Decreased Interest of Females in STEM fields

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Applied Quantitative and Qualitative Research- EDRS 8000

December 8, 2014

Introduction

Science, Technology, Engineering, and Mathematics (STEM) fields comprise a significant part of the American workforce. However, the United States currently has the lowest ratio of STEM to non-STEM bachelor's degrees in the world (National Science Board, 2012). The United States Department of Commerce recently did a study and found that during the beginning of the 21st century the number of employment opportunities in STEM fields had grown three times faster than any other field. They also estimate that within the next decade the United States will need an additional one million STEM professionals. With the explosion of growth in STEM fields women have more opportunities than ever to fill the growing demand of STEM related positions.

Research by Hill, C., Corbett, C. and Rose, A. (2010) found that women are significantly underrepresented in computer science and engineering academic departments and STEM fields. According to Beede, et el. (2011) America's current non-STEM related work force is approximately 48% female while the STEM field workforce is less than 24% female. Females have been shying away from STEM fields even though they earn 38% more than women in comparable non-STEM jobs. The wage gap between males and females jobs is an average of 14% less than that of non-STEM related jobs.

There are many theories that attempt to explain why this has been occurring. The theories include factors for plausible explanation of this decrease in interest and the pursuit of STEM related careers. The possible factors include; lack of female role models, gender stereotyping, the "leaky pipeline" metaphor, and the absence of a family-friendly work environment. This study is an attempt to understand why more females are not consistently seeking to pursue

STEM fields when there is evidence that proves there is a demand for their creativity, innovations, talent, and skills.

Purpose Statement

The purpose of this study is to examine why, with so much opportunity, that more females are not pursuing careers in STEM related fields.

Research Questions

1. How do females perceive STEM fields?
2. Why are females not pursuing careers in STEM fields?
3. How can we increase female interest in STEM fields?

Importance of the Study

According to Beede et al., (2011) the science, technology, engineering, and math (STEM) workforce is crucial to America's innovative capacity and global competiveness. America continually struggles to increase and improve our competitiveness in STEM fields. Females are needed to help meet the growing demands and broadening careers of STEM fields. Even though females have made tremendous gains in education and the workplace over the last 50 years they are still underrepresented in careers that are in STEM fields. The gender-gap in STEM fields needs to be bridged. The importance of females filling the gap is evident in the fact that females currently make up nearly half of the U.S. workforce, half of the college-educated workforce, and less than 25% of the STEM work force. This study will help identify factors that dissuade females from choosing careers in STEM fields. The results of this study will be available to assist educators in determining courses of action that can be taken to encourage females as they pursue careers in science, technology, engineering, and mathematics.

Definition of Terms

STEM is an acronym fairly specific in nature referring to science, technology, engineering, and math; however, there is no standard definition for what constitutes a STEM job (Beede et al., 2011).

Non-STEM refers to any occupation that is not classified in the fields of science, technology, engineering, or math.

Literature Review

The number of women earning advanced degrees in science, technology, engineering, and mathematics (STEM) has increased, yet women remain underrepresented at all ranks of academic hierarchy in these fields (Glass & Minnotte, 2010). Through the investigation of literature there are several identifiable theories that have emerged to explain why fewer females are entering STEM field careers. Among those theories are the "leaky pipeline" metaphor, gender stereotyping, and the lack of role models.

Observers have traditionally relied on the "leaky pipeline" metaphor to explain the underrepresentation of women faculty in STEM fields (Holmes & O'Connell, 2007; Leboy, 2008). Such arguments suggest that gender disparities result from a shortage in the supply of women seeking educational credentials and faculty careers in STEM fields due to cultural and structural barriers (Blickenstaff, 2005). The leaky pipeline metaphor is a way of describing students moving through the various educational stages. Students may begin their educational career interested in STEM fields and as they progress through various educational stages they are "leaking" out of the STEM field pipeline. Men, for the most part, travel smoothly from the beginning to the end of the pipeline and thus dominate STEM. The pipeline is said to be leaky because there is steady attrition of females at every level of STEM, from elementary school into

the workplace, in most industrialized countries around the world (Clark, 2005). Women's percentages in STEM decrease as they progress through the pipeline.

