COMMONLIT

Name: _____ Class: _____

Stephen Hawking

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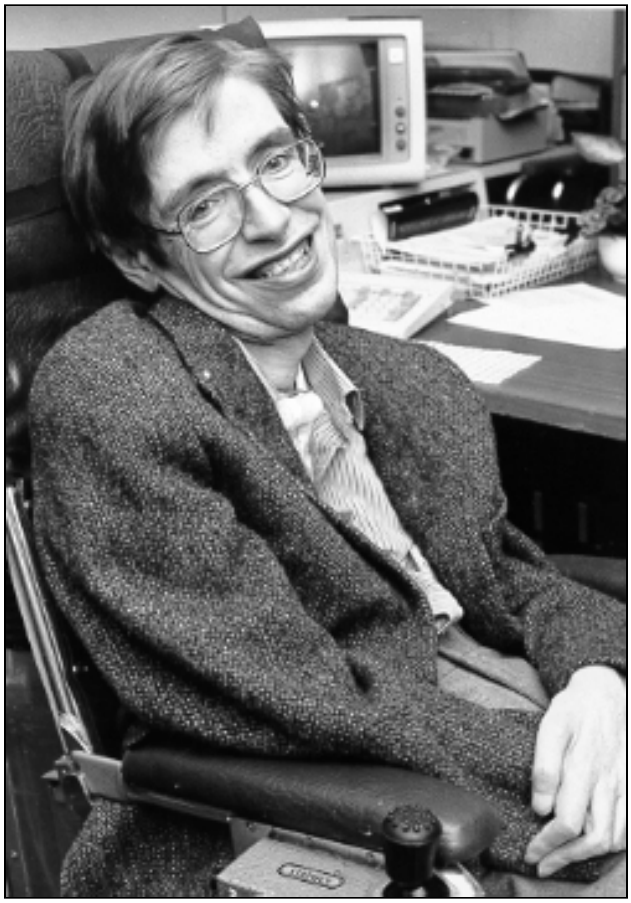
Stephen Hawking, born in 1942, is a renowned physicist and author who studies the universe: its origins, evolution, and eventual fate. In this informational text, Jessica McBirney discusses Hawking's contributions, as well as his battle with amyotrophic lateral sclerosis (ALS), a disease that has paralyzed him over the decades. As you read, take notes on what Hawking has contributed to science, as well as disability rights.

[1] Stephen Hawking is one of the most famous theoretical physicists[1] of our time, and not just for his revolutionary work in physics and cosmology. Over his lifetime, he has contributed immensely to scientific knowledge of relativity, black holes, quantum mechanics, and the universe's beginning. However, he is also well-known throughout the world because of his status as a role-model for people with disabilities. He has lived with motor neuron disease, a paralyzing disease, for decades, but he continues to advocate for others who live and work with disabilities as well.



"Stephen Hawking (Courtesy NASA StarChild)" by NASA is in the public domain.

Early Life

The Hawking family members were all very intelligent; both of his parents studied at Oxford University near London, and his father became head of a division of Britain's National Institute for Medical Research. Hawking himself was born in January 1942. The family was known in their hometown of St. Albans, Britain for being somewhat eccentric[2] — it was common knowledge that family dinners at the Hawking house meant silently reading to yourself at the table.

In high school, Hawking maintained a close group of friends who all enjoyed activities such as making homemade fireworks, building model airplanes, and discussing big topics like religion and the mind. In 1958, Hawking and his friends began constructing basic computers with old clock and telephone parts (computers themselves had only been around for about ten years).

1. a branch of physics that uses mathematical models to explain and predict natural events
2. **Eccentric** ***(adjective):*** unconventional and slightly strange

Oxford and Cambridge

Hawking decided to follow in his parents' footsteps and attend Oxford University, where he studied physics and chemistry. Although Oxford was one of the top universities in the world, Hawking was bored by his first-year studies, calling them "ridiculously easy."

[5] Hawking felt lonely during that first year, so in his second year he decided to become more socially active. He became popular and well-liked, known for being witty and appreciating music and science-fiction. Even though he kept relatively lazy study habits, his incredible intelligence was clear. The professors conducting his final examinations had no choice but to give him top honors, which launched him into PhD studies at Cambridge University.

Graduate school at Cambridge proved difficult for Hawking. He did not get to work with the physicists he had hoped . Worse news came when he was soon diagnosed with motor neuron disease, also known as amyotrophic lateral sclerosis (ALS), and given only two years to live. This understandably depressed him. However, the disease progressed much more slowly than anyone expected, so while he had some trouble walking and speaking clearly, he was still able to pursue his passion for science.

