

JOHN ADAMS

Doctor Atomic

A Guide for Educators



Doctor Atomic

Stories of creation and destruction have long enjoyed a central place in the human imagination. Yet for much of our history, the power to create and destroy was the stuff of legend—until, in 1945, scientific ingenuity put these powers very much in the hands of humankind. In the early morning hours of June 16, 1945, the United States tested an atomic bomb in the remote New Mexico desert. The culmination of a massive, yearslong undertaking that involved more than 100,000 people across the United States, the test is often viewed as a triumph of science and modern thought; for composer John Adams, it was a moment when the modern and the mythic came together with terrifying force. “The manipulation of the atom, the unleashing of that formerly inaccessible source of densely concentrated energy, was the great mythological tale of our time,” he observes. And in 2005, as the world celebrated the 60th anniversary of the end of World War II, Adams’s *Doctor Atomic* brought this modern myth to the opera stage.

At the center of the story stands J. Robert Oppenheimer, the titular doctor and a character as complex and conflicted as any mythological hero. A brilliant physicist, Oppenheimer was tasked with overseeing the scientists of the Manhattan Project, the government initiative to develop atomic weaponry in the early 1940s. Yet Oppenheimer was also a supremely cultured man of literature, music, and art. He was conflicted about the creation of the bomb and exquisitely aware of its potential for devastation, and his story—like any good myth—invites us to examine age-old questions about our powers and our limitations as a species.

This guide thus introduces *Doctor Atomic* as a work of modern mythology that draws on literary, musical, artistic, and dramatic techniques to bring an extremely complex moment to life. Adams’s collaborator and librettist, Peter Sellars, crafted a collage of historical documents, poetry, and spiritual texts to give voice to the historical figures that people the work; set designer Julian Crouch and the artists of 59 Productions created dynamic video projections for the production; and director Penny Woolcock used small, intimate moments to balance this story of explosive power and might. As students apply the techniques of literary analysis, close listening, and critical thinking to *Doctor Atomic*, they will be invited to consider how the dilemma faced by the Manhattan Project scientists continues to resonate today. If you could create something capable of both saving and destroying humanity, the opera seems to ask, would you?



FINLEY



COOKE



FINK



GLENN



OWENS

THE WORK

An opera in **two acts, sung in English**

Music by **John Adams**

Libretto by **Peter Sellars**,
adapted from original sources

First performed on **October 1, 2005**,
at **San Francisco Opera**

PRODUCTION

Penny Woolcock
Production

Julian Crouch
Set Designer

Catherine Zuber
Costume Designer

Brian MacDevitt
Lighting Designer

Andrew Dawson
Choreographer

Leo Warner & Mark Grimmer
for **59 Productions Ltd.**
Video Design

Mark Grey
Sound Designer

PERFORMANCE

The Met: Live in HD
Broadcast: November 8, 2008

Gerald Finley
J. Robert Oppenheimer

Sasha Cooke
Kitty Oppenheimer

Richard Paul Fink
Edward Teller

Thomas Glenn
Robert Wilson

Eric Owens
General Leslie Groves

Alan Gilbert
Conductor

Doctor Atomic is a co-production with
English National Opera.

Production a gift of Agnes Varis
and Karl Leichtman

HD Live in Schools is supported through
a partnership with the New York City
Department of Education.

Opera in the Classroom

The Metropolitan Opera Educator Guides offer a creative, interdisciplinary introduction to opera. Designed to complement existing classroom curricula in music, the humanities, STEM fields, and the arts, these guides will help young viewers confidently engage with opera whether or not they have prior experience with the art form.

On the following pages, you'll find an array of materials designed to encourage critical thinking, deepen background knowledge, and empower students to engage with *Doctor Atomic*'s story, music, and themes. These materials can be used in classrooms and/or via remote-learning platforms, and they can be mixed and matched to suit your students' individual academic needs.

Above all, this guide is intended to help students explore *Doctor Atomic* through their own experiences and ideas. The diverse perspectives that your students bring to opera make the art form infinitely richer, and we hope that your students will experience opera as a space where their confidence can grow and their curiosity can flourish.

WHAT'S IN THIS GUIDE:

Philosophical Chairs: A series of questions that will introduce students to the opera's main themes while sparking their creativity and encouraging debate

Who's Who in *Doctor Atomic*: An introduction to the opera's main characters and their roles in the plot

Synopsis: A complete opera synopsis for young readers

The Source: Information about the literary sources and/or historical events that inspired the opera

Timelines: One or more timelines connecting the opera to events in world history

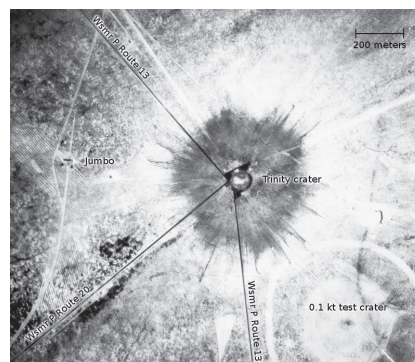
Deep Dives: In-depth looks at various topics relating to the opera

Active Exploration: Interdisciplinary activities connecting the opera to topics in music, the humanities, STEM, and the arts

THROUGHOUT THE GUIDE, YOU'LL ALSO FIND:

Critical Inquiries: Questions and thought experiments designed to foster careful thinking

Fun Facts: Entertaining tidbits about *Doctor Atomic*



FUN FACT

If you visit the site of the Trinity test today, the circle of the bomb blast (about half a mile in diameter) is clearly visible. The bomb test annihilated the existing vegetation, along with every other living thing. When plant and animal life returned to the site many years later, it was yucca plants—rather than the surrounding creosote bushes—that filled in the space.