Warren et al. (2013) states that popular, attractive white girls do not choose calculus, physics, or other higher science and mathematics offerings in high school because they will be considered nerds by their peers. Gender stereotypes activated by either explicit reminders of a stereotype or more subtle implicit cues result in student's underperformance and low academic motivation (Stone & McWhinnie, 2008). Gender stereotype threat is a name given to a decrease in performance that occurs when in-group stereotypes are made salient. Gender stereotype threat can also come in various forms of media. The mere presence of posters or magazines in a STEM classroom or laboratory setting that are male typical can undermine women's interest and performance (Murphy, Steele, & Gross, 2007). The majority of face time on STEM related TV shows tend to be monopolized by men (Kitzinger, et al., 2008). Females in supporting roles are generally portrayed as single. These characters inadvertently steer young women away from the idea of pursuing a STEM career because they lead some girls to believe that they cannot pursue a STEM career and have a family (Whitelegg, et al., 2010, Flicker 2005). Given the pervasiveness of the stereotype that women are incapable of math and science, it is no surprise that researchers have found evidence of this stereotype at an implicit level among both boys and girls (Steffens & Jelnec, 2011).

A Congressional commission (2012) found that a greater proportion of women than men switched out of STEM majors, in part due to a lack of role models and difficulty obtaining academic guidance. Women cite a lack of role models as a significant reason for leaving the fields of physics, chemistry, electrical engineering, and computer science. (Goodman & Damour, 2011). Successful STEM role models encourage girls/women to continue academics in computer

science and related classes, despite obstacles like social pressure, math anxiety, and lack of self-confidence (Hill, C., Corbett, C. and Rose, A., 2010).

This literature review has shown that there are initiatives beginning to be organized and implemented to encourage females in the fields of STEM. The Girl Scouts have started new programs with badges geared toward STEM fields. In 2009, the President launched a campaign called *Educate to Innovate* and in 2010 *Change the Equation*. These campaigns aim to broaden participation in STEM to all Americans, including women, girls, and minorities. The steps that administration have taken is focusing on underrepresented groups, exposing girls and young women to STEM fields, setting the standard with exceptional role models, and promoting tech inclusion.

Methodology

Research design

The research design for this study will be a quantitative survey conducted at the elementary, middle, and high school levels. This will be done to determine the perspective of female students at various educational stages. The survey is designed to measure the female student's perceptions and attitudes toward STEM and STEM careers.

Participants

The targeted population will include four classes of fourth grade students. The number of participants for the study will be one hundred students. The make up of students includes one class that is considered mid to high achieving, one class that is considered high to gifted achieving, one class that is considered mid to low achieving with ELL, and one class that is considered low achieving with inclusion. The students have varied academic abilities and will be considered tier 1, tier 2, SST, 504, gifted, and those with an IEP.

The targeted population also includes one hundred middle school students and one hundred high school students with varying degrees of academic achievement.

Data Sources and Implementation Procedures

After obtaining permission from the Bartow County school superintendent, school principals and technology teachers, a letter explaining the study and permission form will be given to students willing to participate in the survey. A parent or guardian and the student will be required to sign the permission form in order for the student to participate. The student attitude toward S-STEM survey will be given during one class period to decrease the invasion of instructional time. The survey will be sent using survey monkey because all students have access to technology. The survey will give perceptions and thoughts about STEM fields from males and females for a comparison. Students in four blocks at the elementary, middle, and high school will be surveyed. Students will submit their survey anonymously through survey monkey to ensure their protection of privacy.

Instrumentation

This study will be done using a survey developed by the Friday Institute, National Science Foundation under Grant No. 1038154, the Golden LEAF Foundation, and MISO (Monitoring the Impact of STEM Outreach). The Institute gave me e-mail permission to use the instrument as is or with modifications with assurance that there would be proper credit given, appropriate use, confidentiality of all participants, and an agreement to allow them the use of data collected for additional validity and reliability analysis. There are two S-STEM surveys currently available for administration. One survey is designed for students in fourth and fifth grades and the other survey is designed for students in sixth through twelfth grades. The

Cronbach's Alpha for this survey is .85 for upper elementary school and .90 for middle and high school.

The fourth and fifth grade survey is comprised of fifty-one questions. The instrument is comprised of six sections. The six sections include math with eight questions, science with nine questions, engineering and technology with nine questions, 21st century learning with eleven questions, your future with twelve questions, and about yourself with two multi-level questions. An additional question will be added to the S-Survey for the participant to indicate gender.