Career

Hawking made many important discoveries and theories over the course of his life. One of his earliest theories was that the universe began as a single point (and that it had not existed forever, as some scientists believed). This theory is one of the key building blocks in the theory of the Big Bang.[3]

Additionally, Hawking conducted research to learn more about black holes. In 1973, he hypothesized that black holes emit radiation; some scientists thought the idea was ridiculous, but several years later further studies proved he was correct. Hawking frequently made wagers with other scientists about whose theory would eventually be proven correct; he often won, but not always!

In the late 1970s Hawking was made a professor of mathematics at Cambridge University. Both he and his work grew in popularity around the world, and he received many medals and awards for his accomplishments.

[10] As Hawking continued to develop new theories about the beginnings of the universe, he decided to publish a book on the topic that a general audience would be able to read. *A Brief History of Time* was first published in 1984 and immediately made it onto bestseller lists in several countries. Over the next decade, he published several other books, some for scientific audiences and some for general audiences, including a series of children's books (co-authored by his daughter) titled *George's Secret Key to the Universe*.

Hawking remains active in the scientific community. He has been promised a ride on the first privately launched spaceship, the Virgin Galactic spaceship, although there is no launch date yet. He continues to create scientific content for broad audiences but also remains involved with many hot issues in the world of physics.

3. a theory that the universe began because of a cosmic explosion

Living with ALS

Hawking's disease certainly never stopped him from achieving incredible things, but it has posed many difficulties. He lost most of his ability to write while he was still in his 20s, but he was able to continue working in physics by seeing equations in terms of geometry. When he became too unsteady on his feet to walk, he resigned himself to wild and unpredictable wheelchair driving instead. He and his wife campaigned for greater wheelchair access around Cambridge grounds, but he hesitated to call himself a disability rights activist because he preferred to distance himself from the disease.

ALS eventually made Hawking's speech too slurred for others to understand him. He utilized a variety of cutting-edge technologies to help him communicate. At first, he raised his eyebrows to point to letters that spelled out words. Eventually he and some friends developed a computer program that allowed him to select words from over 2,000 pre-coded phrases. The computer was attached to his wheelchair, so he could communicate without a translator. As his disease progressed, he used more and more advanced technology, including predictive software and computers that sensed his cheek movements.

Although he prefers to be known for his work in physics, Hawking has become more of a disability rights activist since the 1990s. Around 2000, he and 11 other people worked on a charter calling governments to increase support for those with disabilities. In 2012, he hosted part of the opening ceremonies for the Paralympics.[4]

4. international contests for athletes with disabilities

Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

1. PART A: Which of the following describes one of the central ideas of the text?
    A. The effects of Hawking's disease on his body have not stopped him from making discoveries that have changed the way we understand the universe.
    B. Since developing ALS, Hawking has stepped back from physics to focus more on contributing to disability rights.
    C. In the first few years following his diagnosis of ALS, Hawking was too disheartened by his new limitations to contribute to disability rights or physics.
    D. While Hawking's mind continues to be sharp, his disease has prevented him from communicating his ideas to others.

2. PART B: Which detail from the text best supports the answer to Part A?
    A. "Worse news came when he was soon diagnosed with motor neuron disease, also known as amyotrophic lateral sclerosis (ALS), and given only two years to live. This understandably depressed him." (Paragraph 6)
    B. "He lost most of his ability to write while he was still in his 20s, but he was able to continue working in physics by seeing equations in terms of geometry." (Paragraph 12)
    C. "As his disease progressed, he used more and more advanced technology, including predictive software and computers that sensed his cheek movements." (Paragraph 13)
    D. "Around 2000, he and 11 other people worked on a charter calling governments to increase support for those with disabilities." (Paragraph 14)

3. How does the following quote from paragraph 4 help readers understand Hawking? "Although Oxford was one of the top universities in the world, Hawking was bored by his first-year studies, calling them 'ridiculously easy.'"
    A. It depicts Hawking as overconfident in his abilities as a student.
    B. It explains why Hawking had a difficult time making friends at school.
    C. It emphasizes how intelligent Hawking truly was as a student.
    D. It shows how little Hawking cared about school in his youth.

4. How does the author support her claim that Hawking has become a disability rights activist?

Discussion Questions

Directions: Brainstorm your answers to the following questions in the space provided. Be prepared to share your original ideas in a class discussion.

1. How did Stephen Hawking overcome the obstacles presented by his disease to continue contributing to science and disability rights? What physical and mental tools helped him do this?

2. How has technology contributed to Stephen Hawking's continued success in the field of physics? How does technology help you succeed? Cite evidence from this text, your own experience, and other literature, art, or history in your answer.

3. How has Stephen Hawking changed the way we understand the universe? Similarly, how do you think Hawking has increased awareness around disability rights?