

How these women changed science forever

This video honours the great women of science who have changed the world forever! How many of these famous female scientists do you know about?

Tasks

Do the preparation task first. Then watch the video and do the exercises. You can also read the transcript.

Preparation task

Match the definitions (a–h) with the vocabulary (1–8).

Vocabulary

1. groundbreaking
2. to make a contribution to
3. to bombard
4. tremendous
5. chromosome
6. pigmentation
7. a primatologist
8. to be an advocate for

Definition

- a. someone who studies primates (e.g. chimpanzees, apes, etc.)
- b. extremely great, important or strong
- c. using new methods, or achieving new results
- d. the natural colour of something, for example someone's skin
- e. to publicly support
- f. a string of DNA, important for the development and functioning of living things
- g. to attack by hitting repeatedly
- h. to help achieve something or make it successful

Task 1

Write the name of the scientist who made the discovery or achievement.

| | | | | |
|-------------|-------------------|--------------|--------------------|--------------|
| Marie Curie | Rosalind Franklin | Jane Goodall | Barbara McClintock | Lisa Meitner |
|-------------|-------------------|--------------|--------------------|--------------|

1. Discovered protactinium
2. Discovered polonium and radium
3. Discovered that chimpanzees could make and use tools
4. Won the Nobel Prize in Medicine
5. Founded a non-profit organisation
6. Awarded the Nobel Prize in Physics

7. Discovered nuclear fission, which led to the development of the atomic bomb
.....
8. Discovered that genetic information is not stationary
9. Discovered the double-helix structure of DNA
10. Became an advocate for conservation

Task 2

Are the sentences true or false?

| | Answer | |
|--|---------------|-------|
| 1. Lisa Meitner worked alone. | True | False |
| 2. Some people were worried about Lisa Meitner's findings. | True | False |
| 3. Barbara McClintock's achievement was recognised immediately. | True | False |
| 4. Rosalind Franklin showed her important findings to Watson and Crick. | True | False |
| 5. Rosalind Franklin was recognised for her contribution to science during her lifetime. | True | False |
| 6. Jane Goodall's findings showed that chimpanzee and human behaviour is often similar. | True | False |

Discussion

Which of the scientists in the video do you think is most important? Which finding do you think is the most interesting?

Transcript

Hey there. Welcome to Life Noggin.

When people talk about women in science, their first thought is almost always of Marie Curie – the first female scientist to receive a Nobel Prize in Physics, and the first scientist to ever receive two Nobel Prizes. She won these thanks to her groundbreaking work studying radiation and discovering two new elements – polonium and radium. And while it's important to know about her contributions to science, many people's knowledge of women in STEM ends there. So today I'm going to help fix that.

Let's start off with another scientist who worked with radioactive elements – Lisa Meitner. Along with physicist Otto Hahn, she discovered a new element called protactinium. But more importantly, she also noticed a strange result when uranium atoms were bombarded with neutrons. See, whenever this happened, the neutron did not stick to the uranium atom. Rather, it caused the atom to split, forming lighter elements in the process and also releasing a tremendous amount of energy. Meitner called this 'nuclear fission', which led to the creation of the atomic bomb. In fact, after her discoveries were published, Albert Einstein wrote a warning letter to US President Franklin D Roosevelt, which resulted in the creation of the Manhattan Project.

If you watched our video on why humans reproduce sexually, you'll know that genes have the ability to move within and between chromosomes. By studying the changes of pigmentation of corn kernels over many generations, Barbara McClintock discovered that genetic information is not stationary. However, at the time, this went against everything that was known about genetics. In fact, it took over 30 years for her work to be seriously considered – eventually resulting in her winning the Nobel Prize in Medicine.

On a related subject, let's talk about DNA. You probably learned in school that its double-helix structure was discovered by scientists James Watson and Francis Crick, but this is only partially true. See, the real discovery was made by Rosalind Franklin in the 1950s. Her X-ray diffraction photographs of DNA were unknowingly shown to Watson and Crick by her colleague Maurice Wilkins. And after seeing the photo, the two scientists almost immediately published a paper in *Nature*, explaining their findings. Unfortunately, the Nobel Prize was awarded to Watson, Crick and Wilkins after Franklin's death, but it's unsure if she would have even been included if she had still been alive. But regardless, it's clear that we should know her name just as well as we know Watson and Crick.

And lastly, let's talk about Jane Goodall. She is a primatologist and best known for her work with chimpanzees in Tanzania. During her time with them, she discovered that chimpanzees were able to make and use tools, which, at the time, only humans were thought to do. This was a huge breakthrough, and she also discovered that chimpanzees ate meat, throw stones as weapons, embrace one another for comfort and formed familial bonds. In fact, the chimps even had a war! After years of research, she speaks out for these animals that cannot speak for themselves. And on top of all of this, she is an advocate for conservation and founded the Jane Goodall Institute, a global non-profit organisation.

So, clearly there are some incredible scientists that you should have learned about in school. But obviously there are tonnes more, so let me know who you want to learn about next time.

Answers

Preparation task

1. c
2. h
3. g
4. b
5. f
6. d
7. a
8. e

Task 1

1. Lisa Meitner
2. Marie Curie
3. Jane Goodall
4. Barbara McClintock
5. Jane Goodall
6. Marie Curie
7. Lisa Meitner
8. Barbara McClintock
9. Rosalind Franklin
10. Jane Goodall

Task 2

1. False
2. True
3. False
4. False
5. False
6. True