Above: An aerial photograph of the Trinity crater shortly after the test.

CURRICULAR CONNECTIONS

This guide invites students to explore the opera through:

Language Arts
World Literature
Poetry
Creative Writing
Visual Arts
History of Science
Social History
Native American and Indigenous Studies
Game Theory
Law
Ethics
Debate
Original Research

Philosophical Chairs

Philosophical Chairs is an activity designed to foster critical thinking, active inquiry, and respectful dialogue among students. To play a game of Philosophical Chairs, participants agree or disagree with a series of statements, but the game doesn't end there. The most crucial element of the game is what happens next: Participants discuss their points of view and can switch sides if their opinions change during the discussion. (For more tips on using Philosophical Chairs in a classroom or via a remote-learning platform, see the activity description in your Google Classroom.)

Each topic statement is deliberately open-ended yet ties into a number of the themes present in *Doctor Atomic*—including the scientific progress that the bomb represented, the long-term impact of the atomic bomb on warfare and international relations, and the moral complexities of the bomb's use. As you and your students explore and learn about *Doctor Atomic*, you can return to these statements: What do they have to do with the opera's story? How might these questions help us explore the opera's story, history, and themes?

ETHICAL/MORAL ASPECTS OF THE ATOMIC BOMB

- Science should only be used for good.
- Every action has a consequence.
- Humans have an innate desire to push boundaries.
- Scientists alone should not determine the fate of others.
- Politicians alone should not determine the fate of others.
- Peace comes at a cost.
- You cannot silence your conscience.
- A country may keep secrets and withhold information for the safety of its citizens.
- Everyone is born knowing right from wrong.
- Nuclear weapons make the world safer. / Nuclear weapons should be destroyed.
- The use of nuclear weapons today poses an existential risk.
- The dropping of the atomic bomb was morally justifiable.



Keep in mind that the process of this activity is just as important as the statements themselves. Imagine a world in which everyone actively listens to one another and engages in respectful dialogue, honoring others and showing respect for the wide array of diverse ideas and opinions that others hold. Philosophical Chairs fosters exactly this kind of space, encouraging students to take what they've learned and change the global landscape for generations to come.



Philosophical Chairs, continued

POLITICAL / STRATEGIC ASPECTS OF THE ATOMIC BOMB

- Terror is an acceptable form of negotiation.
- It is our country's responsibility to be the world's police.
- Rules of war do not exist.
- Decisions of war ought to be based solely on military needs, as opposed to moral considerations.
- The dropping of the atomic bomb was a crime, as opposed to an act of war. (What is the difference between a "crime" and an "act of war"?)
- The atomic bomb made the world safer.
- Taking the life of a noncombatant (civilian) in war is murder.
- The dropping of the atomic bomb was an act of genocide.
- The dropping of the atomic bomb was the only way to end World War II, which justifies its use.
- The president should be the sole person deciding when to authorize a nuclear attack.
- A nuclear weapon will never be used again in war.



Harry Truman

FUN FACT

The laboratory at Los Alamos was so secret when it was built that even Vice President Harry Truman was unaware of its existence.

Who's Who in *Doctor Atomic*

CHARACTER	VOICE TYPE	THE LOWDOWN
J. Robert Oppenheimer One of the lead physicists working on the atomic bomb, and the director of the Los Alamos Laboratory	baritone	Tasked with leading a major scientific undertaking that could be decisive in ending World War II, Oppenheimer must maintain a confident public persona. Yet in private, he is tortured by worries over what the bomb he has helped create might mean for the future of humanity.
Kitty Oppenheimer Oppenheimer's wife	soprano or mezzo-soprano	Waiting at home, caring for her new baby while her husband creates the most powerful bomb in all of history, Kitty is torn between thoughts of life and death, love and destruction.
Pasqualita The Oppenheims' nanny and maid	contralto	An Indigenous woman, Pasqualita uses Tewa poetry to respond to both the bomb test and the tension in the Oppenheimer household. More broadly, she represents the numerous Indigenous peoples employed at the Trinity test site and the impact that ongoing bomb tests would have on Indigenous lands in the western United States.
General Leslie Groves Commander of the Manhattan Project	bass	In contrast to the Manhattan Project physicists, whose focus is on the scientific aspects of the bomb, General Leslie Groves represents the military's interest in the new weapon. He is desperate for the test to go ahead as planned because he hopes to use the bomb to end World War II.
Edward Teller Robert Wilson Physicists working on the bomb	baritone tenor	Teller and Wilson are both concerned about the moral consequences of the terrifying bomb that they have helped develop.
Frank Hubbard A meteorologist	baritone	The right weather conditions are crucial to a successful test: Unexpected weather events could cause a deadly disaster. It is up to Frank Hubbard to track the weather at the test site—but General Groves's insistence that the test take place as planned is making his job difficult.
Captain Nolan An army doctor	tenor	As a trained medic, Captain Nolan worries about the fallout (radioactive particles) that will be released by the detonation of the bomb. (Although fallout was poorly understood in 1945, today it is known to be a major cause of cancer and other medical conditions, and the fallout from a nuclear blast can spread thousands of miles beyond the detonation site.)



