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*Stephanie*



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# About this Product

## BLACK HISTORY SCIENCE CELEBRATION

### FAMOUS BLACK AMERICAN SCIENTISTS, DOCTORS, ENGINEERS & INVENTORS

This resource includes enrichment activities that highlight scientific, medical and engineering achievements by Black American men and women. It includes:

- Ten one-page reading passages that focus on the scientific, medical and engineering accomplishments of Black American men and women
- Reflection questions for each reading passage that prompt discussion about each person's achievement(s) and how the person's achievement(s) impacted the scientific community and general public at large
- One extension activity that directs research of other Black Americans that have made important scientific, medical and/or engineering achievements

This resource can be used many ways:

- Use the passages and questions as bell ringers or warmups
  - Use the passages and questions as exit slips or reflections to end a lesson
  - Assign the passages and questions as homework
  - Use the passages and questions for enrichment
  - Use the activities to provoke conversations about diversity in the scientific community
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# About this Product

## BLACK HISTORY SCIENCE CELEBRATION

### FAMOUS BLACK AMERICAN SCIENTISTS, DOCTORS, ENGINEERS & INVENTORS

In addition to this traditional printable PDF file, this resource includes digital assignments made as fillable slides. Fillable slides allow students to complete assignments on a computer or tablet. The slides have embedded questions with text boxes that allow students to answer questions directly in a document.

Fillable slides are optimized to be used with Microsoft PowerPoint or Google Slides and thus Microsoft Teams and Google Classrooms, respectively. However, fillable slides can be used and assigned with a variety of other online platforms including Schoology, Canvas and Blackboard.

#### Important Notes:

- Each activity is saved as its own file.
- Activities CANNOT be edited; only fillable areas can be manipulated.

#### How can you distribute and share the files with your students?

- The assignments **CAN** be distributed directly to students through email.
- The assignments **CAN** be distributed or assigned with Google Classrooms, Microsoft Teams, Blackboard, Canvas, Schoology and other like platforms that require are password-protected or require a code to enroll.
- The assignments **CAN** be distributed with secure file sharing platforms like Google Drive, OneDrive and DropBox that are password-protected or shared only with students with their email or student account.

Please respect the work I put into creating resources for your classroom and adhere to my licensing and copyright terms. If you have any questions, please email me at [dsj.elkowitz@gmail.com](mailto:dsj.elkowitz@gmail.com). Thank you!

# About this Product

## BLACK HISTORY SCIENCE CELEBRATION

### FAMOUS BLACK AMERICAN SCIENTISTS, DOCTORS, ENGINEERS & INVENTORS

How to use Fillable Slides with Microsoft Teams:

1. Upload an assignment to your One Drive.
2. Create a new assignment.
3. Add the file as a "resource."
4. Assign to the appropriate class or students.
5. Students should complete the work in the slide. They will answer the questions in the text boxes.
6. When finished, the students should submit their work to the teacher.

How to use Fillable Slides with Google Classrooms:

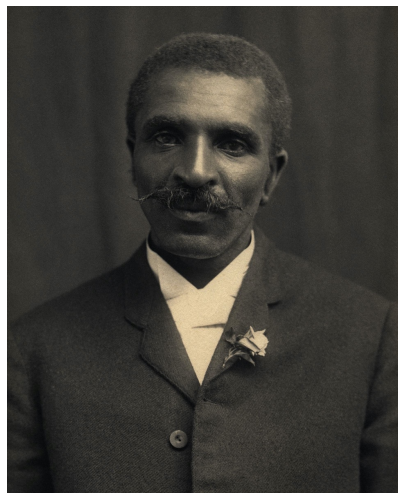
1. Upload the assignment to your Google Drive. Open the assignment with Google slides. Convert the pptx file to Google slides by selecting "Save as Google Slides" under file. **Alternatively, you can drag and drop the pptx file into Google Drive. This automatically converts the pptx file into a Google slide.**
2. Create a new assignment.
3. Add the Google slide to the assignment. Make a copy for each student.
4. Assign to the appropriate class or students.
5. Students should complete the assignment directly in the slide. They will answer the questions directly in the text boxes.
6. When finished, the students submit their work to the teacher.

