically significant differences are highlighted.

By gender, females are more likely than males to strongly agree that they like learning new things, that they try their best to succeed and that their friends would say they are smart.

% who strongly agree with each statement	Total	Gender	
		Male	Female
I like learning new things	**41%**	37%	45%
I consider myself to be an intelligent person	**40%**	39%	42%
I am confident that I will be successful in life	**39%**	37%	40%
I always try my best to succeed at whatever I do	**37%**	30%	44%
My friends would say that I am smart	**34%**	31%	37%
I know what I want to do with my life	**24%**	22%	26%
I am fairly certain of the career I want to pursue	**24%**	23%	26%
I am worried about my future	**9%**	8%	10%
Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.			

Looking at age groups within each gender we find that younger males are more likely than older males to strongly agree that they like learning new things, that they are intelligent and that their friends would consider them to be intelligent, and that they always try their best to succeed. Older females do not exhibit a similar decline in confidence as compared to younger females.

Older females are more certain than older males that they know what they want to do with their lives and what career they wish to pursue. They are also more likely to be worried about their futures. Older males are less likely to become certain about their future as they age.

% who strongly agree with each statement	Total	Males by Age			Females by Age		
		12-13	14-16	17-18	12-13	14-16	17-18
I like learning new things	**41%**	44%	34%	33%	50%	41%	46%
I consider myself to be an intelligent person	**40%**	44%	37%	38%	43%	40%	43%
I am confident that I will be successful in life	**39%**	40%	35%	38%	40%	40%	41%
I always try my best to succeed at whatever I do	**37%**	37%	27%	27%	46%	42%	47%
My friends would say that I am smart	**34%**	38%	27%	30%	38%	38%	36%
I know what I want to do with my life	**24%**	22%	21%	25%	22%	24%	33%
I am fairly certain of the career I want to pursue	**24%**	22%	20%	29%	18%	25%	36%
I am worried about my future	**9%**	6%	7%	12%	7%	9%	13%
Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.							

Attitudes towards learning, intelligence and success in life are fairly consistent across various levels of education[9] and income. However, those with at least one university educated parent are more likely to strongly agree that they, themselves, are intelligent and are more likely to say their friends would think that they are smart. Those whose parents have a high school education or less are more apt to say they know what they want to do with their lives.

Those from lower income households (earning $40,000 or less) are more apt to say they like learning new things and that they know what they want to do with their lives.

% who strongly agree with each statement	Total	Parents' Highest Level of Education			Income		
		HS<	Post Sec	University	<$40K	$40K-<$70K	$70K+
I like learning new things	**41%**	41%	39%	43%	45%	38%	40%
I consider myself to be an intelligent person	**40%**	40%	38%	45%	40%	40%	41%
I am confident that I will be successful in life	**39%**	41%	38%	38%	40%	36%	40%
I always try my best to succeed at whatever I do	**37%**	38%	36%	38%	39%	34%	37%
My friends would say that I am smart	**34%**	28%	33%	39%	33%	34%	36%
I know what I want to do with my life	**24%**	28%	25%	20%	29%	24%	23%
I am fairly certain of the career I want to pursue	**24%**	26%	25%	22%	27%	26%	23%
I am worried about my future	**9%**	10%	9%	8%	9%	10%	9%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

[9] The level of education is based upon the highest level of education indicated for any parent or guardian who plays a significant role in raising the respondent.

Those not born in Canada are more likely than those born in Canada to say they like learning new things, try their best to succeed and that their friends would say they are smart.

% who strongly agree with each statement	Total	Born in Canada		Ethnicity	
		Yes	No	Caucasian	Non Caucasian
I like learning new things	**41%**	40%	47%	40%	45%
I consider myself to be an intelligent person	**40%**	40%	40%	40%	40%
I am confident that I will be successful in life	**39%**	39%	36%	39%	35%
I always try my best to succeed at whatever I do	**37%**	37%	43%	37%	38%
My friends would say that I am smart	**34%**	34%	42%	34%	34%
I know what I want to do with my life	**24%**	24%	21%	24%	23%
I am fairly certain of the career I want to pursue	**24%**	24%	25%	25%	22%
I am worried about my future	**9%**	9%	10%	9%	13%
Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.					

Those whose parents are very involved in developmental activities[10] are consistently more likely to express positive attitudes towards learning and intelligence and are more apt to say they know what they want to do with their lives.

% who strongly agree with each statement	Total	Parental Involvement			
		Least involved	Less involved	More involved	Very involved
I like learning new things	**41%**	27%	35%	41%	49%
I consider myself to be an intelligent person	**40%**	25%	38%	41%	47%
My friends would say that I am smart	**34%**	24%	32%	36%	37%
I always try my best to succeed at whatever I do	**37%**	22%	32%	40%	42%
I am confident that I will be successful in life	**39%**	26%	31%	44%	43%
I am worried about my future	**9%**	7%	8%	9%	10%
I know what I want to do with my life	**24%**	16%	17%	26%	31%
I am fairly certain of the career I want to pursue	**24%**	16%	18%	27%	30%
Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.					

[10] Parental involvement is based on the frequency with which children say their parents participate in a range of activities related to their education, future and development. A detailed description is provided at pages 34-35.

The distinctions among Canadian youth based on the type of household they live in are relatively mild. However, those whose parents live in separate households are somewhat less certain that they will be successful in life and less sure that they know what they want to do with their lives. Those living in a single parent household are surer about what they want to do with their lives.

% who strongly agree with each statement	Total	Household Type		
		Both parents in the same household	Parents in separate households	Single parent
I like learning new things	**41%**	41%	40%	39%
I consider myself to be an intelligent person	**40%**	41%	39%	38%
I am confident that I will be successful in life	**39%**	39%	35%	40%
I always try my best to succeed at whatever I do	**37%**	39%	34%	34%
My friends would say that I am smart	**34%**	35%	32%	31%
I know what I want to do with my life	**24%**	24%	19%	28%
I am fairly certain of the career I want to pursue	**24%**	24%	21%	27%
I am worried about my future	**9%**	9%	7%	10%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

Attitudes towards school

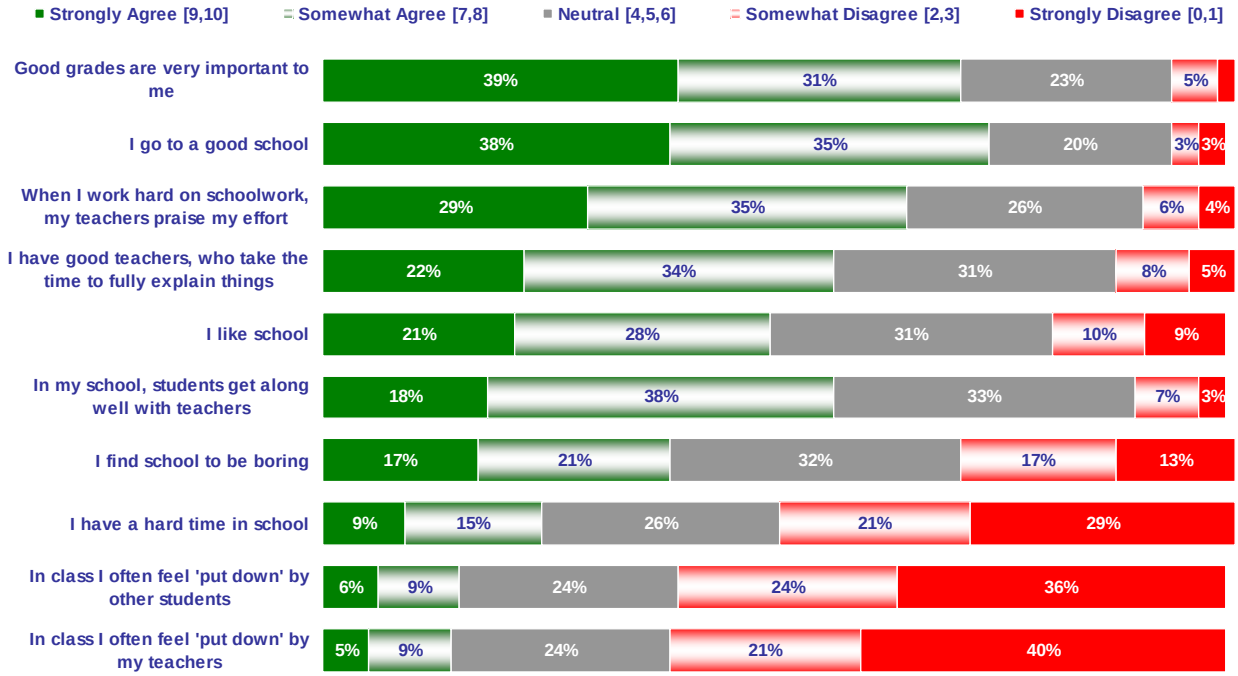
Overall, Canadian youth express positive attitudes towards school. Majorities agree that they go to a good school (73%) and that good grades are important to them (70%). With respect to their teachers, most agree their teachers praise their efforts when they work hard (61%) and take time to fully explain things (56%) and, also, that students get along well with teachers in their school.

While Canadian youth are much more likely to agree than to disagree that they like school (49% agree, 19% disagree and 31% are neutral), they are a bit more likely to agree than to disagree that school is boring (38% agree while 30% disagree).

Canadian youth are least likely to say that they have a hard time at school (24% agree), or to say that they feel 'put down' by other students (15%) or their own teachers (14%).

Attitudes towards school

Please indicate how strongly you agree or disagree with each of the following statements, using a scale of 0 to 10, where 0 means disagree strongly and 10 means agree strongly. Some of these statements are about your experiences at school. If you are not currently enrolled in school, please think back to your most recent experience as a student



Base: All respondents n=2,605

Attitudes towards school are largely consistent across Canada's regions. However, residents of British Columbia are less likely than others to strongly agree that good grades are important, that they go to a good school, that they have good teachers who take time to fully explain things or that they like school. British Columbians are more likely to say they find school to be boring. Residents of Saskatchewan and Manitoba are less likely to say good grades are important to them, but are more likely to say they go to a good school and to say that they like school. Atlantic Canadians are less likely to say that students get along well with teachers at their school.

% who strongly agree with each statement	Total	Region					
		BC	Alberta	Sask/Man	Ontario	Quebec	Atlantic
Good grades are very important to me	**39%**	34%	38%	33%	41%	41%	38%
I go to a good school	**38%**	31%	37%	42%	41%	38%	33%
When I work hard on schoolwork, my teachers praise my effort	**29%**	26%	24%	26%	27%	36%	28%
I have good teachers, who take the time to fully explain things	**22%**	16%	19%	25%	22%	25%	20%
I like school	**21%**	16%	21%	28%	23%	19%	21%
In my school, students get along well with teachers	**18%**	16%	17%	19%	19%	18%	13%
I find school to be boring	**17%**	21%	15%	16%	16%	17%	19%
I have a hard time in school	**9%**	10%	10%	9%	7%	12%	9%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

Younger respondents (12 to 13 years of age) are more likely than older respondents (17 to 18 years of age) to say good grades are important to them and to express positive views towards their schools and their teachers. Older respondents, meanwhile, are more apt to find school boring and to say that they have a hard time in school.

% who strongly agree with each statement	Total	Age		
		12-13	14-16	17-18
Good grades are very important to me	**39%**	46%	36%	36%
I go to a good school	**38%**	45%	35%	36%
When I work hard on schoolwork, my teachers praise my effort	**29%**	36%	27%	24%
I have good teachers, who take the time to fully explain things	**22%**	32%	18%	17%
I like school	**21%**	28%	19%	18%
In my school, students get along well with teachers	**18%**	23%	15%	17%
I find school to be boring	**17%**	18%	15%	20%
I have a hard time in school	**9%**	7%	9%	11%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

Females are more likely than males to say good grades are important to them, to express positive views towards their schools and to say that their teachers praise their efforts when they work hard. Males, meanwhile, are more likely to find school boring and to say that they have a hard time at school.

% who strongly agree with each statement	Total	Gender	
		Male	Female
Good grades are very important to me	**39%**	30%	48%
I go to a good school	**38%**	36%	41%
When I work hard on schoolwork, my teachers praise my effort	**29%**	24%	33%
I have good teachers, who take the time to fully explain things	**22%**	21%	23%
I like school	**21%**	16%	26%
In my school, students get along well with teachers	**18%**	17%	19%
I find school to be boring	**17%**	22%	12%
I have a hard time in school	**9%**	11%	6%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

Both males and females tend to become less positive about school as they age. Males' views grow more dramatically negative than do females' views, despite the fact that the males start out less positive than the females do. For example, among males the perception that good grades are important declines 14 points from 40% among the 12 to 13 year old cohort to 26% among the 17 to 18 year old cohort. Among females the decline is six points (from 52% among 12 to 14 year olds to 46% among 17 to 18 year olds).

Females change more dramatically than males with respect to one question. Older females (8%) are twice as likely as younger females (4%) to strongly agree that they have a hard time at school. Older males (14%) are more likely to say they have a hard time at school, but among males this perception has not increased as dramatically as it has among females.

% who strongly agree with each statement	Total	Males by Age			Females by Age		
		12-13	14-16	17-18	12-13	14-16	17-18
Good grades are very important to me	**39%**	40%	26%	26%	52%	47%	46%
I go to a good school	**38%**	43%	33%	33%	47%	37%	40%
When I work hard on schoolwork, my teachers praise my effort	**29%**	33%	22%	20%	39%	32%	29%
I have good teachers, who take the time to fully explain things	**22%**	33%	17%	15%	32%	20%	19%
I like school	**21%**	23%	14%	12%	34%	24%	23%
In my school, students get along well with teachers	**18%**	22%	15%	16%	23%	16%	19%
I find school to be boring	**17%**	22%	19%	26%	13%	10%	13%
I have a hard time in school	**9%**	10%	10%	14%	4%	7%	8%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

The differences between those whose parents have higher or lower levels of education and income tend to be mild. However, those whose parents have a high school education or less are more likely than average to consider school to be boring and to say they have a hard time at school. Meanwhile, those who have at least one parent with a university education are somewhat more likely to say that good grades are very important to them.

% who strongly agree with each statement	Total	Parents' Highest Level of Education			Income		
		HS<	Post Sec	University	<$40K	$40K-<$70K	$70K+
Good grades are very important to me	**39%**	36%	36%	45%	38%	35%	41%
I go to a good school	**38%**	39%	36%	40%	38%	37%	39%
When I work hard on schoolwork, my teachers praise my effort	**29%**	32%	28%	27%	31%	28%	28%
I have good teachers, who take the time to fully explain things	**22%**	23%	21%	22%	26%	20%	21%
I like school	**21%**	23%	21%	21%	22%	19%	22%
In my school, students get along well with teachers	**18%**	18%	17%	18%	15%	17%	19%
I find school to be boring	**17%**	20%	18%	14%	19%	20%	15%
I have a hard time in school	**9%**	14%	9%	6%	14%	11%	6%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

Immigrants to Canada are more likely than those born in Canada to say that good grades are important, and to express positive views towards their teachers. They are more likely to say that they like school (but not more likely to think they go to a good school). They are less likely to find school boring than those born in Canada. Non-Caucasians are more likely than Caucasians to say good grades are important to them and to say that they like school.

% who strongly agree with each statement	Total	Born in Canada		Ethnicity	
		Yes	No	Caucasian	Non Caucasian
Good grades are very important to me	**39%**	38%	55%	38%	44%
I go to a good school	**38%**	38%	40%	38%	34%
When I work hard on schoolwork, my teachers praise my effort	**29%**	28%	40%	28%	27%
I have good teachers, who take the time to fully explain things	**22%**	22%	28%	22%	24%
I like school	**21%**	21%	28%	21%	27%
In my school, students get along well with teachers	**18%**	18%	21%	18%	20%
I find school to be boring	**17%**	17%	9%	17%	18%
I have a hard time in school	**9%**	9%	6%	9%	8%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

Those whose parents are very involved in developmental activities are more likely to say that good grades are very important, and are more likely to express positive views of school and their teachers. They are, however, not more or less likely than others to find school boring or say they have a hard time at school.

% who strongly agree with each statement	Total	PARENTAL INVOLVEMENT			
		Least involved	Less involved	More involved	Very involved
Good grades are very important to me	**39%**	23%	34%	40%	46%
I go to a good school	**38%**	24%	33%	40%	44%
When I work hard on schoolwork, my teachers praise my effort	**29%**	19%	20%	31%	38%
I have good teachers, who take the time to fully explain things	**22%**	12%	16%	24%	28%
I like school	**21%**	10%	14%	24%	29%
In my school, students get along well with teachers	**18%**	13%	12%	19%	25%
I find school to be boring	**17%**	18%	19%	15%	17%
I have a hard time in school	**9%**	10%	9%	8%	10%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

There are few clear differences between Canadian youth based on the type of household in which they live. Those whose parents live in separate households are somewhat less likely to say they like school and are somewhat less likely to think that teachers get along well with students at their school. Those who live in a single parent household are less likely to say that good grades are very important to them and are somewhat more likely to say they have a hard time at school.

% who strongly agree with each statement	Total	HOUSEHOLD TYPE		
		Both parents in the same household	Parents in separate households	Single parent
Good grades are very important to me	**39%**	41%	38%	31%
I go to a good school	**38%**	39%	38%	38%
When I work hard on schoolwork, my teachers praise my effort	**29%**	29%	26%	29%
I have good teachers, who take the time to fully explain things	**22%**	22%	19%	23%
I like school	**21%**	23%	14%	20%
In my school, students get along well with teachers	**18%**	19%	12%	17%
I find school to be boring	**17%**	16%	16%	20%
I have a hard time in school	**9%**	7%	8%	13%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

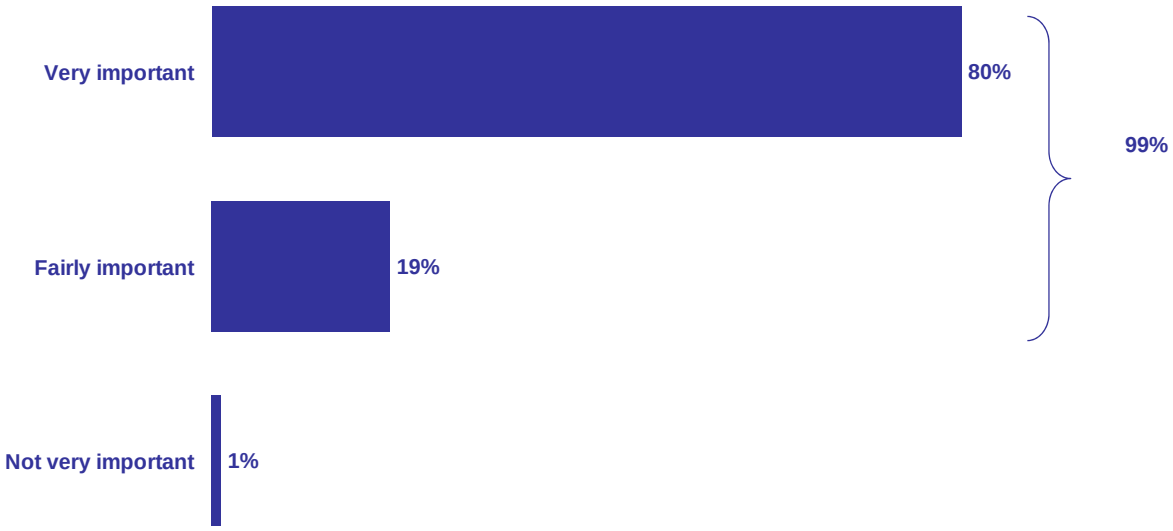
Role of parents

Importance of school to parents

When asked how important it is to their parents that they do well in school, nearly all Canadian youth (99%) say it is either very (80%) or fairly important (19%) to their parents that they succeed. Just one percent says it is not very important to their parents that they do well in school.

Importance of school to parents

In general, how important do you feel it is to your parent(s)/guardian(s) that you do well at school?



Base: All respondents n=2,605

Among the demographic subgroups, those more likely to say that it is very important to their parents that they do well in school include:

- Residents of Alberta (85%) and the Atlantic Provinces (84%) compared to British Columbia (70%);
- Those who have completed grades seven or eight (85%) compared to those who have completed grades 11 or 12 (77%); and,
- Those with a household income of more than $70,000 (82%) compared to those with a household income of less than $40,000 (74%).

Frequency of parental involvement in developmental activities

Canadian youth were asked whether their parents often, sometimes, rarely or never take part in a range of activities related to schooling, future plans, or their work ethic.

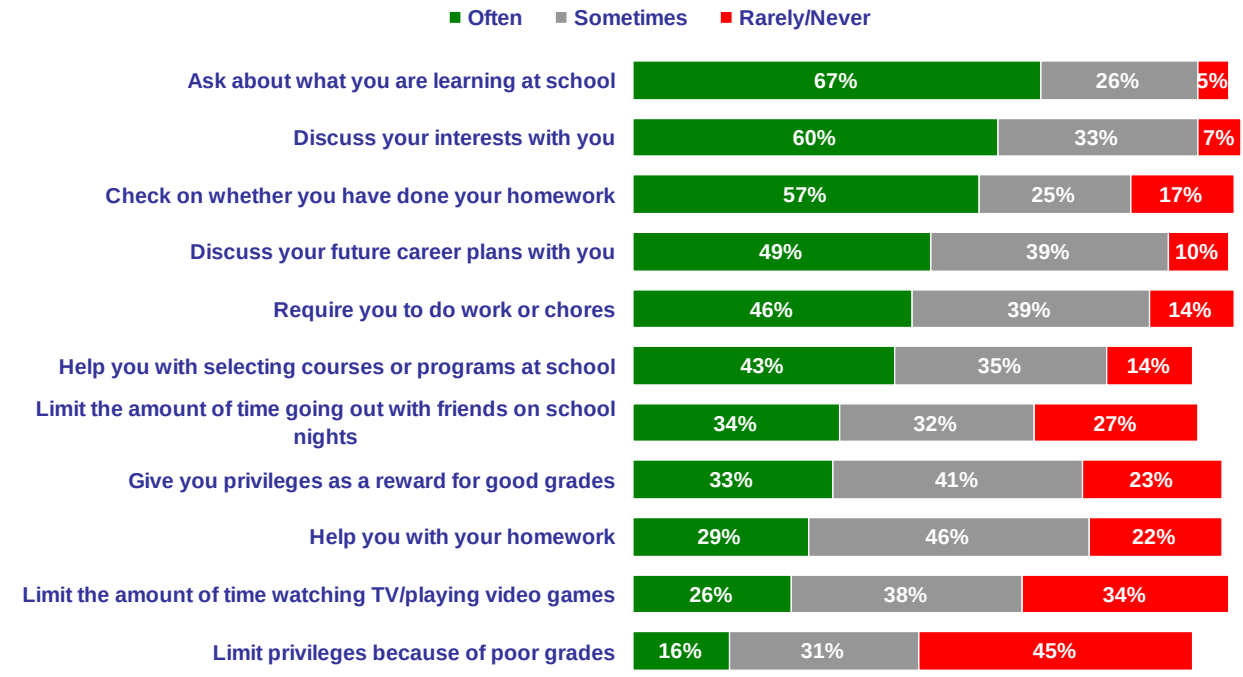
Among the activities tested, majorities of Canadian youth say their parents often ask about what they are learning in school (67%), discuss their child's interests (60%), and check on whether they have done their homework (57%).

Fewer than half say their parents often discuss their child's future career plans (49%), require their child to do work or chores (46%) or help them to select courses or programs at school (43%). About three in ten (29%) say their parents help with their homework.

