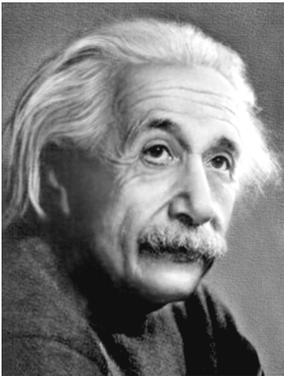


Name: \_\_\_\_\_

## Skill Sheet 18.3

## Albert Einstein

Albert Einstein revolutionized the way we view the physical world on an atomic scale.



Albert Einstein was born in Ulm, Germany, in 1879. He was a quiet child who enjoyed spending hours building houses of cards and playing the violin. One story he liked to tell about his youth was of his first encounter with a magnetic compass: The needle seemed to him to be guided northward by an invisible force. He was convinced there had to be “something behind things, something deeply hidden.” The search for that “something” occupied him until his death in 1955.

Einstein was not fond of school until he entered secondary school in Aarau, Switzerland. There he found first-rate laboratory facilities and teachers who nurtured his interest in science. Einstein went on to attend the Zurich Polytechnic Institute and graduated in 1900 with a teaching degree. His first job was as a technician in the patent office in Bern, Switzerland. Einstein enjoyed evaluating patent claims, but the best part of the position was the stability it provided in his life. He spent many free evenings reading and thinking about current issues in theoretical physics.

In 1905, Einstein published three papers which radically changed the way scientists understand the physical world. While most work in theoretical physics is accomplished through an extended dialogue among scientists, Einstein’s three papers were written in relative isolation. His first paper described light as discreet bundles of radiation. His description formed the basis for much of quantum mechanics. The second paper proposed his theory of special relativity. While Einstein was not the first scientist to generate all of the pieces of this theory, he was the first to unify them. Einstein’s third paper showed that Brownian motion (the erratic motion of microscopic particles in a fluid) provided physical evidence for the existence of atoms and molecules. Until Einstein published his paper, scientists had only theoretical evidence of these tiny particles.

Einstein earned respect as one of Europe’s leading scientific thinkers as a result of these papers. In 1909 he became a professor first in Zurich, then Prague, and eventually back again in Zurich. In 1914 he was appointed director of the Kaiser Wilhelm Physical Institute and professor at the University of Berlin.

Einstein’s interests turned toward a theory of general relativity, which showed how inertia and gravity are connected. His theory predicted that light from distant stars should be bent by the curvature of space near the sun. During a solar eclipse in 1919, his prediction was proven correct. In 1921, he was awarded the Nobel Prize in Physics for his work on the photoelectric effect.

During World War I, Einstein, a pacifist, refused to support Germany’s war aims. In 1933, he left Germany to become a professor at Princeton University. In 1939, concerned about the rise of fascism, he decided force was necessary to face this threat. He sent a letter to President Roosevelt that urged the United States to develop an atomic bomb before Germany did. After the war, Einstein was a strong supporter of nuclear disarmament.

Einstein’s scientific interests in his later years focused on finding a unified field theory, which he hoped could integrate all the known forces in nature into a single equation that would show they were all manifestations of a single fundamental force. While he never managed to find what he was looking for, his work fascinates theoretical physicists to this day.

### Questions

1. Find out how scientists tested Einstein’s theory of general relativity in 1919. Write a paragraph to explain their method.
2. Research Brownian motion and prepare a demonstration for your classmates.