

## Queen Hatshepsut, an Extraordinary Pharaoh

Fill in the circle by the correct answer. Then answer questions 3, 4, and 5.

1. Hatshepsut married Thutmose II because \_\_\_\_\_.  
Ⓐ he was her half-brother  
Ⓑ her father arranged their marriage  
Ⓒ she planned to become Egypt's pharaoh  
Ⓓ she wanted to be the next pharaoh's mother
  
2. Thutmose III showed his resentment for Hatshepsut by \_\_\_\_\_.  
Ⓐ killing her  
Ⓑ revolting against her  
Ⓒ destroying images of her  
Ⓓ denying he was related to her
  
3. How did Hatshepsut convince her people that she deserved to be pharaoh?  
\_\_\_\_\_  
\_\_\_\_\_

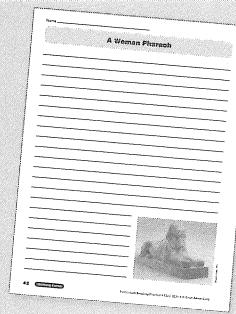
4. How would you summarize Hatshepsut's accomplishments?  
\_\_\_\_\_  
\_\_\_\_\_

5. Do you think Hatshepsut deserved to be pharaoh? Why or why not?  
\_\_\_\_\_  
\_\_\_\_\_

### Write About the Topic

Use the Writing Form to write about what you read.

Do you think Thutmose III moved Hatshepsut's mummy to her nurse's tomb? Back up your opinion with facts and details.



# Alice Ball

## Level 1 ■

Words to Know list, Reading Selection, and Reading Comprehension questions

**Alice Ball's Short but Amazing Life**

Tell in the circle by the correct answer...  
Name \_\_\_\_\_

**A Family of High Achievers**

Alice Ball was born in 1892 into a family of high-achieving scientists. Her grandfather, James Preyer, became a professor of physics at the University of Berlin. Her father, Carl Ball, was a prominent physician who treated Queen Victoria, and Charles Ball, her brother, was a medical researcher. Alice Ball's mother, Anna, was extremely bright and interested in the welfare of people with leprosy. She was a nurse. Sadly, Alice Ball died before she could finish her new treatment method which would have been to be used on patients.

**A Student of Many Talents**

Alice Ball was born into a high-achieving family. Her grandfather, James Preyer, became a professor of physics at the University of Berlin. Her father, Carl Ball, was a prominent physician who treated Queen Victoria, and Charles Ball, her brother, was a medical researcher. Alice Ball's mother, Anna, was extremely bright and interested in the welfare of people with leprosy. She was a nurse. Sadly, Alice Ball died before she could finish her new treatment method which would have been to be used on patients.

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**Alewife Ball's Short but Amazing Life**

Alewife Ball's Short but Amazing Life

**Words to Know**

productive discrimination excited breakthrough legacy insatiable achieves pharmaceutical pharmacy prestigious gaudious liver colitis

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## Level 2 ■■

Words to Know list, Reading Selection, and Reading Comprehension questions

**Alice Ball Finally Receives Recognition**

Tell in the circle by the correct answer...  
Name \_\_\_\_\_

**In 1914, Alice Ball became the first woman to earn a master's degree in science education from the College of Home Economics at the University of Hawaii. In 1915, she received a degree in bacteriology and became a research assistant in the university's medical research department. She was soon promoted to supervisor of leprosy patients. This meant she had to travel to the island of Oahu to care for those with leprosy. Her superior "had a very good sense of humor," according to one of her colleagues.**

**Alewife Ball's Short but Amazing Life**

**Words to Know**

crowding achievement water-soluble chrysanthema liposy symptoms pharmaceutical pharmacy undergraduate thesis commitments alcohol active agents distinction endeavor

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## Level 3 ■■■

Words to Know list, Reading Selection, and Reading Comprehension questions

**Giving Credit Where Credit Is Due**

Tell in the circle by the correct answer...  
Name \_\_\_\_\_

**In 1912, Alice Ball became the first woman to earn a master's degree in chemistry from the College of Home Economics at the University of Hawaii. In 1913, she received a degree in bacteriology and became a research assistant in the university's medical research department. She was soon promoted to supervisor of leprosy patients. This meant she had to travel to the island of Oahu to care for those with leprosy. Her superior "had a very good sense of humor," according to one of her colleagues.**

**Alewife Ball's Short but Amazing Life**

**Words to Know**

originated liposy esters chrysanthema sensationally effective checking noxious instructress water-soluble chlorine gas dominated

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## Assemble the Unit

Reproduce and distribute one copy for each student:

- Visual Literacy page: Timeline of Alice Ball's life, page 51
- Level 1, 2, or 3 Reading Selection and Reading Comprehension page and the corresponding Words to Know list
- Graphic Organizer of your choosing, provided on pages 180–186
- Writing Form: Alice Ball, a Pioneering Chemist, page 52

## Introduce the Topic

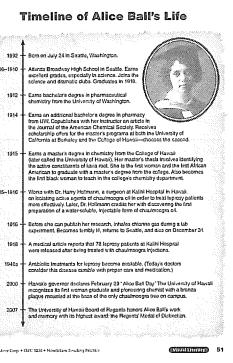
Read aloud and discuss the “Timeline of Alice Ball’s Life” text and portrait on the Visual Literacy page. Explain that because she was an African American woman living in the early 1900s, Alice Ball had many obstacles in her way—yet she achieved an amazing amount in her short life.