Several statements touch on privileges or limitations from their parents. About one in three says their parents often limit the amount of time they spend going out with friends on school nights (34%). A similar proportion (33%) says their parents give them privileges for good grades. Fewer say their parents often limit the amount of time they spend watching television or playing video games (26% say their parents often do, 34% say their parents never do) or that their parents limit privileges because of poor grades (16% say their parents often do, 45% say their parents never do).

Frequency of parental involvement in developmental activities

How often do your parent(s)/guardian(s) do each of the following



Base: All respondents n=2,605

Numbers may not total to 100% due to don't know responses.

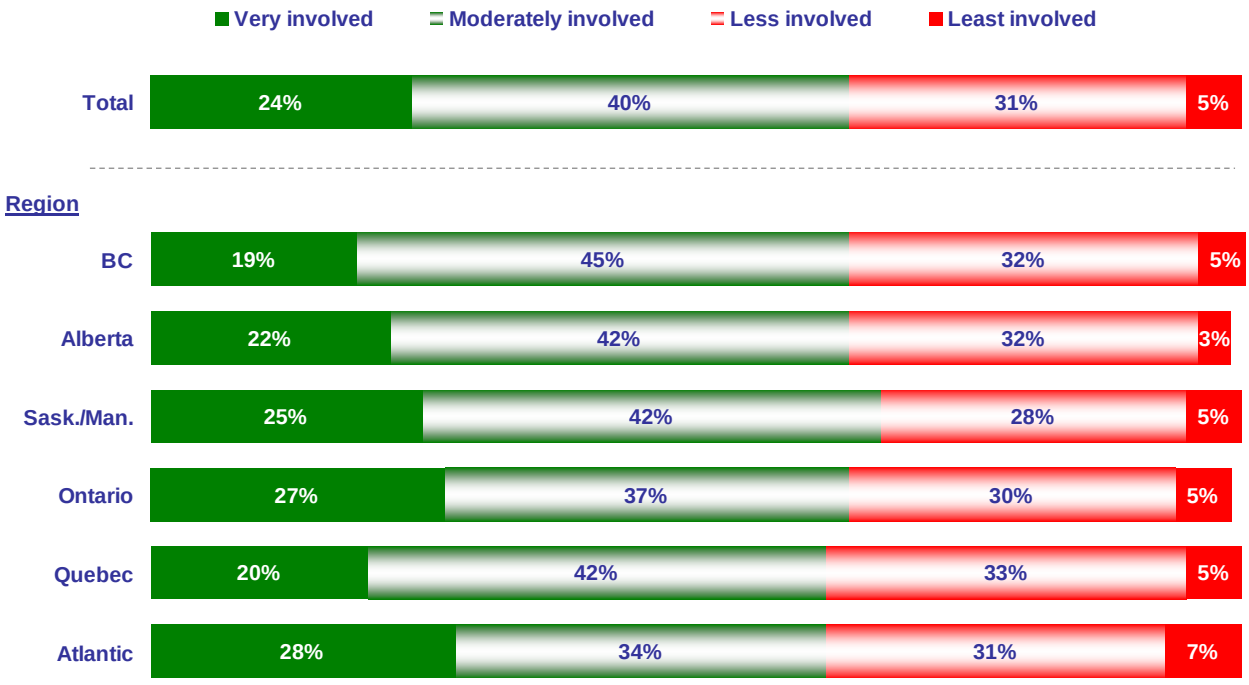
By grouping respondents who indicate that their parents "often" take part in a certain number of the developmental activities tested, it is possible to create an index of parental involvement as follows:

- 24% of respondents have parents who are **very involved,** meaning that they often take part in seven or more activities;
- 40% of respondents have parents who are **moderately involved,** meaning that they often take part in four to six activities;
- 31% of respondents have parents who are **less involved,** meaning that they often take part in one to three activities;
- 5% of respondents have parents who are **least involved,** meaning that they often take part in none of the tested activities.

Regionally, respondents from Ontario and the Atlantic provinces are most likely to have very involved parents, while residents of British Columbia and Quebec are least likely to have very involved parents.

Index of parental involvement – by region

Index of parental involvement based on number of activities in which respondents say their parents "often" take part.

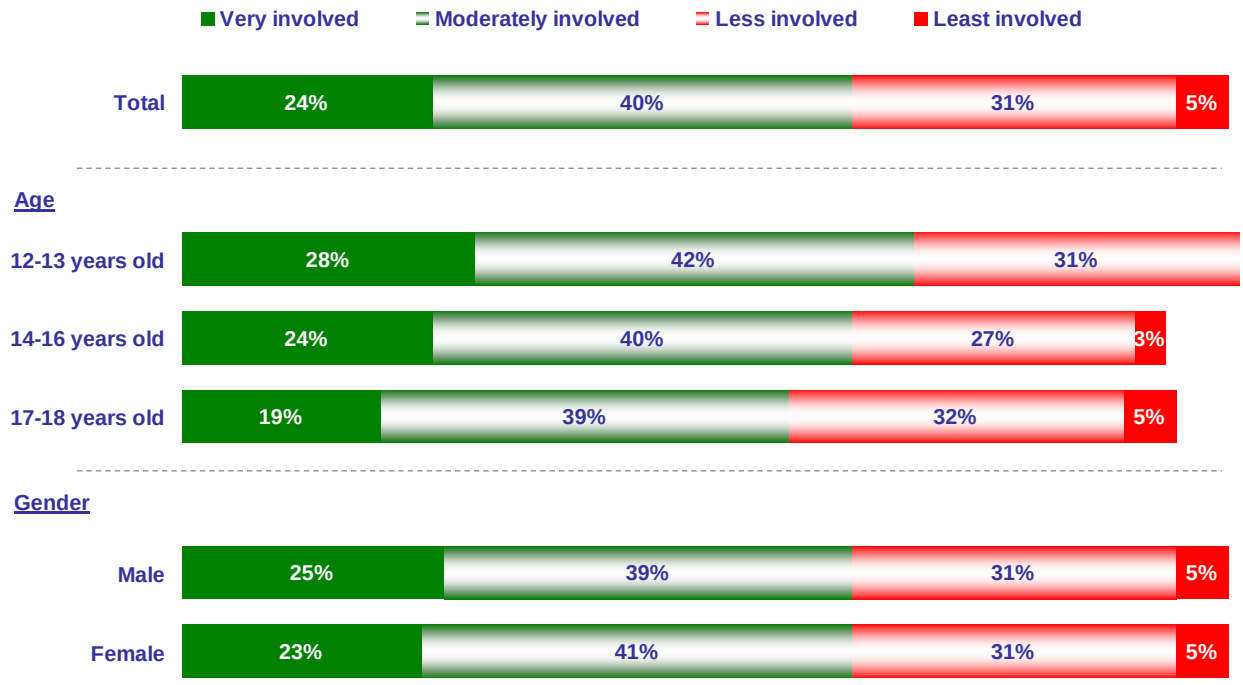


Base: All respondents n=2,605

By age, younger respondents (12 to 13 years of age) are more likely to have very involved parents, while older respondents (17 to 18 years of age) are less likely to have very involved parents. There is little difference in parental involvement between the genders.

Index of parental involvement – by age and gender

Index of parental involvement based on number of activities in which respondents say their parents "often" take part.

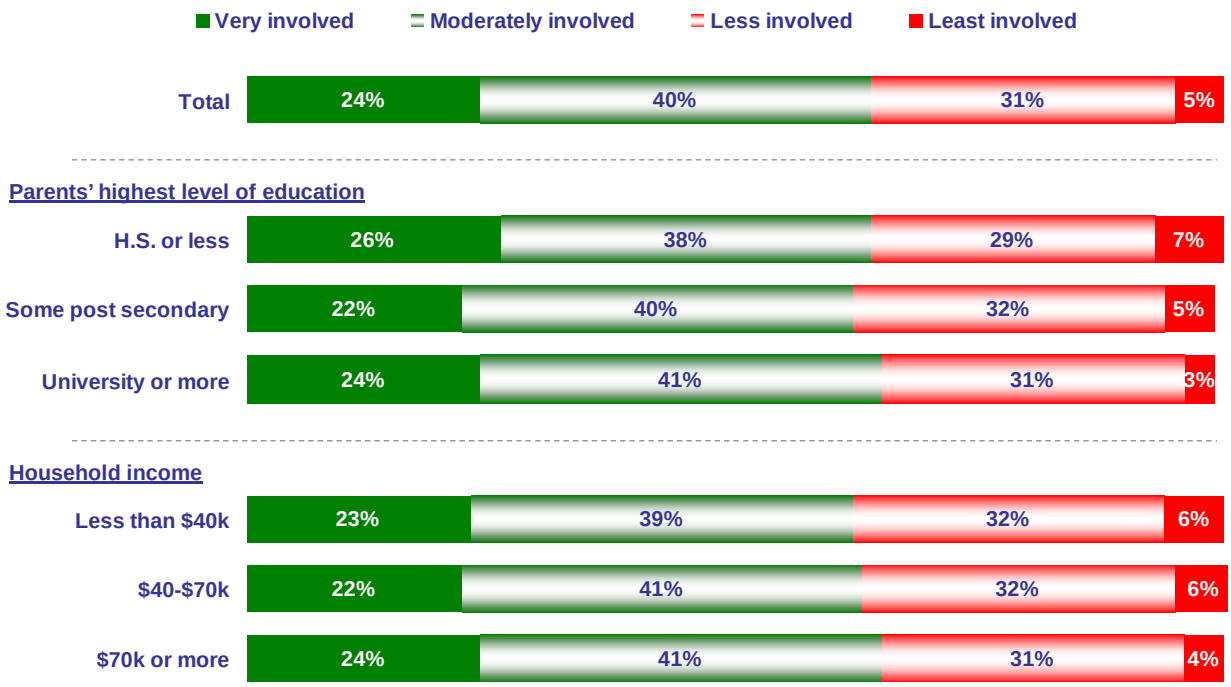


Base: All respondents n=2,605

There is little difference in parental involvement based on the parents' highest level of education or household income.

Index of parental involvement – by parents' education and household income

Index of parental involvement based on number of activities in which respondents say their parents "often" take part.

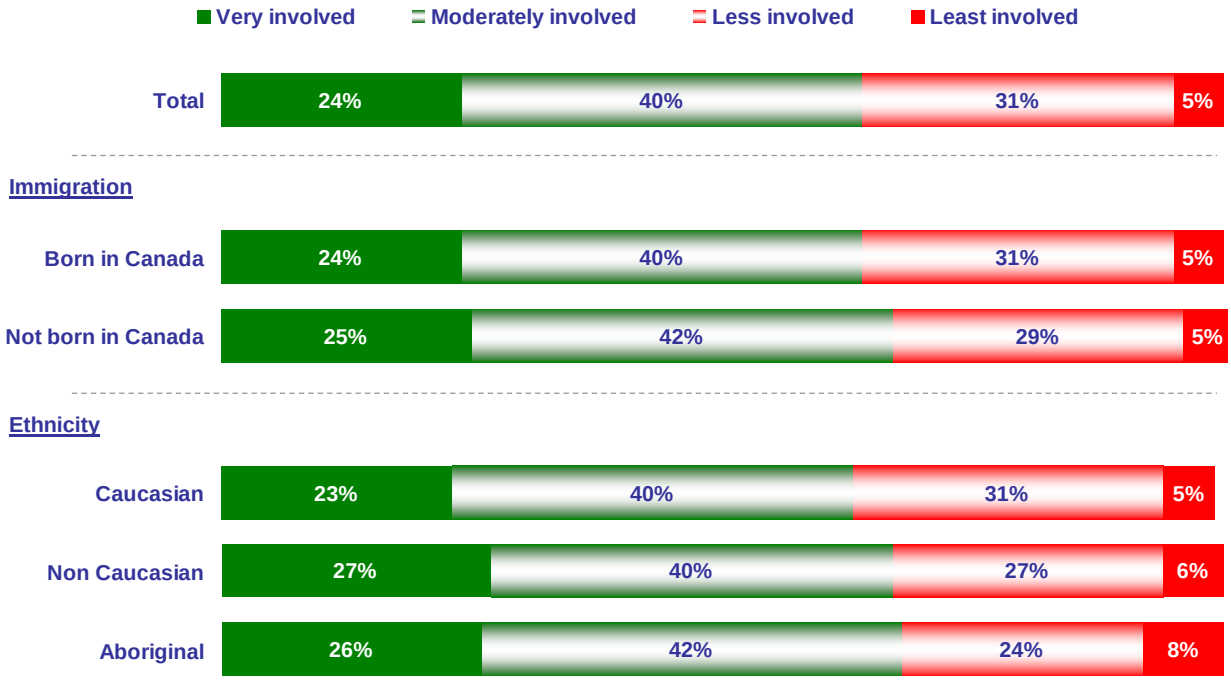


Base: All respondents n=2,605

There are only slight differences in parental involvement among those born in Canada and those who immigrated. Non-Caucasians are slightly more likely than Caucasians to have very involved parents.

Index of parental involvement – by immigration and ethnicity

Index of parental involvement based on number of activities in which respondents say their parents "often" take part.



Base: All respondents n=2,605

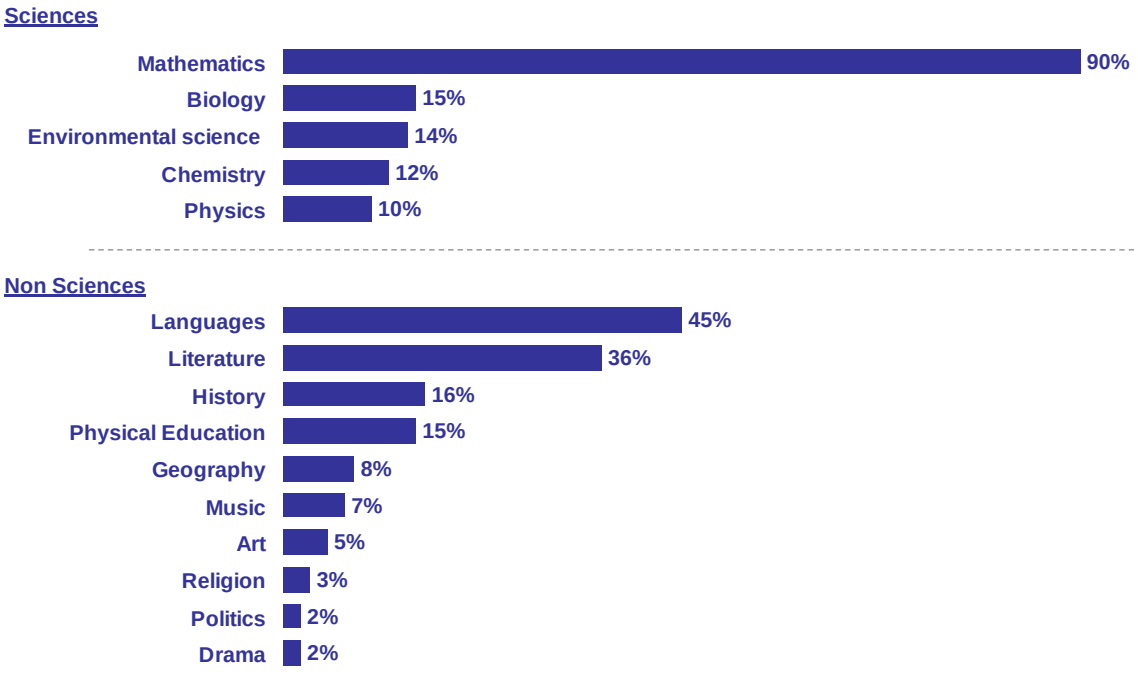
Importance of specific subjects to parents

Canadian youth were provided a list of subjects they may study at school and were asked which among these they believe their parents feel it is most important for them to do well in at school. According to Canadian youth, their parents assign the greatest importance to mathematics (90%), followed distantly by languages (45%) and literature (36%). (The Wellcome Trust Monitor also found that British youth also believe that their parents view mathematics as the most important subject to do well in.)

Fewer than one in five thinks any of the other subjects tested are viewed as most important by their parents, including the science courses tested: biology (15%) environmental science (14%), chemistry (12%) and physics (10%).

Importance of specific subjects among parents

To the best of your knowledge, which of the following subjects do your parent(s)/guardian(s) feel it is most important for you to do well in? If you are no longer studying, please think back to when you were.



Base: All respondents n=2,605

By region, residents of Quebec are more likely to believe that their parents consider mathematics and languages to be important, but are much less likely to think that their parents consider literature, biology or chemistry to be important. Albertans are notably more likely to believe their parents consider chemistry to be an important subject of study.

% who say their parents consider each subject to be important	Total	Region					
		BC	Alberta	Sask/Man	Ontario	Quebec	Atlantic
Mathematics	**90%**	86%	87%	92%	89%	95%	94%
Geography	**8%**	8%	6%	7%	10%	9%	4%
Music	**7%**	8%	8%	5%	8%	6%	4%
Art	**5%**	6%	5%	4%	6%	4%	4%
Languages	**45%**	41%	32%	28%	40%	71%	45%
Literature	**36%**	32%	42%	51%	40%	21%	36%
Religion	**3%**	5%	5%	4%	4%	1%	2%
Drama	**2%**	2%	3%	2%	3%	2%	1%
Politics	**2%**	2%	3%	1%	3%	0	2%
History	**16%**	14%	16%	18%	16%	17%	20%
Physical Education	**15%**	22%	14%	16%	16%	11%	10%
Biology	**15%**	19%	20%	19%	15%	6%	23%
Environmental science	**14%**	13%	16%	16%	14%	14%	14%
Chemistry	**12%**	13%	20%	15%	11%	8%	13%
Physics	**10%**	10%	12%	8%	10%	9%	8%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

Among the scientific subjects, younger respondents (12-13 years) are less likely than older respondents (17-18 years) to say their parents consider the study of biology, chemistry and physics to be important. Older respondents, meanwhile, are less likely to say their parents consider the study of mathematics to be important. The perception that their parents consider biology, chemistry and physics to be important coincides with a greater likelihood to study these subjects and to express interest in them among older students.

Females are more likely than males to say their parents consider the study of literature to be important. Females are also more likely than males to say their parents consider the study of biology to be important. While this coincides with greater interest in literature and biology among females than among males, similar proportions of both females and males say they have studied these subjects.

% who say their parents consider each subject to be important	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
Mathematics	**90%**	94%	93%	82%	92%	89%
Geography	**8%**	10%	9%	6%	9%	8%
Music	**7%**	11%	5%	6%	7%	7%
Art	**5%**	3%	5%	7%	3%	7%
Languages	**45%**	54%	45%	37%	44%	47%
Literature	**36%**	36%	35%	36%	32%	39%
Religion	**3%**	4%	3%	3%	4%	3%
Drama	**2%**	3%	2%	3%	2%	3%
History	**16%**	14%	16%	20%	17%	15%
Physical Education	**15%**	16%	14%	16%	18%	12%
Biology	**15%**	10%	17%	17%	11%	19%
Environmental science	**14%**	16%	14%	12%	15%	13%
Chemistry	**12%**	6%	14%	14%	12%	12%
Physics	**10%**	6%	10%	12%	12%	7%

Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

Those who were not born in Canada are much more likely than those born in Canada to believe their parents consider chemistry and physics to be important subjects of study. By ethnicity, East Asians are more likely to think their parents consider chemistry and physics to be important subjects of study, although there is not much difference between Caucasians and non-Caucasians with respect to these subjects. Curiously, East Asians are less likely than Caucasians to believe that their parents place a high priority on mathematics.

% who say their parents consider each subject to be important	Total	Born in Canada		Ethnicity		
		Yes	No	Caucasian	Non Caucasian	East Asian
Mathematics	**90%**	90%	90%	90%	89%	84%
Languages	**45%**	45%	51%	45%	47%	58%
Literature	**36%**	36%	28%	37%	26%	24%
History	**16%**	17%	13%	17%	11%	8%
Physical Education	**15%**	15%	10%	15%	17%	11%
Biology	**15%**	15%	17%	15%	16%	14%
Environmental science	**14%**	14%	13%	14%	15%	12%
Chemistry	**12%**	11%	20%	11%	15%	19%
Physics	**10%**	9%	19%	9%	13%	16%
Geography	**8%**	9%	5%	9%	8%	4%
Music	**7%**	7%	6%	7%	8%	10%
Art	**5%**	5%	12%	5%	7%	8%
Religion	**3%**	3%	6%	3%	6%	7%
Drama	**2%**	2%	2%	2%	3%	4%
Politics	**2%**	2%	2%	2%	1%	1%

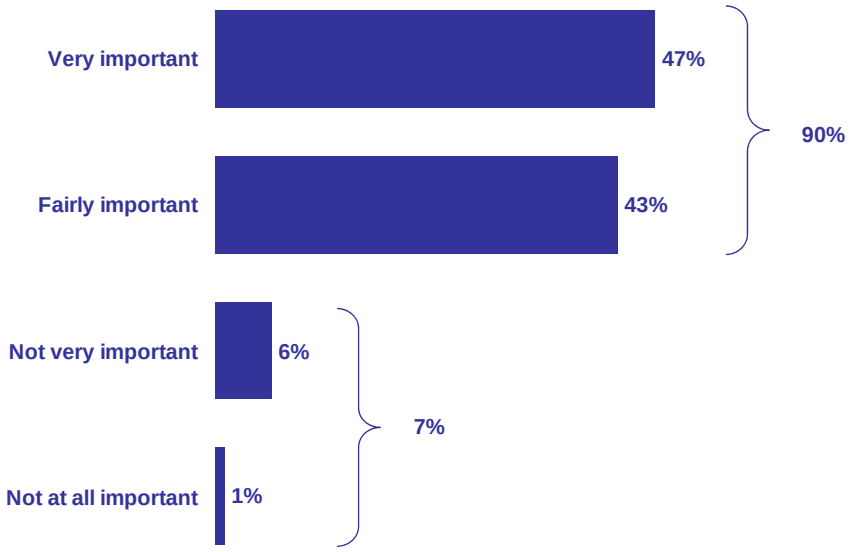
Note: Red shading indicates results that are notably lower than other subgroups. Green shading indicates results that are notably higher than other subgroups.

Importance of scientific subjects to parents

When Canadian youth were asked how important their parents say it is for them to do well in scientific courses generally, nine in ten (90%) say their parents consider their performance in science courses to be either very (47%) or somewhat important (43%). Fewer than one in ten (7%) say their parents view their performance in science courses to be not very (6%) or not at all important (1%).

Importance of scientific subjects to parents

Thinking specifically about science subjects, how important do your parent(s)/guardian(s) think it is that you do well in these subjects at school?



Base: All respondents n=2,605

Those more likely to say their parents consider their performance in science courses to be *very* important include:

- Residents of the Atlantic Provinces (59%) and Alberta (55%) compared to Quebec (37%);
- Those aged 12 or 13 (53%) compared to those aged 17 or 18 (38%);
- Those with a household income of more than $70,000 (53%) compared to those with a household income of less than $40,000 (37%);
- Those who were not born in Canada (57%) compared to those who were (47%);
- Non-Caucasian youth (54%) compared to Caucasian youth (46%);

- Those who have at least one university-educated parent (56%) compared to those whose parents have no more than a high school education (37%);
- Those living with both parents in the same household (49%) compared to those with a single parent (40%);
- Those who are very interested in science (57%) compared to those who are not very interested (34%); and,
- Those whose parents are very involved (60%) compared to those whose parents are less involved (41%), or least involved (30%).

