SILENT SKY
by Lauren Gunderson
PLAY GUIDE

2019 2020
ARIZONA THEATRE COMPANY
THE CURTAIN RISES
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Amelia White, Tori Grace Hines, Veronika Duerr, Inger Tudor, and Director Casey Stangl in rehearsals for ATC’s *Silent Sky*. Photo credit Tim Fuller.

Silent Sky Play Guide by Megan Sutton and Alina Burke, Education Associates. For questions about the guide, please contact msutton@arizonatheatre.org

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ABOUT ATC

The mission of Arizona Theatre Company is to inspire, engage, and entertain – one moment, one production, and one audience at a time.

Under new leadership – and now celebrating its 53rd-season – Arizona Theatre Company is truly “The State Theatre.” Our company boasts the largest subscriber base of any performing arts organization in Arizona, with more than 130,000 people each year attending performances at the historic Temple of Music and Art in Tucson, and the elegant Herberger Theater Center in downtown Phoenix.

Each season of carefully selected productions reflects the rich variety of world drama – from classic to contemporary plays, from musicals to new works – as audiences enjoy a rich emotional experience that can only be captured through live theatre. ATC is the preeminent professional theatre in the state of Arizona. Under the direction of Artistic Director Sean Daniels in partnership with Managing Director Billy Russo, ATC operates in two cities – unlike any other League of Resident Theaters (LORT) company in the country.

ATC shares the passion of the theatre through a wide array of outreach programs, educational opportunities, access initiatives, and community events. Through the schools and summer programs, ATC focuses on teaching Arizona’s youth about literacy, cultural development, performing arts, specialty techniques used onstage, and opens their minds to the creative power of dramatic literature. With approximately 450 Learning & Education activities annually, ATC reaches far beyond the metropolitan areas of Tucson and Phoenix, enriching the theatre learning experience for current and future audiences.

The Temple of Music and Art: The home of ATC productions in downtown Tucson
The Herberger Theater Center: The home of ATC productions in downtown Phoenix
INTRODUCTION TO THE PLAY

SILENT SKY
By LAUREN GUNDERSON
Directed by CASEY STANGL

A celebration of discovery, originality and curiosity. For the last three seasons, playwright Lauren Gunderson has proudly sat on the list of most-produced playwrights in the country. Arizona Theatre Company proudly brings this brilliant and prolific author’s work to the professional stage in Arizona for the first time. Based on the true story of 19th-century astronomer Henrietta Leavitt, astonishing discoveries await as she maps distant stars in galaxies beyond our own. But this brilliant, headstrong pioneer must struggle for recognition in the man’s world of turn-of-the-century astronomy. During this time of immense scientific discoveries, women’s ideas were dismissed until men claimed credit for them. Like the recent film HIDDEN FIGURES, SILENT SKY shines a bright light on women whose achievements have been too long overlooked by the telescope of history. In this exquisite blend of science, history, family ties, and fragile love, a passionate young woman must map her own passage through a society determined to keep a woman in her place.

“Bottom line: Heavenly.” - Atlanta Journal-Constitution

Tori Grace Hines and Veronika Duerr in rehearsals for ATC’s Silent Sky. Photo credit Tim Fuller.
CAST AND CREATIVE

CAST

Veronika Duerr*   Henrietta Leavitt
Victoria Grace*   Margaret Leavitt
Nardeep Khurmi*  Peter Shaw
Inger Tudor*      Annie Jump Cannon
Amelia White*     Williamina Fleming

CREATIVE

Casey Stangl       Director
Jo Winiarski       Scenic Designer
Kish Finnegan      Costume Designer
Jaymi Lee Smith    Lighting Designer
Paul James Prendergast  Sound Designer
Glenn Bruner*     Production Stage Manager

* Denotes members of Actors’ Equity Association, the Union of Professional Actors and Stage Managers in the United States.

Denotes artists included in the ATC’s Arizona Artists Initiative.