## Read and Respond

Form leveled groups and review the Words to Know lists with each group of students. Instruct each group to read their selection individually, in pairs, or as a group. Have students complete the Reading Comprehension page for their selection.

## Write About the Topic

Read aloud the leveled writing prompt for each group. Tell students to use the Graphic Organizer to plan their writing. Direct students to use their Writing Form to respond to their prompt.



### Visual Literacy

**Alice Ball, a Pioneering Chemist**

Name \_\_\_\_\_

**51**

**52** Writing Form Nonfiction Reading Practice • EMC 3236 • © Evan-Moor Corp.

### Writing Form

# Timeline of Alice Ball's Life



- 1892 Born on July 24 in Seattle, Washington.
- 1906–1910 Attends Broadway High School in Seattle. Earns excellent grades, especially in science. Joins the science and dramatic clubs. Graduates in 1910.
- 1912 Earns bachelor's degree in pharmaceutical chemistry from the University of Washington.
- 1914 Earns an additional bachelor's degree in pharmacy from UW. Copublishes with her instructor an article in the *Journal of the American Chemical Society*. Receives scholarship offers for the master's programs at both the University of California at Berkeley and the College of Hawaii—chooses the second.
- 1915 Earns a master's degree in chemistry from the College of Hawaii (later called the University of Hawaii). Her master's thesis involves identifying the active constituents of ava root. She is the first woman and the first African American to graduate with a master's degree from the college. Also becomes the first black woman to teach in the college's chemistry department.
- 1915–1916 Works with Dr. Harry Hollmann, a surgeon at Kalihi Hospital in Hawaii, on isolating active agents of chaulmoogra oil in order to treat leprosy patients more effectively. Later, Dr. Hollmann credits her with discovering the first preparation of a water-soluble, injectable form of chaulmoogra oil.
- 1916 Before she can publish her research, inhales chlorine gas during a lab experiment. Becomes terribly ill, returns to Seattle, and dies on December 31.
- 1918 A medical article reports that 78 leprosy patients at Kalihi Hospital were released after being treated with chaulmoogra injections.
- 1940s Antibiotic treatments for leprosy become available. (Today's doctors consider this disease curable with proper care and medication.)
- 2000 Hawaii's governor declares February 29 "Alice Ball Day." The University of Hawaii recognizes its first woman graduate and pioneering chemist with a bronze plaque mounted at the base of the only chaulmoogra tree on campus.
- 2007 The University of Hawaii Board of Regents honors Alice Ball's work and memory with its highest award: the Regents' Medal of Distinction.

Name \_\_\_\_\_

## Alice Ball, a Pioneering Chemist

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## Words to Know

### Alice Ball's Short but Amazing Life

productive  
discrimination  
excelled  
breakthrough  
leprosy  
incurable  
achievers  
pharmaceutical  
pharmacy  
prestigious  
chaulmoogra  
leper colonies

Alice Ball ■■



## Words to Know

### Alice Ball Finally Receives Recognition

crowning achievement  
water-soluble  
chaulmoogra  
leprosy  
symptoms  
pharmaceutical  
pharmacy  
undergraduate  
thesis  
constituents  
isolating  
active agents  
distinction  
endeavor

Alice Ball ■■■

## Words to Know

### Giving Credit Where Credit Is Due

originated  
leprosy  
ethyl esters  
chaulmoogra  
sensationnally  
effective  
checking  
ravages  
instructress  
water-soluble  
chlorine gas  
dominated

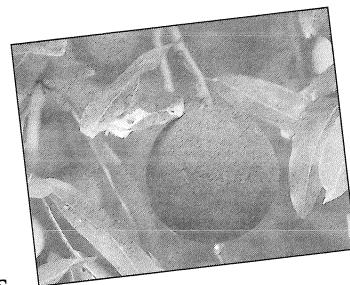
Alice Ball ■■■■

# Alice Ball's Short but Amazing Life

Alice Ball lived only 24 years, but she achieved a great deal during her productive life. Ball was an African American woman who lived in the early 1900s. This was a time when both women and African Americans faced harsh discrimination. Yet Miss Ball excelled in her chosen field, chemistry, and even made a scientific breakthrough. Her discovery greatly eased the suffering of people with leprosy, a terrible and incurable disease. Sadly, Alice Ball died before she could learn how successful her new treatment method would turn out to be.