J. Robert Oppenheimer



Kitty Oppenheimer



Pasqualita



General Leslie Groves



Edward Teller



Robert Wilson



Frank Hubbard



Captain Nolan

PHOTOS: KEN HOWARD/MET OPERA; MARTY SOHL/MET OPERA (PASQUALITA, CAPTAIN NOLAN)

Synopsis

ACT I *Los Alamos Laboratory, New Mexico. June 1945.* Physicist J. Robert Oppenheimer and Project Commander General Leslie Groves are in charge of the Manhattan Project, the monumental, top-secret venture to develop the first atomic bomb. Convinced that an atomic weapon will be decisive in winning World War II, and desperate to create this monstrous new weapon before Germany can beat them to it, the United States has spent years pouring money, manpower, natural resources, and scientific and industrial expertise into the project—including at the remote Los Alamos Laboratory in the New Mexico desert. But recent events have some scientists questioning the wisdom of continuing their work. Germany surrendered to the Allied forces in May, and a number of scientists and politicians have suggested that Japan can be induced to surrender even without the United States dropping a nuclear bomb. Some scientists are also worried about the moral and social implications of the bomb, which promises a kind of instantaneous destruction previously unimaginable in the history of humankind. Two young physicists, Edward Teller and Robert Wilson, circulate a petition asking President Truman not to deploy the weapon. Oppenheimer, however, tells Teller and Wilson to stop undermining the project: He has just returned from Washington, and he knows that Truman has already decided to bomb Japan.

The Oppenheimers' house in Los Alamos. The physicists at Los Alamos are not the only ones concerned about what this bomb—and its impending test—might mean for the future. At home, Oppenheimer speaks with his wife, Kitty, about her fears. Through the poetry of Charles Baudelaire and Muriel Rukeyser, they speak of fear and war, but they also speak about their love for each other. When Oppenheimer leaves, Kitty thinks about the contradictions that are now part of her life: war and peace, destruction and love.

The Trinity test site. July 15, 1945. It is the night before the first atomic bomb test, and a massive, unexpected electrical storm is lashing the test site. The bomb, partially armed and hoisted on a high tower, is in danger of being struck by lightning. General Groves, the military commander overseeing the bomb test, is desperate for the detonation to happen on schedule, but he faces pushback from the scientists around him. Frank Hubbard, the chief meteorologist at the site, warns that attempting the test during a thunderstorm is extremely dangerous. Captain Nolan, of the Army Medical Corps, tries to impress upon Groves the toxic properties of radioactive fallout, which are only just beginning to be understood. As panic starts to take hold, the general dismisses all staff in order to confer with Oppenheimer alone.



Rather than focusing on the science of the upcoming test, though, Oppenheimer and Groves share a friendly moment, and Oppenheimer listens as Groves describes his current diet. Finally, Groves leaves to get some sleep. Left alone, Oppenheimer thinks about the terrifying weapon he has helped create and wonders what the atomic bomb will mean for humanity: Will it lead to peace? Or will it lead to utter destruction?

ACT II *The Oppenheimers' house.* Two hundred miles from the test site, Kitty and Pasqualita watch the night sky for signs of the explosion. Like her husband, Kitty wonders if this bomb will bring peace or devastation to humanity. Rain begins to fall. Katherine, the Oppenheimers' baby, wakes up and begins to cry. Pasqualita comforts her, singing a Tewa lullaby about the "cloud flower" that blossoms in the North.

The test site. Midnight. The test area has been prepared for the explosion. Robert Wilson and Frank Hubbard are at the bomb tower taking last-minute measurements, but both are extremely worried about working on the bomb in the middle of an electrical storm. At the observation bunker, the scientists discuss the possibility that the detonation might set off an uncontrolled chain reaction ending in the destruction of the earth. Oppenheimer assures them that such a result is not possible. With the rain still coming down, Groves decides to take a chance on the storm's passing, and Oppenheimer orders everybody to prepare for the test shot at 5:30AM. Now there is nothing for Groves and Oppenheimer to do but wait, and each is absorbed by his own terrified thoughts. Groves is plagued by fears of sabotage. Oppenheimer again wonders what the bomb will mean for the future.

The physicists, meanwhile, have been making bets on how powerful the bomb's explosion will be. Oppenheimer surprises everyone by guessing that the explosion will be much smaller than predicted. Yet Oppenheimer is far from calm: As he waits for the explosion, terrifying lines from the *Bhagavad Gita* run through his mind.

The hour of the detonation approaches. At "zero minus ten minutes" (ten minutes before the blast), a warning rocket is fired and a siren sounds. The storm breaks, and the sky suddenly clears. A second warning rocket goes off. A third rocket, at "zero minus sixty seconds," signals the final countdown. To protect themselves from the explosion, the scientists and army personnel lie face down in a series of shallow ditches; the ground looks like it is strewn with dead bodies. There is no movement or whisper of activity, only the rhythmic countdown over the loudspeaker. At "zero minus 45 seconds," an engineer flips the switch for the automatic timer. The triggering circuits begin to fire. "Zero minus one." There is an eerie silence.



Deep Dive

SCHOLARS RESPOND

Doctor Atomic—and the events it depicts—continues to interest scholars from a variety of disciplines. For instance, here’s how a physicist and an economist responded to both the opera itself and the ongoing history of the atomic bomb in 2005, the year of *Doctor Atomic*’s premiere.

CREATION AND DESTRUCTION

The first version of the *Doctor Atomic* libretto began with the line “Matter can be neither created nor destroyed but only altered in form.” But at a sneak preview of the work at San Francisco Opera, Berkeley physicist Marvin Cohen objected to the opening lines of the opera, since the explosive power of the atomic bomb was due entirely to the “destruction” of matter. Sellars revised this line to begin “We believed that matter can be neither created nor destroyed,” and the show went on as planned.