ARIZONA ARTISTS INITIATIVE is a new initiative that furthers ATC’s commitment to our community and the artists who live in Arizona, were born in Arizona, return or move to Arizona, or write about Arizona. As the Official State Theatre of Arizona, we celebrate
BEHIND THE SCENES

SCENIC DESIGN

Photo of the set model. Scenic design by Jo Winiarski

PROJECTION DESIGN

Photo rendering of a projection. Projection design by Jeffrey Teeter
Lauren M. Gunderson is the most produced playwright in America of 2017, the winner of the Lanford Wilson Award, the Steinberg/ATCA New Play Award and the Otis Guernsey New Voices Award, she is also a finalist for the Susan Smith Blackburn Prize and John Gassner Award for Playwriting, and a recipient of the Mellon Foundation’s 3-Year Residency with Marin Theatre Company. She studied Southern Literature and Drama at Emory University, and Dramatic Writing at NYU’s Tisch School where she was a Reynolds Fellow in Social Entrepreneurship. Her work has been commissioned, produced and developed at companies across the US including South Coast Rep (Emilie, Silent Sky), The Kennedy Center (The Amazing Adventures of Dr. Wonderful And Her Dog!), Oregon Shakespeare Festival, The O’Neill, The Denver Center, San Francisco Playhouse, Marin Theatre, Synchronicity, Berkeley Rep, Shotgun Players, TheatreWorks, Crowded Fire and more. She co-authored Miss Bennet: Christmas at Pemberley with Margot Melcon, which was one of the most produced plays in America in 2017. Her work is published at Playscripts (I and You, Exit Pursued By A Bear, The Taming, and Toil And Trouble), Dramatists (The Revolutionists, The Book of Will, Silent Sky, Bauer, Miss Bennet) and Samuel French (Emilie). Her picture book Dr Wonderful: Blast Off to the Moon was released from Two Lions/Amazon in May 2017. LaurenGunderson.com

Lauren Gunderson’s Twitter:
https://twitter.com/LalaTellsAStory

Silent Sky Tumblr Page:
https://silentskyplay.tumblr.com/
HISTORICAL CONTEXT

Set in 1900-1920, Silent Sky deals with women’s rights and familial relations through the lens of history. The story is based on the true story and science of early 20th century female “computers” at Harvard Observatory, and specifically Henrietta Leavitt.

Woman’s Rights in the Early 1900s

In 1848, the suffrage movement was launched at a women’s rights convention. The goal of the suffragists was to circulate petitions and lobby Congress to pass an amendment that would enfranchise women. In order to do this, they needed to obtain the right to vote. While the movement came to pass officially in the mid-1800s, it reached new heights at the turn of the century. There were two main groups, the National American Woman Suffrage Association (NAWSA) and National Woman’s Party (NWP). The latter is the group known for picketing the White House. In 1920, due to the tireless efforts of the NAWSA and the NWP, the 19th amendment was ratified and women were finally granted equal voting rights.

Further Reading:

Woman’s Suffrage | History.com
Woman’s Suffrage History Timeline | NPS.gov
HISTORICAL CONTEXT

The Real Henrietta Leavitt

Henrietta Swan Leavitt was born in 1868 in Lancaster, Massachusetts. She attended Oberlin College and then transferred to Radcliffe College, which was called “the Society for the Collegiate Instruction of Women” at that time. It wasn’t until her senior year that she gained an interest in Astronomy. She followed her interest and after graduating from college, became a volunteer assistant in the Harvard Observatory in 1895. It was here that she worked on the venture of determining brightness of stars, a project started by Edward C. Pickering. She worked with fellow female trailblazers, Williamina Fleming and Annie Jump Cannon. Leavitt eventually became an actual employee and head of the photographic stellar photometry department. Her work with measuring distance of stars based on their brightness was revolutionary. Without her work, Edwin Hubble would have never made his discoveries. Leavitt died of stomach cancer at the age of 53. She was a deeply religious woman who never married and had no children. She was buried with her family which consisted of her two parents and two of her siblings, which died in infancy. Henrietta never gained the notoriety she deserved while she was alive, but the Swedish Academy of Sciences tried to nominate her for the 1926 Nobel Prize in physics. Unfortunately, she had already passed and Nobel prizes only went to the living.