Note: It is not absolutely necessary to convert the pptx file to a Google slide when working in Google classrooms. Students can open the pptx file with Google slides, complete work in the text boxes and submit their work without converting the file.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## *George Washington Carver* - AGRICULTURAL SCIENTIST



George Washington Carver is considered the most prominent Black scientist of the early 20<sup>th</sup> century. Carver was an American agricultural scientist and inventor. He developed techniques that improved the quality of soils depleted by repeated cotton planting. He promoted systematic crop rotation, in which farmers would alternate cotton crops with planting sweet potatoes or legumes, like peanuts and soybeans. Alternative crops restored nitrogen in the soil, which improved cotton yields. Furthermore, this gave farmers alternative “cash crops” that were good for human consumption.

### **Rise to Fame**

Carver attended Simpson College in Iowa, where he studied art and piano. His art teacher encouraged him to study botany, which he pursued at the Iowa State Agricultural College in 1891. He conducted studies in plant pathology and mycology, which gained him national recognition and respect.

In 1896, Carver was invited by the first principal and president of Tuskegee Institute, Booker T. Washington, to head its Agricultural Department. He taught at the college for 47 years, developing the department into a strong research facility. While at Tuskegee Institute, George developed his systematic crop rotation. He established an agricultural extension program for the state of Alabama to train farmers in the practice of crop rotation. He also distributed recipes for alternative crops and promoted possible uses of peanuts. He Carver was publicly admired by President Theodore Roosevelt and other prominent international figures.

### **Later in Life**

During the last 20 years of his life, Carver traveled to promote Tuskegee Institute (now known as Tuskegee University), his agricultural methods and peanuts. He published articles that promoted the peanut industry. Carver died in 1943 from complications after falling down a flight of stairs.

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

George Washington Carver Reflection Questions

Directions: Answer the following questions.

1. What was George Carver’s most significant achievement?

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2. How did George Carver’s accomplishment(s) impact the scientific community?

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3. How did George Carver’s accomplishment(s) impact the general public?

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4. What events played a role in George Carver’s rise to fame?

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Mae Jemison- ASTRONAUT, PHYSICIAN & ENGINEER



Mae Jemison is most well-known as the first Black female to travel in space. She was selected as one of fifteen people out of 2,000 applicants to be part of NASA's astronaut corps in 1987, the first chosen group of astronauts following the destruction of Challenger in 1986.

On September 28, 1989, Jemison was selected to serve as a mission specialist for the STS-47 crew. She launched from Cape Canaveral, Florida on September 12, 1992, aboard the Space Shuttle *Endeavour*. Jemison spent nearly eight days in space and orbited Earth 127 times. She returned to Earth on September 20 and soon after resigned from NASA.

### Rise to Fame

Mae Jemison began her undergraduate education at Stanford University at the age of sixteen. She received a BS degree in chemical engineering and a BA degree in African and African-American studies from the university in 1977. She then attended Cornell Medical School and graduated with a medical degree in 1981. Jemison worked as a general practitioner in Los Angeles, California before joining the Peace Corps in 1983. She served as a medical officer for the Peace Corps and was responsible for the health of volunteers in Liberia and Sierra Leone. When Jemison returned to the United States in 1985, she resumed medical practice in Los Angeles. During this time, she was inspired by the 1983 flight of Sally Ride – the first female in space – and Guion Bluford – the first African American in space – and decided to apply to NASA's astronaut training program. Mae Jemison began her career with NASA helping with launch support activities at Kennedy Space Center in Florida. She also helped verify orbital hardware and flight software pertinent to NASA shuttle missions.

### Later in Life

Jemison resigned from NASA in March 1993. She served on the board of directors of the World Sickle Cell Foundation for three years and eventually made her way to Dartmouth College, where she was appointed professor of environmental studies. Over the course of her career, she has received numerous honors and awards and received several honorary doctorates. Furthermore, she has been inducted into the National Women's Hall of Fame and the International Space Hall of Fame.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Mae Jemison Reflection Questions

Directions: Answer the following questions.

1. What was Mae Jemison’s most significant achievement?

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2. How did Mae Jemison’s accomplishment(s) impact the scientific community?

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3. How did Mae Jemison’s accomplishment(s) impact the general public?

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4. What events played a role in Mae Jemison’s rise to fame?