A SPECTACULAR EVENT

In the years following the end of World War II, it was generally assumed that atomic bombs would become a standard weapon in warfare—a terrifying development, given the destructive potential of this new bomb. Yet although many countries rushed to develop their own atomic weapons, the bombings of Hiroshima and Nagasaki remain the only two cases in which an atomic bomb has been dropped as an act of war. In 2005, the Nobel Prize in Economics was awarded to Thomas Schelling and Robert Aumann, game theorists who had spent much of the Cold War strategizing how to avoid nuclear conflict. When Schelling received his prize, he acknowledged that this tacit nuclear cease-fire would have been unthinkable in 1945. “The most spectacular event of the past half century,” he declared, “is one that did not occur. We have enjoyed 60 years without nuclear weapons exploded in anger.”

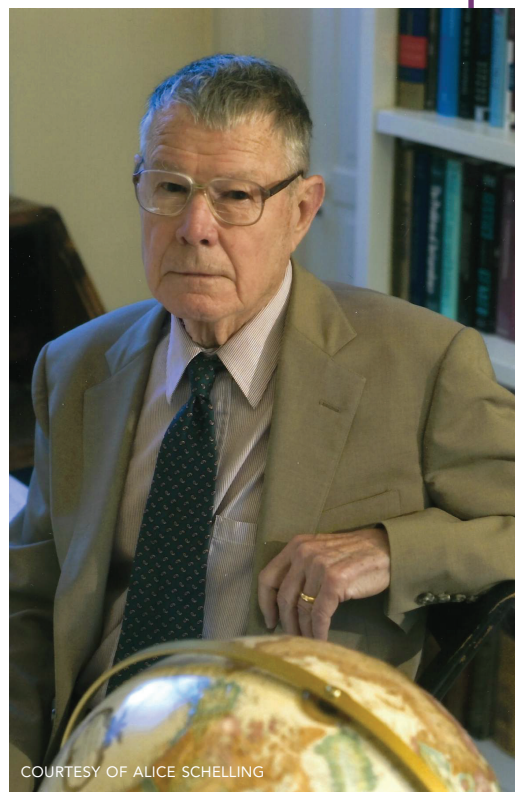
Atomic Energy for Military Purposes

The Official Report
on the Development of the Atomic Bomb
under the Auspices
of the United States Government,
1940–1945

By HENRY DEWOLF SMYTH
CHAIRMAN, DEPARTMENT OF PHYSICS
PRINCETON UNIVERSITY
CONSULTANT, MANHATTAN DISTRICT, U.S. ENGINEERS

Written at the request of
MAJ. GEN. L. R. GROVES, U.S.A.

PRINCETON
PRINCETON UNIVERSITY PRESS
1945



Top: The title page of the governmental report on the atomic bomb from which the opening lines of *Doctor Atomic* were drawn; Bottom: Thomas Schelling; Left: Aftermath of the August 6, 1945, atomic bomb blast in Hiroshima, Japan

Timeline

BUILDING A BOMB

1886

HEINRICH HERTZ demonstrates the existence of **RADIO WAVES**.

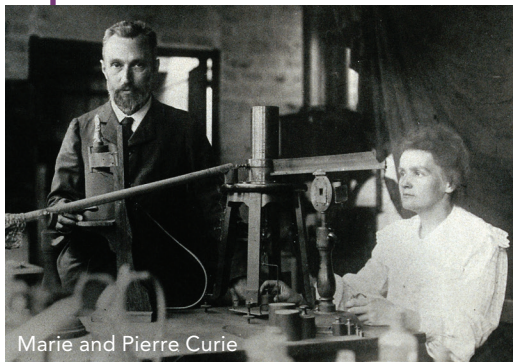
1895

WILHELM CONRAD

RÖNTGEN, a German physicist, **DISCOVERS X-RAYS**, a high-frequency counterpart to the radio waves discovered by Hertz.

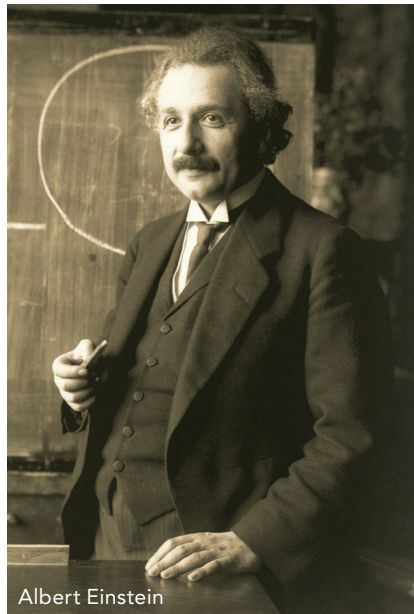
1896

During a series of experiments with X-rays emitted by the element uranium, French physicist **HENRI BECQUEREL** **DISCOVERS A NEW KIND OF ENERGY** emitted by uranium atoms. This energy will come to be known as **RADIATION**.



1898

MARIE AND PIERRE CURIE isolate two previously unknown elements: **RADIUM AND POLONIUM**. Both are highly radioactive. For their work, the Curies are awarded the 1903 **NOBEL PRIZE** in Physics, which they share with Becquerel. Further research with these elements will lead to a Nobel Prize in Chemistry in 1911 for Marie. Unfortunately, both Marie and Pierre will suffer radiation poisoning as a result of their work.



1905

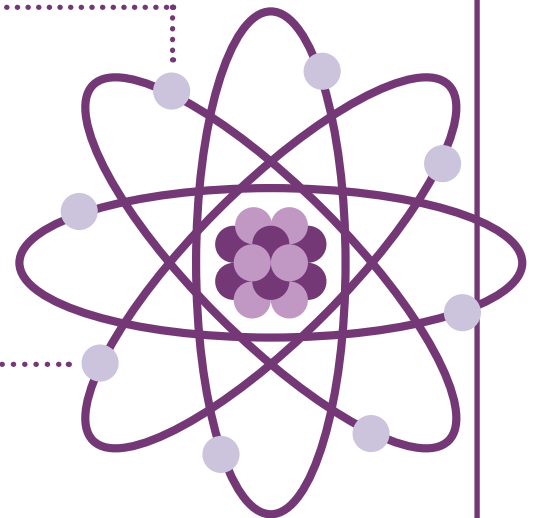
ALBERT EINSTEIN publishes a paper arguing that **MATTER CAN BE CONVERTED TO ENERGY** according to the now-famous formula **$E=MC^2$** (the energy emitted by this conversion will be equal to the mass of the original matter multiplied by the speed of light squared).

