—— "IN SPEECH ARTICULATE AND LOGICAL, IN HER ACTIONS PRUDENT AND PUBLIC-SPIRITED... —— THE CITY GAVE HER SUITABLE WELCOME AND ACCORDED HER SPECIAL RESPECT."—THE *SUDA* LEXICON

HYPATIA

ASTRONOMER, MATHEMATICIAN, AND PHILOSOPHER

Throughout history there have been many female teachers and scholars, and Hypatia was one of the earliest recorded female mathematicians. Her accomplishments in life inspired many, but her death turned her into a legend.

Scholars have narrowed down Hypatia's birth to sometime between 350 and 370 CE in Alexandria, Egypt. Her father, Theon, was a well-known scholar. He made sure that she grew up well educated and with a deep respect for their Greek heritage and values, instilling in her a commitment to uphold those values, no matter the cost.

The city of Alexandria, known for its great library, was seen as a place of learning, but it was also a place where religious tensions between pagans, Jews, and Christians would turn violent. This made it dangerous for Hypatia and her father to practice their Greek traditions, but it was important to them to do so. Her father instructed her in mathematics and astronomy, and she became an expert in both. Soon she began to surpass her father in her mathematical studies and made important commentary on his work while also making her own contributions to geometry and number theory.

Along with her scientific work, Hypatia was an expert in platonic philosophy. She became one of Alexandria's first female teachers. People traveled from faraway lands to hear her speak! She taught neoplatonic philosophy, and her male students gave her respect and loyalty. But this would soon to come to an end.

Eventually her "pagan" teachings made her a target. The brewing religious tensions in the area turned violent. She was killed around 415 CE by a mob of extremist Christians.

Although her death was a tragedy, her life has become a symbol for education in the face of ignorance. We now remember Hypatia as a source of light and knowledge.

HER FATHER WAS ONE OF THE LAST MEMBERS OF THE LIBRARY OF ALEXANDRIA.

INVENTED A NEW VERSION OF THE HYDROMETER.

SHE IS DEPICTED IN RAPHAEL'S FAMOUS PAINTING "THE SCHOOL OF ATHENS".

IS CITED IN AN ANCIENT ENCYCLOPEDIA CALLED THE SUDA.

WAS KNOWN AS "THE EGYPTIAN WISE WOMAN."

THE LIBRARY OF ALEXANDRIA ENDURED WARS & REVOLTS. IT WAS DESTROYED IN 391 CE, WHEN THE ROMAN EMPIRE OUTLAWED PAGANISM.

WORKED WITH HER FATHER ON THEORIES ABOUT THE SOLAR SYSTEM.

MADE PUBLIC SPEECHES ABOUT PLATO & ARISTOTLE.


WAS THE FIRST PERSON TO CREATE A COMPUTER PROGRAM.
WROTE ONE OF THE MOST IMPORTANT DOCUMENTS IN COMPUTER HISTORY.
IS HONORED WITH ADA LOVELACE DAY.
"IMAGINATION IS THE DISCOVERING FACULTY, PRE-EMINENTLY. IT IS THAT WHICH PENETRATES INTO THE UNSEEN WORLDS AROUND US, THE WORLDS OF SCIENCE."– ADA LOVELACE

ADA LOVELACE

MATHEMATICIAN AND WRITER

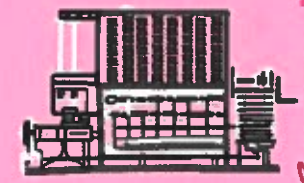
SHE DESCRIBED HERSELF AS A POETICAL SCIENTIST.

HER LAST NAME COMES FROM HER HUSBAND, WILLIAM KING, THE EARL OF LOVELACE.

ADA LOVELACE DAY IS CELEBRATED ON THE 2ND TUESDAY IN OCTOBER.

SHE HAS INSPIRED CHARACTERS IN NARRATIVE & GRAPHIC NOVELS.

When Ada Lovelace first saw the Difference Engine, she became obsessed. The early computing pioneer Charles Babbage invented this gigantic, gear-filled calculator, and after meeting him in 1833, Ada did everything she could to convince him to work with her.



Ada's love affair with math started when she was very young. Her mother, Anne Isabella Milbanke, nicknamed the "Princess of Parallelograms," was a mathematician who wanted the right upbringing for her daughter. Ada's father was the famed poet Lord Byron. The wildness that made him an amazing poet also made Byron something of a lousy husband, which led Ada's mother to leave him after Ada was born. Her mother gave Ada an unusually strict mathematical education.

Ada met Charles Babbage when she was 17 and a very persistent young woman. She begged him to take her on as a student, but he was much too busy thinking up his next mechanical breakthrough. So when Ada saw an article in a Swiss journal about his newest idea, the Analytical Engine, she saw her chance to impress him.

The article was written in French, which Ada spoke, so she translated his paper into English and published it in 1843. But that wasn't all: she added her own notes, making it twice as long! This got Charles's attention, and their collaboration began.