Meaning of science

When asked, using their own words, what they think science means, Canadian youth most often make reference to study, learning or knowledge (43%). One in five says that science has something to do with how things work (21%). Others associate science with the world around us (16%) or with biological life (14%). One in ten mention research or experimenting (11%), while just fewer than one in ten associate science as a way of explaining or understanding why (9%).

What does science mean?

Using your own words, please describe what you think the word science means?

Note: Responses under 2% are not labeled

Base: All respondents n=2,605

Among the demographic subgroups, the following differences are worth noting:

- Residents of Saskatchewan and Manitoba are more likely than average to associate science with study, knowledge and learning (53%) while residents of Quebec are more likely to associate science with research and experimenting (22%).
- Younger respondents (12-13 years of age) are more likely than older respondents to associate science with “how things work” (23%).
- There are very few differences between males and females in what they think science means.

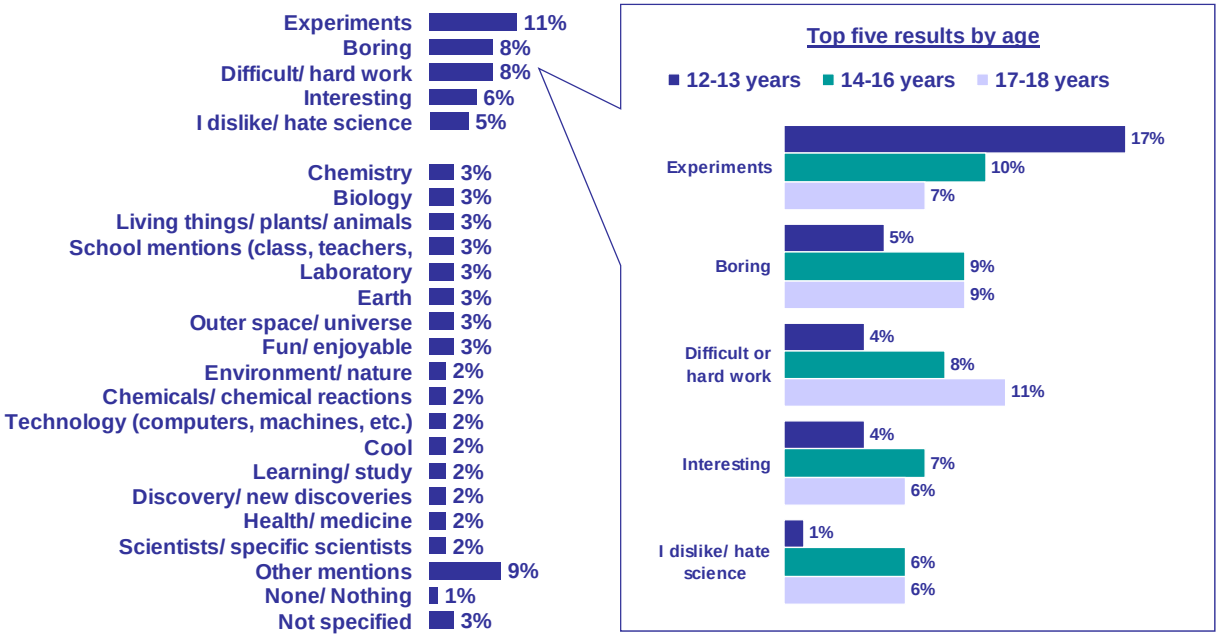
- Higher income respondents ($70,000 or more) are more likely than lower income respondents to associate science with study, knowledge and learning (48%), the phrase “how things work” (25%) and with the world around us, or the Earth (19%). Lower income respondents (less than $40,000) are more likely than higher income respondents to associate science with research and experimenting (16%). A similar pattern occurs between those who have at least one parent with a university education and those whose parents have no more than a high school education.
- Perceptions of what science means are largely consistent among those born, or not born, in Canada and also among respondents of different ethnicities.

Words Associated with Science

Respondents were asked to mention the first words or phrases that come to mind when thinking about science. On this basis the phrases “experiments” (11%), “boring” (8%), “difficult or hard work” (8%), or “interesting” (6%) are most commonly mentioned.

Words associated with ‘Science’

What is the first word or phrase that comes to mind when you think about science?



Note: Responses under 2% are not included

Base: All respondents n=2,605

The top five associations with science vary significantly by age. Younger respondents are much more likely to associate science with the word “experiments” while older respondents are more apt to associate science with the words “boring,” “difficult or hard work” and are more likely to say simply that they dislike or hate science. Curiously, despite the fact that they are more likely to associate science with “boring,” older respondents are also somewhat more likely than younger respondents to associate science with the word “interesting.”

Among other demographic subgroups, we find:

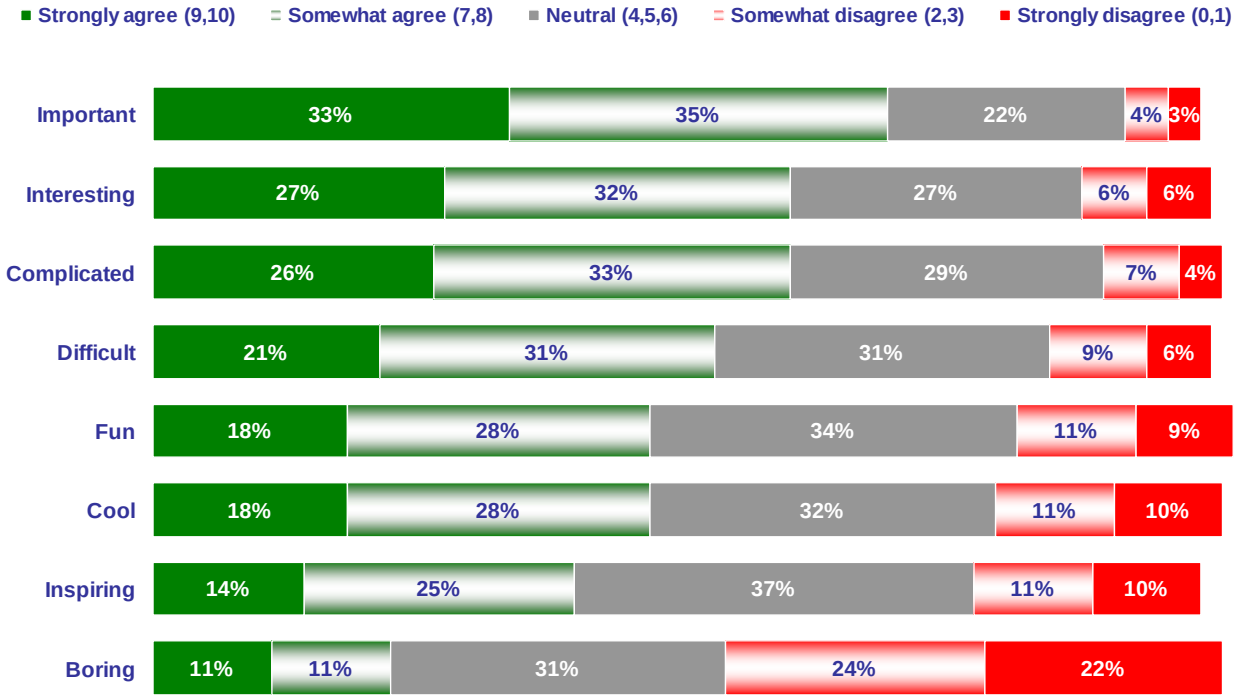
- Males and females, overall, tend to associate the same words with science. Older females (17 to 18 years) are more likely than older males to associate science with the words “biology” (10% versus 2%) and “difficult or hard work” (13% versus 8%).
- There are few differences in associations with science between those born, and not born in Canada.
- Among ethnic groups, East Asians are more likely than Caucasians to associate science with “difficult or hard work” (14% versus 8%), but at the same time are less likely to associate science with the word “boring” (1% versus 8% among Caucasians).
- There are few differences in the words associated with science between respondents with lower or higher levels of household income or parental education.
- Ironically, those who say they do zero hours of homework in math or science per week (14%) are more likely than those who say they do four or more hours of math or science homework per week (5%) to associate science with “difficulty or hard work.”
- While the sense that science is difficult need not also mean that science is boring, those who are not interested in science (15%) are much more likely than those who are interested in science (4%) to associate science with “difficulty or hard work”

Terms to Describe Science

Canadian youth were asked whether they agree or disagree that each of several terms describes science. Over two in three (68%) agree that the word “important” describes science, while three in five (59%) say “interesting” describes science. Majorities also say the terms “complicated” (59%) and “difficult” (52%) describe science. Fewer than half agree that the terms “fun” (46%), “cool” (46%) or “inspiring” (39%) describe science. One in five (22%) agree that the term “boring” describes science.

Terms to describe science

Please indicate how strongly you agree or disagree that each of the following terms describes science, using a scale of 0 to 10, where 0 means disagree strongly and 10 means agree strongly.



Base: All respondents n=2,605

Numbers may not total to 100% due to don’t know responses.

In comparing these prompted associations with science to the unprompted words or phrases that describe science we find the proportion who agree that science is boring (22%) to be 14 percentage points greater than the 8% who volunteer the word “boring” to describe science. Meanwhile, the proportion who agrees that science is difficult (52%) exceeds the 8% who volunteer the words “difficult or hard work” to describe science by 44 percentage points.

These results suggest that while boredom with science is strongly felt among a core segment (the 8% who mention the term on an open-ended basis and the 11% who strongly agree that boring describes science) this perception is not shared by a broad majority. Meanwhile the notion of science as difficult does extend beyond the 8% who mention it as a top-of-mind association to a majority (52%) who agree on a prompted basis that science is difficult.

The difference between the two terms also suggests that while "boring" is an inherently negative association, "difficulty" is not. This is demonstrated in the table below, showing that while very few of those who are interested in science would agree that it is boring (7%), nearly half (46%) agree that it is difficult. Yet, at the same time, those who are not interested in science are more likely to agree that science is difficult (68%) than to agree that science is boring (52%). While boredom may be a matter of taste, this finding shows that the difficulty of science is accepted by many of those who are interested in science even as it deters those who are not interested.[11]

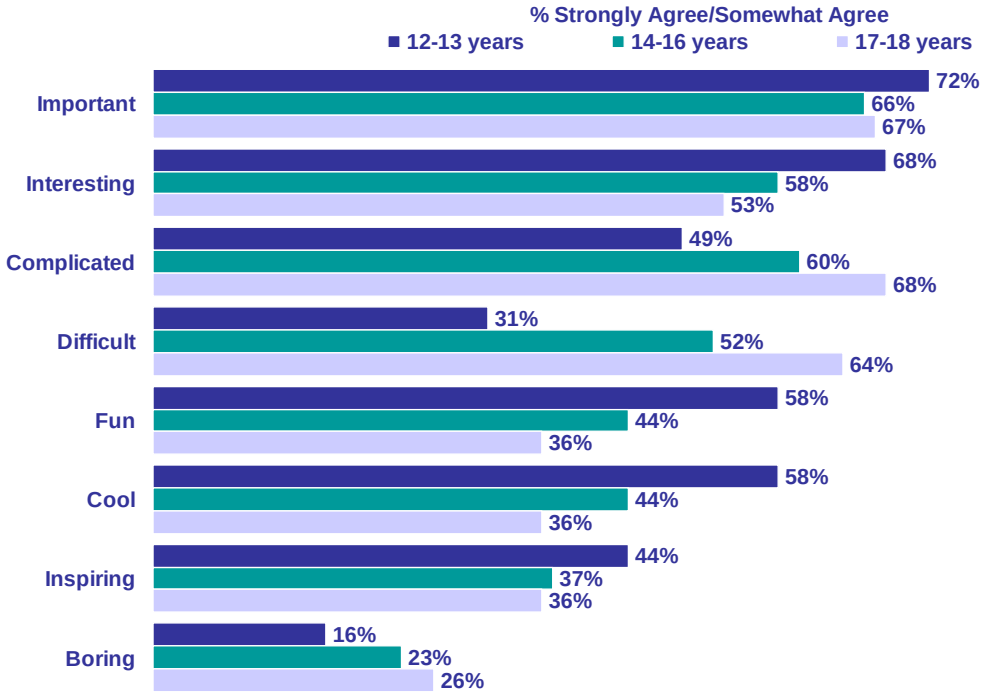
Percentages who…	Total	Interest in Science	
		Very/ Somewhat interested	Not very/ Not at all interested
Agree that science is boring (prompted)	**22%**	7%	52%
Agree that science is difficult (prompted)	**52%**	46%	68%

[11] Future analysis, in the form of a penalty-reward regression analysis, may shed light here. In particular, it may likely be found that while the perception of science as boring carries no particular "reward" (or positive connection to interest in science), the perception of science as difficult may indeed register as a "reward" for those who seek out intellectual challenges. The practical implication of this would be that messaging about the sciences need not shy away from the difficulty of science, but rather embrace difficulty (or "intellectual challenge") as its own reward.

Age significantly impacts perceptions of the words that describe science. The perception of science as “interesting,” “fun,” “cool,” and “inspiring” all decline as respondents grow older, while perceptions of science as “complicated,” “difficult,” and “boring” all increase as respondents grow older. The sense of science as “important” does not greatly change with age.

Describing science by age

Please indicate how strongly you agree or disagree that each of the following terms describes science, using a scale of 0 to 10, where 0 means disagree strongly and 10 means agree strongly.



Base: All respondents n=2,605

The increasing perception of science as “complicated,” “difficult,” and “boring” as students grow older coincides with the fact that they are more likely to study science subjects such as biology, chemistry and physics as they grow older.

While this may appear to suggest that an increasingly difficult curriculum is to blame for more negative perceptions of the sciences as students grow older, the opposite appears to be true: more exposure to the sciences in the curriculum tends to result in more positive views. Those who have studied biology, chemistry or physics are less likely than those who have not studied any of these subjects to view science as "difficult," "complicated" or "boring" and are more likely to view science as both "important" and "interesting." Whether or not one has studied biology, chemistry or physics has little bearing on the perception of science as "fun," "cool" or "inspiring."

% who strongly agree that science is…	Has studied biology, chemistry or physics…	
	Yes	No
Important	35%	28%
Interesting	29%	23%
Complicated	25%	30%
Difficult	20%	25%
Fun	18%	16%
Cool	18%	17%
Inspiring	14%	13%
Boring	9%	16%
Note: Green shading indicates results that are significantly higher.		

Similarly, the amount of effort spent on science does not appear to prompt negative perceptions of science; again, the opposite is true. Those who spend zero hours per week doing math or science homework (20%) are more than twice as likely as those who spend 4 or more hours a week (8%) to strongly agree that science as "boring." Those who spend zero hours per week on math and science homework (31%) are also more likely than those who spend four hours or more (20%) to view science as "difficult," but the difference is not as dramatic. Similarly, 32% of those who do zero hours of math or science homework per week describe science as "complicated" compared to 26% among those who do four hours of math or science homework per week.

The relatively narrow differences between those who do more or less science homework in the perception of science as difficult suggests that while the perception of science as "difficult" and "complicated" are connected with the perception of science as "boring," those who spend more time on science often do acknowledge that it can be "difficult" or "complicated." (Further underlining the notion explored above that while the sense of boredom is inherently negative, the sense of difficulty in association with science is not necessarily negative.)

Attitudes towards science are largely consistent between the genders, although males are somewhat more likely than females to view science as “fun” and “cool.”

% who strongly agree that science is…	Males	Females
Important	32%	34%
Interesting	29%	26%
Complicated	25%	28%
Difficult	20%	23%
Fun	20%	16%
Cool	20%	15%
Inspiring	15%	13%
Boring	10%	12%
Note: Green shading indicates results that are significantly higher.		

While there are few differences among males and females overall, older females (17-18 years) are more likely than older males to view science as “complicated,” “difficult,” and “boring.” They also become more likely to view science as “important.” At 17 or 18 years of age, males are no longer significantly more likely than females to view science as “fun,” or “cool.”

% who strongly agree that science is…	17-18 year old…	
	Males	Females
Important	33%	38%
Interesting	24%	23%
Complicated	31%	38%
Difficult	25%	31%
Fun	14%	13%
Cool	16%	13%
Inspiring	12%	14%
Boring	10%	16%
Note: Green shading indicates results that are significantly higher.		

Interest in science

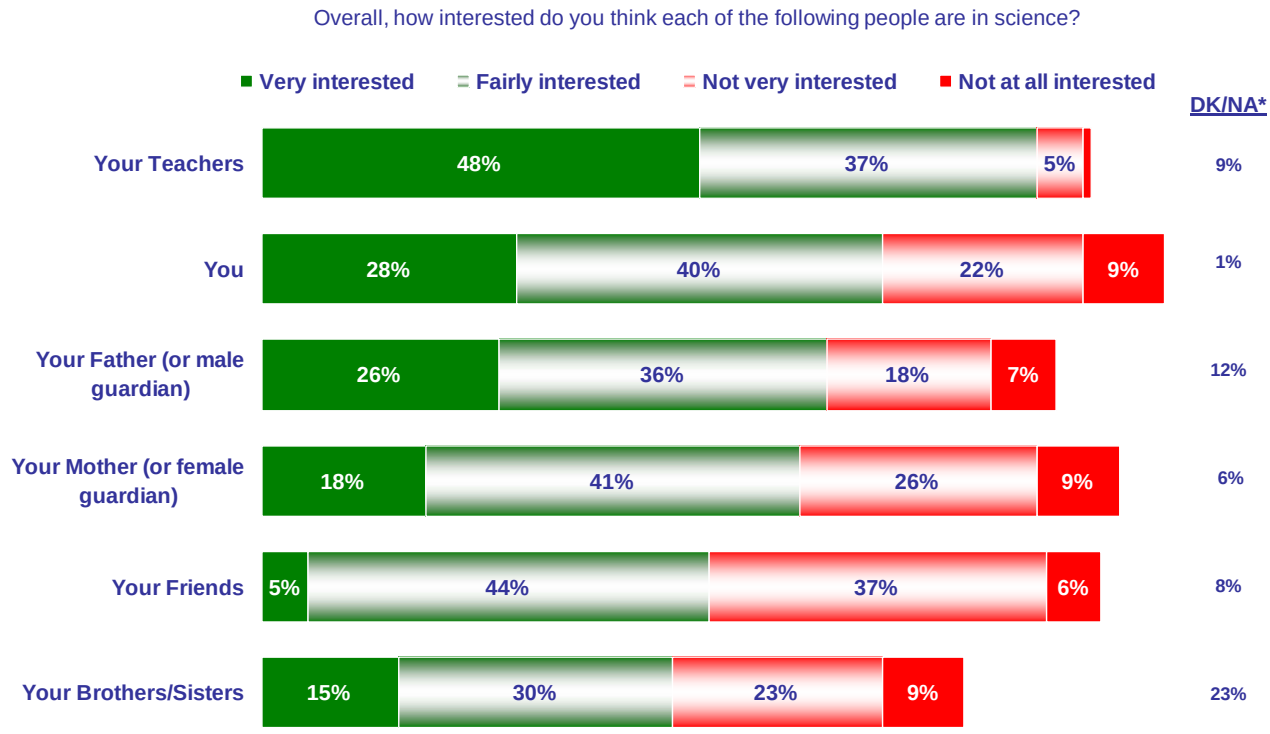
When asked to rate the level of interest in science of themselves and others, two in three Canadian youth (68%) say that they, personally, are either very (28%) or fairly interested (40%) in science. Three in ten (31%) say they are either not very (22%) or not at all interested (9%) in science.

Canadian youth are more likely to think their teachers (85%) are interested in science than to say that they themselves are interested. They are less likely to think their father[12] (62%), mother[13] (59%), friends (49%) and siblings[14] (45%) are interested in science than to say they themselves are interested.

While similar proportions think their mothers and fathers are at least fairly interested in science, Canadian youth are more likely to say their fathers are *very* interested in science than they are to say that their mothers are very interested (26% compared to 18%). Considering their peers, only five percent describe their friends as *very* interested in science, as compared to their siblings (15%).

[12] Tested as “father, or male guardian.”
[13] Tested as “mother, or female guardian.”
[14] Tested as “brothers or sisters.”

Levels of interest in science



Base: All respondents n=2,605

* Indicates responses of "don't know" or "not applicable"

Respondents who indicate that their friends are interested in science are themselves much more likely to be interested in science (87% compared to 68% on average). Similarly, but not to the same extent, respondents who say their mother (79%), father (77%) or siblings (77%) are interested in science are also more likely than average (68%) to express an interest in science themselves.

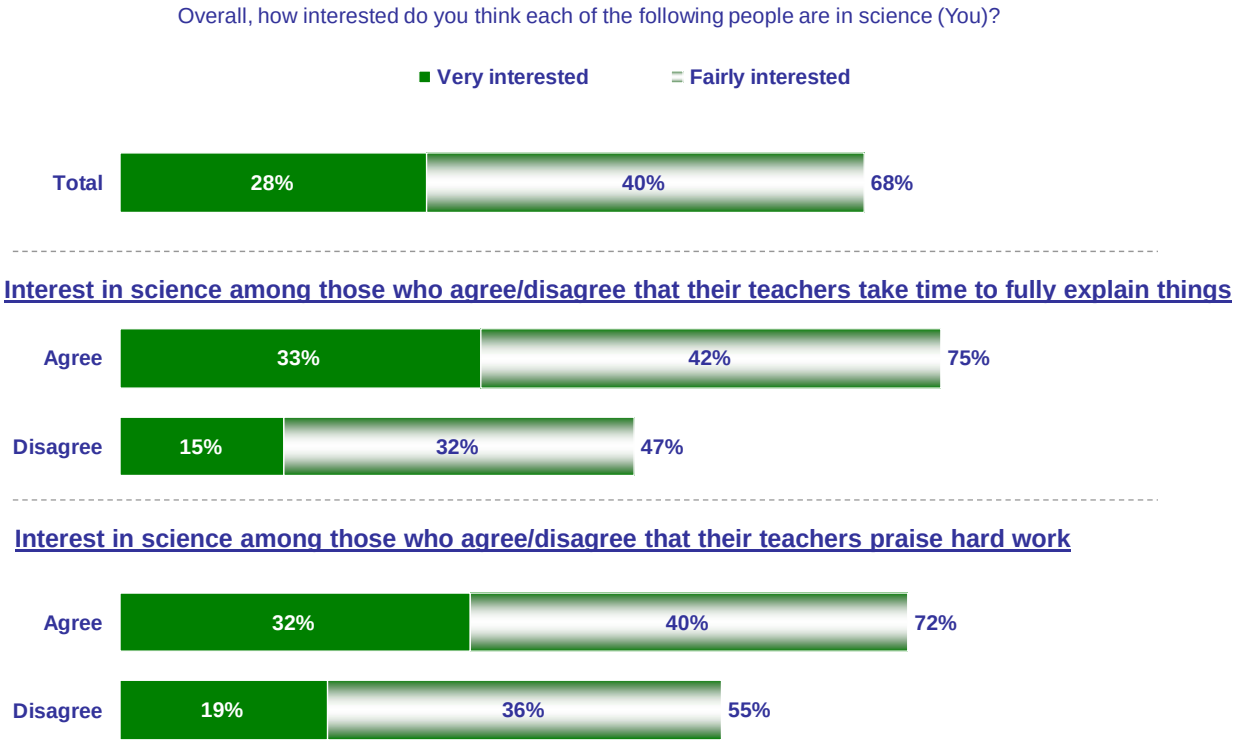
Those who say their teachers are interested in science are not much more likely than average to say they are interested in science (71%). This apparent lack of influence by teachers is attributable to the fact that among Canadian youth the idea that their teachers are interested in science is nearly universal (85% say their teachers are very or fairly interested in science), whereas the perception that family and friends are interested in science is less common.