The middle and high school survey is comprised of fifty-five questions. The instrument is compromised of six sections. The sections include math with eight questions, science with nine questions, engineering and technology with nine questions, 21st century learning with eleven questions, your future with twelve questions, and about yourself with six questions. An additional question will be added to the S-Survey for the participant to indicate gender.

Reliability and Validity

The reliability and validity of the STEM-Student Survey that will be used in this study was tested using exploratory factor analysis, principal axis factoring, and promax rotation. Lawshe's content validity ratio was calculated for each item of the survey. Items that contained gender bias were removed from the original instrument. The Cronbach's Alpha showed that the average was .85 in the upper elementary school S-STEM survey and .90 in middle and high school S-STEM survey. The original instrument was piloted using 109 middle and high school students. Survey takers used suggestions for improvement and engineering education experts assisted in rewriting the engineering and technology attitudes section. The original instrument was edited based on factor analysis, expert feedback, participant feedback, and literature review. The revision of the original instrument resulted in the section "your future" which measures

interest in twelve, broad, STEM career fields. Differential item functioning tests were conducted to assess the internal validity of the original survey. Results showed that measurement invariance held at all five levels.

Proposed Analysis

The researcher proposes that the data be analyzed by converting survey monkey findings into a excel spreadsheet. The researcher will summarize answers and average responses using mean, mode, median, range, frequency counts, and/ or percentages. Comparisons will be done in subgroups concentrating on the female population. Findings will be shown in a pie chart, bar chart, and line graph.

The analysis of this study will be provided to the school superintendent, school principals, and participating teachers. It will be requested that teachers share the findings with students.

References

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Appendices

Upper Elementary School Student Attitudes toward STEM (S-STEM) – 4-5th

Directions:

There are lists of statements on the following pages. Please mark your answer sheets by marking how you feel about each statement. For example:

Example 1:	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I like engineering.	○	○	○	○	○

As you read the sentence, you will know whether you agree or disagree. Fill in the circle that describes how much you agree or disagree.

Even though some statements are very similar, please answer each statement. This is not timed; work fast, but carefully.

There are no "right" or "wrong" answers! The only correct responses are those that are true for you. Whenever possible, let the things that have happened to you help you make a choice.

Please fill in on only one answer per question.

Recommended citation for this survey:

> Friday Institute for Educational Innovation (2012). *Upper Elementary School Student Attitudes toward STEM Survey*. Raleigh, NC: Author.

Math

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. Math has been my worst subject.	○	○	○	○	○
2. I would consider choosing a career that uses math.	○	○	○	○	○
3. Math is hard for me.	○	○	○	○	○
4. I am the type of student to do well in math.	○	○	○	○	○
5. I can handle most subjects well, but I cannot do a good job with math.	○	○	○	○	○
6. I am sure I could do advanced work in math.	○	○	○	○	○
7. I can get good grades in math.	○	○	○	○	○
8. I am good at math.	○	○	○	○	○

Science

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
9. I am sure of myself when I do science.	○	○	○	○	○
10. I would consider a career in science.	○	○	○	○	○
11. I expect to use science when I get out of school.	○	○	○	○	○
12. Knowing science will help me earn a living.	○	○	○	○	○
13. I will need science for my future work.	○	○	○	○	○
14. I know I can do well in science.	○	○	○	○	○
15. Science will be important to me in my life's work.	○	○	○	○	○
16. I can handle most subjects well, but I cannot do a good job with science.	○	○	○	○	○

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
17. I am sure I could do advanced work in science.	○	○	○	○	○

Engineering and Technology

Please read this paragraph before you answer the questions.