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Katherine Johnson - NASA MATHEMATICIAN



Katherine Johnson was an American mathematician whose contributions to NASA were vital to the success of the first and subsequent US crewed spaceflights. Johnson's calculations of orbital mechanics were critical to calculating trajectories, launch windows and emergency return paths for Project Mercury spaceflights. These calculations made it possible to launch Alan Shepard and John Glenn into space. Her calculations were also pertinent to flights to the moon. Specifically, she calculated the rendezvous path for the Apollo Lunar Module and command module. Later, her calculations were essential to the beginning of the Space Shuttle Program.

### Rise to Fame

Katherine Johnson's strong mathematical abilities were evident at an early age. She began attending high school in Institute, West Virginia at the age of ten and began math studies at West Virginia State at the age of 14. She graduated summa cum laude in 1937 with degrees in mathematics and French. Johnson wanted to become a research mathematician after graduating, but it was hard for Black women to enter this field. She began working as a teacher. In 1953, she accepted a job with the National Advisory Committee for Aeronautics (NACA) as a "computer" analyzing aerodynamic topics.

In 1958, NACA was dissolved and replaced with the newly created National Aeronautics and Space Administration (NASA). She was hired by NASA as an aerospace technologist. Johnson calculated the trajectories and launch windows for Mercury missions in 1961. She also plotted the backup navigational charts for astronauts in case of emergencies. NASA was also using electronic computers to make calculations. However, Johnson was called on to verify all computer numbers. In fact, John Glenn refused to fly unless Johnson verified the computer's calculations. Johnson later worked directly with computers and helped establish "trust" with their calculations. In 1969, Johnson helped calculate the trajectory for the Apollo 11 flight to the moon. She worked on the Apollo 13 Moon mission. When the mission aborted, her emergency backup charts helped set a path to return the crew to Earth safely.

### Later in Life

Johnson continued working for NASA until 1986. She spent her later years encouraging students to enter STEM fields. The 2016 movie *Hidden Figures* follows Johnson and other African-American women who worked for NASA. Johnson died in 2020 at the age of 101.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Katherine Johnson Reflection Questions

Directions: Answer the following questions.

1. What was Katherine Johnson’s most significant achievement?

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2. How did Katherine Johnson’s accomplishment(s) impact the scientific community?

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3. How did Katherine Johnson’s accomplishment(s) impact the general public?

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4. What events played a role in Katherine Johnson’s rise to fame?

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

## *Percy Lavon Julian* - RESEARCH CHEMIST



Percy Lavon Julian was an American research chemist who received more than 130 chemical patents. He was considered a pioneer in the synthesis of medicinal drugs from plants. Julian was the first person to synthesize physostigmine, a substance used to treat glaucoma and as an antidote for plant toxins that cause delirium and hallucination. He was also a pioneer in the large-scale chemical synthesis of estrogen, progesterone and testosterone using plant compounds. This work was vital to the production of cortisone, corticosteroids and birth control pills. For his achievements, Julian became the first African American chemist inducted into the National Academy of Science.

### **Rise to Fame**

Julian grew up in the early 1900s when it was rare for African Americans to receive an education beyond eighth grade. Nevertheless, Julian attended DePauw University in Indiana and graduated as valedictorian in 1920. He first took a position as a chemistry instructor at Fisk University. In 1923, he received an Austin Fellowship in Chemistry to attend Harvard University to obtain a master's degree. He gained his Ph.D. from the University of Vienna in 1931, making him the first African American to receive a doctorate in chemistry. He returned to the United States and continued teaching until 1936, when he was offered a position with Glidden Company. He first worked on several soybean-based inventions. He invented Aero-Foam, a widely used product during World War II that used soy proteins to put out oil and gas fires.

Julian changed his focus to biomedical inventions in 1940. He worked on synthesizing progesterone, estrogen and testosterone using plant sterols from soybean oil. At the time, doctors were just discovering uses for these human hormones. Julian used his patented technique to mass produce these hormones, which made it possible to treat many hormone deficiencies and paved the way for the production of birth control pills. In 1949, Julian discovered a new way to synthesize cortisone, a hormone used to treat rheumatoid arthritis. Julian worked for Glidden, discovering and patenting dozens of techniques that allowed for the synthesis of many other medicinal drugs.

### **Later in Life**

In 1954, Julian founded his research firm, Julian Laboratories. He became one of the first Black millionaires when he sold his company in 1961. He then founded the Julian Research Institute. He ran the nonprofit organization until his death in 1975.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Percy Lavon Julian Reflection Questions

Directions: Answer the following questions.

