

Are You Destined for Mathematical Greatness?

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The Philadelphia High School for Girls

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Overview

Tolstoy teaches us that it is the activity of all the people that causes the movement of a nation. I am hoping that my students will see themselves as a part of a crusade to forward mathematics and science. In this curriculum unit, students will focus on biographies of mathematicians and scientists beginning with graduates of The Philadelphia High School for Girls (see End Notes for school history) and from there, take a deeper look at peers who excel at mathematics and science.

To begin their investigation into Girls' High history, the students will watch *The Top Secret Rosies*, a documentary about women who were called upon to become human computers to create ballistics tables, and who eventually became the first programmers of ENIAC, the world's first general purpose computer, during World War II. This story of was overlooked for many years! The students will also consider the biographies of other women have risen to the top of their fields in mathematics and science after graduating from Girls' High. Dorothy Kapenstein, a former librarian and the longtime archivist for The Philadelphia High School for Girls, will provide us with a list of alumnae.

After investigating the biographies of Girls' High graduates, the students will turn their attention to their own generation and find a current student who excels at math. Each year, the school inducts sophomores, juniors and seniors into Girls' High chapter of Mu Alpha Theta, a national high school, and junior and community college honor society. The students can choose one of these girls already identified as honor math students, or they can choose someone in their own math class. The task will be to interview the

successful math students and see what characteristics, skills and habits these girls possess.

The project concludes with a self-reflection on each student's experience and learning during the process. The hope is that most students, who will probably not go on to become famous mathematicians, are inspired to set high goals for themselves in math and science classes and use what they learned in the unit to be inspired and capable of success in the STEM fields. Even if the only thing learned is a new strategy for completing homework or getting math questions answered or studying for a test, the unit will be a success!

Rationale

For years, there has been conversation about a bias against girls in mathematics classrooms and careers. Author Claire Cain Miller writes in *The Upshot*, an online news and data visualization portal on the *New York Times'* website, about a study done by Victor Lay and Edith Sand published in *The National Bureau of Economic Research*. She states, "the most important finding in the paper is that a biasing teacher affects the work choices students make and whether to study math and science years later." The researchers reason that encouragement given to girls during elementary school could increase their confidence and decrease the gender gap. In his web article for *Science*, John Bohannon says that not only do both male and female teachers call on girls in math class less frequently than boys, but they are hired less frequently for math related jobs by both male and female employers.

Many girls enter high school feeling as if they are inadequate in mathematics. I have 30 years experience teaching mathematics in coed classrooms and have seen many young women adopt various behaviors in math class. Some girls don't answer questions because they don't want to get an answer wrong and some girls don't answer questions because they don't want to get it right! Finding a female student who excels in math is not always an easy task in a coeducational high school.

As a relatively new teacher at The Philadelphia High School for Girls, I was inspired by the behavior of girls in single-sex classrooms. For obvious reasons, they cannot experience gender bias at this stage of their education. Girls are willing to make mistakes in front of their peers, which is one of the most important competencies in learning mathematics. If a student waits to answer until she knows she is right, there will be holes in her content knowledge. I am happy to report that my girls are supportive of each other, giving positive reinforcement to those who get answers right and support to those who get answers wrong. What a head start to excelling in mathematics and choosing math or science as a college major when the classroom is a fertile environment for learning. It's no wonder that so many graduates of Girls' High went on to pursue STEM careers even before the term STEM existed!

A discussion of mathematics education these days must reference the new Common Core State Standards for Mathematics. These standards were developed to allow students to develop an understanding and appreciation of mathematics and not just rote procedures to solve problems. The Common Core State Standards recommend attention and use of the 8 Mathematical Practices. The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years.

As a student in the class “Biography as History or Perhaps History as Biography,” I was drawn in to the individuals we studied, as much by their day-to-day lives as by their accomplishments. Given the opportunity to interview alumnae and ask about their lives and their accomplishments and careers will enable students to see their future selves in STEM careers and the path to get there.