Further Reading:

Henrietta Swan Leavitt | famousscientists.org
Meet Henrietta Leavitt | astronomy.com
Annie Jump Canon became interested in astronomy as a child when her mother taught her about the constellations. This led her to study astronomy and physics at Wellesley College where she learned to make spectroscopic measurements. In short, spectroscopy measures radiation in relation to wavelength. In 1896, Canon became one of The Harvard Computers under Edward C Pickering. She is known for coining the phrase “Oh, Be A Fine Girl—Kiss Me!” a mnemonic device still used today to learn the spectral classifications of stars. This phrase is said in Silent Sky several times. This phrase was just a fraction of her effort to perfect the universal system of stellar classification that we still use today. Her work, known as the Draper Catalogue, compiled the largest accumulation of astronomical information ever assembled by an individual. After Pickering’s death in 1919, she became the director of the Harvard Computers. She became the first woman to ever be awarded an honorary doctorate from Oxford University in 1925. She was also the first woman to become an officer in the American Astronomical Society. She was a member of the National Women’s Part, a suffragette, and advocated for equal rights for women.
HISTORICAL CONTEXT

Williamina Fleming

Williamina Flemming may not appear to be the most likely candidate for the group of educated women computing and sorting stars under Edward Pickering. She emigrated from Scotland to the US in 1878 with her husband, who left her as soon as she became pregnant. Almost a Cinderella story, she worked as a maid for Edward Pickering until he recognized her potential and hired her to do clerical work for him at Harvard. Her most famous work was on the classification of stellar spectra, and it became known as the Pickering-Fleming System. She exceeded all societal expectations for a woman of her station when she became the Curator of Astronomical Photographs in 1899. In 1906 she became the first American woman elected to be an honorary member of the Royal Astronomical Society of London. The Astronomical Society of Mexico also awarded her the Guadalupe Almendaro Medal for her discovery of new stars.
Women and the Stars

Henrietta Leavitt fought against prejudice surrounding women in science that women are still combatting today. We have come far, and Leavitt laid a path for future women in her field, but a brief look at the history of women in space shows us that sexism has always been and continues to be a huge obstacle for women in this male-dominated field.

Over 500 human beings have been to space. Of those 500, only 59 have been women. Although 50 of these women flew with NASA, the Soviet Union put the first woman, Valentina Tereshkova, in space in 1963. It was not until twenty years later in 1983 that the United States made Sally Ride the first American woman in space. Women had been fighting to be astronauts long before Sally Ride succeeded in becoming one. In fact, in 1961—before the Soviet Union sent the first woman into space—William Randolph Lovelace, who helped develop the tests for NASA’s male astronauts, had 19 women undergo the same tests. Of those 19, 13 women passed, and they became known as the Mercury 13. When the Mercury 13 were not invited to continue astronaut training, Jerrie Cobb—the first to pass the tests-- lead the charge to be included in the NASA astronaut corps and spoke about gender discrimination at a hearing for a Subcommittee of the House Committee on Science and Astronautics in 1962. NASA only reiterated that all astronauts were required to be graduates of military jet test piloting programs and have engineering degrees, which was impossible for women at the time.

In spite of the Mercury 13 and their fight for equality, the first NASA astronaut class to include women was not until 1978. Sally Ride and 5 other women were part of this class, and since Sally Ride’s first flight in 1983, there has been some progress for women in space. The first woman to do a space-walk, or be outside of a vehicle in space, was Svetlana Savitskaya in 1984, followed shortly after by the first American woman, Kathryn (Kathy) Sullivan also in 1984. Although for decades NASA relied heavily on African American women in their computer department, the first African American woman astronaut to go to space was Mae Jemison in 1992. Eileen Collins was one of the first female astronauts to come from a piloting background, and became the first woman to pilot a space shuttle in 1995 as well as the first space shuttle commander in 1999. The first woman space station expedition crew member was Susan Helms in 2001, and Peggy Whitson became the first female space station commander in 2008. Sunita Williams, and Indian-American astronaut, became the first woman of color to command the space station in 2012.