1. What was Percy Julian’s most significant achievement?

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2. How did Percy Julian’s accomplishment(s) impact the scientific community?

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3. How did Percy Julian’s accomplishment(s) impact the general public?

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4. What events played a role in Percy Julians’s rise to fame?

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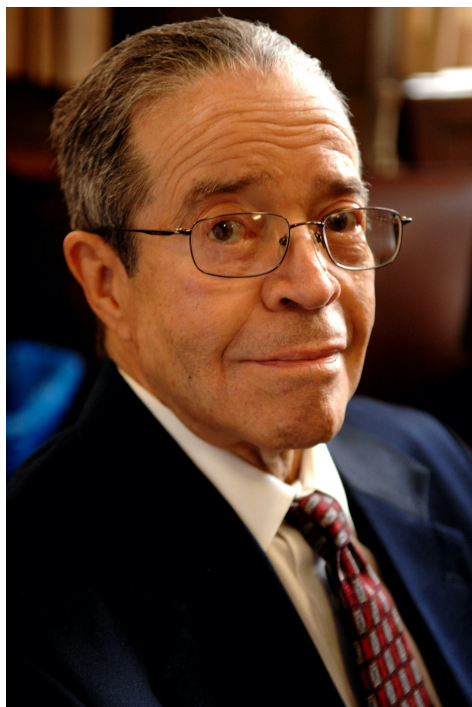
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Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Jesse Ernest Wilkins Jr - NUCLEAR SCIENTIST & ENGINEER



Jesse Ernest Wilkins Jr was an African American nuclear scientist, mathematician and mechanical engineer. He is most well known as being the youngest student ever at the University of Chicago. In 1936, he enrolled at the university at the age of thirteen. By 1942, Wilkins had earned a bachelor's degree, master's degree and Ph.D. from the university.

Wilkin's seven decades of research included significant contributions to mathematics and civil and nuclear engineering. He served as an associate mathematical physicist and then a physicist at the Chicago Met Lab during the Manhattan Project. Although unaware that the project's goal was to develop an atomic bomb, Wilkins's research helped develop methods of extracting fissionable nuclear material from Plutonium.

### Rise to Fame

Wilkin was only 19 years old when he earned his PhD. After completing his studies at the University of Chicago, he taught mathematics at Tuskegee Institute. He returned to the University of Chicago Metallurgical Lab in 1944, where he contributed to the research and development of the first nuclear weapons that ultimately ended World War II in the Pacific. Wilkins was unaware of the purpose of his research until the atomic bomb was dropped on Hiroshima in August 1945, one year later.

At the end of 1944, Wilkins collaborated with Eugene Wigner, a Nobel Prize-winning physicist, to research neutron absorption and its role in controlling fission reactions. Their collaboration led to the discovery of the Wigner-Wilkins spectra. This discovery was imperative to the design and development of nuclear reactors for electrical power.

### Later in Life

Wilkins spent his later career as a professor teaching applied mathematics physics at Howard University and later, applied mathematics and mathematical physics at Clark Atlanta University. He retired in 2003. Wilkins died on May 1, 2011 at the age of 87.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Jesse Ernest Wilkins Jr Reflection Questions

Directions: Answer the following questions.

1. What was Jesse Wilkins's most significant achievement?

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2. How did Jesse Wilkins's accomplishment(s) impact the scientific community?

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3. How did Jesse Wilkins's accomplishment(s) impact the general public?

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4. What events played a role in Jesse Wilkins's rise to fame?

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Name: \_\_\_\_\_

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## Rebecca Lee Crumpler - PHYSICIAN



Dr. Rebecca Lee Crumpler was the first African American woman to become a doctor in the United States. She graduated from the New England Female Medical College in 1864 at a time when very few African Americans – both men and women – could attend medical college. She first practiced medicine in Boston, caring for primarily poor women and children. When the Civil War ended in 1865, she moved to Richmond, Virginia to perform missionary work and provide medical care to freed slaves. Rebecca later moved back to Boston to continue her care for impoverished women and children. In 1883, she published a book focused on maternal and pediatric care. It was one of the first books about medicine written and published by an African American.