Through the completion of this unit, I hope to be able to provide the students with ample opportunities to see the value math has had in women’s lives and how valuable these women are to the world!

Objectives

This unit is intended for high school students in math or science classes. This unit could fit anywhere in the school year and could also be done as two separate projects: Part 1 and Part 2. I would recommend that the student interviews take place after the first report card, so the teacher can identify successful math students.

The Objectives of the unit will include the following:

- Students will watch *The Top Secret Rosies* and identify the Rosies from Girls’ High and the contributions made by women at a time when few women had professions in mathematics.
- Student teams will investigate the biography and accomplishments of selected graduates of The Philadelphia High School for Girls who have or have had math and science careers.
- Students will develop their interviewing skills.
- Students will practice their interview skills by watching a video of Oprah Winfrey interviewing Michael Jackson and at selected moments stop the video and write their own follow-up question.
- Students will read an article on Terry Gross and listen to select passages of interviews as examples of how she crafts questions.
- Student teams will interview Girls’ High alumnae.

- Students or student teams will interview a person they see as an excellent math student. They will report on the student's characteristics, study methods and habits and how they get their math questions answered.
- Students will complete a self-reflection questionnaire on the project.

Strategies

- Developing and practicing interview skills.
- Taking an oral history.
- Using Story Corp app to record interview.
- Jig-sawing alumnae biographies so students or student teams do only one or two interviews and then share with class.
- Completing a self-reflection exercise once curriculum unit is complete.

Classroom Activities

Lesson 1 "The Top Secret Rosies"

Learning Objective: At the end of this lesson, students will be able to explain how WWII opened the door for women in the workforce, specifically in the field of mathematics and explain the significance of the human computing they did.

Materials:

- DVD "The Top Secret Rosies" (60 mins.)
- Discussion Questions (appendix)

Procedures:

1. Before beginning the documentary, make sure students are familiar with the term Rosie the Riveter. This could be a pre-viewing homework assignment or a Do Now.
2. Watch the documentary "The Top Secret Rosies". The questions could be answered by students as they watch the movie, or discussed as they watch, stopping at various points, or discussed after watching. Because the video is 60 minutes long, this may have to be done over 2 days.

Lesson 2 Select an alumna to interview

Learning Objective: At the end of this lesson, students will have selected a graduate of their high school who has had or is in a career in math and/or science.

Materials:

- List of alumni who have careers in math and/or science with whom you have arranged interviews (perhaps you can get assistance from your principal, your counselor(s), career day coordinator and alumni association in creating the list).

Procedures:

1. Create teams of 2-4 students. This list can be based on interest in the careers or the alumna, teacher selected, or student selected.
2. Each team will receive the name of an alumna.
3. The student team will investigate/research the career (education needed, job description, etc.)
4. The student team will investigate/research the alumna (year of high school graduation, college attended, etc.) if possible (perhaps LinkedIn or archives.) Once basic timeline information is gathered, students should also investigate current events of the time period in order to use that information to make connections to develop interview questions.

Lesson 3 Developing interview skills – Follow-up Questions

Learning Objective: At the end of this lesson, students will be able to ask follow up questions that demonstrate listening and critical thinking skills.

Materials:

- YouTube video of Oprah Winfrey’s interview of Michael Jackson. (link provided in bibliography.)
- Teacher direction sheet. (appendix)
- Interviewing and Health History (optional)
- Questions for student interviews

Procedures:

1. Teach students the techniques of skilled interviewing. (included in teacher direction sheet)
2. Watch Oprah’s video, listening to her questions, stopping the video, asking the students what follow up questions they would ask, then watching the video to see how Oprah continues and what technique of skilled interviewing she has used.
3. Students practice asking follow questions by interviewing each other and asking follow-up questions. In a group of 4, student A will interview student B (with one or two of questions listed below or of their own design that are not too personal) and depending on student B’s answers, A will ask follow-up questions and demonstrate at least 1 technique of skilled interview. Students C and D will observe and give feedback. The roles will rotate until each team member has had an opportunity to interview and ask follow-up questions.