NASA’s 2013 astronaut class was 50% women, which shows that women in space have taken the groundwork laid by their predecessors and strived to achieve more. However, earlier this year NASA cancelled what would have been their first ever all-female space-walk, giving the flimsy excuse of not having enough space suits in the right size. This is a perfect example of how men continue to be more present when it comes to our space program and how difficult it is to break out of the androcentric precedent that history has set for us.
Henrietta Leavitt joined a group of women known as “The Harvard Computers” who worked under Edward C. Pickering sorting and gathering data on millions of stars. The word “computer” at the time clearly had a different meaning than it does now, but until mechanical computers were invented and became mainstream, women have historically been given the most opportunities within the field of computing. This was a small hole in the fabric of misogyny through which women could make their mark and grow their influence in STEAM-related areas.

Women were allowed to be computers for a number of reasons. One was that women could be paid less, so one could hire many more women than men for the same price which was beneficial for huge projects like Pickering’s. Another is simply that computing was a job few men wanted to do. It was tedious doing complicated calculations by hand over and over, and many men with degrees were typically able to get higher-up jobs than that. Educated women, however, often found that computing was the best job they were allowed to have.

As early mechanical computers developed in the 1950s and 60s, women computers sometimes became programmers and error-checkers for those mechanical computers. This gave women a foot in the door to the computer science and engineering world, although they faced a lot of prejudice and are still often deterred from working in those fields today.
Women in Computing Timeline

A timeline of the history of women in computing in America from 1737 to 1978

- **1737**: Maria Mitchell, astronomer and discoverer of "Miss Mitchell's Comet" worked as a computer charting the planet Venus

- **1842**: Ada Lovelace worked with Babbage on his design for a "mechanical computer" as first programmer

- **1849**: Women were hired as computers in Washington D.C. to do calculations on ballistics

- **1877**: Henrietta Leavitt published her paper on the relationship between the brightness and distance of stars

- **1893**: The Harvard Computers were started by Edward Charles Pickering

- **1912**: Henrietta Leavitt joined the Harvard computers

- **1918**: Women were hired as computers in Washington D.C. to do calculations on ballistics

- **1921**: NACA, which later became NASA, hired women to work on computers analyzing data from wind tunnels and flight tests

- **1935**: WAVES, American women contributed to wartime calculations and worked with early calculating machines

- **1941**: Dorothy Vaughan became the first African American supervisor at NASA

- **1943**: Women of science working on the Manhattan Project computers worked with early models of computers

- **1945**: Mina Rees was one of the first women to enter the WAVES program, the first women's general-purpose computer

- **1948**: Evelyn Boyd Granville and Alston Howard was the first African American woman to get a Ph.D in mathematics and was a NASA mathematician

- **1949**: Dorothy Vaughan became the first African American supervisor at NASA

- **1955**: Katherine Johnson, an African American computer at NASA, co-published a series of papers defending the accuracy of her calculations with the funding position specified. It was later confirmed that a woman at NASA received credit as an author of a report.

- **1958**: Mary Ann Williams was the first person to use a computer in a private home and developed the first operating system for the first mainframe computer.

- **1960**: Margaret Hamilton was director of the M.I.T. Instrumentation Laboratory, and led the development of the on-board computer for Apollo, a moon landing

- **1969**: Elizabeth Farnsworth led a team that developed the Experimental Proton Sounding Rocket, which was a key tool in the search for new astronomical objects