Also, unlike family and (in most circumstances) teachers, individuals generally choose their friends. It is therefore not surprising to find a strong connection between the two kinds preference: one for science, the other for friends.

Interest in science among those who say their… are also interested in science	Very/Somewhat interested in science	Difference from average (68%)
Friends	87%	+19 pts
Mother	78%	+11 pts
Father	77%	+10 pts
Siblings	76%	+8 pts
Teachers	71%	+3 pts

While the perception that one's teachers are interested in science may be a given, the sense that their teachers encourage hard work and take time to fully explain things is less common. Those who agree that their teachers take time to fully explain things (75%) are 28 percentage points more likely than those who disagree (47%) to express an interest in science. The sense that teachers praise hard work is also influential (72% of those who agree that their teachers praise their students' efforts express an interest in science compared to 55% among those who disagree, amounting to a difference of 17 percentage points).

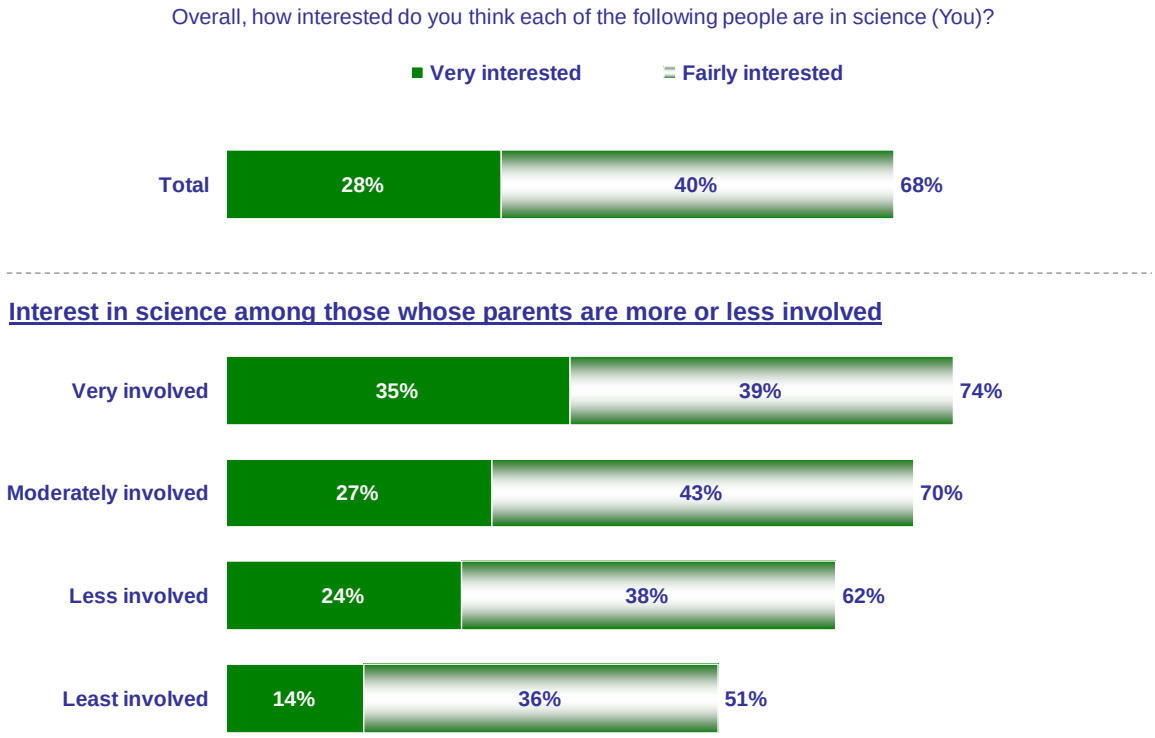
Personal interest in science by attitudes towards teachers



Base: All respondents n=2,605

The extent to which parents are involved in their children's lives also significantly impacts interest in science. Those whose parents are very involved in a range of developmental activities (72%) are much more interested in science than those whose parents are least involved (51%).

Personal interest in science by parental involvement

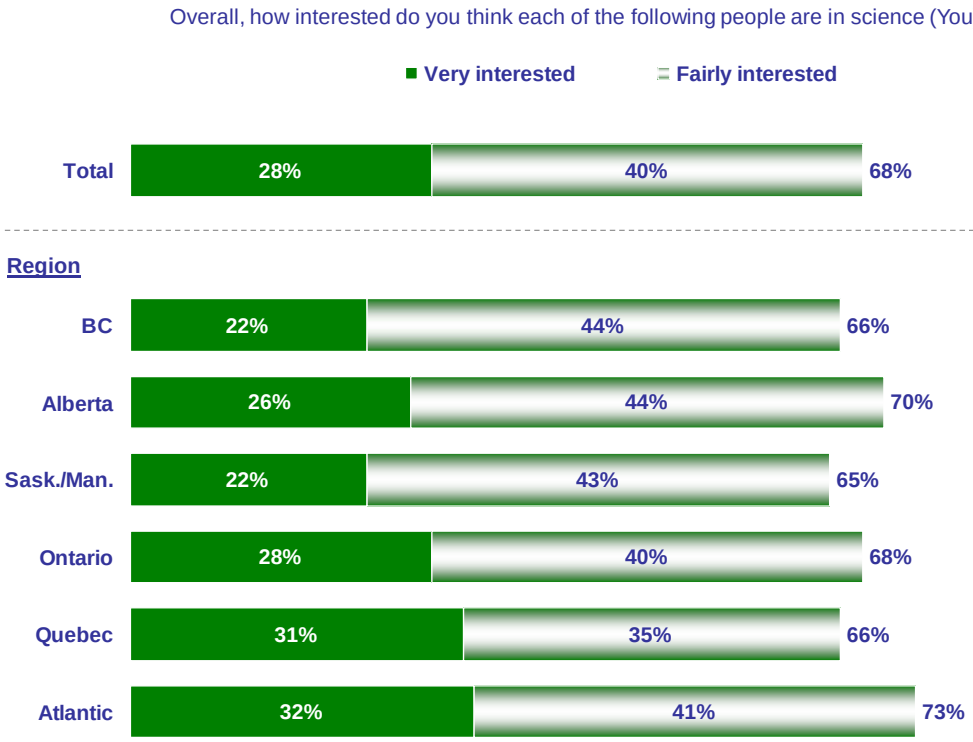


Base: All respondents n=2,605

Interest in science by region

Overall interest in science does not vary widely by region. However, it is worth noting that residents of Quebec (31%) and the Atlantic Provinces (32%) are more likely to say they are very interested in science than are residents of British Columbia (22%) and Saskatchewan and Manitoba (22%).

Personal interest in science by region

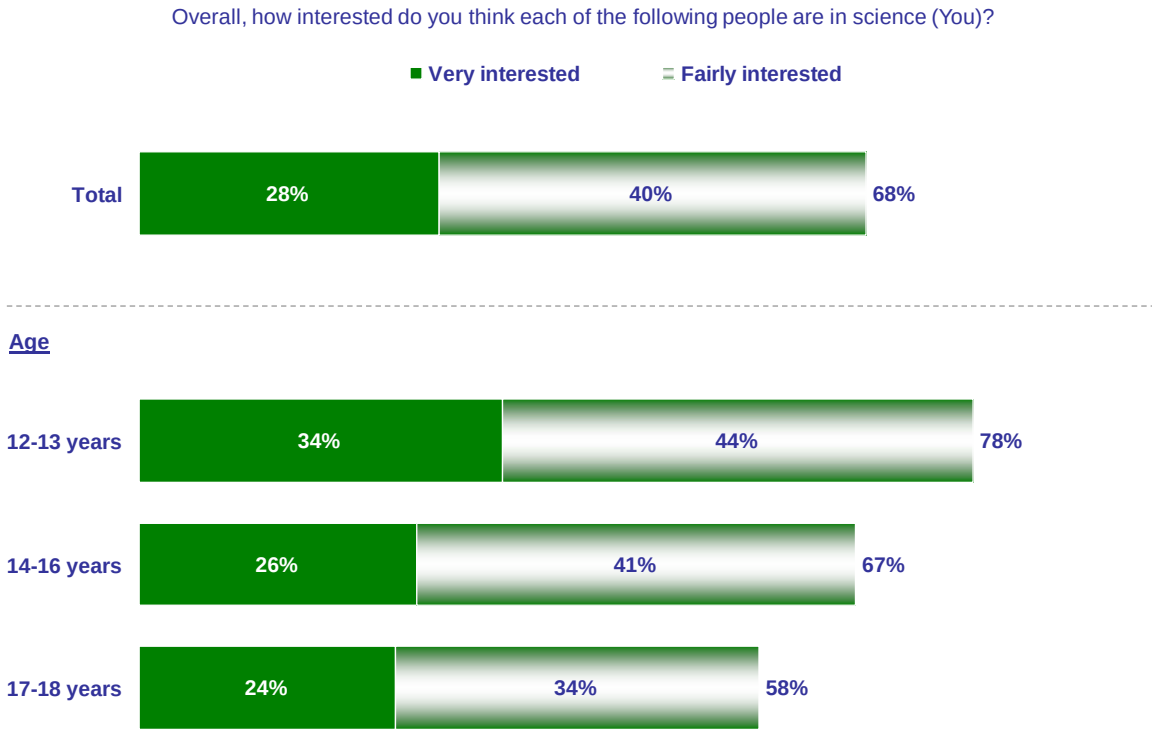


Base: All respondents n=2,605

Interest in science by age

As we have seen, younger respondents (12 to 13 years of age) tend to be more positive than older respondents (17 to 18 years of age) with respect to their school experience. It is therefore perhaps not surprising to find that younger respondents (78%) express higher levels of interest in science than do older respondents (58%).

Personal interest in science by age



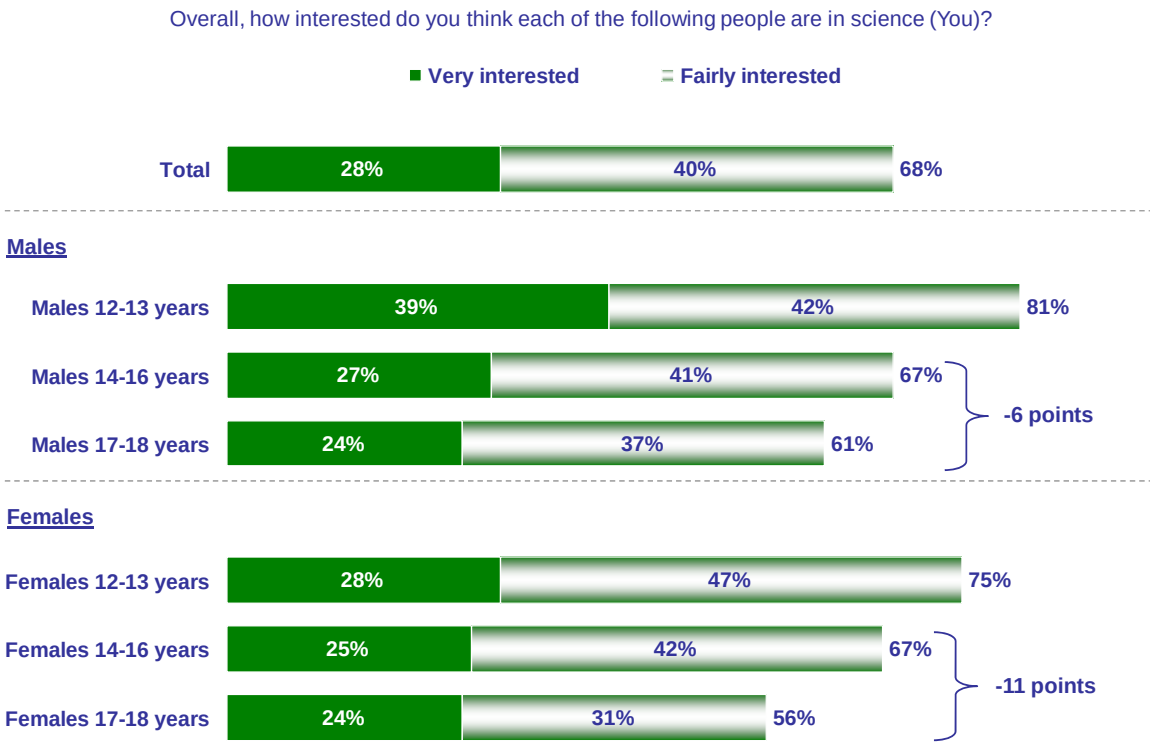
Base: All respondents n=2,605

Interest in science by gender

We find little difference between males and females in terms of their overall interest in science. Similar proportions of males (69%) and females (66%) say they are either very or fairly interested in science.

However, when looking at the difference between males and females by cohort, we find that interest in the sciences declines more rapidly among females between the ages of 14 to 16 and 17 to 18 (dropping by 11 points) than it does among males between the same age groups (dropping by 6 points). While the decline in interest in science between the ages of 12 and 13 and 17 and 18 is comparable between the genders (a 20 point decline among males and a 19 point decline among females), this finding suggests that declining interest in science may accelerate among females as they grow older.

Personal interest in science by gender and age

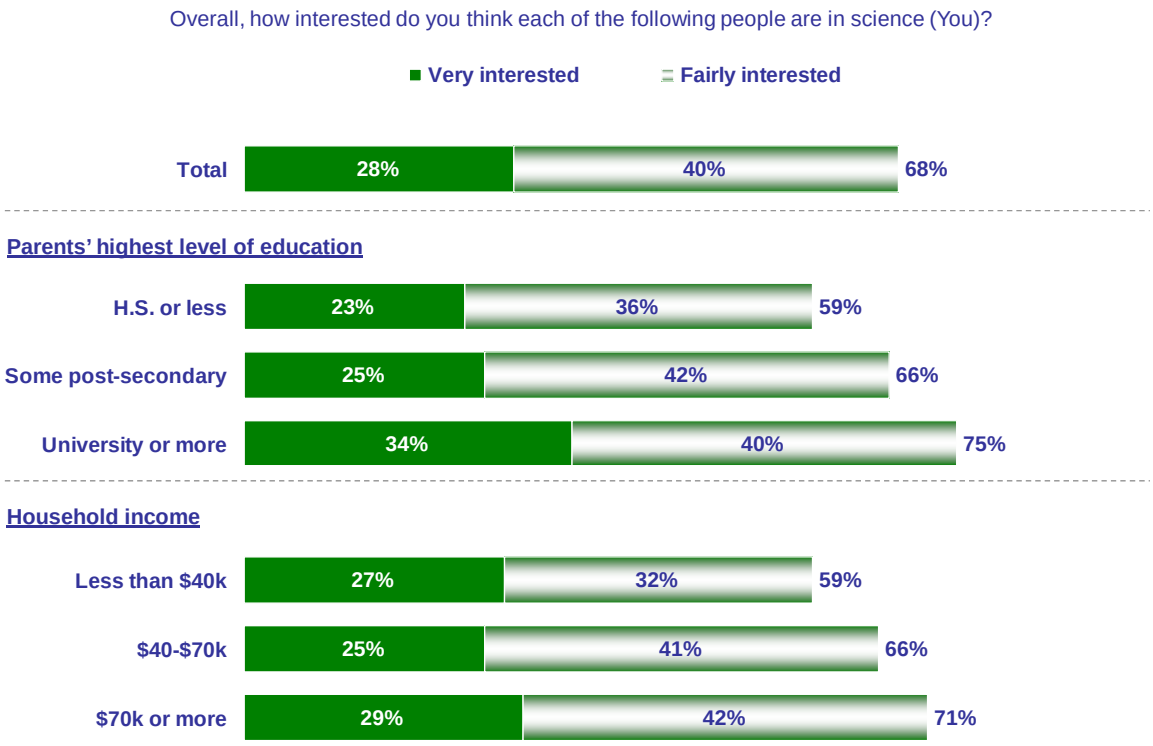


Base: All respondents n=2,605

Interest in science by parents' highest level of education and household income

Overall interest in science is significantly lower among respondents whose parents have lower levels of education and income than among those whose parents have higher levels of education and income. Between education and income, the parents' level of education appears to be more influential. While there is little difference between lower and higher income respondents in the proportions who are *very* interested in science, respondents who have at least one parent with a university degree (34%) are much more likely than those whose parents have no more than a high school education (23%) or who have some post secondary education (25%) to express an interest in science.

Personal interest in science by parents' education and household income



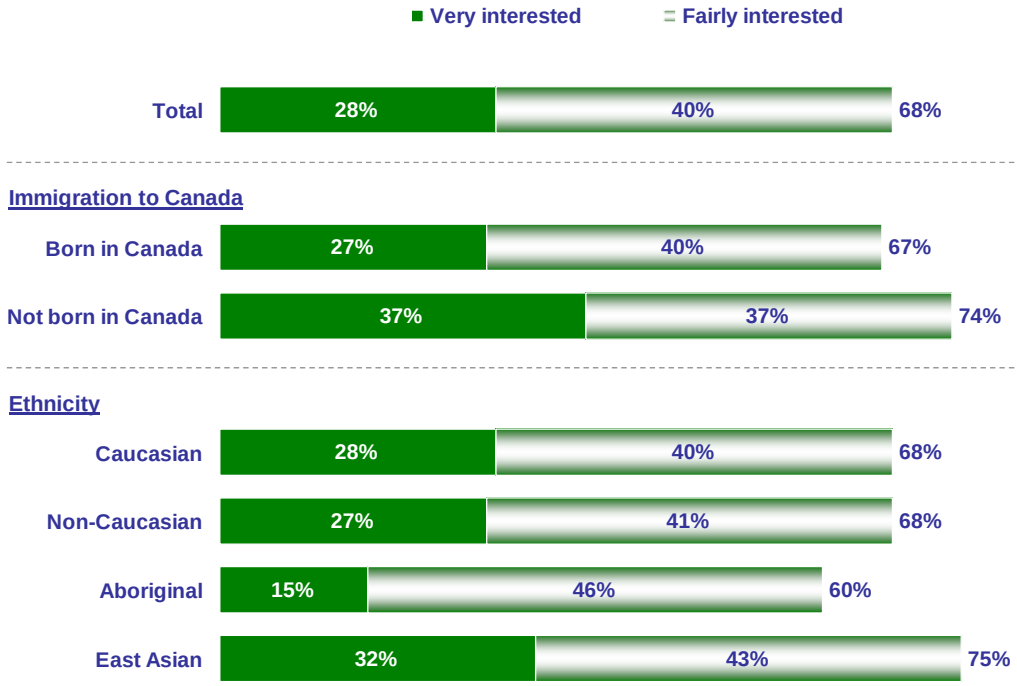
Base: All respondents n=2,605

Interest in science by immigration and ethnicity

Respondents who say they were not born in Canada (74%) are more likely than those who say they were born in Canada (67%) to express an interest in science. By ethnicity, there is little overall difference between Caucasians (68%) and non-Caucasians (68%) in interest in science. However, East Asians (75%) are notably more likely to express an interest in science, while Aboriginal youth are much less likely to express interest (60%).

Personal interest in science by immigration and ethnicity

Overall, how interested do you think each of the following people are in science (You)?



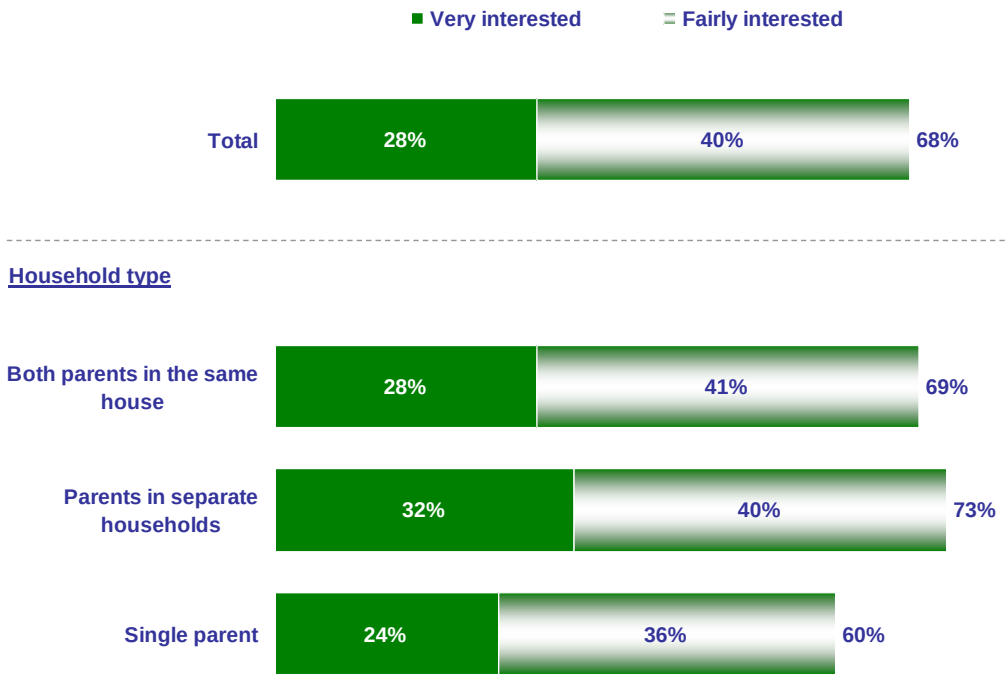
Base: All respondents n=2,605

Interest in science by household type

Respondents living with both parents in a single household (69%) or with both parents in separate households (73%) are more likely than those who live in a single parent household (60%) to express an interest in science.

Personal interest in science by household type

Overall, how interested do you think each of the following people are in science (You)?



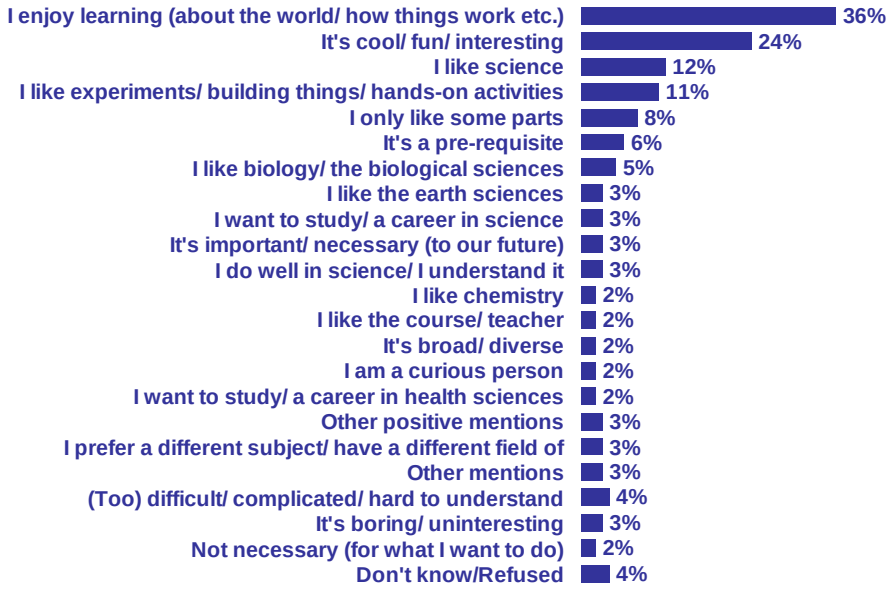
Base: All respondents n=2,605

Reasons for interest or disinterest in science

Canadian youth who described themselves as very or fairly interested in science (68%) were asked why they felt this way. These respondents most often say they are interested in science because they enjoy learning about the world or about how things work (36%). One in four say it is because they consider science to be cool, fun or interesting (24%). Just over one in ten say simply that they like science (12%), while others say they like experiments, building things or the hands-on activities associated with science (11%).