### Rise to Fame

Rebecca was raised in Pennsylvania by her aunt, who acted as the doctor in her community, caring for sick neighbors. Rebecca's aunt inspired her to pursue a career in health care. At the age of 21, she moved to Massachusetts and was employed as a nurse from 1855 to 1864. She began her medical education at the New England Female Medical College in 1865. In March 1864, the board of trustees at the college named her a Doctor of Medicine, making her the country's first formally trained African American female physician. She focused her career on learning about and treating diseases that affected women and children. She used the notes she kept over the years to publish a book, *A Book in Medical Discourses*, in 1883. Her book was dedicated to nurses and mothers and emphasized the "possibility" of preventing disease by understanding human anatomy and physiology. Crumpler was the only female physician to publish a book in the 19th century.

### Later in Life

In the early 1870s, Crumpler attended the classes to study mathematics. She taught for a few years before her death in 1895. After her death, one of the first medical societies for African American women was named The Rebecca Lee Society in her honor. Her home on Joy Street in Boston is a stop on the Boston Women's Heritage Trail.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Rebecca Lee Crumpler Reflection Questions

Directions: Answer the following questions.

1. What was Rebecca Crumpler’s most significant achievement?

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2. How did Rebecca Crumpler’s accomplishment(s) impact the scientific community?

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3. How did Rebecca Crumpler’s accomplishment(s) impact the general public?

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4. What events played a role in Rebecca Crumpler’s rise to fame?

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

## *Alexa Canady* - NEUROSURGEON



Alexa Canady is a retired African American physician. In 1981, she became the first board-certified Black female neurosurgeon when she completed her residency at the University of Minnesota. She was the chief of neurosurgery at the Children's Hospital of Michigan from 1987 to 2001. In addition to performing surgery while at the Children's Hospital of Michigan, Dr. Canady conducted research with Wayne State University. Her research led to the development of a shunt that helps with hydrocephalus – the buildup of fluid in cavities deep within the brain – in pediatric patients. From 2001 to 2012 she worked as a part-time surgeon and consultant at Sacred Heart Hospital in Pensacola, Florida.

### **Rise to Fame**

Dr. Canady attended the University of Michigan and graduated with a bachelor's degree in zoology in 1971. She continued her education at the University of Michigan Medical School, graduating cum laude honors in 1975. She decided to pursue a career in neurosurgery, despite the difficulties she might face entering that residency, being a female and African American. Dr. Canady completed an internship at the Yale-New Haven Hospital before beginning her neurosurgery residency at the University of Minnesota.

Dr. Canady finished residency in 1982 and decided to specialize in pediatric neurosurgery. She earned her board certification in pediatric neurosurgery in 1984, becoming the first female and first Black person to do so. Dr. Canady became chief of neurosurgery at Children's Hospital of Michigan in 1987. She specialized in surgeries that corrected congenital spinal abnormalities, hydrocephalus, and brain tumors. She was considered a patient-focused surgeon, known to play video games with her pediatric patients. While practicing, she conducted research and was a professor of neurosurgery at Wayne State University.

### **Later in Life**

Dr. Canady intended to retire in Pensacola, Florida in 2001. However, she realized a need for pediatric neurosurgery in the area and practiced as a part-time surgeon at the Sacred Heart Hospital until her full retirement in 2012. Dr. Canady received multiple honorary degrees, awards and recognitions. She continues to be an advocate for her profession and diversity in medicine.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Alexa Canady Reflection Questions

Directions: Answer the following questions.

1. What was Alexa Canady's most significant achievement?

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2. How did Alexa Canady's accomplishment(s) impact the scientific community?

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3. How did Alexa Canady's accomplishment(s) impact the general public?

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4. What events played a role in Alexa Canady's rise to fame?

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

## *Annie Easley* - COMPUTER & ROCKET SCIENTIST



Annie Easley was a well-admired African American computer scientist, rocket scientist and mathematician. She worked for the Lewis Research Center of NASA and its predecessor, the National Advisory Committee for Aeronautics (NACA). She was one of the first African Americans to work as a computer scientist for NASA. While at NASA, Easley was a leading member of the research team that developed the Centaur family of rockets. Her work with the Centaur rockets was important to laying the foundation for space shuttle launches. She is also recognized for her work in the development and implementation of computer codes that analyzed alternative power technologies, including the battery technology used early in hybrid automobiles.