- a. What is your favorite book?
- b. What is your favorite movie?
- c. What is your favorite subject in school?
- d. Who is your hero?
- e. What inspires you?
- f. What are your hobbies?

Lesson 4 Developing Interview Skills – Writing Questions

Learning Objective: At the end of this lesson, students will be able to use research and critical thinking skills to write interview questions.

Materials:

- New York Times article “Terry Gross and the Art of Opening Up”
- Excerpts from New York times article “Terry Gross and the Art of Opening Up” (appendix)
- podcast of Fresh Air, December 29, 2011 Terry Gross interview with Maurice Sendak (appendix)
- background information on a person of interest (principal, teacher, current music or movie star, etc.)

Procedures:

1. Assign article or excerpts from the NY Times Magazine article “Terry Gross and the Art of Opening Up”
2. Discuss how good interview questions are crafted or woven by putting together two facts about a person’s biography and putting them together to ask if those things are connected.
3. Listen to (2:29 – 9:14) (or read highlighted portion from the transcript) excerpts of Terry Gross’s interview with Maurice Sendak (author of *Where the Wild Things Are*). Ask students to notice how Terry makes connections of Maurice’s life to characters in his book. She even asks if one portion is connected to the Holocaust!
4. Give students background information about a selected person of interest. Have them investigate the current events of that person’s “youth” and develop interview questions that consider and connect influences. As teams craft these questions, other teams will evaluate if they are appropriate or inappropriate (insightful, too personal, etc.)

Lesson 5 Writing Interview Questions for Students' Alumna

Learning Objectives: At the end of this lesson, student teams will have a list of interview questions to ask their alumna.

Materials:

- Suggested interview questions (appendix)
- background data on each alumna (gathered in Lesson 2)
- Story Corp App (optional)

Procedures:

1. Make sure student teams have some basic information about their alumna and have researched current events of the alumna's youth (Lesson 1).
2. Review suggested interview questions with teams, instructing them to mix a series of fact collecting and personal questions to make a list of at least 10 questions. Reference what they've learned in Lessons 3 and 4.
3. Students' in teams evaluate other teams' questions. This could also be done as a whole class exercise.
4. Teacher evaluates student teams' questions. (This could be done as part of step 3.)

Lesson 6 Interviewing Alumna

Lesson Objectives: At the end of this lesson, the student teams will have recorded (video and/or audio) or transcribed an interview with an alumna who has or who had a career in a STEM field.

Materials:

- Alumna
- Interview schedule
- Parental Permission (if applicable for offsite interviews – check with school administration)
- Interview recording devices (StoryCorp app, recording equipment, transcriber, etc.)
- Thank you gifts or notes for alumna

Procedures:

1. Arrange an interview schedule for each student team and their alumna. This will vary depending on logistical restrictions. You may need to travel or use Skype if alumna is unable to come to school. Perhaps students could attend an alumni event.
2. Establish roles for team members during the interview process. Roles could include: interviewer, recorder, director, technician, writer, editor, etc. These roles

- could be rotating and simultaneous. If roles are rotating, a director or supervisor will be necessary to maintain fairness and order.
3. Supervise or arrange for supervision of interviews. Perhaps the librarian(s), counselor(s) or other school personnel could assist.
 4. Student teams conduct interviews.
 5. Student teams record interviews by transcribing, video recording, and audio recording.
 6. Student teams edit interview and prepare interview for preservation with a transcription, video or audio recording.
 7. Student teams share alumnae interviews with each other so entire class gets to hear all of the interviews.
 8. Share alumnae interviews by creating booklet, newsletter, bulletin board, video, etc. This could be more permanently preserved with the alumni association or the library.

Lesson 7 Interviewing a Good Math Student

Learning Objectives: At the end of this lesson, student teams will have recorded or transcribed an interview with a fellow high school student who is doing well in math class.