Engineers use math, science, and creativity to research and solve problems that improve everyone's life and to invent new products. There are many different types of engineering, such as chemical, electrical, computer, mechanical, civil, environmental, and biomedical. Engineers design and improve things like bridges, cars, fabrics, foods, and virtual reality amusement parks. **Technologists** implement the designs that engineers develop; they build, test, and maintain products and processes.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
18. I like to imagine creating new products.	○	○	○	○	○
19. If I learn engineering, then I can improve things that people use every day.	○	○	○	○	○
20. I am good at building and fixing things.	○	○	○	○	○
21. I am interested in what makes machines work.	○	○	○	○	○
22. Designing products or structures will be important for my future work.	○	○	○	○	○
23. I am curious about how electronics work.	○	○	○	○	○
24. I would like to use creativity and innovation in my future work.	○	○	○	○	○
25. Knowing how to use math and science together will allow me to invent useful things.	○	○	○	○	○
26. I believe I can be successful in a career in engineering.	○	○	○	○	○

21st Century Skills

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
27. I am confident I can lead others to accomplish a goal.	○	○	○	○	○
28. I am confident I can encourage others to do their best.	○	○	○	○	○
29. I am confident I can produce high quality work.	○	○	○	○	○
30. I am confident I can respect the differences of my peers.	○	○	○	○	○
31. I am confident I can help my peers.	○	○	○	○	○
32. I am confident I can include others' perspectives when making decisions.	○	○	○	○	○
33. I am confident I can make changes when things do not go as planned.	○	○	○	○	○
34. I am confident I can set my own learning goals.	○	○	○	○	○
35. I am confident I can manage my time wisely when working on my own.	○	○	○	○	○
36. When I have many assignments, I can choose which ones need to be done first.	○	○	○	○	○
37. I am confident I can work well with students from different backgrounds.	○	○	○	○	○

Your Future

Here are descriptions of subject areas that involve math, science, engineering and/or technology, and lists of jobs connected to each subject area. As you read the list below, you will know how interested you are in the subject and the jobs. Fill in the circle that relates to how interested you are.

There are no "*right*" or "*wrong*" answers. The only correct responses are those that *are true for you*.

	Not at all Interested	Not So Interested	Interested	Very Interested
1. **Physics:** is the study of basic laws governing the motion, energy, structure, and interactions of matter. This can include studying the nature of the universe. *(aviation engineer, alternative energy technician, lab technician, physicist, astronomer)*	○	○	○	○
2. **Environmental Work:** involves learning about physical and biological processes that govern nature and working to improve the environment. This includes finding and designing solutions to problems like pollution, reusing waste and recycling. *(pollution control analyst*, *environmental engineer or scientist, erosion control specialist, energy systems engineer and maintenance technician)*	○	○	○	○
3. **Biology and Zoology:** involve the study of living organisms (such as plants and animals) and the processes of life. This includes working with farm animals and in areas like nutrition and breeding. (*biological technician, biological scientist, plant breeder, crop lab technician, animal scientist, geneticist, zoologist)*	○	○	○	○
4. **Veterinary Work:** involves the science of preventing or treating disease in animals. *(veterinary assistant, veterinarian, livestock producer, animal caretaker)*	○	○	○	○
5. **Mathematics:** is the science of numbers and their operations. It involves computation, algorithms and theory used to solve problems and summarize data. *(accountant, applied mathematician, economist, financial analyst, mathematician, statistician, market researcher, stock market analyst)*	○	○	○	○

	Not at all Interested	Not So Interested	Interested	Very Interested
6. **Medicine:** involves maintaining health and preventing and treating disease. *(physician's assistant, nurse, doctor, nutritionist, emergency medical technician, physical therapist, dentist)*	○	○	○	○
7. **Earth Science:** is the study of earth, including the air, land, and ocean. *(geologist, weather forecaster, archaeologist, geoscientist)*	○	○	○	○
8. **Computer Science:** consists of the development and testing of computer systems, designing new programs and helping others to use computers. *(computer support specialist, computer programmer, computer and network technician, gaming designer, computer software engineer, information technology specialist)*	○	○	○	○
9. **Medical Science:** involves researching human disease and working to find new solutions to human health problems. *(clinical laboratory technologist, medical scientist, biomedical engineer, epidemiologist, pharmacologist)*	○	○	○	○
10. **Chemistry:** uses math and experiments to search for new chemicals, and to study the structure of matter and how it behaves. *(chemical technician, chemist, chemical engineer)*	○	○	○	○
11. **Energy:** involves the study and generation of power, such as heat or electricity. *(electrician, electrical engineer, heating, ventilation, and air conditioning (HVAC) technician, nuclear engineer, systems engineer, alternative energy systems installer or technician)*	○	○	○	○