Ada imagined a world where computers did more than mere calculations—a world where they could write music and become extensions of human thought. She also designed a way to program the Analytical Engine, using punch cards with a stepwise sequence of rational numbers called Bernoulli numbers. This is recognized as the first computer program ever!

Ada was a true visionary, and she remains an inspiration to this day. Her name has become a call to action and proof that women can accomplish great things in technology, computing, and programming.

THE US DEPARTMENT OF DEFENSE NAMED A COMPUTER LANGUAGE "ADA."

SHE SIGNED HER LETTERS TO CHARLES BABBAGE AS "LADY FAIRY."

HER PROGRAM WAS INSPIRED BY THE PUNCH CARDS USED IN MECHANICAL LOOMS.

"[THE OTHER WOMEN] DIDN'T ASK QUESTIONS OR TAKE THE TASK ANY FURTHER. I ASKED QUESTIONS; I WANTED TO KNOW WHY. THEY GOT USED TO ME ASKING QUESTIONS AND BEING THE ONLY WOMAN THERE."—KATHERINE JOHNSON

KATHERINE JOHNSON

PHYSICIST AND MATHEMATICIAN

Katherine Johnson was born in 1918 in West Virginia and always had a love of learning and math. She excelled in school and enrolled at West Virginia State College when she was only 15 years old.

Katherine assumed she was going to become a math teacher or a nurse, like other women she knew, until she got to college and met her professor, the famous mathematician W. W. Schieffelin Claytor. He inspired Katherine to become a research mathematician and helped her pick out the classes she would need to achieve this goal.

When she was 18, Katherine graduated college. It was the height of the Great Depression and jobs were scarce, so she fell back on teaching in high school. In the 1950s, NASA began to have more openings for African-American female computers. Katherine applied and got a job!

Katherine wanted to know the in and outs of what she was working on. She was not allowed in meetings, so she asked if it was against the law for a woman to be in one. Her boldness and curiosity paid off, and she was included. Calculating flight paths involved complicated geometry equations, and Katherine was extremely good at these. She was pulled into working on the 1961 manned Mercury mission and successfully calculated the launch window.

Her skill in mathematics was on point; she quickly became a leader in calculating trajectory, making her an essential part of the team that calculated the path for the first manned mission to the moon in 1969. She did most of the calculations on the project and was also in charge of checking the math of the brand-new mechanical computers at NASA. The math had to be perfect if the Apollo team was to return to Earth safely. The Apollo mission was a success, and her crucial contributions made it possible!

Katherine later worked on lots of important NASA projects, including the space shuttle program and plans for the mission to Mars. Her work has helped astronauts visit the stars and come safely back to earth. She retired after 33 years of service in 1986.

AS A LITTLE GIRL, SHE LOVED NUMBERS AND WOULD COUNT EVERYTHING SHE COULD FIND.

IN 2015 SHE WON THE PRESIDENTIAL MEDAL OF FREEDOM AT AGE 97.

COAUTHORED 26 SCIENTIFIC PAPERS.

MAJORED IN MATH AND FRENCH IN COLLEGE.

THE MOON & THE APOLLO SHUTTLE MOVE AT DIFFERENT SPEEDS— HER CALCULATIONS ENSURED THEY WOULD MEET.

WAS THE 1997 MATHEMATICIAN OF THE YEAR.

HELPED WRITE THE FIRST TEXTBOOK ABOUT SPACE TRAVEL.

RECEIVED AN HONORARY DOCTOR OF LAW DEGREE FROM THE STATE UNIVERSITY OF NEW YORK.

"THE FIRST THING ABOUT EMPOWERMENT IS TO UNDERSTAND THAT YOU HAVE THE RIGHT TO BE INVOLVED. THE SECOND ONE IS THAT YOU HAVE SOMETHING IMPORTANT TO CONTRIBUTE. AND THE THIRD PIECE IS THAT YOU HAVE TO TAKE THE RISK TO CONTRIBUTE IT."– MAE JEMISON

MAE JEMISON

ASTRONAUT, EDUCATOR, AND DOCTOR

Mae Jemison always knew she would go into space. She was born in 1956 in Alabama and grew up in Chicago. She was obsessed with the Apollo missions but noticed that there was no one who looked like her going up into space. However, the fictional TV show *Star Trek* featured people of different genders and races working together. This had an impact on young Mae, and Lieutenant Uhura became her role model.

Mae went to Stanford and double majored in chemical engineering and African-American studies. She went on to Cornell and became a medical doctor. She worked in the Peace Corps in Sierra Leone and Liberia for several years. She continued working as a doctor until it was time to chase her space dream. Mae applied to NASA and became an astronaut.

In 1992, Mae Jemison became the first African-American woman in space. On the space shuttle *Endeavour*, she took an Alpha Kappa Alpha sorority flag, a West African Bundu statue, and a poster of Judith Jamison dancing. She wanted African and African-American culture to be represented in space and no longer left out.