Materials:

- List of upper class students who are doing well in math (this can be compiled by math teachers, honor roll list or honor societies)
- Interview schedule
- Interview questions (appendix)
- Parental Permission (if necessary)
- Interview recording devices (StoryCorp app, recording equipment, transcriber, etc.)
- Thank you gifts or notes for interviewees

Procedures:

1. Arrange an interview schedule for each student team and their upperclassman. This will vary depending on logistical restrictions. You will need cooperation from other the upperclassman and their teachers.
2. Establish roles for team members during the interview process. Roles could include: interviewer, recorder, director, technician, writer, editor, etc. These roles could be rotating and simultaneous. If roles are rotating, a director or supervisor will be necessary to maintain fairness and order.
3. Student teams create a list of at least 10 interview questions from those mandatory, suggested and those they create themselves
4. Review student teams' interview questions.

5. Supervise or arrange for supervision of interviews. Perhaps the librarian(s), math teacher(s), counselor(s) or other school personnel could assist.
6. Student teams conduct interviews.
7. Student teams record interviews by transcribing, video recording, and audio recording.
8. Student teams edit interview and prepare interview for preservation with a transcription, video or audio recording.
9. Share student interviews with class and others by creating booklet, newsletter, bulletin board, video, etc.

Lesson 8 Self-Reflection

Learning Objectives: At the end of this lesson, students will reflect on the project: what they learned, how this will influence their math studies, their career choices and their future.

Materials:

- Self-reflection questions (appendix)
- Teacher guidelines for student self-reflection
- Grading rubric for student self-reflection

Procedures:

1. Direct students to answer student reflection questions. This could vary in the number of questions answered, the format of the answers and the body that answers (team and/or individual).
2. Teacher grades self-reflection as its own entity, or a portion of the project grade.
3. Teacher does his/her own reflection and evaluation of project.

Endnotes

- The Philadelphia High School for Girls is a public college-preparatory school for academically talented young women. The school's mission is to provide learning experiences in a safe, nurturing environment to prepare students for success in college and leadership in their chosen fields. Established in 1848, The Philadelphia High School for Girls was one of the first public schools for women. Notable alumnae include Gloria Rachel Allred (class of 1958), an American civil rights lawyer, Constance Elaine Clayton (class of 1951), Superintendent of Schools in Philadelphia from 1982 to August 1993, the first woman and first African American to hold the position, Barbara Clementine Harris (class of 1948), the first woman ordained a bishop in the Anglican Communion. The school's motto is *Vincit qui se vincit* (she conquers who conquers herself).

- This unit is intended as one project. It can also be done in two parts, in which case the self-reflection questions should be done at the end of each interview process.
- As noted, I teach in an all-girls school. My intended audience and focus are females, but this can be tweaked to include males as well.
- Another focus of this unit is careers in STEM fields. This focus could also be changed to reflect any career field for outstanding alumni and the legacy of any high school.
- I did not include a grading rubric for the project. This is really an individual teacher choice. Because it will take significant class time, it should count for a grade.
- Feel free to share your ideas and observations with me ☺! Thank you!

Annotated Bibliography/Works Cited/Resources

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<http://www.nextgenscience.org/>

Cain Miller, Claire. "How Elementary School Teachers' Biases Can Discourage Girls From Math and Science." *The Upshot-The New York Times*, 07 Feb. 2015. Web. 07 June 2016

Bohannon, John. "Both Genders Think Women Are Bad at Basic Math" Science AAAS Latest News, 10 March 2015. Web. 07 June 2016.

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Top Secret Rosies The Female Computers of World War II. Dir. LeAnn Erickson. PBS, 2010. DVD.

Paulita Jackson. "Michael Jackson Oprah Winfrey Interview FULL." *YouTube*. YouTube, 30 Nov. 2013. Web. 01 Aug. 2016. <<https://www.youtube.com/watch?v=BbItFJJPPmA>>.

Burton, Susan. "Terry Gross and the Art of Opening Up." *The New York Times*. The New York Times, 24 Oct. 2015. Web. 01 Aug. 2016.
 <http://www.nytimes.com/2015/10/25/magazine/terry-gross-and-the-art-of-opening-up.html?_r=0>.