Reasons for interest in science

Why do you say that you are [Very/Fairly interested] in science?



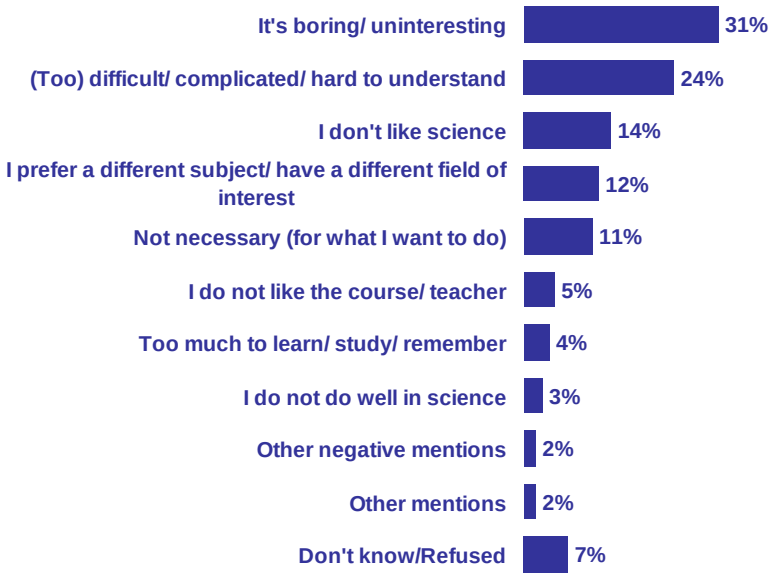
Note: Responses under 2% are not included

Base: Respondents who are very/fairly interested n=1,766

Canadian youth who described themselves as not very or not at all interested in science (31%) were asked why they felt this way. Most often these respondents say it is because science is boring or uninteresting (31%), followed by one in four who say science is difficult, complicated or hard to understand (24%). Fewer than one in five say simply that they don't like science (14%), while others say they are uninterested because they prefer other subjects or have other interests (12%) or because they do not see science as necessary for what they plan to do (11%).

Reasons for disinterest in science

Why do you say that you are [Not very/Not at all interested] in science?



Note: Responses under 2% are not included

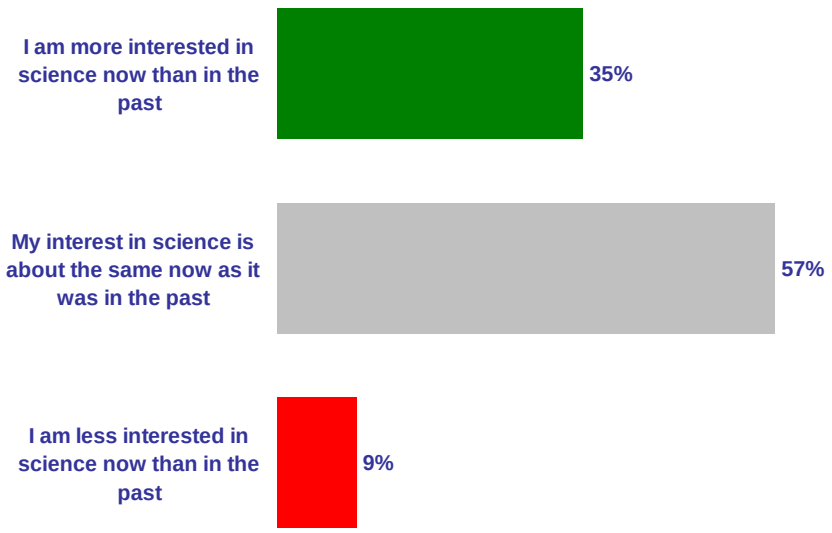
Base: Respondents who are not very/not at all interested n=801

Interest in science: now compared to the past

When asked whether they are more interested, less interested or have about the same interest in science now than in the past, Canadian youth are much more likely to say that they are more interested in science (35%) than to say that they are less interested (9%). The majority of Canadian youth believe that their interest in science is about the same now as it was in the past (57%).

Interest in science: now compared to the past

Which of the following statements best reflects your interest in science?



Base: All respondents n=2,605

Those more likely to say they are more interested in science now than in the past include:

- Those aged 12 or 13 (43%) compared to those aged 17 or 18 (26%);
- Those with a household income of more than $70,000 (38%) compared to those with a household income of less than $40,000 (30%)
- Those who spend four or more hours on science and math homework (42%) compared to those who spend no time (21%);
- Those who are very interested in science (46%) compared to those who are not (23%);
- Those who got six or more correct answers in scientific literacy (41%) compared to those who got two or less correct (25%);

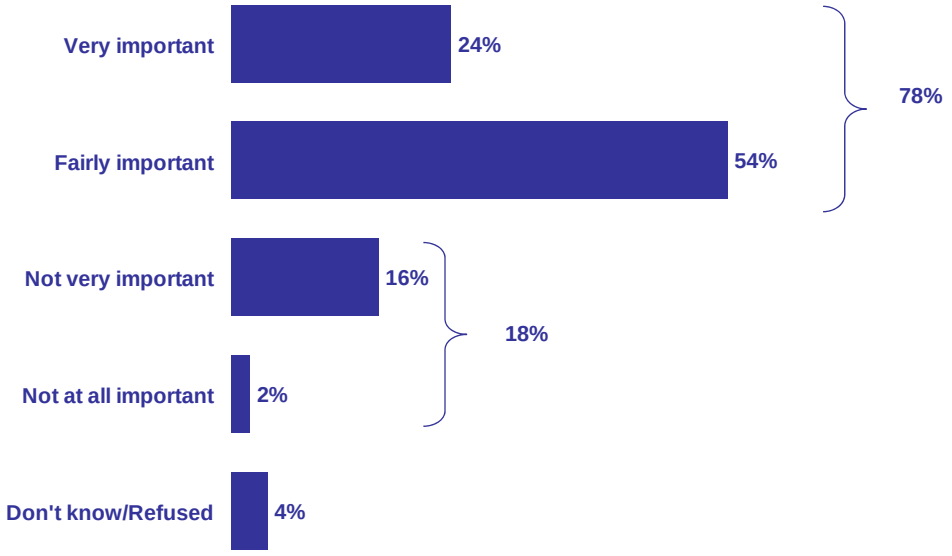
- Those whose parents are very involved (41%) compared to those whose parents are least involved (19%);
- Those who say their parents feel it is very important they do well in school (37%) compared to those who say their parents feel it is only fairly important that they do well in school (26%); and,
- Those whose parents feel it is very important to do well in science (46%) compared to those whose parents feel it is not important at all to do well in science (10%).

Importance of understanding science

Canadian youth were asked how important they consider it to be to have an understanding of science, putting aside their personal interest in science either as a school subject or a future career choice.[15] On this basis, nearly four in five (78%) consider it to be either very (24%) or fairly important (54%) to have an understanding of science. Fewer than one in five (18%) say it is not very (16%) or not at all important (2%) to have an understanding of science.

Importance of understanding science

Leaving aside your interest in science as a school subject or future career, how important do you think it is for you, personally, to have an understanding of science?



Base: All respondents n=2,605

Regionally views are fairly consistent with respect to the importance of understanding science; however, residents of Quebec are significantly less likely to consider an understanding of science to be very important (17%).

[15] This question was asked after participants were provided several different quotes describing science.

Among the other demographic subgroups, those more likely to consider it to be very important to have an understanding of science include:

- Those aged 12 or 13 (28%) compared to those aged 17 or 18 (19%);
- Those who were not born in Canada (38%) compared to those who were 24%)
- Non-Caucasian youth (35%) compared to Caucasian youth (23%);
- Those with at least one university-educated parent (34%) compared to those whose parents have no more than a high school education (17%);
- Those who spend four or more hours on science and math homework per week (32%) compared to those who spend zero hours (14%);
- Those who are very interested in science (34%) compared to those who are not (14%);
- Those whose parents are very involved (34%) compared to those whose parents are least involved (16%);
- Those who say their parents feel it is very important they do well in school (28%) compared to those who say their parents feel it is only fairly important they do well in school (10%); and,
- Those who say their parents feel it is very important they do well in science (41%) compared to those who say their parents feel it is not important at all to do well in science (4%).

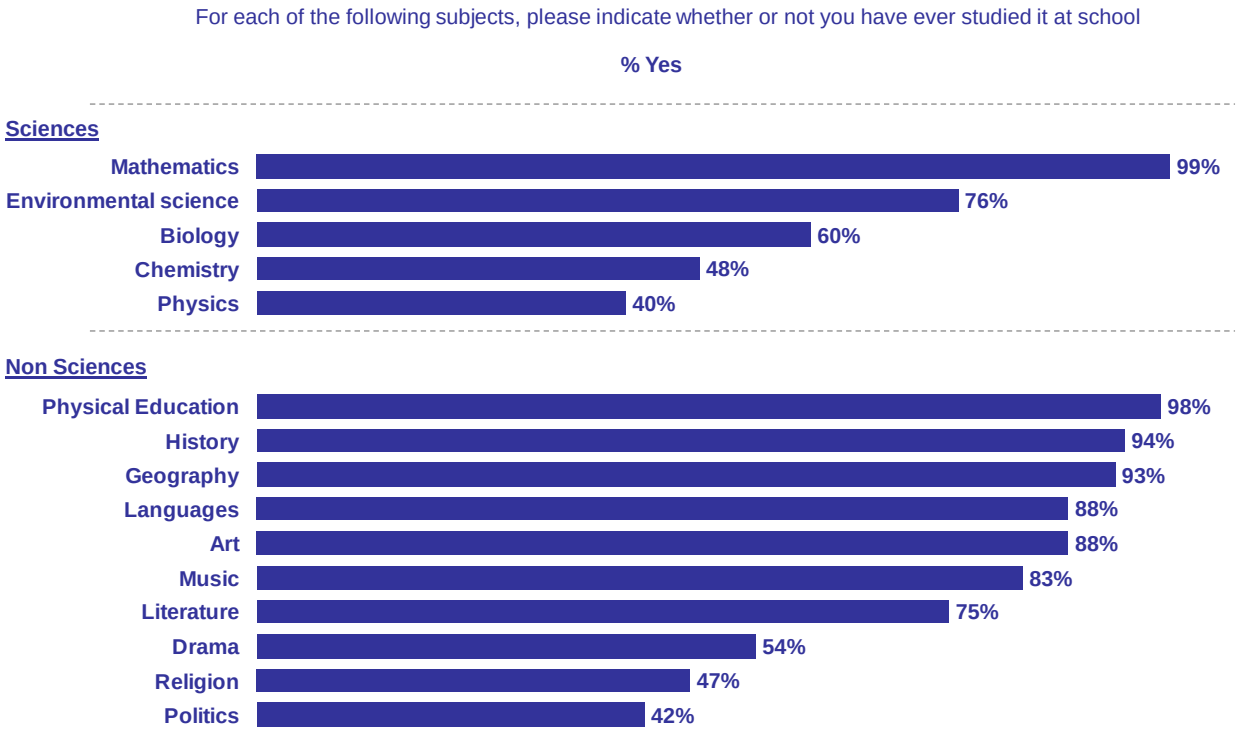
Exposure to and interest in aspects of the curriculum

Experience studying various subjects

When asked whether they had ever studied a variety of subjects commonly taught in school, nearly all respondents say they had studied mathematics (99%) and physical education (99%). Over nine in ten also say they had studied history (94%) and geography (93%), while just fewer than nine in ten say they had studied languages (88%) or art (88%).

Considering scientific courses, three in four say they have studied environmental sciences (76%), while three in five say they have studied biology (60%). Fewer than half say they have studied chemistry (48%) or physics (40%).

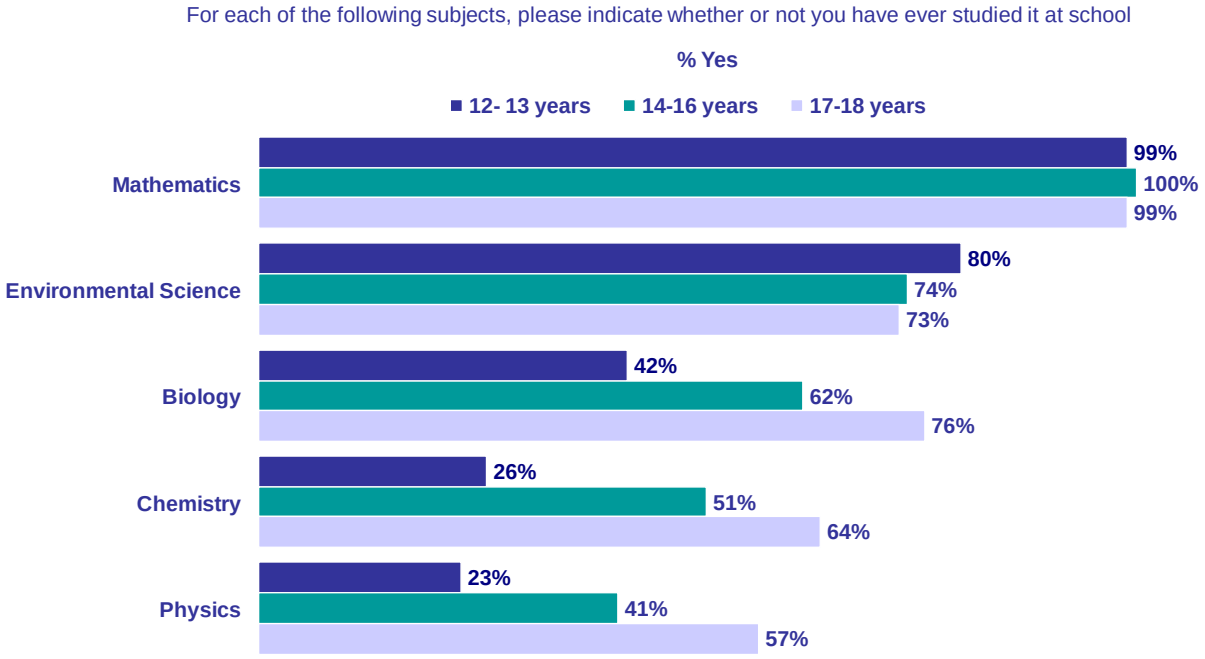
Experience studying various subjects



Base: All respondents n=2,605

The study of mathematics remains constant (and nearly universal) among each of the three age groups. The study of environmental science is somewhat higher among those 12 to 13 years of age than among older respondents.[16] Meanwhile, the proportions who have studied biology, chemistry and physics increase as respondents grow older.

Study of scientific subjects by age



Base: All respondents n=2,605

Those more likely to say they have studied biology include:

- Those with a household income of more than $70,000 (64%) compared to those with a household income of less than $40,000 (51%);
- Caucasian youth (61%) compared to Aboriginal youth (49%); and,
- Those with at least one university-educated parent (66%) compared to those whose parents have no more than high school education (53%).

[16] There appear to be introductory science courses within the grades 7 and 8 curricula in several provinces that may be construed as "environmental science" by the respondents. For example, British Columbia identifies among the goals of its grade eight science curriculum that students, "develop an understanding of the nature of science and technology, of the relationships between science and technology, and of the social and environmental contexts of science and technology."

Those more likely to say they have studied chemistry include:

- Residents of Alberta (63%) compared to Quebec (36%);
- Those with a household income of more than $70,000 (52%) compared to those with a household income of less than $40,000 (38%);
- Those who were not born in Canada (61%) compared to those who were (47%);
- Those with at least one university-educated parent (54%) compared to those whose parents have no more than high school education (42%);
- Those living with both parents in the same household (50%) compared to those with a single parent (42%);

Those more likely to say they have studied physics include:

- Residents of Alberta (45%) compared to the Atlantic Provinces (29%);
- Those aged 17 or 18 (57%) compared to those aged 12 or 13 (23%);
- Those who were not born in Canada (53%) compared to those who were (40%);
- Caucasian youth (40%) compared to Aboriginal youth (29%); and,
- Those with at least one university-educated parent (47%) compared to those whose parents have no more than high school education (38%).

Interest in scientific versus non-scientific subjects

Canadian youth were asked to rate their interest in a variety of subjects commonly taught at school on a scale of zero to 10, where zero means not at all interested and 10 means very interested. Of the 15 different subjects tested, five were related to science: mathematics, environmental science, biology, chemistry and physics.

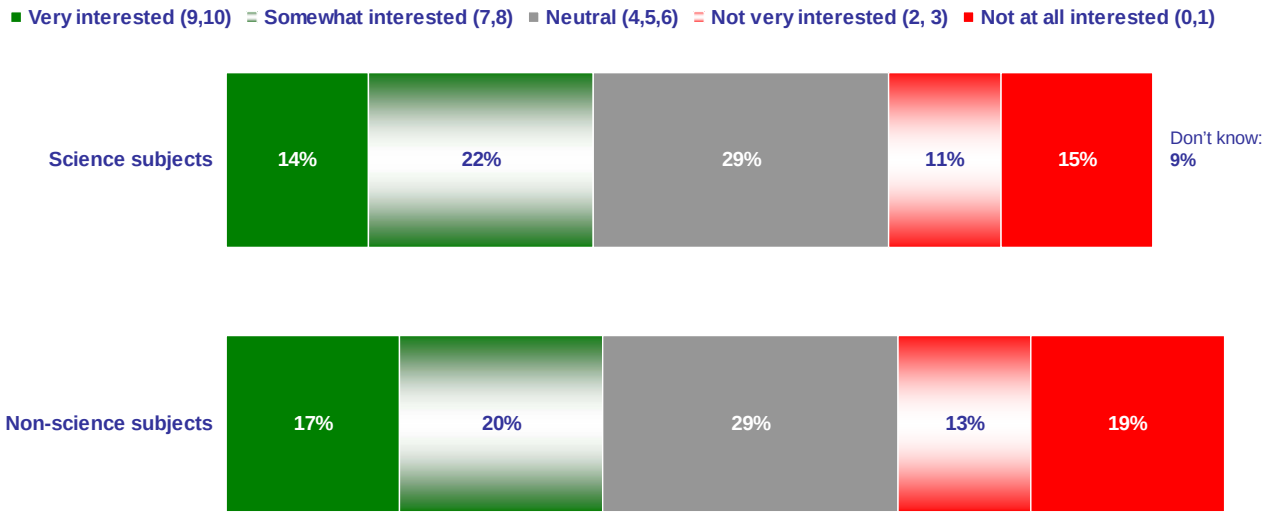
Based on an average of interest in the five scientific subjects tested, over one in three (36%) are either very (14%) or somewhat interested (22%) in these subjects. One in three (29%) express neutral views, while one in four (26%) indicate that they are not very (11%) or not at all interested (15%). About one in ten (9%) say they don't know whether or not they are interested (which is not surprising in light of the fact that many younger students have not yet studied the science subjects tested and have therefore not formed an opinion).

The average expression of interest in the 10 non-scientific subjects tested (37%) is similar to interest in the scientific subjects (36%). Disinterest in non-scientific subjects (32% not very or not at all interested) is somewhat higher than disinterest in scientific courses (26%). This may be explained by the lower proportion (2%) who say don't know when asked to rate their interest in non-scientific courses (consistent with the fact that fewer respondents say they have not studied these courses in the past).

Interest in science versus non-science subjects

Please indicate your level of interest in each of the following subjects at school, using a scale of 0 to 10, where 0 means not at all interested and 10 means very interested: Please answer with respect to each subject, even if you have never actually studied it at school.

Measures average level of interest across the tested subjects



Base: All respondents n=2,605

Numbers may not total to 100% due to don't know responses.

Regionally, respondents from Atlantic Canada (16%) are most likely to say they are very interested in scientific subjects (followed closely by residents of Ontario and Alberta at 15%). Regional differences are slight with respect to interest in non-scientific courses.

By age, younger respondents (12-13 years of age) express higher levels of interest in both scientific and non-scientific subjects than older respondents (17-18 years of age). Among younger respondents (12-13 years of age), interest in non-scientific subjects (23%) is higher than interest in scientific subjects (17%). Among older respondents, however, interest in non-scientific subjects declines sharply (to 14%) and is only two percentage points higher than interest in scientific subjects (12%).

By gender, males are equally interested in scientific (15%) and non-scientific subjects (15%). Females are more interested in non-scientific subjects (19%) than in scientific subjects (13%).

By ethnicity, East Asian respondents (19%) are more interested than Caucasian respondents (14%) in scientific subjects. East Asian (18%) and Caucasian respondents (17%) express similar levels of interest in non-scientific subjects.

	% very interested in…	
	Scientific subjects	**Non-scientific subjects**
Total	**14%**	**17%**
Region		
British Columbia	10%	16%
Alberta	15%	17%
Sask./Man.	12%	15%
Ontario	15%	18%
Quebec	14%	17%
Atlantic Canada	16%	17%
Age		
12-13 years	17%	23%
14-16 years	13%	16%
17-18 years	12%	14%
Gender		
Male	15%	15%
Female	13%	19%
Ethnicity		
Caucasian	14%	17%
Non-Caucasian	17%	19%
East Asian	19%	18%

Respondents with at least one university educated parent are somewhat more likely than those whose parents have no more than a high school education to say they are very interested in both scientific and non-scientific subjects. Likewise, those whose parents are very involved are more likely than those whose parents are least involved to express interest in both scientific and non-scientific subjects.

Those who say their teachers encourage hard work are seven percentage points more likely than others to say they are very interested in scientific subjects (17% versus 10%). Those who say their teachers encourage hard work are also more likely to say they are very interested in non-scientific subjects, but the difference is only four percentage points (19% versus 15%). A similar dynamic occurs between those who say their teachers take time to fully explain things and those who do not.