- **1978**: The Association for Women in Computing was founded

- **The Arizona Theatre Company**
## HISTORICAL CONTEXT

### History of Astronomy Timeline

- **750 BC** Mayan astronomers discovered an 18.6 year cycle in the rising and setting of the moon and created the first almanacs
- **387 BC** Plato founded the Platonic Academy and promoted the idea that the Earth was the center of the solar system
- **270 BC** Earliest recorded sighting of Halley’s Comet by Chinese astronomers
- **4 BC** Astronomer Shi Shen cataloged 809 stars in 122 constellations, and observed sunspots
- **140** Ptolemy published star catalogue listing 48 constellations and endorsed geocentric universe
- **400** Hindu cosmological time cycles calculated the average length of length of time it takes for the Earth to orbit the Sun as 365 days
- **499** Indian mathematician-astronomer Aryabhata identified the force of gravity to explain why objects do not fall as the Earth rotates
- **628** Indian mathematician-astronomer Brahmagupta recognized gravity as a force of attraction, briefly describing what would become Newton’s second law of motion
- **830** First major work of Arabic astronomical work, the *Zij al-Sindh*, contained tables for the movements of the Sun, Moon, and 5 planets known at the time
- **1031** Abu Said Sinjari suggested the possible heliocentric moment of the Earth around the Sun
- **1054** Chinese astronomers recorded the sudden appearance of a bright star which was the Crab supernova exploding
- **1150** Indian astronomer Bhāskara II calculated the longitudes and latitudes of the planets and lunar/solar eclipses
- **1350** Ibn al-Shatir demonstrated using trigonometry that the Earth was not the center of the universe, later used in the Copernican model
- **1543** Nicolaus Copernicus published his theory that Earth travels around the Sun
- **1572** Tycho Brahe proved that the heavens could change after seeing a supernova travel beyond Earth’s atmosphere
- **1608** Hans Lippershey tried to patent the first refracting telescope, which started the astronomical revolution in Europe
- **1609** Johannes Kepler introduced his 3 laws of planetary motion
- **1610** Galileo Galilei wrote about his discovery of spots on the Sun, craters on the Moon, four satellites on Jupiter, and argued a Copernican, Sun-centered universe
- **1655** Christian Huygens studied Saturn and discovered its moon, Titan, as well as suggested that it was surrounded by a thin ring
- **1668** Isaac Newton built the first reflecting telescope
- **1687** Newton established the theory of gravitation and laws of motion
- **1705** French astronomer Nicolas de Lacaille sailed the oceans to compile a catalog of more than 10000 stars in the southern sky
- **1781** William Herschel discovered Uranus
- **1784** Charles Messier published his catalog of star clusters and nebulae which is still used today
- **1814** Joseph von Fraunhofer built the first accurate spectrometer and measured the spectrum of the Sun’s light
- **1838** Friedrich Bessel measured the distance to 61 Cygni, the first star besides the Sun to have its distance measured from Earth. This established framework for measuring the scale of the universe
**HISTORICAL CONTEXT**

**History of Astronomy Timeline Continued**

- **1845** Irish astronomer William Parsons completed the first great telescope and studied the structure of nebulas.
- **1845** Jean Foucault and Armand Fizeau took first detailed photographs of the Sun’s surface - the birth of scientific astrophotography.
- **1846** German astronomer Johann Gottfried Galle discovered Neptune.
- **1872** Henry Draper took a photograph of Vega star which developed the idea that spectroscopy is the key to understanding how stars evolve.
- **1872** William Huggins gave the first indication of how fast stars are moving.
- **1895** Konstantin Tsiolkovsky published an article on the possibility of space flight, discovering that a rocket would work in a vacuum.
- **1901** Annie Cannon proposed a sequence of classifying stars by absorption lines in their spectra, still used today.
- **1906** Ejnar Hertzsprung established the standard for measuring the true brightness of a star.
- **1906** Henry Norris Russell published a diagram that showed the relationship between the color and magnitude of 90% of stars in the Milky Way.
- **1910** Williamina Fleming published her discovery of white dwarf stars.
- **1912** Henrietta Swan Leavitt discovered the period-luminosity for cepheid variables.
- **1916** Karl Schutzschild used Einstein’s theory of relativity to lay the groundwork for a black hole theory.
- **1923** Edwin Hubble discovered a Cepheid variable and proved that Andromeda and other nebulas are far beyond our own.
- **1925** Hubble produced a classification system for galaxies.
- **1925** Cecilia Payne-Gapschkin discovered that hydrogen is the most abundant element in the Sun’s atmosphere.
- **1926** Robert Goddard launched the first rocket (like a model rocket) powered by liquid fuel and demonstrated that a rocket can work in a vacuum.
- **1929** Hubble discovered that the universe is expanding.
- **1931** Georges Lemaitre suggested the “Big Bang”.
- **1932** Karl Jankst detected the first radio waves coming from space.
- **1938** Hans Bethe explained how stars generate energy.
- **1944** A group of scientists led by Wernher von Braun developed the first rocket-powered ballistic missile.
- **1948** The largest telescope in the world was completed at Palomar Mountain in California.
- **1957** The Soviet Union launched Sputnik 1 into space.
- **1975** US launched satellite Explorer 1.
- **1958** NACA became NASA.
**HISTORICAL CONTEXT**