"Maurice Sendak: On Life, Death And Children's Lit." *NPR*. NPR, n.d. Web. 01 Aug. 2016. <<http://www.npr.org/2011/12/29/144077273/maurice-sendak-on-life-death-and-childrens-lit>>.

Resources for Teachers

<https://storycorps.me/> Instructions for downloading the StoryCorp app to a computer or smart phone. This is an excellent device to assist students in the interview process, it suggests questions or allows you to write your own and takes you through the entire interview process including recording. After recording the interview the user has an option to keep it local on their device or to upload it to the StoryCorps.me platform.

<http://www.digitaltrends.com/computing/how-to-record-a-skype-call-on-your-pc-or-mac/> This website gives directions to record a Skype call in case you are using that as an interview platform.

<https://www.youtube.com/watch?v=-FQWpfZIPT8> "Women are as capable mathematically as men, so why aren't there more women in mathematical research? Are female mathematicians as ambitious as men? Are the accomplishments of female mathematicians as recognized as those of men? Dr. Lynne Walling (Reader and Head of Pure Mathematics at University of Bristol) explores these questions in her talk "Women and Men: Ambition in an ambivalent society" at the School of Mathematical Sciences, The University of Nottingham. She also discusses barriers and discouragement women in mathematics often face, and strategies women might employ."

<http://www.upworthy.com/these-6-women-got-written-out-of-tech-history-theyre-finally-being-recognized?g=2&c=upw1> Article on the women from Philadelphia who were among the first to program ENIAC. This complements and gives more detail than the documentary "The Top Secret Rosies".

<http://www.tamuc.edu/academics/colleges/humanitiessocialsciencesarts/departments/literatureLanguages/firstYearWriting/interviewQuestions.aspx>. Tips for writing interview questions.

<http://www.wikihow.com/Write-Interview-Questions> Simplified notes on writing interview questions

<http://thewritepractice.com/six-ways-to-ask-better-questions-in-interviews/> More notes on writing interview questions

Paslay, Charles S. *Highly Effective Writing: Interdisciplinary Writing Program, Reasoning, Writing, and Achievement*. Wilmington, DE: Systematic Achievement, 2006. Print. This manual contains multiple ideas for writing in all subject areas.

Content Standards

From PA Academic Standards for Reading, Writing, Speaking and Listening:

- 1.2.11.C Produce work in at least one literary genre that follows the conventions of the genre.
- 1.4.8.B Write multi-paragraph informational pieces (e.g., letters, descriptions, reports, instructions, essays, articles, interviews).
- 1.6.11.A Listen to others.
 - Ask clarifying questions.
 - Synthesize information, ideas and opinions to determine relevancy.
 - Take notes.
- 1.6.11.C Speak using skills appropriate to formal speech situations.
 - Use a variety of sentence structures to add interest to a presentation.
 - Pace the presentation according to audience and purpose.
- 1.6.11.D Contribute to discussions.
 - Ask relevant, clarifying questions.
 - Respond with relevant information or opinions to questions asked.
- 1.6.11.E Participate in small and large group discussions and presentations.
 - Conduct interviews.
 - Participate in a formal interview (e.g., for a job, college).

From the Next Generation Science Standards

2. Influence of Engineering, Technology, and Science on Society and the Natural World

9-12 Connection Statements

Modern civilization depends on major technological systems, such as agriculture, health, water, energy, transportation, manufacturing, construction, and communications.

From Common Core State Standards for Mathematics, The Standards for Mathematical Practices:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the

subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years.

Appendix

Appendix includes:

- Discussion Questions for *Top Secret Rosies* – Lesson 1
- Teacher Direction Sheet for Follow-Up Questions for Oprah Winfrey interview of Michael Jackson - Lesson 3
- Excerpt from NY Times Magazine Article – *Terry Gross and the Art of Opening Up* by Susan Burton – Lesson 4
- Excerpts from transcript of Fresh Air December 29, 2011, Terry Gross interview with Maurice Sendak – Lesson 4
- Alumna Interview Question Bank – Lesson 5
- Honor Math Student Interview Question Bank – Lesson 7
- Self-Reflection Questions – Lesson 8

Top Secret Rosies – The Female Computers of World War II A Documentary by
LeAnn Erikson

These questions can be discussion questions or questions students answer as they view the documentary.