1911

The chemist **ERNEST RUTHERFORD** identifies the **STRUCTURE OF THE ATOM**: a cloud of electrons surrounding a very dense nucleus of protons.

1932

Physicist **JAMES CHADWICK**, working in Rutherford's laboratory, **DISCOVERS NEUTRONS**, uncharged particles that exist alongside protons in the nucleus. This discovery will soon lead to experiments in splitting the nucleus, a crucial first step in the development of atomic fission.



1938

The German physicists **OTTO HAHN** and **FRITZ STRASSMANN** theorize a process of **URANIUM FISSION** that will allow a chain reaction to occur.

JANUARY 1939

FRÉDÉRIC JOLIOT, the son-in-law of Marie and Pierre Curie, provides experimental proof of Hahn and Strassmann's theory and begins early experiments in building a **NUCLEAR REACTOR**.

AUGUST 1939

A group of physicists, including *Doctor Atomic*'s **EDWARD TELLER**, writes a letter to president **FRANKLIN DELANO ROOSEVELT**. In the letter, they argue that, with Hahn and Strassmann's discoveries, a **NUCLEAR BOMB IS POSSIBLE** and that Germany may well be working to create one. Crucially, the physicists suggest that the United States start working to create an atomic bomb before Germany can.



President Franklin Delano Roosevelt
LIBRARY OF CONGRESS

SUMMER 1942

Over the course of just a few weeks, **J. ROBERT OPPENHEIMER** and a group of colleagues work out a practical concept for a **FISSION BOMB**. Oppenheimer, along with **GENERAL LESLIE GROVES**, will be put in charge of a top-secret lab on a high plateau in the New Mexico desert: **LOS ALAMOS**. With Oppenheimer and Groves representing scientific and military interests respectively, the scientists of the **MANHATTAN PROJECT** begin **DEVELOPING THE BOMB**.

DECEMBER 1942

The Italian physicist **ENRICO FERMI** conducts the world's first controlled **NUCLEAR REACTION**—on a squash court under the University of Chicago stadium. Fermi will go on to be one of the lead scientists on the Manhattan Project.

MAY 8, 1945

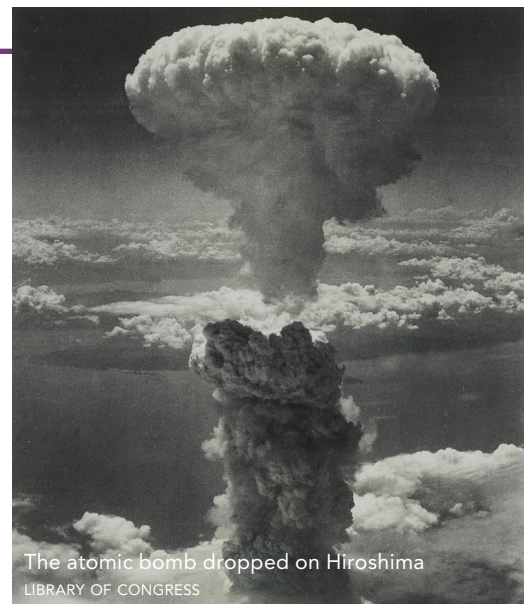
Germany surrenders unconditionally to the Allied forces.

JUNE 16, 1945

In the early morning hours, the United States **TESTS AN ATOMIC BOMB** at the Trinity test site.



J. Robert Oppenheimer's ID badge
photo from the Los Alamos Laboratory



The atomic bomb dropped on Hiroshima
LIBRARY OF CONGRESS

AUGUST 6, 1945

Although some politicians and scientists have suggested that Japan can be induced to surrender even without a nuclear attack, an **ATOMIC BOMB** is dropped on the city of **HIROSHIMA**. 70,000 civilians are killed in the explosion, and as many more are seriously injured.

AUGUST 9, 1945

The U.S. drops a second atomic bomb on Japan, this time on the city of **NAGASAKI**.

AUGUST 15, 1945

Japan surrenders.

CRITICAL INQUIRY

While many people hoped that the atomic bomb would end World War II, Oppenheimer expressed a hope that the bomb would mark the end of all war. What do you think he meant? Why might the atomic bomb have this effect? Did the atomic bomb end all war? Has an atomic bomb been used in a war since the explosion at Nagasaki?

