

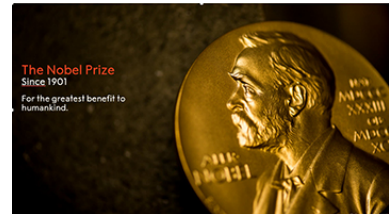
THE NOBEL PRIZE

Nobel Prize lessons

Teachers manuscript – Alfred Nobel and the Nobel prize

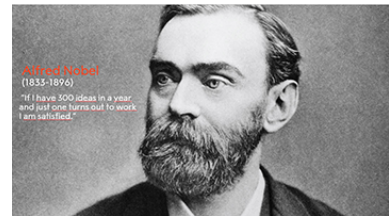
The Nobel Prize

- The Nobel Prize is a prize in five categories that has been awarded for over 100 years. More than 900 individuals and organizations from over 70 countries have received it.
- Now, we'll take a closer look at how the Nobel Prize works, at its founder Alfred Nobel and some of the awarded achievements.



Alfred Nobel

- As you've seen in the film Alfred Nobel lives during the 19th century. He is born in Stockholm but lives in various places during his life: St. Petersburg, Hamburg, Paris and San Remo.
- He speaks many languages and, as a young man, dreams of becoming an author. Instead, his father Immanuel encourages all his four sons to become engineers. He will become a successful chemist, inventor and businessman.



Dynamite

- Alfred Nobel starts experimenting with the liquid explosive nitroglycerine, and he invents dynamite, an explosive much more secure to handle than nitroglycerine alone.
- Alfred Nobel continues to develop explosives, as well as other inventions and ideas, such as artificial silk and the first aluminium boat in the world.
- He is careful with his patent applications and starts many companies and factories for dynamite production. Business travels and his companies occupy most of his time. His invention, dynamite, makes him one of the wealthiest people in Europe.
- Alfred Nobel is known for his inventions but is also criticized. Dynamite is not only used in mining and for the construction of railroads, tunnels and canals. It is also used in warfare.



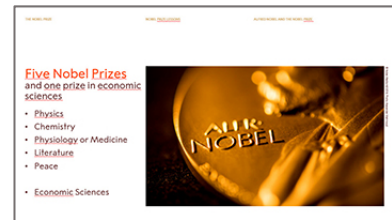
The will

- At the age of 62 Alfred Nobel writes his will. One year later, on 10 December 1896, he dies of a stroke. In his will, he writes that a large part of his estate is to be placed in a fund. The yearly interest on this fund would pay for a prize given to "those who, during the preceding year, shall have conferred the greatest benefit to humankind".
- According to the will, the prize would go to the worthiest candidates, whether they are Scandinavian or not.
- Question to your students: Do you remember which categories the Nobel Prize is awarded in?



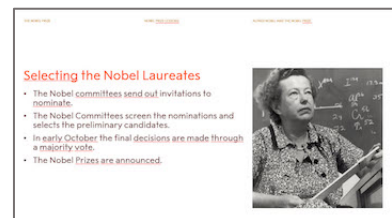
Five Nobel Prizes and one prize in economic sciences

- According to the will of Alfred Nobel, the prize would be divided into five categories: physics, chemistry, physiology or medicine, literature and peace.
- He also writes who would select the Laureates. The physics and chemistry prize would be awarded by the Royal Academy of Sciences, the physiology or medicine prize by Karolinska Institutet, the literature prize by the Swedish Academy and the peace prize by a committee consisting of five persons elected by the Norwegian Parliament (Storting).
- The first Nobel Prize was awarded in 1901. In the late 1960s, Sveriges Riksbank (Sweden's central bank) established a prize in economic sciences in memory of Alfred Nobel. The economics prize is awarded at the same time as the Nobel Prize, as part of the same ceremony.



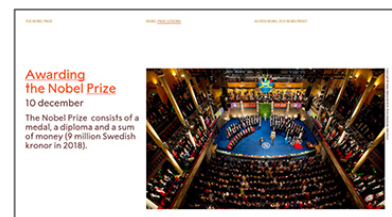
Selecting the Nobel Laureates

- This is Maria Goeppert Mayer, who was awarded the Nobel Prize in Physics in 1963 for “discoveries concerning nuclear shell structure”. This is how she was selected for the prize. All Nobel Laureates are chosen in a similar way.
- The Swedish Academy of Sciences appointed a committee of five members to take care of the physics prize selection. In September 1962 the committee sent out a large number of invitations to nominate for the prize of 1963. The invitations were sent to different scientists and professors in physics.
- On 1 February 1963 the committee received 79 nominations. Two were for Maria Goeppert Mayer. After having reviewed the list, the committee chose Goeppert Mayer and some other names for a short list to be presented to the members of the Academy of Sciences.
- In the beginning of October, she was voted one of the three final candidates for the Nobel Prize in Physics. Two months later she attended the Nobel Prize ceremony in Stockholm and received her award.



Awarding the Nobel Prize

- On December 10 each year, the Nobel Prize is presented.
Question to your students: Do you remember why it's on the 10th of December? [It's the day Alfred Nobel passed away.]
- The Prize in each category consists of a medal, and a large sum of money. In 2018 the prize amount is nine million Swedish kronor, over a million US dollars.
- The Prize Award Ceremony is held at Stockholm Concert Hall for all categories except the Peace Prize, which is awarded in Oslo, Norway.
- After the actual award ceremony, there is an elegant banquet in each city to honour the new Nobel Laureates.



Now, we will take a closer look at the achievements of some Nobel Laureates.

