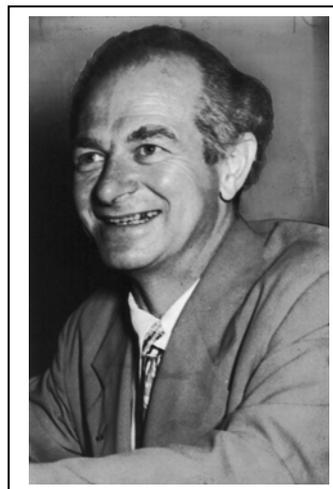


Linus Carl Pauling

1962

*“To kill and maim people is immoral. War kills and maims people.
War is immoral.”*

Linus Carl Pauling (1901 – 1994) was an amazing man. He remains the only individual to have been awarded two separate and unshared Nobel Prizes – Chemistry in 1954 and Peace in 1962. He believed that science could improve the lives of human beings. He believed in the good of humankind.



Linus C. Pauling was born on February 28, 1901, to German immigrant parents, in Portland, Oregon. When he was nine his father died, leaving Linus, his two younger sisters, and their mother to make their own way in the world. This began a stretch of more than 15 years when Pauling tried to pursue his education, while his mother tried to get him to quit school and become the support of the family. He did not quit school but he did find many ways to make money

and most of it went to help support his mother and sisters. By the time he was twelve he was a freshman at Washington High School in Portland. After four years of school, with or without the help of his teachers, and of odd jobs (delivering milk, running film projectors, and even working in a shipyard) he left high school. He did not graduate because the high school required their students to take a class in civics and Pauling saw no reason why he should. Later, after his Nobel Prize for Peace in 1962, the administration agreed that he had learned civics on his own and granted him his high school diploma.

- Professor at California Institute of Technology for thirty-seven years
- Received the Nobel Peace Prize for Chemistry in 1954
- State Department denied him a visa for two years
- Awarded the Nobel Peace Prize on October 20, 1962, the same day the Nuclear Ban Treaty was signed

“...war must be abolished if the human race is to survive”

result of his research.

Linus Pauling’s work added much to the body of knowledge in the physical sciences, especially in chemistry and biochemistry. The Nobel Prize for Chemistry he received in 1954 was the

Dr. Pauling was a well-respected scientist and yet problems surrounded his work. It was a result of his work related to peace issues. During World War II, Linus Pauling as did everyone at California Institute of Technology, worked on war-related projects as a consultant for the National Defense Research Commission. His projects included work

on rockets, submarines, and military aircrafts. Ironically, though his national defense work earned him the Presidential Medal of Merit in 1948, it was the military's use of atomic weaponry that turned him in a new direction. He had hoped to return to his work as a scientist but the start of the Atomic Age created an ethical dilemma for him, and many other scientists, that could not be ignored.

In 1946, together with his friend, Albert Einstein, and a group of scientists, Linus Pauling formed the Emergency Committee of Atomic Scientists whose task was to publicize the danger of the change in the nature of war and international relations that the atom bomb would bring. As a molecular scientist, Pauling was not only concerned about the damage of a nuclear war, but the long-term effects of radiation on people. Seeing the negative side effects of nuclear war led Pauling to become an active and very vocal supporter of peace organizations and a leader in the drive to ban nuclear testing.

In 1953 Pauling published his book, *No More War*. In April of 1954, when he requested a passport, he was denied it. On November 3 of that year, while he was giving a lecture on hemoglobin at Cornell University, he was called to the telephone to learn that he had just been awarded the Nobel Prize in Chemistry. His first worry was would he be able to get a passport so he could accept the prize in person? He applied immediately and for weeks he heard nothing. In Washington there were strong voices opposing the granting of the passport. One senator asked, "Are you in the State Department allowing some group of people in some foreign country to determine which Americans get passports?" On November 27, however, barely two weeks before the ceremony in Sweden, his passport did arrive.

Linus Pauling's works led him to believe that the testing of nuclear weapons must be limited or ended completely. Thus in 1957, Linus Pauling, with the assistance of two colleagues and his wife, Ava, circulated a petition among American scientists to end nuclear weapons testing. Eventually, the petition spread around the world and, in January 1958, he presented U.N. Secretary-General the petition signed by 11,021 prominent scientists from 49 countries.

Linus Pauling's celebrity and his cause once again led to a Congressional inquiry. Twice he was summoned to appear before the Senate Internal Security Subcommittee in 1960 to answer questions about the origin and circulation of the test ban petition. In addition, he had to confront the question of Communist sympathies that he clearly denied. However, when pressed to provide the names of individuals who worked with him to collect signatures, he refused.

