

## Marie Curie

### Reading and Discussion

Marie Curie's maiden name was **Maria Skłodowska**. She was born in Poland in November 1867 and died in July 1934. Marie was the youngest of five siblings. Both her parents were teachers and educators. Her family was from a very educated and cultured background, but they were poor and struggled with money issues. When Marie was still very young, both her mother and oldest sibling died.

Marie Curie was a very bright and good student. When she finished school, she did not have any options of continuing her studies in Poland as there were no universities for women. She worked for a year as a governess, and then went to Paris to join her sister to continue her studies.

Marie went to the **Sorbonne University** in Paris to study physics and obtained her degree in 1893. While there, she met **Pierre Curie**, who was a physics professor and they got married in 1895. In 1896, Antoine Henri Becquerel discovered an element called uranium, which was known for its radioactivity. The Curies coined the term '**radioactivity**.'

To write her thesis, Marie Curie thought of researching uranium. Using an electrometer, which is a device used to compare radiations given off by different elements and substances, she found that radiation is not a result of interactions between different molecules. It was a property within the atoms themselves. During her research, she also discovered that **pitchblende**, which is the ore from which uranium is obtained, had a much higher radioactivity than uranium. She concluded that the pitchblende must have other elements in it that were more radioactive. So the Curies set about the task of trying to extract these unknown substances from tons of pitchblende. This means that they tried to separate and isolate these elements from the pitchblende.

Pitchblende was a valuable ore and an expensive one if it included uranium. However, it was much cheaper after the uranium was removed. This was good as the Curies used up tons of it trying to achieve their goal. Their work conditions were very rough because they usually had very little money as they spent any money they had in buying equipment and materials needed for their experiments. This meant that they lived in poor housing conditions and sometimes did not have enough to eat. They even used a shed as their laboratory to conduct their experiments with the pitchblende.

After several attempts to separate radioactive substances from pitchblende, they managed to obtain a teaspoonful from tons of pitchblende. This teaspoon was thousands of times more radioactive than uranium. The substance they were able to extract consisted of two new elements. The first one was named '**polonium**' after Marie Curie's home country Poland. The second element was named **radium**.

Name \_\_\_\_\_

Date \_\_\_\_\_

Though they succeeded in their experiment in 1898, it took until 1910 for Madame Curie to be able to get radium in its pure state. The Curies also studied the radiations from radium as well as the effect of magnetism on radiations. This is considered to be the groundwork for research in nuclear physics.

The Curies had two daughters, Irene and Eve. In 1906, Pierre Curie died in a street accident. In 1903, they shared the **Nobel Prize** with Becquerel for Physics. Madame Curie continued her research and was awarded another Nobel Prize for Chemistry in 1911. This made her the first scientist to receive two Nobel Prizes and the first woman scientist to ever receive a Nobel Prize. She was also the first woman professor at the Sorbonne University and the first woman to chair the physics department.

During World War I, Madame Curie supported the use of x-ray machines to help injured soldiers. She also donated the gold Nobel Prize medals that she and her husband had received to help the soldiers.

At the time, the dangers of radioactive elements was unknown, so there were no proper measures taken to handle these elements. Until this day, Marie Curie's notebooks and even cookbook cannot be touched or handled without wearing the proper protective gear. Madame Curie became ill from a blood disease most probably caused by radioactivity.

To honor the hard work and years of contribution of the Curies, a measurement unit of radioactivity was named **Curie**. In addition, an element called **curium** was also named after them.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Activities

### Activity A: Multiple Choice:

1. Marie Curie was all of the following except:

- a. Physicist
- b. Chemist
- c. Professor
- d. Engineer

2. The element discovered called 'polonium' was named as such because:

- a. It honored Marie Curie's home country Poland
- b. It rhymed with uranium
- c. It was random
- d. None of the above

3. From pitchblende, Marie Curie was able to extract and isolate:

- a. Uranium
- b. Sodium
- c. Radium
- d. All of the above

### Activity B: List three things Marie Curie was considered the first woman to achieve:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

### Activity C: True or False:

\_\_\_\_ 1. Marie Curie discovered an element called uranium.

\_\_\_\_ 2. Marie Curie discovered that pitchblende had more radioactivity than uranium.

\_\_\_\_ 3. Marie Curie refused to donate the gold medals that she and her husband Pierre had been awarded for winning the Nobel Prize during World War I.

\_\_\_\_ 4. At the time, Marie and Pierre Curie understood how radioactive chemicals should be handled and wore protective gear.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Answer Key

### Activity A

1. Marie Curie was all of the following except:

- a. Physicist
- b. Chemist
- c. Professor
- d. **Engineer**

2. The element discovered called 'polonium' was named as such because:

- a. **It honored Marie Curie's home country Poland**
- b. It rhymed with uranium
- c. It was random
- d. None of the above

3. From pitchblende, Marie Curie was able to extract and isolate:

- a. Uranium
- b. Sodium
- c. **Radium**
- d. All of the above

### Activity B

1. First woman to win a Nobel Prize
2. First woman to be a professor at the Sorbonne University in Paris
3. First woman to head the chair of the Physics Department
4. First woman to receive 2 Nobel Prizes in different fields (Physics & Chemistry)

### Activity C

- F 1. Marie Curie discovered an element called uranium.
- T 2. Marie Curie discovered that the pitchblende had a much higher radioactivity than uranium.
- F 3. Marie Curie refused to donate the gold medals that she and her husband Pierre had been awarded for winning the Nobel Prize during World War I.
- F 4. At the time, Marie and Pierre Curie understood how radioactive chemicals should be handled and wore protective gear.