Discovery – the physics prize 2011

- The Nobel Prize in Physics is awarded to people who have either made inventions or discoveries in this field.
- Can an ancient exploding star tell us something about the size of the universe? The physics laureates Saul Perlmutter, Brian Schmidt and Adam Riess studied such stars, called supernovae.
- Following the intensity of light of the supernovae the scientists could calculate that the expansion of the universe is accelerating. They expected the opposite, that the expansion would slow down.
- What causes this acceleration? Dark energy, one of the greatest enigmas in physics today.



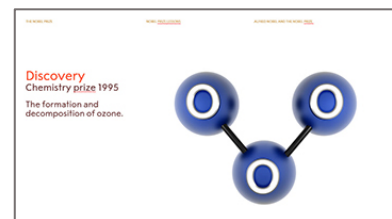
Benefit

The discovery changed the way physicists look at the universe. The dark energy constitutes about three quarters of the universe. The scientists have helped to unveil a universe that to a large extent is unknown to science.



Discovery – the chemistry prize 1995

- The Nobel Prize in Chemistry rewards important discoveries or improvements that provide new knowledge about the composition of materials, how they are created and how they change due to chemical reactions.
- The atmosphere around our earth contains small amounts of ozone; molecules made from three oxygen atoms.
- Nobel Laureates Paul Crutzen, Mario Molina and Sherwood Rowland made pioneering contributions to explaining how ozone is formed and decomposes through chemical processes in the atmosphere.
- In 1974, Mario Molina and Sherwood Rowland demonstrated that CFC gases, freons, have a damaging effect on ozone in the atmosphere. Freons had many uses, including propellants in spray cans and refrigerants in refrigerators.



Benefit

- The Nobel Laureates' research showed how sensitive the ozone layer is to the influence of emissions due to humans.
- When the politicians learnt how the ozone layer is damaged they acted quickly and made international agreements to severely restrict the use of substances that damage the ozone layer.
- Without a protective ozone layer in the atmosphere, animals and plants could not exist, at least upon land.



Discovery – the medicine prize 2008

- The Nobel Prize in Physiology or Medicine is a reward for discoveries that help us to understand how organisms work, or that lead to important cures for a disease.
- The image shows a change in the tissue that can develop into cervical cancer (the dark purple to the middle left in the image).
- Nobel Laureate Harald zur Hausen discovered what causes cervical cancer in 1983.
- Cervical cancer is the second most common cancer among women, affecting some 500,000 women per year. 250,000 women die every year, mainly in developing countries.



Benefit

- Harald zur Hausen's made his research available to the scientific community and other scientists could develop vaccines.
- By June 2017, more than 70 countries had started a vaccination program against HPV infection.



Achievement – the literature prize 1993

- The Nobel Prize in Literature has mainly been awarded to authors who have written works of fiction – such as novels, short stories, poetry collections and theatrical plays. The prize has also been awarded to authors in other literary genres, such as essays and song lyrics.
- What is it like to be an African American girl in the 1940s? Why is the strongest wish of the main character Pecola to have blue eyes? *The Bluest Eye*, a novel by Literature Laureate Toni Morrison tells us about Pecola and her childhood, surrounded by poverty, alcoholism and racism.
- Toni Morrison depicts the history of the African American minority. One of her most famous novels, *Beloved*, is about Sethe, who escaped slavery, and would rather see her two-year-old daughter dead than sold as a slave. The book is inspired by true events and has also become a film.
- The stories are narrated with a poetical style and with humour, despite the often-heavy topics.



Benefit

- The work of Toni Morrison helps us understand how oppression and racism can affect people.
- She is described as a literary artist and has given the joy of reading both to critics and to the wider public.



Achievement – the peace prize 2014

- Important categories that have been rewarded with the Nobel Peace Prize are disarmament, mediation and work aimed at a better organised world. In recent decades, efforts to promote democracy, human rights and environmental work have also been rewarded.
- When Malala Yousafzai was 10 years old the Taliban took control in the area of Pakistan where she lived, restricting the ability of girls to go to school. She refused to be silenced and fought for her right to an education.
- At age 15, she survived an assassination attempt by the Taliban.
- At age 17, she became the youngest Nobel Laureate ever.



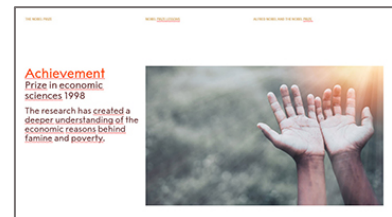
Benefit

- Malala Yousafzai has become a leading voice for girls right to education, as well as an important role model for both children and adults all over the world.
- She has shown by example that children and young people, too, can contribute to improving their own situations.
- Her struggle has led to an awakening concerning the lack of education for about 60 million children in the world.



Achievement – the prize in economic sciences 1998

- The Sveriges Riksbank Prize in Economic Sciences is awarded to a person or persons who have produced works of outstanding importance in the field of economic sciences.
- Democracy can prevent famine. This according to the economist Amartya Sen who has studied famines and found more causes than a lack of food supplies. There are, for example, areas exposed to famine that, at the same, export food.
- He claims that famines have never occurred in democratic countries. Why? In a democracy there is public debate, and the people can make the state answer to misdoings. The state needs to face responsibility and make changes.
- Sens research includes how resources are divided and ideas of how welfare and poverty can be measured.



Benefit

- Amartya Sen has helped us to understand the economic reasons behind famine and poverty. His research has created a better basis for developing measures to prevent famines, or to reduce their dismal consequences.

