Sabrina Shisler
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Unit 5 Assignment

J. Robert Oppenheimer

J. Robert Oppenheimer was a genius in the field of physics and he was a unique person in the field of science due to his interest in topics outside of the realm of science. Oppenheimer was interested in architecture, poetry, and minerals at a young age, and he attended the Ethical Culture School in New York that instilled a strong sense of morality in Oppenheimer that would prove to determine his fate with relations to the government of the United States. The most important aspect of Oppenheimer's learning was the opportunities he had to work with skilled colleagues that contributed important discoveries to the fields of chemistry, physics, and mathematics. The respect and reputation that Oppenheimer gained in the science community is what prompted the United States government to turn to him as the leader of a 10,000-person project with the goal of building an atomic bomb at the age of 38.

The relationships with accomplished scientists that helped J. Robert Oppenheimer gain the experience and knowledge that led him to gain the reputation as a world-renowned physicist are expertly chronicled as the online exhibit sponsored by The University of California in Berkeley, *Oppenheimer: A Life,* follows the major events of Oppenheimer's life. In his early years, Oppenheimer worked with J.J. Thomson at the Cavendish Laboratory in Cambridge, England, but as Oppenheimer discovered that he was "somewhat poor at experimental work", he sought to learn more about theoretical physics. This led Oppenheimer to the decision to attend the University of Gottingen in Germany to work with Max Born. (The Early Years) As Oppenheimer studied theoretical physics, with a particular focus on quantum mechanics, at the University of Gottingen, Oppenheimer interacted with many notable scientists and mathematicians, including Paul Dirac, Ed Condon, Werner Heisenberg and Wolfgang Pauli. Oppenheimer would continue pursuing his interest in theoretical physics as he worked with Pauli on the fundamental problems of quantum field theory and the continuous spectrum. (The Early Years)

After working with Pauli in Zurich, the acceptance of an assistant professorship at the University of California in Berkeley turned out to be a vital decision in Oppenheimer's life. A long-lasting collaboration with Ernest O. Lawrence, inventor of the cyclotron, began at the University of California in Berkeley. (Building a School) The online exhibit of *Lawrence and the Cyclotron* provided insight into the unlikely relationship that was forged between the two physicists by saying,

> Oppenheimer and Lawrence were opposites in many ways. He was a cosmopolitan Jew with interests in transcendental philosophy, a European-trained abstract theorist and an expert in quantum and relativity theory. Lawrence was a midwest Lutheran, a U.S.-trained pragmatic experimentalist, and an expert in electronics and fundraising.

Their collaboration marked the rise of American physics as the theorist and experimentalist became friends. (Big Science) Oppenheimer's connection with Lawrence proved to be of great importance when Oppenheimer was brought into a project that Lawrence was working on whose goal was to use nuclear fission in order to create a weapon, until General Leslie R. Groves appointed Oppenheimer as the scientific director of The Manhattan Project (*Oppenheimer: A Life*; Los Alamos) Due to the relationship that existed between Oppenheimer and Lawrence, "Lawrence and his machines took part in the Manhattan Project, which produced the first atomic bombs." (*Lawrence and the Cyclotron*; Home)

Many factors contributed to J. Robert Oppenheimer's success at learning, but the pillar that led to Oppenheimer's notoriety as one of the most eminent Americans in the history of this nation was the reputation he established as he chose the colleagues with which to work. More than anything, Oppenheimer loved to learn. He described his time at Harvard by saying, "I loved it. I almost came alive. I took more classes than I was supposed to, lived in the stacks, and just raided the place." (pg 118 Passion for Learning) Philip A. Cusick made an optimistic statement in *A Passion for Learning* when he said, "one would hope that in a democratic society that has institutionalized and made compulsory some of the model's elements [pillars], quality education of the type attained by the subjects [Oppenheimer] would be available to all." (pg 162)