1. What is the origin of the name “Rosie”
2. The story opens with twin sisters from Girls High. Give 2 facts about the girls and give 2 details about their experience at Girls High.
3. In 1936, not many women went to college. What influenced these women to continue their education?
4. WW II Questions:
 - a. In 1941, what event prompted the US to declare War?
 - b. Explain why the war leads to an increase in women joining the workforce.
 - c. How does modern military warfare differ from what was used in WWII? (including H-Bomb and Mustard Gas)
 - d. What ended WWII?
5. How were the women’s’ computations used in the war? What accommodations needed to be made?
6. What was Modern Military-Industrial Complex?
7. What is ENIAC and of what significance was it?
8. What was the computing women’s’ salary?
9. The movie ends with the quote: “Everyday that a young woman walks through a door they [the Top Secret-Rosies] opened, the legacy of these women lives on.” Comment on this statement.

Preparation for Interviewing Activity

Before the students interview their alumna or their peers, they must develop and practice good interviewing procedures. Teach them the techniques of skilled interviewing:

- Active listening
- Guided questioning
- Non-verbal communication
- Empathetic responses
- Validation
- Reassurance
- Partnering
- Summarization
- Transitions
- Empowering the interviewee

The following table uses an interview Oprah Winfrey did with Michael Jackson. Although Oprah has interviewed many celebrities, I chose this video because Michael Jackson's fame is universal and timeless. He did not grant many interviews, so this is very special.

Oprah's Interview with Michael Jackson

<https://www.youtube.com/watch?v=BbItFJJPPmA>

| | Time | | |
|----|---------------|--|----------------------------------|
| 1. | 8:19 – 8:56 | Oprah "You seem to come alive onstage ... Were you as happy offstage as you were onstage?" Notice: Oprah doesn't just ask question, she prefaces question with things she notices about Michael performing. | Michael: "I was very sad." |
| | | To Students: What would you ask next? How would you continue? | |
| | 8:56-9:59 | Oprah uses guided questions to draw out answers from Michael | |
| 2. | 16:40 – 17:15 | Oprah: "How did adolescence affect you?... Was that a particularly difficult time for you?" | Michael: "Very, very difficult." |
| | | To students: What would you ask next? How would you continue? | |
| 3 | 17:15-21:00 | Oprah asks "How so?" She validates and reassures Michael while listening. She says "I understand." She asks provoking questions and clarifying questions. | |

This fall, Gross marks her 40th anniversary hosting “Fresh Air.” At 64, she is “the most effective and beautiful interviewer of people on the planet,” as Marc Maroon said recently, while introducing an episode of his podcast, “WTF,” that featured a conversation with Gross. She’s deft on news and subtle on history, sixth-sensey in probing personal biography and expert at examining the intricacies of artistic process. She is acutely attuned to the twin pulls of disclosure and privacy. “You started writing memoirs before our culture got as confessional as it’s become, before the word ‘oversharing’ was coined,” Gross said to the writer Mary Karr last month. “So has that affected your standards of what is meant to be written about and what is meant to maintain silence about?” (“That’s such a smart question,” Karr responded. “Damn it, now I’m going to have to think.”) Gross says very little about her own life on the air. “I try not to make it about me,” Gross told me. “I try to use my experiences to help me understand my guests’ experiences, but not to take anything away from them.” Early in her career, she realized that remaining somewhat unknown allows “radio listeners to do what they like to do, which is to create you.” She added, “Whatever you need me to be, I’ll be that.”