### **Rise to Fame**

In 1955, Easley began her career working for NACA Lewis Flight Propulsion Laboratory after learning about its need for people with strong math skills. She was hired as a “human computer,” analyzing problems and doing calculations by hand. She was only one of four African Americans at the lab where about 2500 people worked. Early in her career, Easley ran simulations for a Plum Brook Reactor Facility, which became the primary NASA facility for space-related nuclear energy research and development.

Easley furthered her education while working full-time at the lab and earned a BS at Cleveland State University in 1977. During her 34-year career, Easley made contributions to many programs as a computer scientist. Her work was important to space shuttle launches as well as launches of satellites. Notably, Easley's work contributed to the 1997 launch of the Cassini probe that studied Saturn, its rings and its natural satellites.

### **Later in Life**

Easley was dedicated not only to her work but also to advocating for more women and people of color in the fields of science, technology, engineering, and mathematics. She became an equal employment opportunity counselor, helping to address issues of discrimination based on gender, race and age. She continued to encourage female and minority students to pursue STEM careers until she died in 2011 at the age of 78.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Annie Easley Reflection Questions

Directions: Answer the following questions.

1. What was Annie Easley's most significant achievement?

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2. How did Annie Easley's accomplishment(s) impact the scientific community?

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3. How did Annie Easley's accomplishment(s) impact the general public?

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4. What events played a role in Annie Easley's rise to fame?

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Walter Lincoln Hawkins - POLYMER CHEMIST & INVENTOR



Walter Lincoln Hawkins was an American chemist and engineer often regarded as the pioneer of polymer chemistry. He worked at Bell Laboratories and is most well known for designing long-lasting plastic to wrap telephone cables. This invention allowed the introduction of telephone service to Americans across the country, especially those in rural communities. In addition to his research and innovations, Hawkins was a strong advocate for minority students and established the Bell Laboratories Summer Research Program for Minorities and Women. He also helped establish the Bell Laboratories Cooperative Research Fellowship Program, which recruits and supports minorities seeking a Ph.D. in engineering. Both programs benefitted minorities even after Hawkins' death.

### Rise to Fame

Hawkins exhibited an interest in creating things and learning about how things worked at an early age. When he was young, he often took apart his toys and reassembled them to make new toys. After graduating high school, he attended the RPI in New York. He was only one of two Black students at the school. He graduated with a BS in chemical engineering in 1932. He then enrolled at Howard University, where he earned a master's degree in chemistry in 1934. Four years later, he earned a Ph.D. in Chemistry at McGill University in Montreal, Canada. He stayed at the university for several years, teaching and researching cellulose chemistry.

In 1942, Bell Laboratories hired Hawkins. He was the first African American to join its staff. Hawkins eventually became head of his department in 1972. Early in his career, he focused on producing cheap alternatives to rubber that could be made in the United States during World War II. After the war, Hawkins focused on creating new and improved insulation for telephone cables. At the time, cables were encased in expensive lead over incredibly long distances, and common plastics were brittle and couldn't be used outdoors for long periods. In 1956, Hawkins helped invent a plastic that could withstand extreme fluctuations in temperature, last for up to seventy years and was cheaper than lead. This invention allowed affordable phone service to thousands of Americans, especially those in rural areas.

### Later in Life

During the 34 years Hawkins worked for Bell Laboratories, he contributed to 18 patents, 55 research articles and three books. He focused on minority advocacy efforts after his retirement from Bell Labs in 1976. Hawkins died in 1992 at the age of 81.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Walter Lincoln Hawkins Reflection Questions

Directions: Answer the following questions.

1. What was Walter Hawkins' most significant achievement?

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2. How did Walter Hawkins' accomplishment(s) impact the scientific community?

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3. How did Walter Hawkins' accomplishment(s) impact the general public?

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4. What events played a role in Walter Hawkins' rise to fame?