	% very interested in…	
	Scientific subjects	**Non-scientific subjects**
Total	**14%**	**17%**
Parents' highest level of education		
High school or less	12%	15%
Some post secondary	13%	17%
University or higher	17%	19%
Parental involvement		
Very involved	17%	21%
Least involved	9%	10%
Has teachers who encourage hard work		
Agree	17%	19%
Disagree	10%	15%
Has teachers who take time to fully explain things		
Agree	18%	20%
Disagree	8%	13%

Interest in scientific subjects

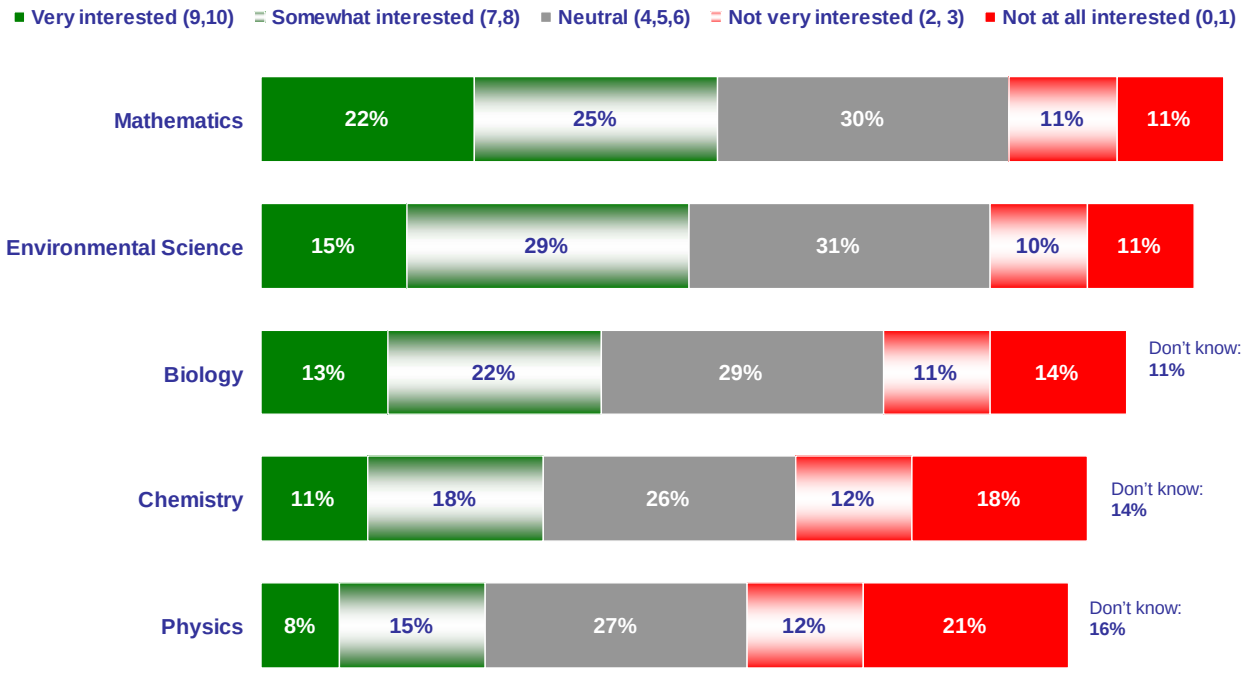
Interest in the five scientific subjects tested is highest with respect to mathematics (47% very or somewhat interested) and environmental science (44%) followed distantly by biology (35%). Respondents are more likely to express disinterest than interest in chemistry (31% are not interested while 29% are) and physics (33% are not interested compared while 23% are).

Interest in the scientific subjects tested declines in the same order as experience studying the subjects. Interest is higher with respect to mathematics and environmental science, which respondents are much more likely to say they have studied, than with respect to biology, chemistry or physics, which respondents are less likely to say they have studied. With respect to the less-studied courses, biology, chemistry and physics, at least one in ten says they don't know whether or not they are interested in them.

Those who have studied biology, chemistry or physics are more likely to express interest in each of these subjects than those who have not studied them.

Interest in scientific subjects

Please indicate your level of interest in each of the following subjects at school, using a scale of 0 to 10, where 0 means not at all interested and 10 means very interested: Please answer with respect to each subject, even if you have never actually studied it at school.



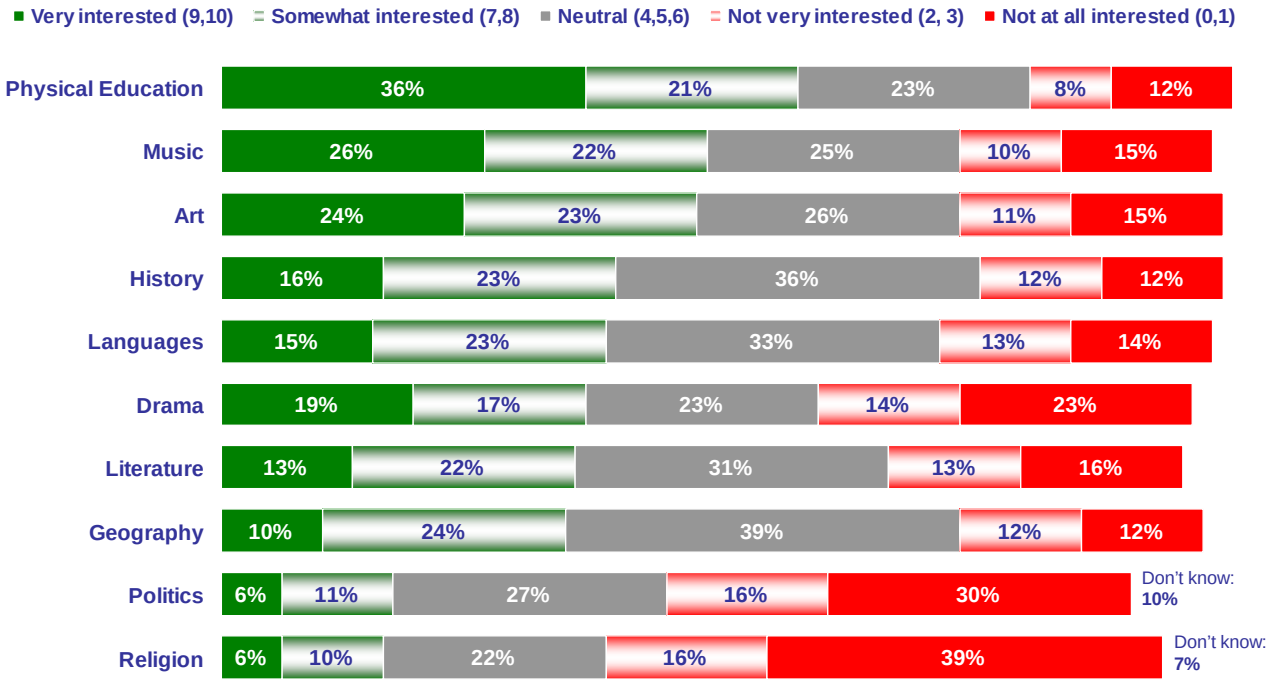
Base: All respondents n=2,605

Interest in non-scientific subjects

Interest in the non-scientific subjects tested ranges from a high of 57% for physical education to a low of 17% for politics and 16% for religion. Interest is greater than disinterest for all the non-scientific subjects, with the exception of drama (37% are not interested while 36% are), politics (47% are not interested while 17% are) and religion (55% are not interested while 16% are). As with the scientific subjects, the proportion who says they don't know tends to be higher with respect to those subjects less often studied (including drama, 6%, literature, 5%, politics, 10%, and religion, 7%).

Interest in non-scientific subjects

Please indicate your level of interest in each of the following subjects at school, using a scale of 0 to 10, where 0 means not at all interested and 10 means very interested: Please answer with respect to each subject, even if you have never actually studied it at school.



Base: All respondents n=2,605

Numbers may not total to 100% due to don't know responses.

Interest in scientific and non-scientific subjects by gender and age

Considering gender, we find that males (36%) and females (36%) express the same level of overall interest in scientific subjects. By age group, young males (43% among those 12-13 years) express a higher level of interest in the sciences than young females do (36% among those 12-13). However, interest in the sciences declines much more sharply among males than among females (dropping by 14 points between males 12-13 years and 17-18 years compared to a drop of 5 points among females 12-13 years and 17-18 years).

By subject, interest among males declines across all five subjects, including the traditionally male subjects of interest, physics and chemistry. However, males both start out (at 12-13 years of age) and end up (at 17-18 years of age) more interested than females are in both of these subjects. The decline in interest among males in physics is particularly mild (declining by 4 points compared to the 14 point decline in interest among the sciences overall).

% who are either very or somewhat interested in each subject	All Respondents	MALE				
		All males	12-13	14-16	17-18	Gap*
Sciences (average)	**36%**	**36%**	**43%**	**36%**	**29%**	**-14**
Sciences (excl. biology)	*36%*	*37%*	*45%*	*37%*	*30%*	*-15*
Mathematics	47%	48%	60%	47%	39%	-21
Environmental science	44%	42%	54%	40%	33%	-21
Biology	35%	31%	36%	32%	27%	-9
Chemistry	29%	32%	37%	34%	24%	-13
Physics	23%	27%	29%	27%	25%	-4
* “Gap” indicates the percentage point difference between 17-18 year olds and 12-13 year olds.						

Females are less interested in each of the science subjects tested than males in each of the science subjects apart from biology and environmental science. At 17 to 18 years of age (39%), females are seven points more interested in biology than they were when they were 12 to 13 years of age (32%). Females are also become slightly more interested in physics, but interest in this subject remains essentially constant (and, as noted, is lower than among males). Excluding biology, interest in the remaining science subjects declines at a similar rate among females (dropping by 12 points) as it does among males (dropping by 15 points).

% who are either very or somewhat interested in each subject	All Respondents	FEMALE				
		All females	12-13	14-16	17-18	Gap*
Sciences (average)	**36%**	**36%**	**36%**	**37%**	**31%**	**-5**
Sciences (excl. biology)	*36%*	*35%*	*38%*	*36%*	*26%*	*-12*
Mathematics	47%	45%	55%	47%	33%	-22
Environmental science	44%	46%	50%	46%	27%	-23
Biology	35%	38%	32%	41%	39%	+7
Chemistry	29%	27%	26%	30%	22%	-4
Physics	23%	20%	19%	21%	21%	+2
* “Gap” indicates the percentage point difference between 17-18 year olds and 12-13 year olds.						

Females (40%) express higher levels of interest in the non-scientific subjects on average than do males (33%). Interest among females in the non-scientific subjects declines more dramatically than it does among males (16 points versus 12 points among males) and represents a sharper decline in interest than was found with respect to the scientific subjects (which declined by five points among females). Yet, despite the sharper decline in interest, 17 to 18 year old females (34%) remain more interested than 17 to 18 year old males (27%) in non-scientific subjects.

Despite the sharp decline in interest, 17 to 18 year old females also remain more interested in non-science subjects (34%) than in science subjects (31% among all sciences, 26% among sciences excluding biology). This is particularly apparent with respect to languages and literature, two subjects traditionally preferred by females compared to males. While interest among females in languages and literature declines by 17 points between the ages of 12 to 13 and 17 to 18, interest in these subjects (39%) remains higher than interest in any single scientific subject apart from biology (also 39%). Interest in literature (41%), by itself, is higher among females aged 17 to 18 than interest in biology.

Males, meanwhile, are less interested in non-scientific subjects (and particularly languages and literature) when 12 to 13 years of age and – although their interest declines less dramatically – they remain much less interested in non-scientific subjects as 17 to 18 year olds relative to females (27% compared to 34% among females) and relative to their interest in scientific subjects (31%).

% who are either very or somewhat interested in each subject	All Respondents	MALE				
		All males	12-13	14-16	17-18	Gap*
Non-sciences (average)	**37%**	**33%**	**39%**	**32%**	**27%**	**-12%**
Languages and literature (average)	*37%*	*27%*	*31%*	*27%*	*25%*	*-6%*
Languages	38%	30%	33%	30%	27%	-6%
Literature	35%	24%	28%	23%	22%	-6%
* "Gap" indicates the percentage point difference between 17-18 year olds and 12-13 year olds.						

% who are either very or somewhat interested in each subject	All Respondents	FEMALE				
		All females	12-13	14-16	17-18	Gap
Non-sciences (average)	**37%**	**40%**	**50%**	**39%**	**34%**	**-16%**
Languages and literature (average)	*37%*	*47%*	*56%*	*47%*	*39%*	*-17%*
Languages	38%	46%	56%	46%	37%	-19%
Literature	35%	48%	55%	47%	41%	-14%
* "Gap" indicates the percentage point difference between 17-18 year olds and 12-13 year olds.						

Availability of science streams or special programs

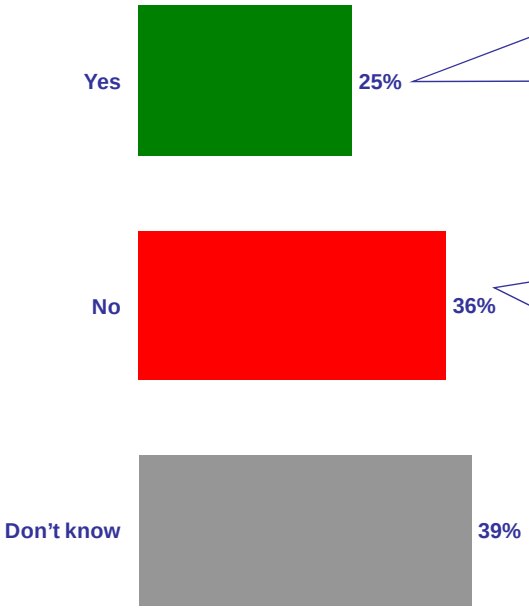
When asked whether their school has an optional or special program of study that focuses on science, one in four (25%) say their school does offer such a program, while 75% say their school does not offer a science stream (36%) or don't know whether or not it does (39%).

The 25% of respondents whose school offers a specific stream of science study were asked whether or not they are enrolled or plan to enroll in the science stream. About half of these respondents (51%) say they either are currently enrolled in the science stream (29%), plan to enroll in it (16%) or would like to enroll but cannot do so (6%). One in three (34%) say they would *not* like to enroll in the science stream offered at their school. Sixteen percent don't know whether or not they would enroll in the science stream offered by their school.

Among the 75% of respondents who say their school does not offer a science stream or who don't know whether or not it does, just over one in five (22%) say they would plan to enroll in a science stream if it were offered at their school. Just over one in four say they would be interested in it, but probably not enroll (26%), while the same proportion (26%) say they would not be interested and would not enroll in the science stream if offered. An additional one in four (26%) say they don't know.

Availability of science streams or special programs

Some schools provide the choice to study more science, either as an optional stream or as a special program in addition to regular studies. To the best of your knowledge, does your school offer a science stream or special program?



Which of the following best describes you?

- **I would not like to enroll in the science stream or special program at my school (34%).**
- **I am currently enrolled (29%).**
- **I plan to enroll (16%).**
- **I would like to enroll, but cannot do so (6%).**
- **Don't know (16%)**

Base: Say school offers a science stream or special program n=626

If my school had a science stream or special program….

- **I would be Interested, but probably not enroll in it (26%).**
- **I would not be Interested in or plan to enroll in it (26%).**
- **I would enroll in it (22%).**
- **Don't know (26%).**

Base: Say school does not offer a science stream or special program or don't know n=1,979

Base: All respondents n=2,605

Those more likely to say their school offers a special stream of study in science include:

- Those aged 17 or 18 (30%) compared to those aged 12 or 13 (13%);
- Those with a household income of more then $70,000 (28%) compared to those with a household income of less than $40,000 (21%);
- Those who were not born in Canada (33%) compared to those who were (24%); and,
- Those with at least one university-educated parent (30%) compared to those whose parents have no more than high school education (21%).

Those more likely to say they are currently enrolled in the science stream offered by their school include:

- Residents of Alberta (37%) and Atlantic Canada (37%) compared to residents of British Columbia (24%) or Saskatchewan and Manitoba (23%);
- Those whose parents' have some post secondary education (33%) or a university degree (29%) compared to those whose parents have a high school education or less (20%);
- Those whose parents are very (32%) or moderately involved (32%) compared to those whose parents are less (25%) or least involved (17%);

- Those who say their friends are interested in science (35%); and,
- Those who say their teachers encourage hard work (33%) and take time to fully explain things (35%) compared to those who do not believe their teachers encourage hard work (24%) or take the time to fully explain things (17%).

Males (29%) and females (28%) are equally likely to say that they are enrolled in the science program offered by their school.

Those more likely to say they would be interested in enrolling in a science stream if one were offered by their school include:

- Residents of the Atlantic Provinces (30%);
- Younger respondents (12-13 years: 28%) compared to older respondents (17-18 years: 14%);
- Those not born in Canada (36%) compared to those who were born in Canada (21%);
- East Asian respondents (33%) compared to Caucasian respondents (22%);
- Those who have at least one parent with a university degree (31%) compared to those whose parents have just some post-secondary education (18%) or a high school degree or less (17%);
- Those whose parents are very involved (29%) compared to those whose parents are least involved (12%);
- Those who say their teachers encourage hard work (25%) and take time to fully explain things (26%) compared to those who do not believe their teachers encourage hard work (16%) or take the time to fully explain things (12%); and,
- Those who say their friends (28%), mother (27%), father (28%) or siblings (27%) are interested in science.

As with enrollment in a science stream, males (22%) are no more likely than females (21%) to say that they would enroll in a science stream, if one were offered at their school.

Weekly Activities

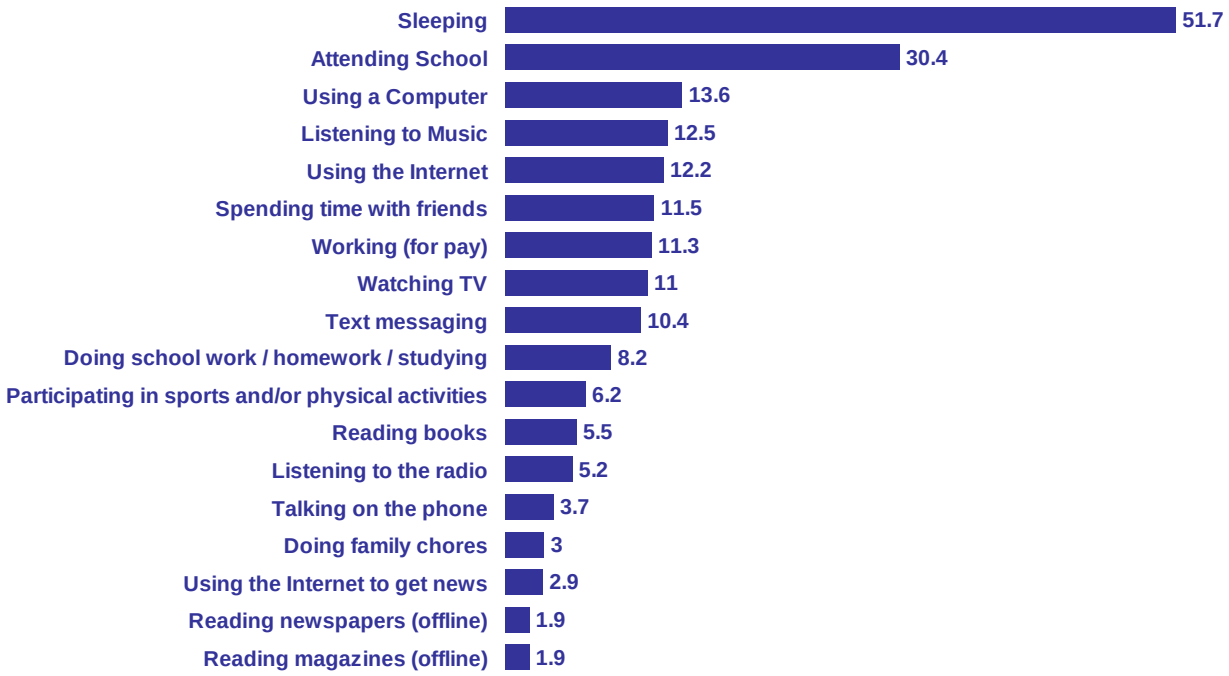
Respondents were asked to estimate the number of hours they spent doing several different activities during a typical week. Among the tested activities, Canadian youth spend the most time sleeping (on average 51.7 hours per week, or 7.4 hours per day) and going to school (30.4 hours per week, or about 6.1 hours per each of the five work days). Apart from the 30.4 hours spent attending school each week, Canadian youth say they spend 8.2 hours per week doing homework or studying.

Among the activities tested, Canadian youth spend a substantial amount of time using a computer (13.6 hours), using the Internet (12.2 hours) and text messaging (10.4 hours). They spend 12.5 hours per week listening to music, 11 hours watching TV and 5.2 hours listening to the radio. They spend 5.5 hours per week reading books, 2.9 hours getting news online, 1.9 hours reading newspapers offline and 1.9 hours reading magazines offline. They spend 11.5 hours with friends and 3.7 hours talking on the phone. They spend 11.3 hours working for pay and 3 hours doing family chores. They spend 6.2 hours doing physical activities.

The number of hours Canadian youth say they spend on the tested activities exceeds the total number of hours in a week (168 hours). This is likely because many of the tested activities may be done simultaneously (for example, listening to the radio while spending time with friends, or watching TV while text messaging).

Weekly activities

Please indicate the average number of hours that you spend doing each of the following activities, in a typical week.



Base: All respondents n=2,605

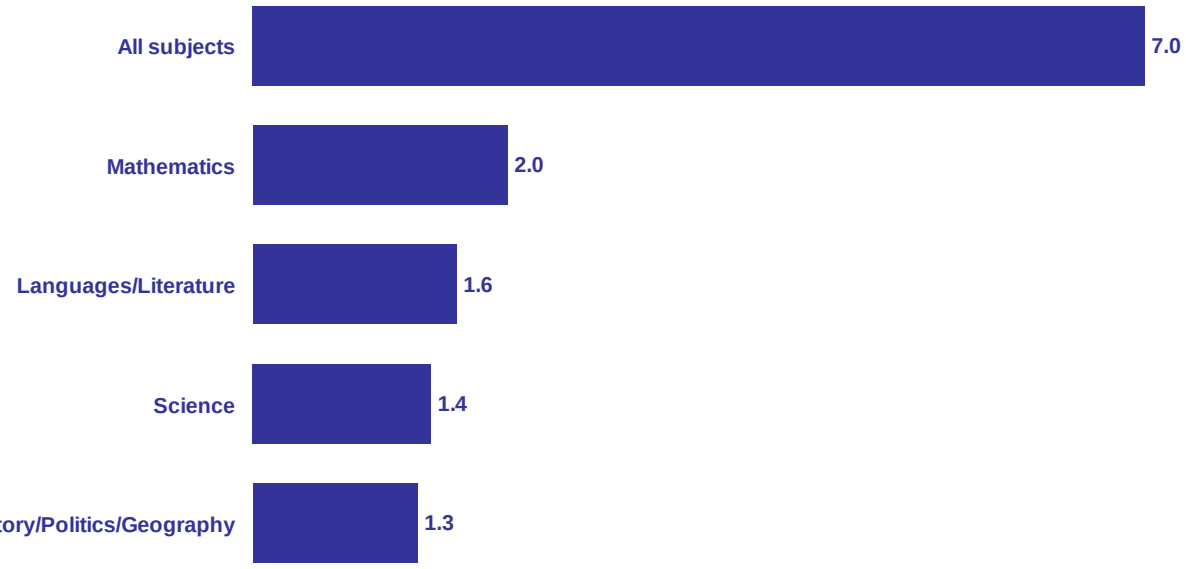
Time spent weekly on homework

When asked how many hours they spend per week doing homework in several different subject areas, Canadian youth say they spend the most time doing homework for mathematics (2.0 hours per week), followed by homework for languages or literature courses (1.6 hours), science courses (1.4 hours), and homework for history, politics and geography courses (1.3 hours). The total number of hours they say they spend on homework for all courses is 7.0 hours.[17]

Time spent weekly on homework

In total, about how many hours, if any, do you spend on homework in the following subjects each week?

(Mean number of hours spent per week)



Base: All respondents n=2,605

[17] This result is somewhat less than the 8.2 hours they say they spent "doing school work, homework or studying" during a typical week when asked about a range of activities. The difference between the two results suggests there a distinction between "doing homework," as asked in this question, and other forms of study (such as preparing for an exam), which may not be specifically assigned as homework.

Those who are interested in science spend more time doing science homework than those not interested in science (1.7 hours per week versus 0.9 hours among those not interested).