The Source

POETRY AND HISTORICAL DOCUMENTS ASSEMBLED BY PETER SELLARS

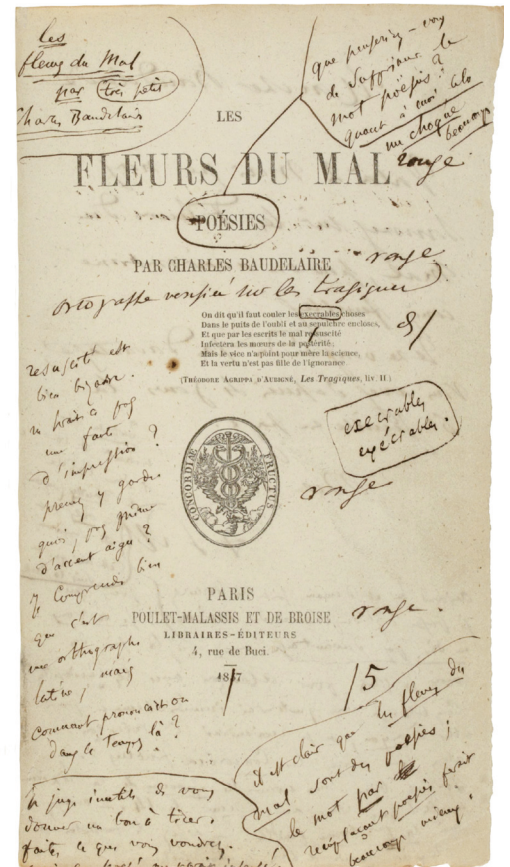
"I don't write," Peter Sellars told a documentary filmmaker shortly before the premiere of *Doctor Atomic*. "What I did here was *assemble*." Drawing on historical documents (including a selection of papers that had only recently been declassified) relating to the development of the atomic bomb, memoirs and other statements by Manhattan Project scientists, and works of literature associated with the characters' real-life counterparts, Sellars crafted a complex and evocative libretto for *Doctor Atomic*.

Some of these sources have an obvious historical connection to the events of the opera. For instance, the work's opening lines ("We believed that matter can be neither created nor destroyed ...") are taken from a governmental report titled "Atomic Energy for Military Purposes: The Official Report on the Development of the Atomic Bomb under the Auspices of the United States Government, 1940–1945." Similarly, much of Edward Teller's dialogue is drawn from the scientist's memoirs. Other sources, however, represent an eclectic array of poetic traditions; Sellars selected these sources because of their historical or personal connections to the opera's characters. The most notable examples include:

CHARLES BAUDELAIRE

A French poet of the mid-19th century, Baudelaire is best known for a volume of poems called *The Flowers of Evil* and for *Paris Spleen*, the volume of prose poems from which many of Oppenheimer's lyrics are drawn. Baudelaire was known for writing eloquently and fearlessly about such topics as beauty, sexuality, drug use, sensation, despair, and death. On the night before the Trinity test, Oppenheimer had a book of Baudelaire's poetry in his pocket. In *Doctor Atomic*, Peter Sellars weaves Baudelaire's poetry into Oppenheimer's conversations with Kitty, when the married couple discusses both their love for one another and their trepidation about the future the bomb might usher in.

Top: Frontispiece to the 1857 proof of *The Flowers of Evil*, annotated by Charles Baudelaire; Middle: Unpublished frontispiece for *The Flowers of Evil*; Bottom: Photograph of Charles Baudelaire



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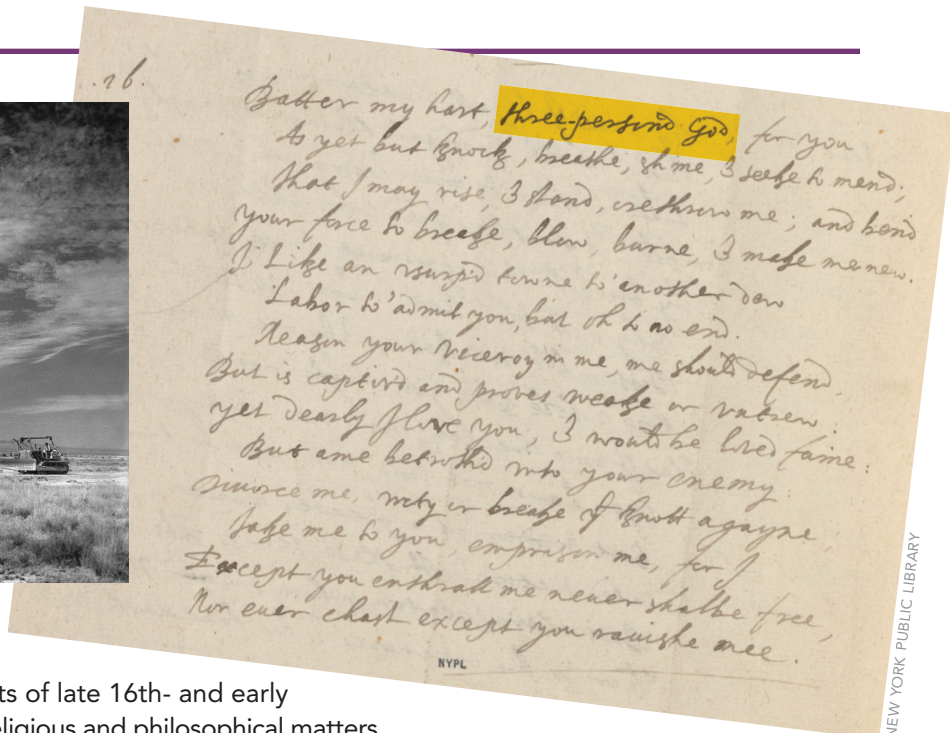
UNITED STATES DEPARTMENT OF ENERGY

JOHN DONNE

Donne was one of the metaphysical poets of late 16th- and early 17th-century England, who wrote about religious and philosophical matters from a deeply personal perspective. One of Donne's "Holy Sonnets" refers to a "three-person'd God"—the Christian notion of god as a "trinity" consisting of a father in heaven, the son Jesus Christ, and the holy spirit. Years after the first atomic bomb test, Oppenheimer would recall that he named the atomic test site "Trinity" after this poem. In the opera, Oppenheimer recites Donne's sonnet as he waits for the bomb's detonation, and the poem's invocation to "break, blow, and burn" the speaker to cleanse him of his sin can be understood both as Oppenheimer's wish to be absolved from his role in creating the bomb and as a reference to the terrifying power of the bomb to break, blow, and burn whatever it hits.