**History of Astronomy Timeline Continued**

- **1959** The Soviet Union and US launched probes to the Moon
- **1961** The Soviet Union sent Yuri Gagarin as the first person to orbit the planet
- **1962** The Mariner 2 became the first probe to reach another planet
- **1963** The Soviet Union sent Valentina Tereshkova as the first woman in space
- **1966** The Luna 9 made a soft landing on Moon
- **1967** Jocelyn Bell Burnell and Antony Hewish detected the first pulsar, an object emitting regular pulses of radio waves
- **1968** Apollo 8 mission became first human spaceflight mission to enter gravitational influence of another celestial body
- **1969** Neil Armstrong and Buzz Aldrin became the first men on the moon in Apollo 11
- **1972** Charles Thomas Bolton presented irrefutable evidence of the existence of a black hole
- **1975** Russian probe Venera 9 landed on surface of Venus, photographs
- **1976** 2 NASA probes arrived on Mars, photographs
- **1977** Voyager 1 & 2 launched to study planetary systems
- **1981** Space Shuttle Columbia made its maiden flight
- **1983** US made Sally Ride the first American woman in space
- **1992** Cosmic Background Explorer satellite produced a detailed map of the background radiation remaining from the Big Bang
- **1998** Construction on the International Space Station began
- **2006** IAU adopted new definition of a planet and a new classification of dwarf planets (bye Pluto)
- **2008** 2008 TC3 became the first Earth-impacting meteoroid spotted and tracked prior to impact
- **2012** Visual proof of black holes published
- **2017** Neutron star collision caused a breakthrough for multi-messenger astronomy
- **2019** China’s Chang’e 4 became first spacecraft to perform a soft landing on the lunar far side
- **2020** NASA proposed to launch Mars 2020 to Mars with a brand new Mars rover

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**Historical Context Sources**


Discussion Questions

* What does each character want? How do they get what they want?
* What is the overall theme of the play?
* What does this play teach us about our history?
* What moment from the play stuck with you the most?
* Did you like the character of Peter? Why/why not?
Orchestra of Sound Activity:

Music is a large part of Silent Sky, use this activity to explore the influence of melody on storytelling.

Age Range: Elementary/Middle School

Materials: None

Instructions:

1. Divide the class into groups of 3 or 4.
2. Have the groups sit in sections across the stage like an “orchestra”.
3. Choose one student to be the “conductor”.
4. The “conductor” should stand in front of the stage facing toward the “orchestra”.
5. Have the conductor assign each section an instrument (i.e. violins, trumpets, percussion, flutes, harp, cellos, etc.) If necessary, explore what each of these instruments sound like.
6. One by one, the conductor will point at each section to test out the instruments.
7. Then the conductor will turn around and announce to the audience “The next piece we will be playing is called [Swimming in December]” (He/she can make up any name he/she chooses)
8. The song begins. Each time the conductor gestures to a particular section, the performers will make sounds of their instrument. When the conductor raises his hands high, the volume of the performers increases. Hands low, the volume decreases.
9. The song ends when the conductor raises his hands and quickly closes his fists.
10. Then the whole orchestra stands and takes a bow.

From http://www.bbbpress.com/2015/06/drama-game-orchestra-of-sound-emotion/

This can be followed by a discussion of the music in Silent Sky, here are some ideas to get the conversation started:

• How does music affect the story?
• As an audience member, how did the story affect you?
• What are different ways you can use music to tell stories?