	Not at all Interested	Not So Interested	Interested	Very Interested
12. **Engineering:** involves designing, testing, and manufacturing new products (like machines, bridges, buildings, and electronics) through the use of math, science, and computers. *(civil, industrial, agricultural, or mechanical engineers, welder, auto-mechanic, engineering technician, construction manager)*	○	○	○	○

About Yourself

1. How well do you expect to do this year in your:

	Not Very Well	OK/Pretty Well	Very Well
English/Language Arts Class?	○	○	○
Math Class?	○	○	○
Science Class?	○	○	○

2. More about you.

	Yes	No	Not Sure
Do you know any adults who work as scientists?	○	○	○
Do you know any adults who work as engineers?	○	○	○
Do you know any adults who work as mathematicians?	○	○	○
Do you know any adults who work as technologists?	○	○	○

3. More about you.

What is your gender?	Male	Female
	○	○

Middle/High School Student Attitudes toward STEM (S-STEM) – 6-12th

Directions:

There are lists of statements on the following pages. Please mark your answer sheets by marking how you feel about each statement. For example:

Example 1:	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I like engineering.	○	○	○	○	○

As you read the sentence, you will know whether you agree or disagree. Fill in the circle that describes how much you agree or disagree.

Even though some statements are very similar, please answer each statement. This is not timed; work fast, but carefully.

There are no "right" or "wrong" answers! The only correct responses are those that are true *for you*. Whenever possible, let the things that have happened to you help you make a choice.

Please fill in only one answer per question.

Recommended citation for this survey:

Friday Institute for Educational Innovation (2012). *Middle/High School Student Attitudes toward STEM Survey*. Raleigh, NC: Author.

Math

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
27. Math has been my worst subject.	○	○	○	○	○
28. I would consider choosing a career that uses math.	○	○	○	○	○
29. Math is hard for me.	○	○	○	○	○
30. I am the type of student to do well in math.	○	○	○	○	○
31. I can handle most subjects well, but I cannot do a good job with math.	○	○	○	○	○
32. I am sure I could do advanced work in math.	○	○	○	○	○
33. I can get good grades in math.	○	○	○	○	○
34. I am good at math.	○	○	○	○	○

Science

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
35. I am sure of myself when I do science.	○	○	○	○	○
36. I would consider a career in science.	○	○	○	○	○
37. I expect to use science when I get out of school.	○	○	○	○	○
38. Knowing science will help me earn a living.	○	○	○	○	○
39. I will need science for my future work.	○	○	○	○	○
40. I know I can do well in science.	○	○	○	○	○
41. Science will be important to me in my life's work.	○	○	○	○	○
42. I can handle most subjects well, but I cannot do a good job with science.	○	○	○	○	○

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
43. I am sure I could do advanced work in science.	○	○	○	○	○

Engineering and Technology

Please read this paragraph before you answer the questions.

Engineers use math, science, and creativity to research and solve problems that improve everyone's life and to invent new products. There are many different types of engineering, such as chemical, electrical, computer, mechanical, civil, environmental, and biomedical. Engineers design and improve things like bridges, cars, fabrics, foods, and virtual reality amusement parks. **Technologists** implement the designs that engineers develop; they build, test, and maintain products and processes.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
44. I like to imagine creating new products.	○	○	○	○	○
45. If I learn engineering, then I can improve things that people use every day.	○	○	○	○	○
46. I am good at building and fixing things.	○	○	○	○	○
47. I am interested in what makes machines work.	○	○	○	○	○
48. Designing products or structures will be important for my future work.	○	○	○	○	○
49. I am curious about how electronics work.	○	○	○	○	○
50. I would like to use creativity and innovation in my future work.	○	○	○	○	○
51. Knowing how to use math and science together will allow me to invent useful things.	○	○	○	○	○
52. I believe I can be successful in a career in engineering.	○	○	○	○	○

21st Century Skills

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
38. I am confident I can lead others to accomplish a goal.	○	○	○	○	○
39. I am confident I can encourage others to do their best.	○	○	○	○	○
40. I am confident I can produce high quality work.	○	○	○	○	○
41. I am confident I can respect the differences of my peers.	○	○	○	○	○
42. I am confident I can help my peers.	○	○	○	○	○
43. I am confident I can include others' perspectives when making decisions.	○	○	○	○	○
44. I am confident I can make changes when things do not go as planned.	○	○	○	○	○
45. I am confident I can set my own learning goals.	○	○	○	○	○
46. I am confident I can manage my time wisely when working on my own.	○	○	○	○	○
47. When I have many assignments, I can choose which ones need to be done first.	○	○	○	○	○
48. I am confident I can work well with students from different backgrounds.	○	○	○	○	○

Your Future

Here are descriptions of subject areas that involve math, science, engineering and/or technology, and lists of jobs connected to each subject area. As you read the list below, you will know how interested you are in the subject and the jobs. Fill in the circle that relates to how interested you are.