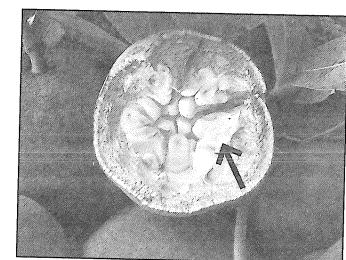
## A Family of High Achievers

Miss Ball was born into a high-achieving family. Her grandfather, James Presley Ball, Sr., was a famous photographer. He was known for his portraits of Frederick Douglass, Queen Victoria, and Charles Dickens. Her father, J.P. Ball, Jr., was a lawyer at a time when it was extremely hard for a black man to enter any profession. At her family's photography studios, Alice became familiar with and interested in chemicals. She was eager to learn more about the many ways chemicals could benefit people.



## A Successful College Career

After graduating from high school in Seattle, Miss Ball entered the University of Washington. There she earned not one but two science degrees. One was in pharmaceutical chemistry and the other was in pharmacy. At UW, Alice copublished with her pharmacy professor a 10-page article, which appeared in the prestigious *Journal of the American Chemical Society*. Ball received two scholarship offers to pursue her master's degree in chemistry. One was from the University of California at Berkeley. The other was from the College of Hawaii, which later became the University of Hawaii.



**Chaulmoogra oil comes from the seeds of the fruit.**

Miss Ball had lived briefly in Hawaii as a girl. Maybe this is why she chose to return there for graduate school. It took her only a year to earn her master's degree. She was both the first woman and the first African American to earn a higher degree from the College of Hawaii. She did so well in her classes that after graduation the college hired her to teach chemistry there. Alice Ball was the chemistry department's first black instructor.

## A Brilliant Research Chemist

A local surgeon who treated leprosy patients hired Miss Ball to help him conduct research. She quickly discovered a way to inject chaulmoogra oil into patients' bodies without causing painful side effects. The "Ball Method" healed many patients and allowed them to leave leper colonies where they were forced to live. Tragically, Alice Ball died before she could publish her research results.

## Alice Ball's Short but Amazing Life

Fill in the circle by the correct answer. Then answer questions 3, 4, and 5.

1. In paragraph 3, the word “pharmacy” means “\_\_\_\_\_.”  
 A drugstore  
 B the practice of preparing medications  
 C a person who is licensed to sell medical drugs  
 D related to the production and sale of medical drugs
2. The author thinks Alice Ball is amazing because Ball \_\_\_\_\_.  
 A was an African American woman in the early 1900s  
 B had a father and a grandfather who overcame obstacles  
 C turned down a scholarship for a master’s program at UC Berkeley  
 D achieved a great deal in a short time despite the obstacles she faced
3. What inference can you make about how Alice Ball’s family affected her character?  


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4. In what ways does Alice Ball stand out among women of the early 1900s?  


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5. Why do you think some leprosy patients were “forced to live” in “leper colonies”?  


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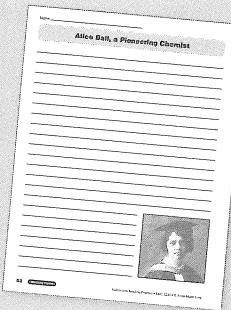


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### Write About the Topic

Use the Writing Form to write about what you read.

Explain why Alice Ball is a good role model for girls today who are interested in scientific careers.



# Alice Ball Finally Receives Recognition

In 1915, Alice Ball became the first woman to earn a master's degree in science (chemistry) from the College of Hawaii (which later became the University of Hawaii). In addition, she was the college chemistry department's first African American researcher and instructor. Alice Ball's crowning achievement was even more impressive. She was the first medical researcher to develop a water-soluble form of chaulmoogra oil. This form could be injected into leprosy patients' bodies without causing painful side effects. For decades, doctors used the "Ball Method" to relieve the terrible symptoms of leprosy.

Alice Augusta Ball was born on July 24, 1892, in Seattle, Washington. She grew up around chemicals because her grandfather was a famous photographer. Alice's father, mother, and aunt were photographers, too. In her four years at the University of Washington (1910–1914), Ball earned two degrees. One was in pharmaceutical chemistry. The other was in pharmacy. As an undergraduate at UW, Ball also copublished an article in a respected scientific journal.