This activity fulfills the following standards:

TH.RE.7.HS1a Respond to what is seen, felt, and heard in a theatrical work to develop criteria for artistic choices.
TH.RE.8.HS1e Justify personal aesthetics, preferences, and beliefs through participation in and observation of a theatrical work.
CLASSROOM GUIDE

Women in History, a History/Theatre Arts-Integration Lesson:

Use this lesson to discover other important women in history who, like Henrietta, didn’t receive the recognition they deserved.

Age Range: High School

Materials: Computer or phones for research, paper for notes

Instructions:

1. Split students into groups of two or three (if possible make sure the group has both boys and girls)
2. Have each group choose a team name and put it on the white board.
3. Next, give the students five minutes to choose a female historical figure and write it on the white board next to their group name (first come, first serve – no repeats of the same person). Encourage to choose someone they have never heard about.
4. Allow the students to research their figure for 10-15 minutes. They should be looking for biographical information and information about their particular contribution. Make sure students are taking notes (if the students need more support, use the guided note sheet on page 23).
5. Have each group elect a member to play the woman they researched. The rest of the group will be in the audience observing the activity in step 6.
6. The teacher will explain that she will act as a talk show host and interview the famous women. The student should fully become the character, physically, vocally, etc. They should also answer with factual information from their research. If they really don’t know, then they should make something up, but they have to be ready to justify their fiction. They can take their notes up with them.

* Interview Question Options:

  * What is your favorite food? (throw in a few fun or low pressure questions to relax the students)
  * When were you born?
  * How did you change history?
  * Who inspired you?
  * How did you feel being overshadowed in your professional life because of your gender?
  * Was there someone who received the recognition that should have been yours?
  * What would you say to women today?

Continued on next page.
CLASSROOM GUIDE

Women in History, a History/Theatre Arts-Integration Lesson:

7. Close/Discussion: Once the interview has been concluded, allow the “audience” to respond first, then the actors.
   Response prompts:
   * Thoughts about these women?
   * Is it important to recognize them?
   * What was it like stepping into these women’s shoes?
   * How have these women shaped our society? Etc.

Links for research:
https://explorethearchive.com/15-important-women-in-history
https://medium.com/the-mission/50-women.heroes.who.changed.the.world-c07eefb7184

This activity fulfills the following standards:

Arizona Academic Standards in the Arts (Theatre):
TH.RE.8.HS1b Identify and compare cultural perspectives and contexts that influence the evaluation of theatrical work.

TH.RE.9.HS1a Examine a theatrical work using supporting evidence and criteria, while considering art forms, history, culture, and other disciplines.

TH.CN.11.HS1b Use basic theatre research methods to better understand the social and cultural background of a theatrical work.

Arizona’s Social Science Standards (History):
HS.H4.2 Explain how artistic, philosophical, and scientific ideas have developed and shaped society and institutions.

HS.H4.1 Examine how historically marginalized groups have affected change on political and social institutions.
CLASSROOM GUIDE

Women in History, a History/Theatre Arts-Integration Lesson GUIDED NOTE SHEET:

Born:

Died:

Schooling:

Major Contribution:

Was there someone else who received credit for her work?

Random Facts:

Family Life:

Other Passions:

You might not be able to find all of this information, but attempt to get to know her as well as you can.
Exploring the Solar System through Character and Movement, a Theatre/Dance/Science Arts-Integration Lesson:

Use this lesson to learn about rotation/revolution and character creation through movement exercises.

**Age Range:** Grade 6-8

**Materials:** Computers or phones for research, large open space, paper for notes

**Instructions:**

**Opener:** “The earth is spinning (rotating) as it revolves around the sun. This is why the stars appear to move night by night. Our perspective is simply changing as we revolve around the sun.”

1. Have the students stand in a large circle. Instruct each of them to imagine they were a planet and identify their axis point. The earth’s axis point is at a - 23.5° angle/tilt, but for the purposes of the exercise, ours will be straight up and down.

2. Next, have them explore rotation by turning one time. The earth makes one complete rotation every 24 hours, causing day and night. Have them do it again, this time turning counterclockwise, as earth does.