There are no "*right*" or "*wrong*" answers. The only correct responses are those that *are true for you*.

	Not at all Interested	Not So Interested	Interested	Very Interested
1. **Physics:** is the study of basic laws governing the motion, energy, structure, and interactions of matter. This can include studying the nature of the universe. *(aviation engineer, alternative energy technician, lab technician, physicist, astronomer)*	○	○	○	○
2. **Environmental Work:** involves learning about physical and biological processes that govern nature and working to improve the environment. This includes finding and designing solutions to problems like pollution, reusing waste and recycling. *(pollution control analyst*, *environmental engineer or scientist, erosion control specialist, energy systems engineer and maintenance technician)*	○	○	○	○
3. **Biology and Zoology:** involve the study of living organisms (such as plants and animals) and the processes of life. This includes working with farm animals and in areas like nutrition and breeding. (*biological technician, biological scientist, plant breeder, crop lab technician, animal scientist, geneticist, zoologist)*	○	○	○	○
4. **Veterinary Work:** involves the science of preventing or treating disease in animals. *(veterinary assistant, veterinarian, livestock producer, animal caretaker)*	○	○	○	○
5. **Mathematics:** is the science of numbers and their operations. It involves computation, algorithms and theory used to solve problems and summarize data. *(accountant, applied mathematician, economist, financial analyst, mathematician, statistician, market researcher, stock market analyst)*	○	○	○	○

	Not at all Interested	Not So Interested	Interested	Very Interested
6. **Medicine:** involves maintaining health and preventing and treating disease. *(physician's assistant, nurse, doctor, nutritionist, emergency medical technician, physical therapist, dentist)*	○	○	○	○
7. **Earth Science:** is the study of earth, including the air, land, and ocean. *(geologist, weather forecaster, archaeologist, geoscientist)*	○	○	○	○
8. **Computer Science:** consists of the development and testing of computer systems, designing new programs and helping others to use computers. *(computer support specialist, computer programmer, computer and network technician, gaming designer, computer software engineer, information technology specialist)*	○	○	○	○
9. **Medical Science:** involves researching human disease and working to find new solutions to human health problems. *(clinical laboratory technologist, medical scientist, biomedical engineer, epidemiologist, pharmacologist)*	○	○	○	○
10. **Chemistry:** uses math and experiments to search for new chemicals, and to study the structure of matter and how it behaves. *(chemical technician, chemist, chemical engineer)*	○	○	○	○
11. **Energy:** involves the study and generation of power, such as heat or electricity. *(electrician, electrical engineer, heating, ventilation, and air conditioning (HVAC) technician, nuclear engineer, systems engineer, alternative energy systems installer or technician)*	○	○	○	○

	Not at all Interested	Not So Interested	Interested	Very Interested
12. **Engineering:** involves designing, testing, and manufacturing new products (like machines, bridges, buildings, and electronics) through the use of math, science, and computers. *(civil, industrial, agricultural, or mechanical engineers, welder, auto-mechanic, engineering technician, construction manager)*	○	○	○	○

About Yourself

1. How well do you expect to do this year in your:

	Not Very Well	OK/Pretty Well	Very Well
English/Language Arts Class?	○	○	○
Math Class?	○	○	○
Science Class?	○	○	○

2. In the future, do you plan to take advanced classes in:

	Yes	No	Not Sure
Mathematics?	○	○	○
Science?	○	○	○

3. Do you plan to go to college?
- ❍ Yes
- ❍ No
- ❍ Not Sure

4. More about you.

	Yes	No	Not Sure
Do you know any adults who work as scientists?	○	○	○
Do you know any adults who work as engineers?	○	○	○
Do you know any adults who work as mathematicians?	○	○	○
Do you know any adults who work as technologists?	○	○	○

4. More about you.

What is your gender?	Male	Female
	○	○