While at the College of Hawaii, Alice Ball gained a reputation as an excellent research chemist. Her master's thesis there was about the "chemical constituents of the active principle of the ava root." This inspired Dr. Harry Hollmann, a surgeon at Hawaii's Kalihi Hospital, to ask for Ball's help in isolating the active agents in chaulmoogra oil. In just months, she achieved this feat that scientists had been unable to accomplish in hundreds of years. Sadly, Alice did not live to enjoy her success. She grew very ill after inhaling chlorine gas in her laboratory and died December 31, 1916. She was only 24 years old.

In 1918, the *Journal of the American Medical Association* reported that health examiners had released 78 leprosy patients from Kalihi Hospital. The health of the patients had improved after they received chaulmoogra injections. Fast-forward more than 80 years, during which Alice Ball received almost no credit for her work. Then, in 2000, Hawaii's Governor Ben Cayetano declared that February 29 was "Alice Ball Day." The University of Hawaii honored Ball with a plaque mounted at the base of a chaulmoogra tree on campus. And, in 2007, the university awarded Alice Ball with the Regents' Medal of Distinction. The medal calls her an "individual of exceptional accomplishment and distinction who [has] made significant contributions to the university...within [her] field of endeavor."



## Alice Ball Finally Receives Recognition

Fill in the circle by the correct answer. Then answer questions 3, 4, and 5.

1. In paragraph 1, the term “water-soluble” most likely means “\_\_\_\_\_.”  
 (A) liquid  
 (B) dry  
 (C) able to dissolve in water  
 (D) impossible to combine with water
2. Alice Ball “grew up around chemicals” because \_\_\_\_\_.  
 (A) her family used them to develop photographs  
 (B) her parents worked as research chemists in laboratories  
 (C) she grew up in a region where chemicals were plentiful  
 (D) her teachers treated leprosy patients with chaulmoogra injections
3. What ideas justify calling the “Ball Method” Alice Ball’s “crowning achievement”?
   
 \_\_\_\_\_  
 \_\_\_\_\_

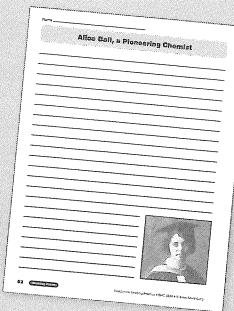
4. What was the relationship between Miss Alice Ball and Dr. Hollmann?
   
 \_\_\_\_\_  
 \_\_\_\_\_

5. What inference can you make about how long it took for Ball to receive recognition?
   
 \_\_\_\_\_  
 \_\_\_\_\_

### Write About the Topic

Use the Writing Form to write about what you read.

Write a description of Alice Ball that explains how you think she was able to achieve so much during her short life.



# Giving Credit Where Credit Is Due

In 1925, a biographer wrote the following: "Dr. Harry T. Hollmann of Honolulu is credited with having originated [leprosy] treatment with the ethyl esters extracts of chaulmoogra oil, which has been sensationaly effective, checking the ravages of the disease and having effected apparent cures. The chaulmoogra oil specific, which was perfected as a result of Dr. Hollmann's early work...is now in general use throughout the world where leprosy exists."

In 1922, however, Dr. Hollmann had given credit where it was due. He wrote: "I interested Miss Alice Ball, M.S., an instructress in chemistry at the College of Hawaii in the chemical problem of obtaining for me the active agents in the oil of chaulmoogra. After a great amount of experimental work, Miss Ball solved the problem for me..."

In 1915, Alice Ball became the first woman to earn a master's degree in science from the College of Hawaii. (The college later became the University of Hawaii.) Also, Ball was the college chemistry department's first black researcher and instructor. Her next feat was even more impressive. She was the first researcher to develop a water-soluble form of chaulmoogra oil. This form could be injected into leprosy patients' bodies without painful side effects. For decades, doctors used the "Ball Method" to relieve the symptoms of leprosy. Yet Alice did not live to enjoy her success. She grew ill as a result of inhaling chlorine gas in her laboratory and died on December 31, 1916. She was only 24 years old.

After Ball's death, Dr. Arthur L. Dean, a chemist and president of the College of Hawaii, carried on the young woman's work. A laboratory at the college produced enough of the new injectable chaulmoogra to supply requests from all over the world. The treatment came to be known as the "Dean Method."

Fast-forward more than 80 years, during which Alice Ball received next to no credit for her work. (The exception was Dr. Hollmann's mention in 1922.) In 2000, Hawaii's governor declared February 29 to be "Alice Ball Day." The University of Hawaii honored Ball by mounting a plaque at the base of the lone chaulmoogra tree on campus. In 2007, the university honored Alice Ball with the Regents' Medal of Distinction. The medal calls her an "individual of exceptional accomplishment...who [has] made significant contributions to the university...within [her] field of endeavor."

Why did it take so long to give Ball full credit for her work? Miles Jackson, a UH professor, explained: "Men dominated higher education in 1915..."



Ball in her graduation cap and gown, circa 1915