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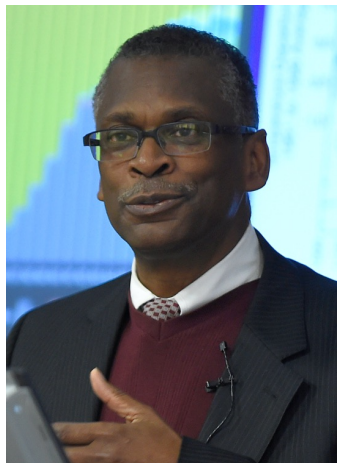
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Name: \_\_\_\_\_

Date: \_\_\_\_\_

# *Lonnie George Johnson* - INVENTOR & AEROSPACE ENGINEER



Lonnie George Johnson is an American inventor, entrepreneur and engineer who holds more than 120 US patents. He worked twelve years at NASA between 1979 and 1991. While working for NASA, he helped develop the nuclear power source for the Galileo missions to Jupiter. He also worked on several weapons-related projects and helped develop unmanned spacecraft for the exploration of the outer solar system. In 1990, Johnson invented the Super Soaker gun, one of the world's bestselling toys since its released. He also contributed to the development of several Nerf gun line of toys. After leaving NASA, Johnson went on to develop his own technology-development companies.

## **Rise to Fame**

Johnson attended college at Tuskegee University, where he earned a bachelor's degree in mechanical engineering in 1972 and then a master's degree in nuclear engineering in 1974. After college, Johnson joined the US Air Force. While serving in the Air Force, he worked on the stealth bomber program, developing aircraft designed to appear "totally invisible" and avoid detection using stealth technology.

Johnson left the Air Force and joined NASA's jet propulsion laboratory in 1979. His most notable projects included the Galileo mission to Jupiter, the Mars Observer project and the Cassini mission to Saturn. Johnson is also well known for developing the Johnson Tube, a CFC-free refrigeration system, in 1988. Simultaneously, while working for NASA, Johnson conceived the idea of the Super Soaker. He received a patent for the toy in 1986, and it first appeared in toy shops in 1990. The Super Soaker generated over \$200 million in sales in 1991, the same year Johnson resigned from NASA.

## **Later in Life**

Today, Johnson owns two technology-development companies: Excellatron Solid State and Johnson Electro-Mechanical Systems (JEMS). Excellatron focuses on the development and production of solid-state batteries that can be used in implantable medical devices. The batteries have military applications as well. JEMS is credited with developing a Thermo-Electrochemical converter system, an engine that converts thermal energy to electrical energy. This device could be used in solar power plants and ocean thermal power generation.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Lonnie George Johnson Reflection Questions

Directions: Answer the following questions.

1. What was Lonnie Johnson's most significant achievement?

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2. How did Lonnie Johnson's accomplishment(s) impact the scientific community?

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3. How did Lonnie Johnson's accomplishment(s) impact the general public?

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4. What events played a role in Lonnie Johnson's rise to fame?

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Celebrating Black American Contributions to the Scientific Community

Directions: Research a Black American scientist, doctor, engineer or inventor. This person should be a pioneer in his or her field and/or made a scientific or engineering achievement that positively impacted the scientific community.

Significant Black American scientists, doctors, engineers and inventors to consider:

- **Marie M Daly:** first African American woman to receive a PhD
- **Alice Ball:** developed treatment of leprosy
- **Frederick McKinley Jones:** inventor of refrigeration equipment
- **Granville T Woods:** made key contributions to the development of the telephone
- **James McCune Smith:** first African American physician in the United States
- **Roger Arliner Young:** zoologist, biologist and marine biologist
- **Betty Washington Greene:** Ph.D. chemist who worked for the Dow Chemical Company
- **Otis Boykin:** inventor and engineer that patented as many as 26 devices
- **Gladys West:** mathematician, contributed to mathematical modeling of Earth's shape
- **Ernest Everett Just:** pioneering biologist who studied cell surfaces
- **Warren Washington:** atmospheric scientist
- **Guion Bluford Jr:** aerospace engineer and first African American astronaut
- **Edward Bouchet:** first African American to earn a Ph.D. in the United States

You are not limited to the list of people listed above.

Write a short essay that answers the following questions:

1. What was this person's most significant scientific achievement(s)?
2. How did the person's achievement(s) contribute to the scientific community?
3. How did the person's achievement(s) impact society and the general public?
4. How might the world be different if this person never lived? Do you think someone else would have made the discovery, invention and/or achievement of this person?

Additionally:

- Include a photo of the person.
- Discuss personal details that played a role in this person's professional achievements
- Explain why did you choose to recognize *this* person's accomplishments. Was there something specific that inspired you to research this particular individual?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Celebrating Black American Contributions to the Scientific Community

This image shows a full page of blank, lined paper. It features approximately 28 horizontal blue or grey lines spaced evenly apart, typical of notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings on the page.