Standing Vishnu, c. third quarter of the tenth century
THE METROPOLITAN MUSEUM OF ART



Left: The Trinity test site; Right: An excerpt from John Donne's "Holy Sonnets"



A Bhagavad Gita manuscript from the 19th century
LIBRARY OF CONGRESS

THE BHAGAVAD GITA

The *Bhagavad Gita*, the title of which means "Song of God," is a 700-verse Hindu scripture that is part of the *Mahabharata*. Commonly referred to as the *Gita*, this text explores the moral dilemmas of violence and war as the mortal hero Arjuna seeks counsel from Krishna, an incarnation of the god Vishnu, on how to achieve *moksha*, or release from the infinite cycle of death and rebirth. Sometime after the Trinity test, Oppenheimer recalled that a line from the *Bhagavad Gita* had come to mind at the precise moment of the explosion: "Now I am become Death, destroyer of worlds." In Sellars's libretto, Oppenheimer and the gathered scientists recite one of the *Gita*'s descriptions of Vishnu, the god of destruction, as they contemplate the explosion of the bomb: "At the sight of this, your shape stupendous, full of mouths and eyes ... terrible with fangs ... with your mouths agape and flame-eyes staring—all my peace is gone; my heart is troubled."

MURIEL RUKEYSER

Both Kitty Oppenheimer and the American poet Muriel Rukeyser hailed from New York and were fiercely liberal. They were also about the same age, and it was these shared biographical details that led Peter Sellars to select Rukeyser's poetry for Kitty's operatic texts. Act II opens with a setting of Rukeyser's poem "Easter Eve, 1945," which was written as a response to the darkest days of World War II. Kitty sings this poem as she waits with her housekeeper and sleeping children in their home, far from the Trinity test site.



Muriel Rukeyser, photographed in 1945
by Imogen Cunningham
MUSEUM OF FINE ARTS, BOSTON



TEWA POETRY

The traditional Tewa poem recited by Pasqualita, the Oppenheimers' nanny, is a recurring motif in the second act of the opera. Speaking of a "cloud flower" that blossoms in the North, the poem functions equally well as an evocative lullaby for the Oppenheimers' baby and as a description of the terrifying mushroom cloud that will bloom over the bomb's detonation site.

Left: A portrait of Chaiwa, a Tewa girl,
photographed by Edward S. Curtis;
Right: Two Tewa girls standing outside
a pueblo building, photographed by
Edward S. Curtis
LIBRARY OF CONGRESS



A Conversation with John Adams

You count *Doctor Atomic* among your most significant achievements. Why is that? What gives me the most satisfaction are those pieces that weave American cultural and historical material into a work of music drama, using a few choice symbols to summon up the essence of America's collective psyche. The atomic bomb is the most emphatic symbol expressing the American predicament in the world at this moment. It expresses the triumph of technological and scientific prowess. At the same time, the lamentable fact that we are the only nation in the world that has used the atomic bomb is a moral burden that we have to carry. The manipulation of the atom, the unleashing of that formerly inaccessible source of densely concentrated energy, is the great mythological tale of our time.

Unlike many opera composers who remain specialists in the art form, you have an extraordinary ability to move back and forth between the stage and the concert hall. You even wrote a *Doctor Atomic Symphony*. One thing I love about writing for the stage is that I'm prodded to devise new ways to represent something musically. For example, the landing of Air Force One on the runway in Beijing [in *Nixon in China*], or what it must have felt like to be on the

floor of the New Mexico desert in the incredibly tense moments before the world's first nuclear bomb went off—these are images that force the composer to go beyond his normal way of doing things. And when I return to instrumental music after these experiences, I find that it has profoundly enriched my musical vocabulary. *Fearful Symmetries* is a work that used the idiom I had developed in *Nixon*, and it ended up becoming a successful dance piece and my most choreographed work. My Chamber Symphony and Violin Concerto could not have existed had it not been for the kind of new chromatic writing that I developed in *The Death of Klinghoffer*. I couldn't imagine my musical language being where it is now, in 2008, were it not for the experiences I've had writing for the stage.

What makes it so difficult to land on the right subject matter for an opera? [You have to] find a story that is compact. Sort of like a uranium atom, it has to be capable of holding an enormous amount of energy in a small package. That's why novels are often failures when it comes to being adapted to the stage. Each one of my operas has a unique dramatic conceit.



Doctor Atomic opening night bows at the Met
MARTY SOHL/MET OPERA

Why did you decide to write your memoirs? I just started writing—actually during the most intense stage of working on *Doctor Atomic* (go figure!)—and found that writing prose was equally as satisfying to me (and a lot easier) than writing notes. The good feedback I was getting from readers of *Hallelujah Junction* stimulated me to write the libretto for my next opera, *A Flowering Tree*.

What has been most satisfying for you about the course *Doctor Atomic* has taken since its world premiere in 2005? I was very happy that in both San Francisco and Chicago the productions seemed to provide almost an electrical charge to the cultural community, in the sense that intellectual people from all different walks of life came to see it because they were curious about a work of art that dealt with these matters. Some people told me they had gone back to see it four or five times. It was also a successful draw in Amsterdam at the Netherlands Opera. That's very encouraging because it's a serious work and it's daunting on many levels. At the Met, a lot of intelligent and thoughtful people will see it, and I'm very pleased about that.

Interview by Thomas May



A scene from *Nixon in China*
KEN HOWARD/MET OPERA



A scene from *The Death of Klinghoffer*
KEN HOWARD/MET OPERA

Timeline

THE COMPOSITION OF *DOCTOR ATOMIC*



John Adams

1947

John Adams is born in Worcester, Massachusetts, on February 15. His earliest music training will be clarinet lessons with his father, and he will begin composing at age 10.