Those who spend four or more hours per week doing homework in all subjects include:

- Residents of Ontario (71%), Quebec (70%) and Atlantic Canada (71%) compared to residents of Saskatchewan and Manitoba (60%), Alberta (65%) or British Columbia (65%);
- Females (76%) compared to males (61%);
- Those not born in Canada (88%) compared to those born in Canada (67%);
- Non-Caucasian (73%), and particularly East Asian respondents (86%), compared to Caucasian respondents (68%); and,
- Those with a higher household income ($70,000 or more: 72%) compared to those with a lower household income (less than $40,000: 60%);
- Those who have at least one parent with a university degree (77%) compared to those whose parents have a high school education or less (63%).

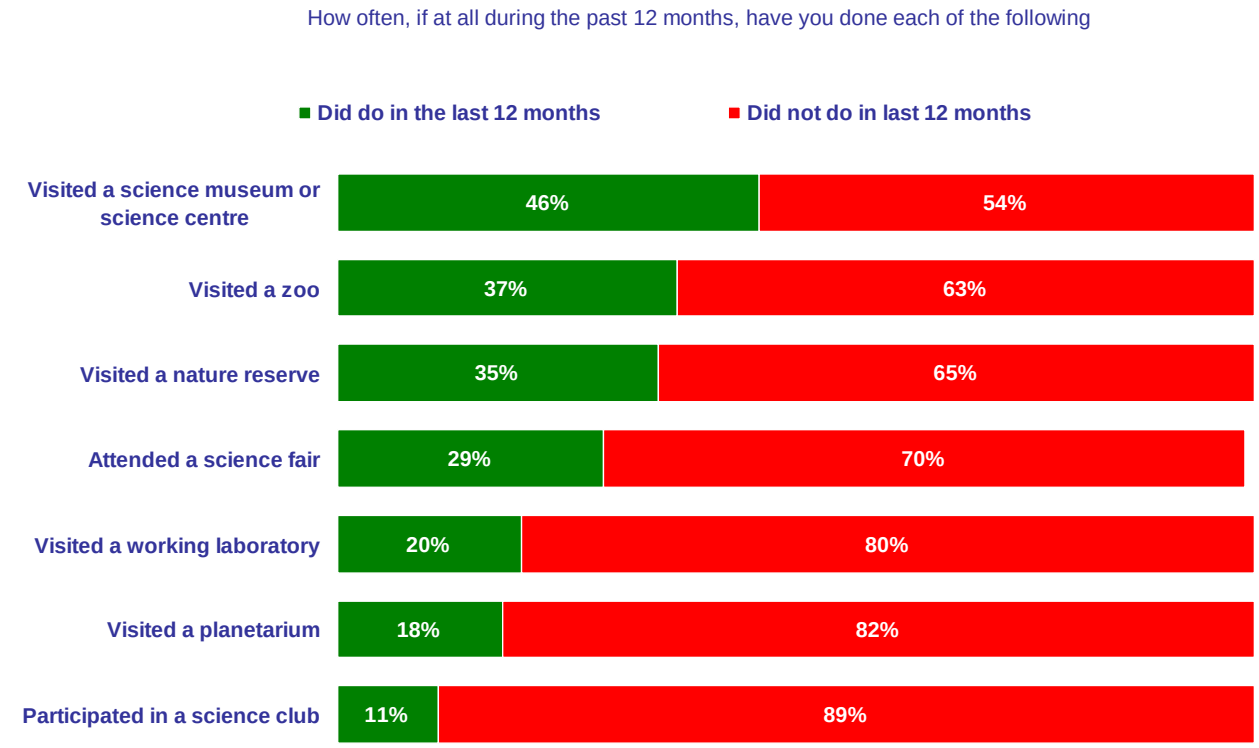
Those more likely to spend four hours or more per week doing science homework include:

- Females (12%) compared to males (7%);
- Those aged 17 or 18 (15%) compared to those aged 12 or 13 (5%);
- Those who were not born in Canada (17%) compared to those who were (9%);
- Non-Caucasian (12%), and particularly East Asian respondents (22%), compared to Caucasian respondents (9%); and,
- Those with at least one university-educated parent (14%) compared to those whose parents have no more than high school education (7%).

Exposure to science outside of school

Respondents were asked whether or not they had participated in several extracurricular activities related to science in the past 12 months. Among the activities tested, respondents most often say they had visited a science museum or science centre in the past 12 months (46%). Over one in three say they had visited a zoo (37%) or nature reserve (35%). Three in ten say they attended a science fair (29%), while about one in five say they visited a working laboratory (20%) or visited a planetarium (18%). Respondents least often say they participated in a science club (11%).

Participation in science-related activities



Base: All respondents n=2,605

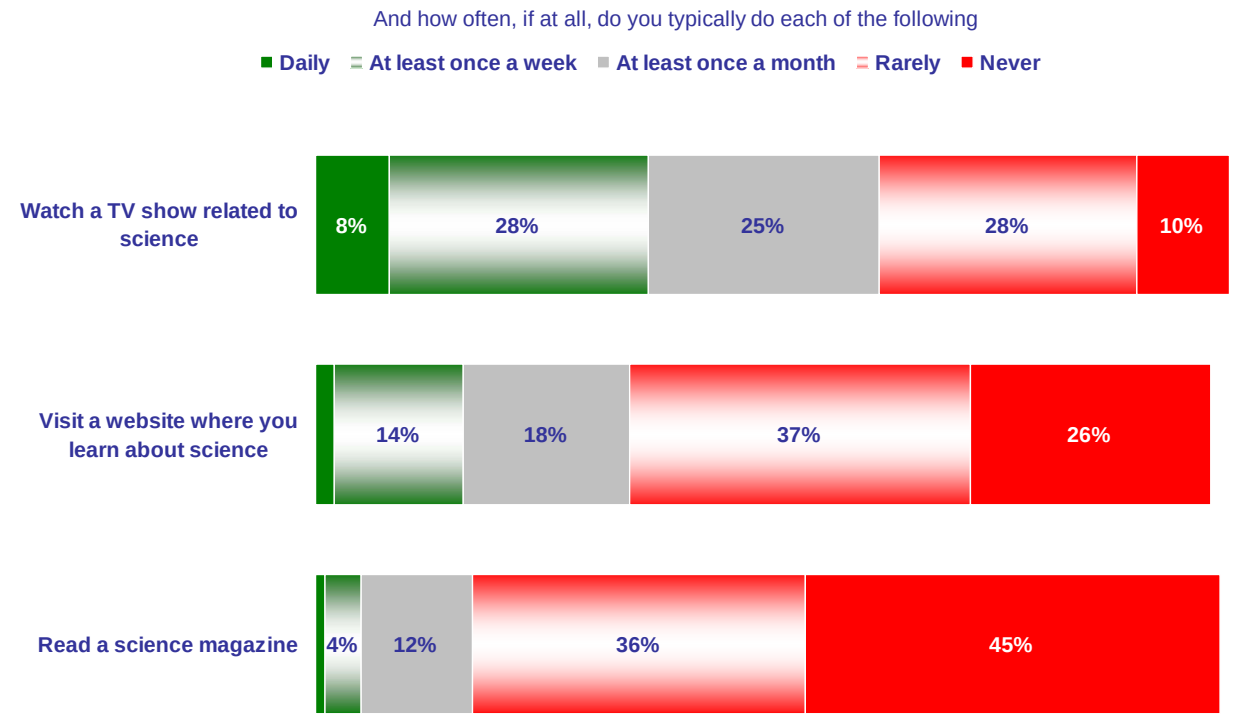
Younger respondents (12-13 years) are more likely than older respondents (17-18 years) to say they have visited a science museum, zoo, science fair or planetarium or participated in a science club in the last 12 months than are younger respondents. Females are more likely than males to say they have visited a planetarium, zoo or science fair in the past 12 months.

Those who are interested in science are more likely than those who are not interested to say they have done each of the tested extra-curricular activities related to science at least once in the past 12 months.

Use of science-related media

When asked how often they use several science-related media, a majority of respondents say they regularly watch a television show related to science (61% say they do so either daily, at least once a week or at least once a month). One in three (34%) say they regularly visit a website to learn about science. Seventeen percent say they read a science magazine regularly.

Use of science-related media



Base: All respondents n=2,605

Numbers may not total to 100% due to don't know responses.

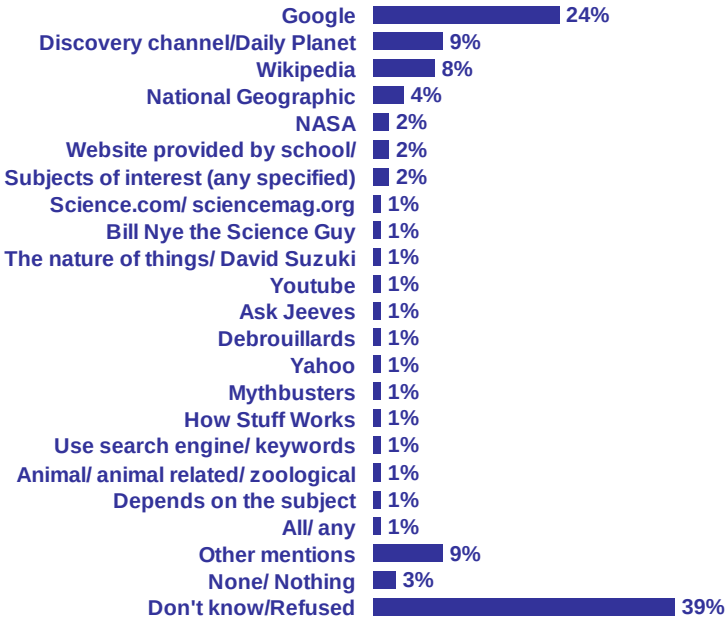
Older respondents (17-18 years) and males are more likely than younger respondents and females to say they read watch science related TV shows, visit websites to learn about science and watch television shows related to science.

Scientific Websites

When asked on an open-ended basis what website they would visit if they were to use the Internet to learn something about science, respondents most often say they would use Google (24%). The website of the Discovery Channel, also known as the Daily Planet (9%) and Wikipedia (8%) follow in a distant second and third place. The National Geographic website (4%) is the only other online destination mentioned by more than 2% of respondents. Four in ten respondents (39%) say they don't know where they would look online to learn something about science.

Preference for scientific websites

If you were to use the Internet to learn something about science, which websites would you visit? (Unprompted)



Base: All respondents n=2,605

Younger respondents (12-13 years) are somewhat more likely than older respondents (17-18 years) to say they would visit the website of the Discovery channel (11% versus 7%) or Wikipedia (11% versus 7%). Older respondents are somewhat more likely than younger respondents to say they would use Google (25% versus 20%).

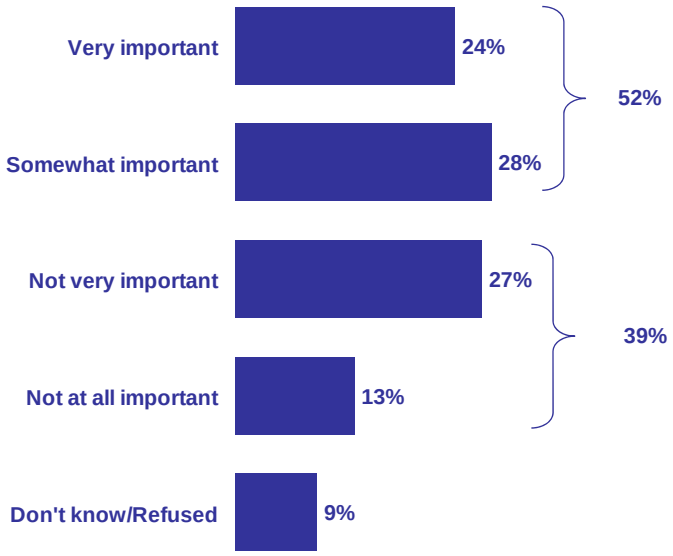
Considering science as a career

Importance of science for future career

Respondents were asked how important they think studying science will be to the career they eventually pursue.[18] Just over half (52%) think studying science will be at least somewhat important to the career they eventually pursue, while two in five (39%) say studying science will not be important to their future career. Canadian youth are much more likely to say that studying science will be very important (24%) to their future career than to think it will not be important at all (13%). One in ten (9%) don't know whether or not the study of science will be important to their future career.

Importance of science for future career

How important do you think that studying science in school will be to the career you eventually pursue?

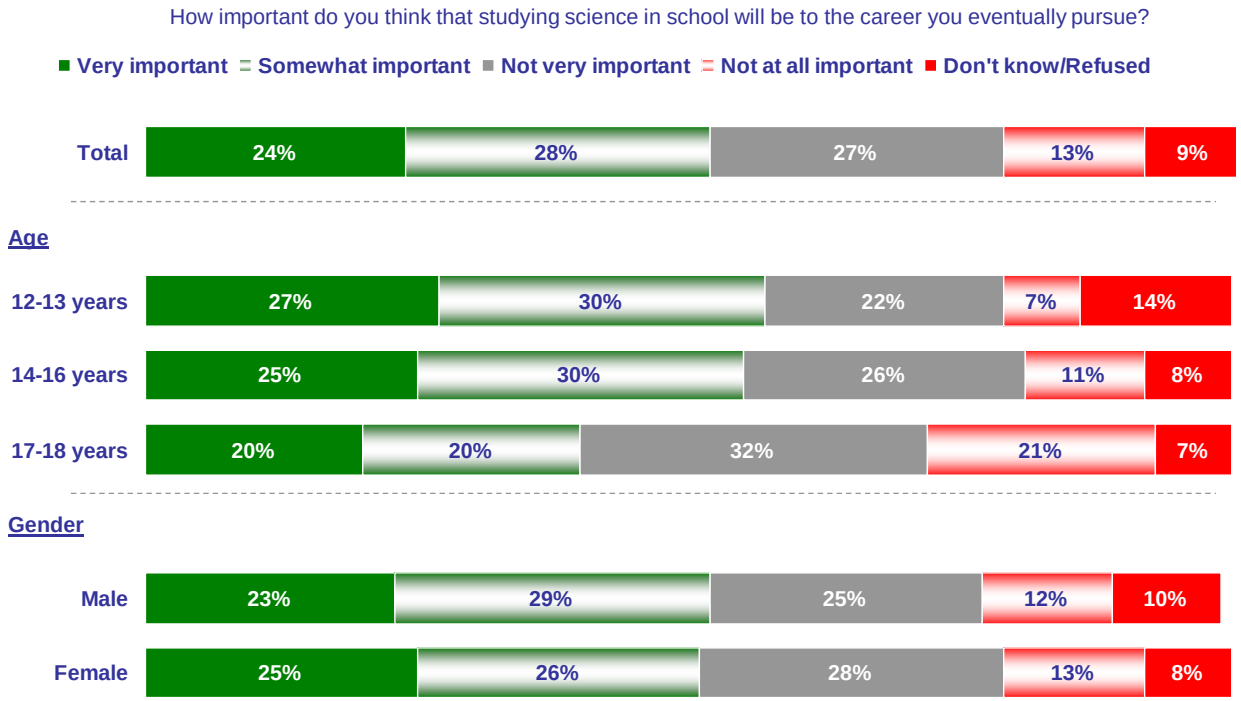


Base: All respondents n=2,605

[18] The questions in this section were asked after participants were provided several different quotes describing science.

The perception that science will be important to the career they eventually choose declines dramatically with age, from a high of 57% among those 12 to 13 years of age to 40% among those 17 to 18 years of age. The declining perception that science will be important to their future career coincides with an increase in certainty with respect to the career they will pursue (which grows from 39% among12 to 13 year olds to 56% among those 17 to 18 years of age). In other words, as respondents become more certain of what they plan to do with their lives they become less apt to view science as an important part of their plans.

Importance of science for future career by age and gender



Base: All respondents n=2,605

Numbers may not total to 100% due to don't know responses.

Males and females do not differ significantly in the perception that science will be important to the career they eventually pursue (23% of males and 25% of females say it will be *very* important) and does not greatly shift between males and females of different ages.

Among other subgroups, those more likely to consider science to be *very* important to the career they will eventually pursue include:

- Residents of the Atlantic Provinces (29%) compared to Quebec (18%);
- Those aged 12 or 13 (27%) compared to those aged 17 or 18 (20%);
- Those who were not born in Canada (36%) compared with those who were (23%);

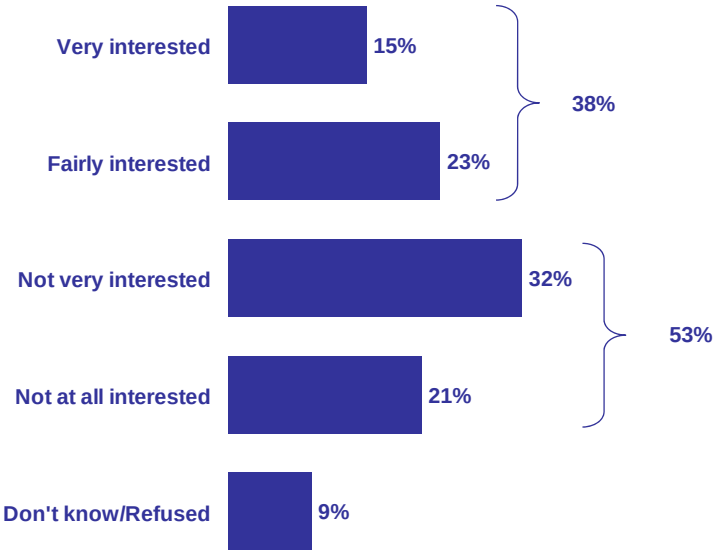
- Non-Caucasians (30%), particularly East Asians (36%), compared to Caucasians (23%);
- Those with a household income of more than $70,000 (28%) compared to those with a household income of less than $40,000 (19%); and,
- Those with at least one university-educated parent (34%) compared to those whose parents have no more than high school education (13%).

Interest in a scientific field

Despite the fact that most (52%) view science as important to the career they may eventually pursue, Canadian youth are much less apt to prefer a career in science. When asked how interested they would be in working in a scientific field, about two in five Canadian youth (38%) say they would be at least fairly interested, while the majority (53%) says they would not be interested. Those who say they are not at all interested in working in a scientific field (21%) significantly outweigh those who say they are very interested in doing so (15%). One in ten (9%) don't know whether or not they are interested in working in a scientific field in the future.

Interest in pursuing a scientific field

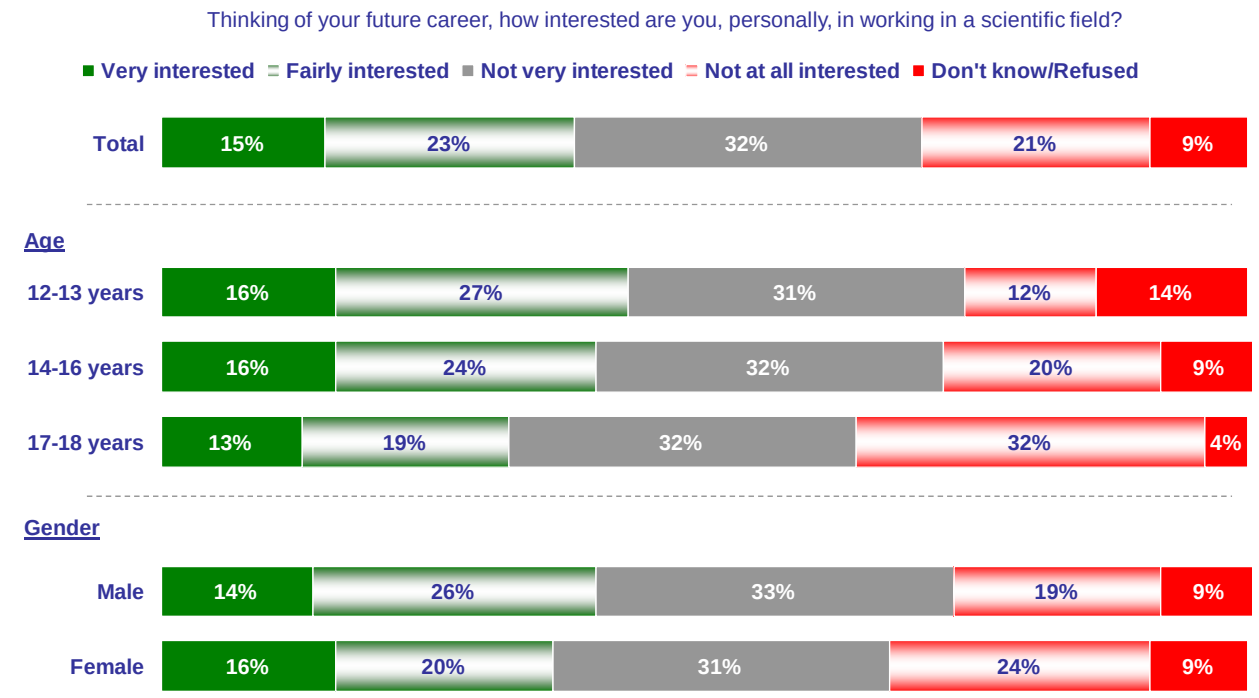
Thinking of your future career, how interested are you, personally, in working in a scientific field?



Base: All respondents n=2,605

As with the importance respondents see science playing in their career choice, interest in a scientific career also decreases significantly with age (from 38% among those 12 to 13 years of age to 29% among those 17 to 18 years of age).

Interest in a scientific career by age and gender



Base: All respondents n=2,605

Numbers may not total to 100% due to don't know responses.

Similar proportions of males (40%) and females (36%) say they would be either very or fairly interested in pursuing a scientific career. Young males (12-13 years) are much more likely than young females to express an interest in a scientific career (47% versus 38%, respectively. However, interest in a scientific career declines more sharply with age among males than among females. Among males 17 to 18 years old, 33% express interest in a scientific career (representing a decline of 14 points). Among females of the same age, 31% express interest in a scientific career (representing a decline of 7 points).

Among other demographic subgroups, those more likely to say they are interested (very or fairly) in working in a scientific field in the future include:

- Residents of the Atlantic Provinces (45%) compared to residents of Saskatchewan and Manitoba (33%) and British Columbia (34%);
- Those who were not born in Canada (52%) compared to those who were (38%);
- Non-Caucasians (43%) compared to Caucasians (38%);

- Those with a higher household income ($70,000 or more: 42%) compared to middle income ($40,000-$70,000: 35%) and lower income respondents (less than $40,000: 36%);
- Those with at least one university-educated parent (50%) compared to those whose parents have no more than high school education (28%);
- Those whose parents are very involved (46%) compared to those whose parents are least involved (30%);
- Those who say their teachers encourage hard work (43%) and take time to fully explain things (43%) compared to those who do not believe their teachers encourage hard work (27%) or take the time to fully explain things (26%); and,
- Those who say their friends (48%), mother (45%), father (44%) and siblings (46%) are interested in science.

Reasons for interest or disinterest in a scientific field

The 38% of respondents who say they are very or fairly interested in pursuing a scientific career were asked why. On this basis, one in five (22%) say that science is a pre-requisite to the career they hope to pursue. Fourteen percent say that while the study of science may interest them, what they ultimately expect to pursue as a career may differ. Thirteen percent say they are interested in pursuing a scientific field because it's fun, cool or interesting to them, while 10% say it is because they enjoy learning about the world or about how things work. Just fewer than one in ten (8%) say they have not decided what they want to do in the future.

Reasons for interest in the field of science

Why do you say that you are (very or fairly) interested in working in a scientific field?