Over the years, Gross has done some 13,000 interviews, and the sheer range of people she has spoken to, coupled with her intelligence and empathy, has given her the status of national interviewer. Think of it as a symbolic role, like the poet laureate — someone whose job it is to ask the questions, with a degree of art and honor. Barbara Walters was once our national interviewer, in a flashier style defined by a desire for spectacle. Gross is an interviewer defined by a longing for intimacy. In a culture in which we are all talking about ourselves more than ever, Gross is not only listening intently; she’s asking just the right questions.

Matthew Weiner, the creator of “Mad Men,” has been among the most frequent guests on “Fresh Air.” He imagined being interviewed by Gross years before it first happened, and once it did, “you’re like: Oh, this is my fantasy of a conversation,” Weiner told me. “I’m not even talking about people hearing it. I’m talking about actually having the conversation.”

“Having the conversation” — that’s what’s compelling about the wish. It’s a wish not for recognition but for an experience. It’s a wish for Gross to locate your genius, even if that genius has not yet been expressed. It’s a wish to be seen as in a wish to be understood.

The interview wish is as old as the form itself. Journalistic interviews in the United States increasingly began to appear in the 1860s. Before that, when reporters talked to people, they typically didn’t quote them. Once interviewing started, it became a craze. It had its own practitioners, often women, who were thought to be better at drawing people out.

Henry James's journalists were almost all "interviewers," and his characters, like Selah Tarrant in "The Bostonians," crave their scrutiny: "The wish of his soul was that he might be interviewed," James wrote.

At first the interview was regarded as a particularly American phenomenon — pushy, but fair too, because it involved the cooperation of the interviewee, not just a sneaky reporter. The practice shifted radically after World War II. Television gained popularity — the age of the broadcast interviewer began. And psychoanalysis — that other great innovation in opening people up — was being practiced more widely.

Gross's interviews have often been compared to therapy. That's in part because of her seemingly neutral stance, but also because of the feeling of safety she gives her interviewees. Once in a while, a guest confesses to Gross that he's confiding something for the very first time. "I don't know that I've said that to anyone," the "Project Runway" host Tim Gunn told Gross in 2014, of spending time in a psychiatric hospital as an adolescent. Gross's response was as affecting as Gunn's story. She handles confessions quietly, acknowledging the weight of what's been said without drawing undue attention to it.

Gross herself started seeing a therapist several years ago. "When she asks me a question that gets exactly to the heart of what I'm trying to say, but maybe haven't articulated clearly, it just feels so good," Gross told me. "My ideal as an interviewer is to be the person who gets it. Like somebody can tell you something really personal," she continued, and "you can ask them something that can help them comfortably move to the next place and go deeper." She went on: "Hearing someone speak really personally, and having that affirm your experience as a sexual person, or as a sick person, or just as a person trying to get through daily life, is really valuable. And I think that's why we turn to literature, I think that's why we turn to film, beyond the entertainment it gives us."

Gross's impulse to explore what provokes her — the impulse that drove her to pick up the landline and call Craven — underlies her 40 years of interviews. Ira Glass, who was my boss at "This American Life," observes that Gross brings "real questions she personally has been wondering about" to the kind of interviews that tell us "what should we make of the latest news from Iraq or Syria" — as well as the good editorial sense of when to let an expert "march off in unplanned directions." He adds: "There've been times when I've relistened, just to hear the order of the questions and to figure out what was planned and unplanned. Like a magician sitting in on another guy's act for two nights so he can figure out the trick, to steal it." Glass singles out Gross's "great improviser's performance chops. Not surprising that she loves jazz artists and stand-up comedians so much. She's their journalist peer."

That's when she asks herself: What do I care about? What in all of this research is meaningful? It's important to be away from her notes when she does this. She emerges

from the shower with her “major destination points.” Then she goes to her office and refers back to her notes — sheafs of facts; dog-eared, marked-up books — for the details.

A version of this article appears in print on October 25, 2015, on page MM34 of the Sunday Magazine with the headline: How to Talk to Strangers.