3. Now, define orbit as “the time it takes for the earth to make one complete revolution around the sun”. Explain that it takes one year to make their way around the sun. Mark a starting point and have the students walk counterclockwise in the circle until they return to the starting point – that is one revolution.

4. Now, have the students combine both rotation and revolution by spinning and walking in a circle simultaneously. That is how earth moves in relation to the sun. Extra challenge: have them try and tilt their axis as they spin and rotate!

5. Using the chart on page 26, have students pick a planet (multiple students can have the same planet)

6. Allow each student 5-10 minutes to research their planet. Then return to the circle and, one by one, have them introduce themselves as their planet and state the following information: Name (of the planet), one fun fact, favorite color. This should be done in a character voice of some kind – the idea is they are embodying the planet. They should use the information from the table above to determine if their character speaks quickly (based on the speed of their rotation/revolution), if they are bright and open (the sun), or small and timid (Pluto – if you are including it).

Continued on next page.
Exploring the Solar System through Character and Movement, a Theatre/Dance/Science Arts-Integration Lesson:

7. If your students need more support with the theatrical side of things, model it using the earth and have them try (all students simultaneously) doing their own “earth monologue”, then launch into the research.

**Closer:** If you are able, move someplace with lots of space (a field outside works wonderfully). Each planet will place themselves around whoever is the sun and they will both rotate and revolve (trying to emulate their planets speed) around the sun. After they do this once, have them do it again incorporating the characterization as they move. You will have one dizzy class.

**This activity fulfills the following standards:**

- Arizona Academic Standards in the Arts (Theatre):
  - TH.CR.2.6b Contribute ideas and accept and incorporate the ideas of others in preparing or devising theatrical work.
  - TH.PR.4.6b Demonstrate physical choices to create meaning in a theatrical work.
  - TH.CR.3.6c Use physical and vocal exploration for character development in an improvised or scripted theatrical work.

- Arizona’s Science Standards (Earth and Space):
  - 6.E2U1.8 Develop and use models to explain how constellations and other night sky patterns appear to move due to Earth’s rotation and revolution.

- Arizona Academic Standards in the Arts (Dance):
  - DA.CR.1.6c Create movement from a variety of stimuli (for example music/sound, observed dance, literary forms, natural phenomena, current news or social events, personal experience) that expands movement vocabulary and develops artistic expression. Use movement to create an original dance study.
### Exploring the Solar System through Character and Movement, a Theatre/Dance/Science Arts-Integration Lesson:

<table>
<thead>
<tr>
<th>Planet</th>
<th>Rotation Period</th>
<th>Revolution Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>58.6 days</td>
<td>87.97 days</td>
</tr>
<tr>
<td>Venus</td>
<td>243 days</td>
<td>224.7 days</td>
</tr>
<tr>
<td>Earth</td>
<td>0.99 days</td>
<td>365.26 days</td>
</tr>
<tr>
<td>Mars</td>
<td>1.03 days</td>
<td>1.88 years</td>
</tr>
<tr>
<td>Jupiter</td>
<td>0.41 days</td>
<td>11.86 years</td>
</tr>
<tr>
<td>Saturn</td>
<td>0.45 days</td>
<td>29.46 years</td>
</tr>
<tr>
<td>Uranus</td>
<td>0.72 days</td>
<td>84.01 years</td>
</tr>
<tr>
<td>Neptune</td>
<td>0.67 days</td>
<td>164.79 years</td>
</tr>
<tr>
<td>Pluto</td>
<td>6.39 days</td>
<td>248.59 years</td>
</tr>
</tbody>
</table>
Silent Sky

PLAY ANALYSIS WORKSHEET

PROTAGONIST
How is this story about them?

ANTAGONIST
In what ways does this character work against the Protagonist?

THEME OF THE PLAY
What was the main idea/theme of the play?

What does it say about the time in which it was set?

Meaning of the Title – why this title, what does it mean/represent? Often an idea is expressed through a feeling – what lies beneath the feeling?

MOOD OF THE PLAY
How does the mood start and how does it change throughout the show?

PERSONAL REACTION
What is your main take away? What did you like? What didn’t you like?