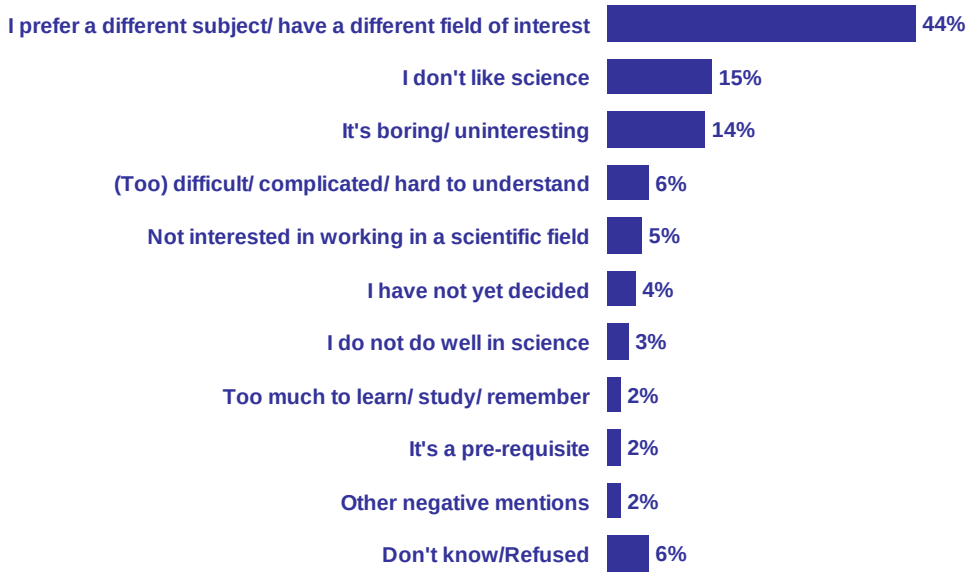
Note: Responses under 2% are not included

Base: Respondents Very/Fairly interested in working in a scientific field n=999

The 53% of respondents who are not very or not at all interested in pursuing a scientific career say it is because they prefer a subject or field of interest other than science (44%). Others say it is because they don't like science (15%) or find it to be boring or uninteresting (14%). Six percent say it is because they find science to be too difficult, complicated or hard to understand.

Reasons for disinterest in field of science

Why do you say that you are (not very or not at all) interested in working in a scientific field?



Note: Responses under 2% are not included

Base: Respondents Not very/Not at all interested in working in a scientific field n=1,374

Views on science as a good field for young people to pursue

Although only 38% of Canadian youth say they themselves are interested in a scientific career, the majority (62%) think that science would be a good field for young people to go into as a career. Just 4% say science would not be a good field to go into, while one in three (34%) say they don't know.

While interest in pursuing a scientific career declines with age, there is no similar decline in the view that science is a good field for young people to pursue. By gender, females (66%) are significantly more likely than males (57%) to say that science would be a good field to go into as a career.

Views on science as a good field for young people to pursue

Base: All respondents n=2,605

Numbers may not total to 100% due to don't know responses.

Those more likely to see science as a good field to enter include:

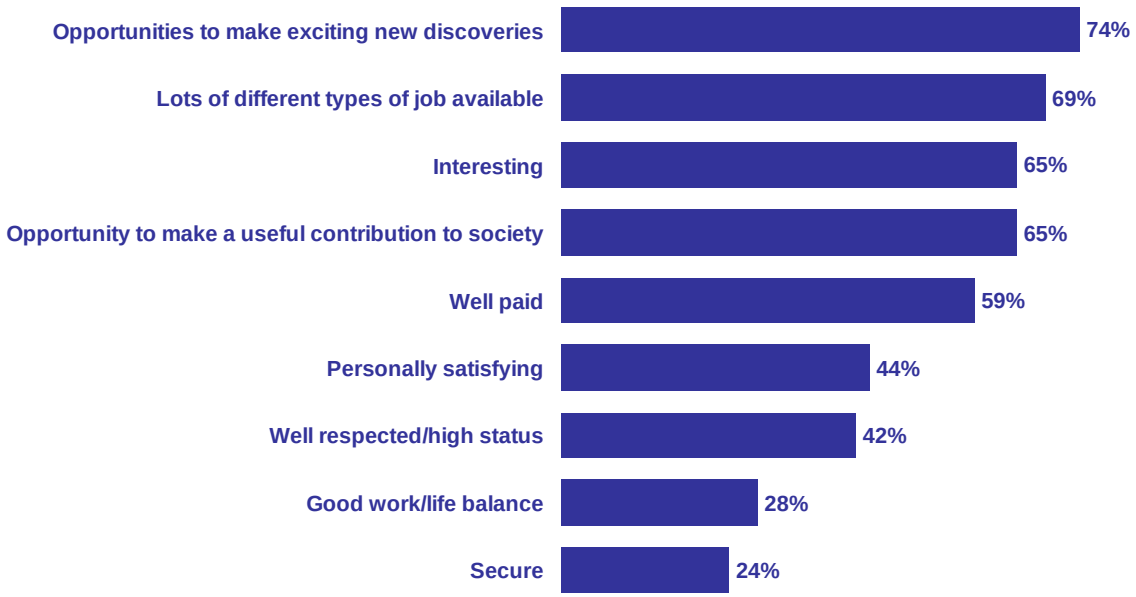
- Ontarians (67%) and Atlantic Canadians (68%) compared to residents of Quebec (53%);
- Those with higher household incomes ($70,000 or more: 67%) compared to those with lower household incomes (less than $40,000: 52%);
- Those not born in Canada (75%) compared to those born in Canada (62%);
- East Asians (74%) compared to Caucasians (62%);
- Those who have at least one parent with a university degree (72%) compared to those whose parents have no more than a high school degree (51%);
- Those who do at least four hours of science homework per week (71%) compared to those who do no science homework (48%);
- Those whose parents are very involved (67%) compared to those whose parents are least involved (56%);
- Those who say their teachers encourage hard work (66%) and take time to fully explain things (66%) compared to those who do not believe their teachers encourage hard work (50%) or take the time to fully explain things (47%); and,
- Those who say their friends (71%), mother (68%), father (68%) and siblings (69%) are interested in science.

Reasons to pursue or not to pursue a scientific career

The 62% of respondents who consider science a good field for young people to go into were asked which among several different reasons would explain why. Among the possible reasons provided these respondents most often indicate that a scientific career provides opportunities to make new discoveries (74%). About two in three selected the notions that a scientific field offers lots of different types of jobs (69%), is interesting (65%) or provides an opportunity to make a useful contribution to society (65%). About three in five opt for the reason that a scientific career is well paid (59%). Fewer than half indicate that a scientific career would be a good field to enter because it is personally satisfying (44%) or because it is a well-respected, high-status career (42%). The notions that a scientific career affords a good work-life balance (28%) or offers job security (24%) rank lowest among the list of reasons for pursuing a scientific career.

Reasons to pursue a scientific career

Which of the following, if any, do you think are reasons why science is a good field for young people to go into as a career?



Base: Respondents who think that science is a good field for young people to go into as a career n=1,606

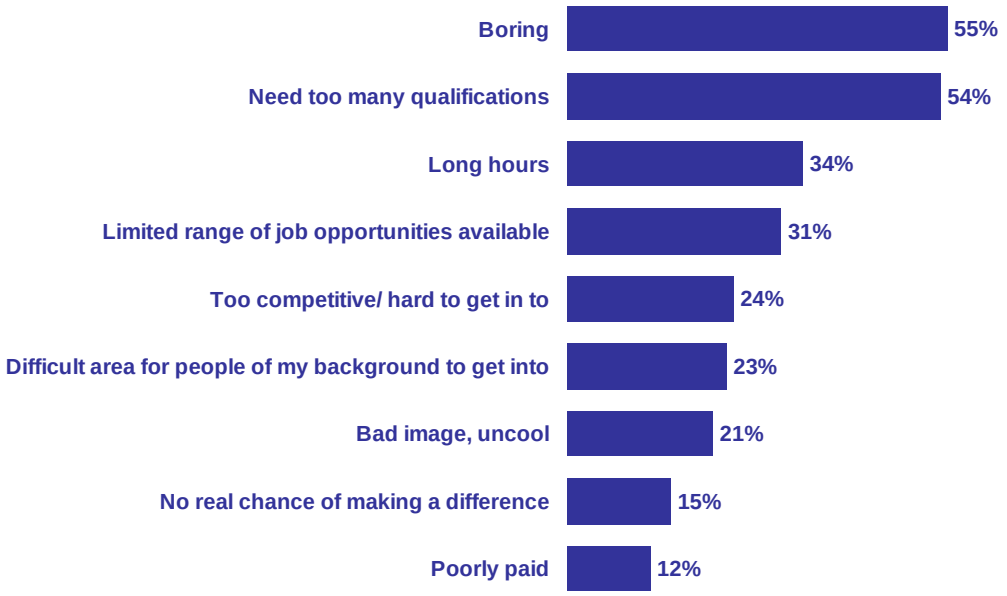
Among the demographic subgroups the following differences emerge:

- Residents of British Columbia (77%) are more likely to think of science as a good career because of the wide range of different jobs available. Quebec residents are less likely to view science as a good career because it would be interesting (50%) or personally satisfying (34%).
- Younger respondents (12-13 years) are more likely than older respondents (17-18 years) to think of science as a good career for young people because of the opportunity to make new discoveries (78% versus 72%) and because it would be interesting (69% versus 58%). Older respondents are somewhat more likely to view science as a good career for young people because there are lots of different jobs available (70% versus 65%) and because a scientific career is well respected or high status (45% versus 39%).
- Overall, males and females are similar in the reasons for viewing science as a good career. However, older males (17-18 years) are more likely than older females to say that science would be a good career choice because it is interesting (62% compared to 54%).
- Respondents from higher income households ($70,000 or more) are more likely than those from lower income households (less than $40,000) to view science as a good career choice because it is interesting (67% compared to 55%) and well respected (45% compared to 36%). Lower income respondents are more likely to think science would be a good career choice because it would offer a good work-life balance (33% compared to 26% among higher income respondents).
- Those who have at least one parent with a university education are more likely than those whose parents have no more than a high school education to think science would be a good career choice because there are lots of different jobs available (72% versus 64%), because it would be interesting (71% versus 65%), because it would be personally satisfying (49% versus 39%) and because it would be well respected or high status (46% versus 32%).
- Non-Caucasians (50%), and particularly East Asians (56%), are more likely than Caucasians (41%) to say science would be a good career for young people because it is well respected or high status.

The 4% of respondents who do not view science as a good field to enter were asked which among several reasons explains why not. Among the possible reasons provided these respondents most often indicate that science would not be a good field to enter because it is boring (55%) or because too many qualifications are required (54%). Long hours (34%) and a limited range of job opportunities (31%) are selected by at least three in ten. One in four identifies the competition or difficulty getting into a scientific career (24%) and the difficulty for someone of their background to get into a scientific field (23%) as barriers. One in five respondents do not view science as a good career because it has a bad image or is uncool (21%). Those who do not view science as a good career least often believe it is because there is no real chance to make a difference (15%) or because it is poorly paid (12%).

Reasons why not to pursue a career in science

Which of the following, if any, do you think are reasons why science is not a good field for young people to go into as a career?



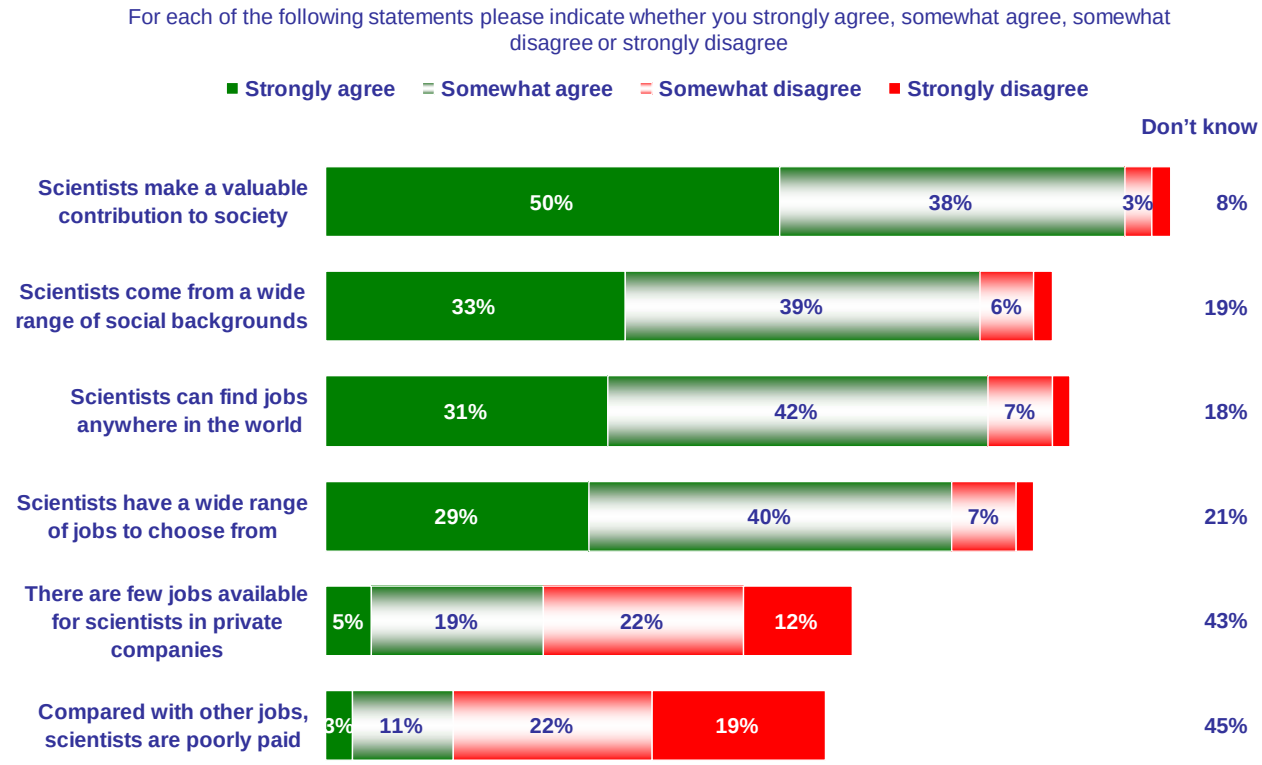
Base: Respondents who don't think that science is a good field for young people to go into as a career n=107

Perceptions regarding scientists and scientific work

Canadian youth were asked whether they agree or disagree with several statements about scientists. Among the statements tested, Canadian youth most often agree that scientists make a valuable contribution to society (88% agree, including 50% who strongly agree). Nearly three in four (72%) also agree that scientists come from a wide range of social backgrounds (only 8% disagree with this, while 19% say they don't know). A similar proportion (73%) agree that scientists can find jobs anywhere in the world (only 9% disagree, while 18% say they don't know). Nearly seven in ten (69%) agree that scientists have a wide range of jobs to choose from (again, disagreement is low at 9% while 21% say they don't know).

Respondents are more likely to disagree than agree that there are few jobs for scientists in private companies (34% disagree, 24% agree) or that scientists are poorly paid compared to other jobs (41% disagree, 14% agree). With respect to both statements, respondents most often say they don't know whether or not there are few jobs for scientists in private companies (43% don't know) or whether scientists are poorly paid compared to other jobs (45% don't know).

Perceptions regarding scientists and scientific work



Base: All respondents n=2,605

Scientific literacy

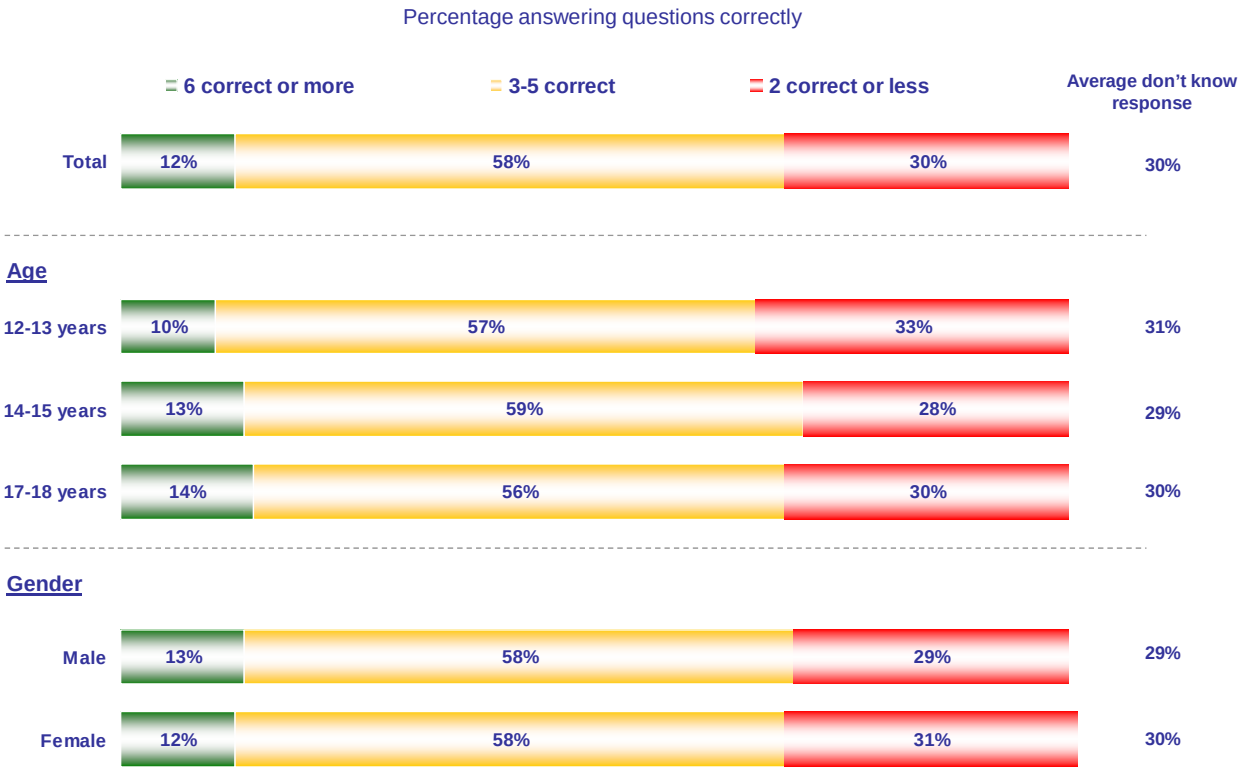
Respondents were asked a series of nine, factual, multiple choice questions about the sciences, which were selected to include questions about the physical and natural sciences and to reflect a range of difficulty.[19] Of the nine questions asked, just over one in ten (12%) were able to correctly answer six questions or more. About three in five (58%) were able to answer between three and five questions correctly. Three in ten respondents (30%) were able to correctly answer two questions or fewer.

On average, across all questions, three in ten (30%) answered don't know. Don't know responses were much higher than average with respect to two questions, both dealing with physics. Three in five (61%) said they don't know when asked about the difference between radio waves and visible light. A similar proportion, 58%, said they don't know when asked which of several terms are related to the Theory of Relativity.

The overall results do not vary greatly either by age or gender (although respondents 17-18 years of age are somewhat more likely than those 12-13 years to have answered six or more questions correctly).

[19] The questions were selected from among those included in a longer scientific literacy quiz, designed by James Trefil, a U.S. physics professor and noted author of science books intended for the general public.

Scientific literacy



Base: All respondents n=2,605

The following tables detail the responses to each of the nine scientific literacy questions asked by the overall response and by age and gender. The shaded bar indicates the correct response.

Which of the following is NOT part of the scientific method?

	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
Careful observation of nature	3%	3%	3%	2%	3%	2%
Building theories to explain what you observe	1%	1%	1%	0	1%	1%
Testing the predictions of those theories against observations	1%	1%	1%	1%	1%	1%
They are all part of the scientific method	**81%**	**78%**	**82%**	**83%**	**80%**	**82%**
Don't know/ Not sure	14%	16%	13%	14%	15%	14%

You touch the inside of a window with a wooden frame on a cold day and find that the glass feels colder than the wood. This is because…

	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
The glass is at a lower temperature	13%	15%	13%	12%	13%	13%
Wood is a poorer heat conductor than glass	**32%**	**32%**	**30%**	**34%**	**33%**	**31%**
Wood generates more heat than glass	21%	22%	21%	20%	21%	20%
None of the above	10%	9%	11%	9%	10%	10%
Don't know/ Not sure	24%	22%	25%	25%	23%	25%

The difference between radio waves and visible light is that…

	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
Radio waves have electrical fields, visible light doesn't	6%	6%	5%	6%	7%	5%
Radio waves have magnetic fields, visible light doesn't	9%	10%	9%	9%	9%	10%
Visible light has a longer wavelength than radio waves	12%	10%	13%	12%	12%	12%
Visible light has a shorter wavelength than radio waves	**12%**	**10%**	**12%**	**13%**	**13%**	**10%**
Don't know/ Not sure	61%	64%	61%	60%	60%	63%

According to the Theory of Relativity…

	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
No massive object can be accelerated past the speed of light	19%	19%	19%	21%	20%	19%
Moving clocks run slower than stationary ones	2%	2%	1%	2%	2%	1%
Moving objects are shortened in the direction of motion	5%	5%	4%	5%	5%	4%
All of the above	**16%**	**14%**	**18%**	**16%**	**15%**	**17%**
Don't know/ Not sure	58%	61%	57%	56%	57%	59%

Which of the following is a permanent feature of the Earth's surface?

	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
The Atlantic Ocean	6%	8%	6%	6%	6%	6%
The Rocky Mountains	5%	6%	5%	4%	5%	5%
The Sahara	1%	2%	1%	1%	2%	1%
No geological feature of the Earth's surface is permanent	**70%**	**67%**	**71%**	**71%**	**71%**	**69%**
Don't know/ Not sure	18%	18%	17%	19%	17%	19%

Most of the fresh water in the world is located in…

	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
The eastern United States	1%	1%	1%	0	1%	1%
Antarctica	**23%**	**22%**	**25%**	**22%**	**24%**	**22%**
The Great Lakes	46%	44%	46%	47%	45%	46%
None of the above	7%	8%	7%	8%	7%	8%
Don't know/ Not sure	23%	26%	22%	23%	22%	24%

- Respondents from Ontario are more likely to say that most of the world's fresh water is located in the Great Lakes (59% compared to 46% on average).

The most abundant animals in the world are…

	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
Mammals	20%	21%	20%	19%	19%	21%
Fish	6%	6%	6%	5%	6%	6%
Insects	**55%**	**54%**	**54%**	**56%**	**56%**	**54%**
Birds	2%	2%	3%	2%	2%	3%
Don't know/ Not sure	17%	17%	17%	18%	18%	17%

DNA…

	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
Contains the information that allows cells to run chemical reactions	**16%**	**14%**	**16%**	**19%**	**17%**	**16%**
Makes up most of the material inside a cell	16%	14%	17%	15%	17%	15%
Is almost all composed of genes	29%	29%	30%	27%	29%	29%
None of the above	9%	8%	9%	11%	9%	10%
Don't know/ Not sure	29%	35%	27%	28%	29%	30%

The earliest animals we could say are related to modern humans appeared on Earth…

	Total	Age			Gender	
		12-13	14-16	17-18	Male	Female
Thousands of years ago	15%	15%	14%	17%	14%	16%
Millions of years ago	**38%**	**37%**	**40%**	**35%**	**40%**	**36%**
Billions of years ago	18%	18%	17%	19%	18%	17%
Trillions of years ago	6%	7%	7%	5%	6%	7%
Don't know/ Not sure	23%	22%	22%	24%	22%	24%