New York Times Magazine

<http://www.nytimes.com/2015/10/25/magazine/terry-gross-and-the-art-of-opening-up.html?emc=eta1>

Maurice Sendak: On Life, Death And Children's Lit : NPR

<http://www.npr.org/2011/12/29/144077273/maurice-sendak-on-life-death-and-childrens-lit>

Alumna Interview Question Bank

1. What year did you graduate from The Philadelphia High School for Girls?
2. Where did you attend college?_ What was your major?
3. How did you decide upon your career path?
4. What exactly do you do?
5. How do you use mathematics in your job?
6. How do use science in your job?
7. How have you experienced gender bias?
8. Did you feel you had to make a choice between family and career?
9. Tell me something about your family growing up.
10. How did the current events of the time affect your career choice?
11. What was the biggest influence on your career choice?
12. What about your education at Girls' High prepared you for your career?
13. What is your most vivid memory of Girls' High?
14. Who was your favorite teacher at Girls' High? Why?
15. What was your favorite tradition from Girls' High (contest, senior day, etc.)?
16. What was your favorite year (9th, 10th, 11th or 12th grade) at Girls' High?
Why?
17. If you could change anything about your time at Girls' High, what would it be?
18. What advice would you give my classmates and me as freshmen at Girls' High?

Honor Math Student Question Bank

1. What is your favorite subject so far in school?
2. Why is this your favorite subject?
3. Has math always come easy to you? Have you always been good at it?
4. Do you find math interesting? Why?
5. Do you think math will be necessary for you in your future? Why?
6. What college and career choices are you considering?
7. How does your family influence your success in math class?
8. What is your favorite subject or topic in math?
9. What do you do while sitting in math class that influences your success?
10. How do you get your questions answered in math class or at home?
11. What do you do when you don't understand something in math?
12. How do you do your math homework? How long does this take you?
13. How do you study for a math test?
14. To you, what makes a math teacher good?
15. Are there any strategies or techniques you use for doing math that you can recommend to my classmates and me?
16. Is there any other advice you would give to a freshman?

Self Reflection Questions

For this project, you have:

- Learned about the Top Secret Rosies, the women who were human computers during WWII and opened the door to women in mathematics.
- Learned interviewing skills including skilled techniques, developing questions based on research and critical thinking skills and asking follow-up questions.
- Researched an alumna with a career in a STEM field, developed interview questions and interviewed the alumna!
- Created a product from your interview.
- Interviewed an upperclassman who is an excellent math student.

1. What are your experiences with gender bias?
2. How did your thoughts about what you'd like to do as a career change after doing this project? What were they and are they?
3. What was your favorite part of this project? Why?
4. What influence do you think your high school experience will have on your career choices?
5. What other influences do you think will affect your career choices?
6. What careers do you believe are closed to women?
7. In what way will you change your approach to math classes after completing this project?
8. The Top Secret Rosies were granted opportunities because of WW II. What influence do you think world current events will have on your career choices?
9. Reflect on the women who broke barriers in STEM fields. How is this significant in your life?
10. You have had the opportunity to participate in two interviews. What question are you most proud of having asked? What question do you regret having asked?
11. What parallels can you draw between yourself and either or both of the women you interviewed?
12. This project has exposed you to Girls' High legacy in mathematics and science. How has this inspired you? How will you contribute?
13. This project has introduced you to the field of journalism. What aspect of journalism appealed to you?
14. Imagine yourself 20 years from now, being interviewed by a student at The Philadelphia High School for Girls. What words of advice or memorable moments will you tell her?
15. What aspect of a person's biography interests you most.

16. Why do you think it is important to study biographies?
17. What did you learn from interviewing a Girls' High student?
18. How will you apply what you learned from interviewing your peer?
19. You and your team have conducted two interviews and heard those of the other teams. How do you think your work compared to the other teams?
How much do you think your specific subjects influenced your work?
20. You have worked with your team on two interviews and the work associated with these interviews. How did your team work together? Is there anything that you, your team members or your teacher could have done to make this team process better?
21. What would you change about this project? What about the project worked or did not work? What would you add to enhance the project?