The following year, she left NASA and started numerous companies, including her own technology consulting firm, the Jemison Group Inc. Mae is the founder of the BioSentient Corporation, which creates devices that will allow doctors to monitor patients' day-to-day nervous system functions.

The technology and problem solving to get humans in space created inventions that we use today on earth. Mae was inspired by this and became principal of the 100 Year Starship project. The goal is to make sure human beings will be able to travel to the next solar system within the next 100 years. This project will also inspire new solutions to materials, recycling, energy, and fuel, just as the space race did. Dr. Mae Jemison still has her eyes on the stars while helping solve problems here on earth.

FOUND OUT SHE WAS GOING TO BE AN ASTRONAUT IN BETWEEN GIVING MEDICAL EXAMINATIONS.

HER DAD TAUGHT HER HOW TO COUNT CARDS AS A KID.

WENT ON AN EIGHT-DAY MISSION IN SPACE.

THE FIRST LANDMARK SHE IDENTIFIED FROM SPACE WAS CHICAGO, HER HOMETOWN.

DID EXPERIMENTS WITH BONE CELLS WHILE IN SPACE.

WON A SCHOLARSHIP TO STANFORD WHEN SHE WAS 16.

WAS FEATURED ON AN EPISODE OF *STAR TREK: THE NEXT GENERATION*.

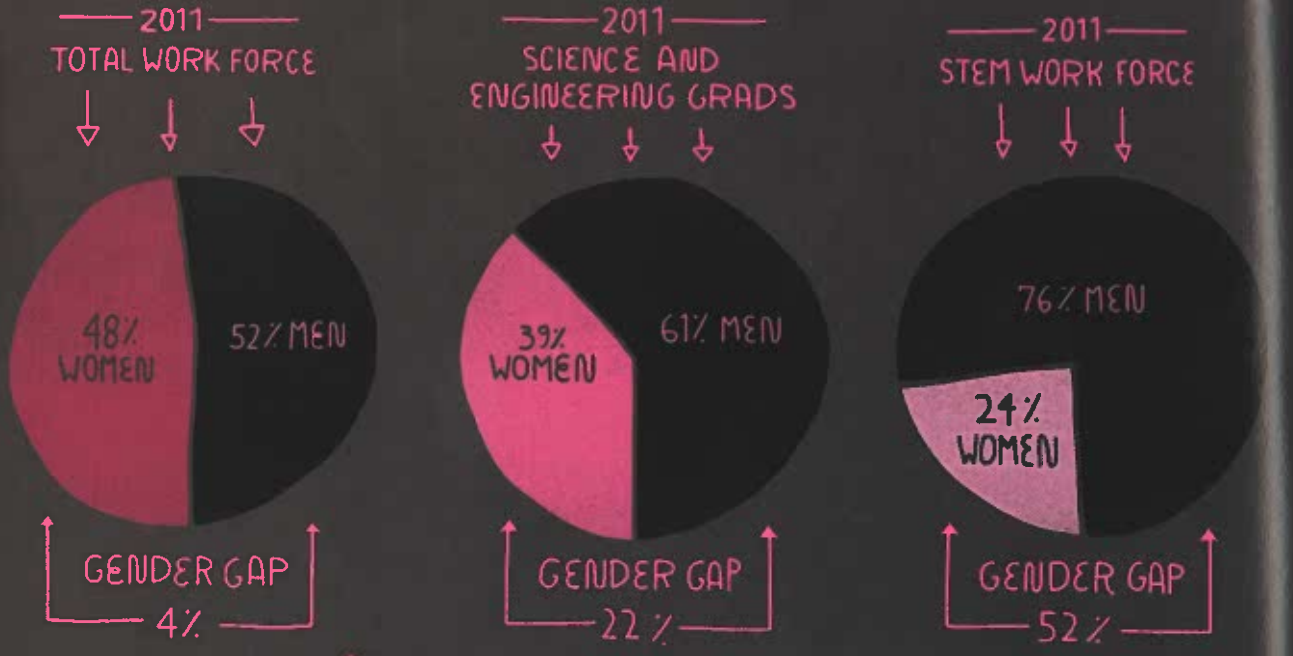
FOUNDED "THE EARTH WE SHARE" SCIENCE CAMP FOR KIDS.

SHE IS A DANCER.

STATISTICS IN STEM

The US government has used the census to understand the demographics of the American workforce. The 2011 census (published in 2013) gave the world insight into how poorly women are represented in the STEM fields. From the mid-twentieth century to the new millennium, there has been a definite increase in female scientists, but women are still underrepresented in these fields. That simply won't do. There are little girls right now who could grow up to cure cancer, explore a new galaxy, or even discover a new type of energy. Let's inspire more awesome girls and women to share their point of view and make amazing discoveries!

GENDER GAP PERCENTS



PERCENTAGE OF WOMEN IN STEM FROM 1970-2011