1957

Peter Sellars is born in Pittsburgh, Pennsylvania, on September 27.

1965

Adams attends Harvard, where he receives both bachelor's and master's degrees in music. The Harvard composition faculty is deeply invested in the musical modernism currently in vogue in Europe, and Adams will initially embrace the sharp dissonances and complex forms of the style.



Harvard University
NOAH FRIEDLANDER / WIKICOMMONS

1971

Adams moves to San Francisco to teach at the city's music conservatory. As he gets to know the city's thriving new music scene, Adams broadens his compositional palette to include minimalism and other distinctly American styles and forms.

1978

Adams is hired as by the San Francisco Symphony to serve as their advisor on new music. He founds the orchestra's *New and Unusual Music* series and soon becomes one of the United States' most important voices for contemporary classical music.

1980

Peter Sellars graduates from Harvard. By this time, he has already made a name for himself by staging wildly reimagined versions of opera and theater—including an abridged version of Wagner's *Ring* cycle with puppets. Throughout the 1980s, his productions of canonic operas will challenge performers and audience members alike to reconsider these works' place in the modern world. For instance, he sets Mozart's *Don Giovanni* in Harlem; places the philandering and womanizing men of Mozart's *The Marriage of Figaro* in Trump Tower; and casts the epic hero of Handel's *Orlando* as an astronaut stationed at Cape Canaveral.



Peter Sellars



Alice Goodman
JONATHAN TICHLER/MET OPERA



The Met's production of *Nixon in China*
KEN HOWARD/MET OPERA

CRITICAL INQUIRY

Pamela Rosenberg thought of Oppenheimer's story as an American version of the Faust myth, a 400-year-old story about a scholar who sells his soul to the devil in exchange for vast knowledge and insight. Why might she have viewed Oppenheimer as a modern-day Faust? Can you think of any other myths or stories that are similar to the plot of *Doctor Atomic*?

1983

Adams and Sellars begin working on an opera based on Richard Nixon's 1972 visit to China. *Nixon in China*, which features a libretto by Alice Goodman and is directed by Sellars, premieres at Houston Grand Opera in 1987. The opera receives both Emmy and Grammy awards, and its recording is named one of the "ten most important records of the decade" by *Time*.

1989

The Adams-Sellars-Goodman collaboration continues with *The Death of Klinghoffer*, an opera about the hijacking of a cruise liner in 1969 by members of the Palestine Liberation Front. The work immediately sparks furious backlash, and the resulting controversy pushes Adams to take a long break from opera.

1999

Pamela Rosenberg is hired as the general director of San Francisco Opera. Early in her tenure, she oversees the production of a series of operas based on the Faust legend. Wishing to create a new opera that will serve as an "American Faust," she selects the story of J. Robert Oppenheimer, a man who, like Faust, found himself caught between his thirst for knowledge and his own sense of ethics and morality. Rosenberg approaches Adams about writing a score for this new opera, and he once again decides to collaborate with Sellars.

Initially, Adams and Sellars ask Alice Goodman to write the libretto for *Doctor Atomic*, but when Goodman drops out, Sellars agrees to take over the task of preparing the opera's text.

2005

Doctor Atomic premieres on October 1 at San Francisco Opera.

2008

On October 13, *Doctor Atomic* is performed for the first time at the Met.

Active Exploration

The following activities will help familiarize your students with the plot of *Doctor Atomic*, forge connections between a variety of classroom subjects, and encourage creative responses to the opera. They are designed to be accessible to a wide array of ages and experience levels.

AN ATOMIC ASSEMBLAGE

Invite students to write a found poem (a poem that takes words, phrases, and passages from other sources and arranges them to reveal new meaning) about the legacy of the atomic bomb. To deepen this study, invite students to learn about the aftermath of the atomic detonations in Hiroshima and Nagasaki during the Second World War.

BATTER MY HEART

Invite students to create a visual depiction of the internal and external forces propelling Oppenheimer toward the Trinity test, the first-ever detonation of a nuclear weapon.

THE CLOUD FLOWER BLOSSOMS

Invite students to explore the connection between science and the earth, and between the scientists and the Indigenous people living on the ancestral lands that became the Trinity test site. To deepen this study, invite students to write and conduct a brief research plan that will help them learn about Indigenous history in their region.

SOUNDSCAPES

Play the opening minutes of *Doctor Atomic* for students, and then invite them to create a soundscape composition using sampled sounds from their own lives.

“TAKADIMI”: EXPLORING RHYTHMIC SOLFÈGE

Introduce your students to rhythmic solfège, a concept that has roots in classical Indian music. Use these solfège syllables to practice performing a variety of rhythmic patterns, and then invite your students to explore how musical patterns can reflect the rhythm of poetry and speech.

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DOCTOR ATOMIC PRODUCTION PHOTOS: KEN HOWARD / MET OPERA



Oppenheimer (left) and Groves (right) at the Trinity test site

FUN FACT

General Leslie Groves enjoyed a highly decorated military career. In addition to overseeing the Manhattan Project, he oversaw the construction of the Pentagon.

COMMON CORE CONNECTIONS

These activities directly support the following ELA-Literacy Common Core Strands:

CCSS.ELA-Literacy.RL.7.9

Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history.

CCSS.ELA-Literacy.RL.8.3

Analyze how particular lines of dialogue or incidents in a story or drama propel the action, reveal aspects of a character, or provoke a decision.

CCSS.ELA-Literacy.SL.9–12.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 9–12 topics, texts, and issues, building on others' ideas and expressing their own clearly.