Linus Pauling was convinced that rational people could find ways to live and cooperate peacefully under guidelines of international law and justice. He spent the rest of his life working to advance human scientific knowledge and to further the cause of peace throughout the world. As he acknowledged, there was a great deal of work left to do but he was ever the optimist. His death on August 19, 1994 removed a vital force in the peace movement but his achievements laid the groundwork for additional agreements such as the Nuclear Non-Proliferation Treaty of 1968 and the Comprehensive Nuclear Test Ban Treaty of 1996. His life, which spanned most of the twentieth century, left a legacy of unflinching hope as summed up in Dr. Pauling's words by Gunnar Jahn in his Nobel Peace Prize Presentation Speech, "I believe that there is a greater power in the

world than the evil power of military force, of nuclear bombs – there is the power of good, of morality, of humanitarianism.”

Classroom Activities

Linus Pauling

The teacher should invite students to go to (or provide them with data from) the website Of the Preparatory Commission for the Comprehensive Nuclear Test Ban Treaty Organization (<http://pws.ctbto.org>). Of special interest would be the number nuclear warheads that exist in the world and the list of nations that have ratified the treaty and the list of those which have not. Linus Pauling was instrumental in the movement, which led to this treaty through his petitioning activities.

Vocabulary Terms:

1. Misuse
2. Atomic Age
3. Ethical Dilemma
4. Molecular
5. Petition
6. Congressional Inquiry
7. Nuclear Non-Proliferation
8. Legacy

Discussion Questions:

- Why did Linus Pauling receive the Nobel Peace prize in 1962? (Level 1)
What is a petition? (Level 1)
What was Linus Pauling petitioning for? (Level 2)
What is important enough for you to petition for? (Level 3)
Do you think Linus Pauling deserved to win the Nobel Peace Prize? (Level 3)

Activity:

Overview – Linus Pauling believed that the scientist was a pivotal figure in modern society. However, his views often conflicted with those of politicians.

Petition for Change

Primary Subject - Social Studies

Grade Level - 6

Cooperative Learning Lesson Plan

Materials Needed:

1. Rules chart for cooperative groups
2. Petition
3. Self / Peer Evaluation Chart
4. Teacher Evaluation Chart

5. Dictionaries
6. List of Vocabulary Words Flipchart Paper and Markers
7. Blank paper; 4 pieces per group (I'd use parchment paper to make it more authentic) for journal entries and petitions

Prerequisite Skills: Students must have read the prior article on Linus Pauling and have answered the discussion questions. Students must have had some experience working in cooperative groups in various subject areas. These skills include being able to perform specified tasks, understanding accountability for their specific task, and being able to analyze as a group whether or not they have successfully completed their task.

Lesson Objective(s):

Academic: After reading the article on Linus Pauling, students will be placed in cooperative groups of 5 (called "Coalition Groups"). Within their Coalition Groups, students will pick an issue important to the whole group. Each Coalition Group will then be required to create a petition for change and present it to the class for signing.

Social: After completing this lesson, students will have evaluated themselves and their peers as a team and will be required to explain in a one page paper (done as homework) what each of the roles were in their Coalition Group, why each of these roles are important in completing this task, the social skills necessary for completing their task (empathy, listening skills, peer help, role assignment, etc.) successfully and how they determined whether or not their Coalition Group successfully completed their task.

Present Objectives:

Today, we are going to look at one specific issue that was a very important theme in this article, and that is the issue of creating a Coalition Group and how we go about petitioning to against nuclear war. Before we get into our groups, we are going to go over some rules needed for successfully completing our petitions. At this time, I'd like everyone to come to the front of the room on the carpet for a brainstorming session where we will create our class list of skills for working in our Coalition Groups and post them on our flipchart paper.

The list of rules should look something like this

1. Working Together
2. Keeping on Track
3. Move to your groups quietly and quickly
4. Take turns
5. Ask for clarification
6. Bring all materials with you
7. Contribute! Contribute! Contribute!
8. Provide clarification when asked
9. Stay with your group until the task is completed
10. Support your point(s) of view with evidence

11. Build on each other's ideas
12. Speak in quiet voices
13. Ask for help when needed (first a teammate, then the teacher if necessary)
14. Paraphrase to show understanding
15. REALLY listen to your partners
16. Encourage each other
17. Continue to analyze your progress
18. Call your partners by their proper name
19. Compliment each other
20. Come to consensus
21. Know and understand your individual task
22. Check for understanding
23. Rally your ideas together
24. Use good eye contact when speaking and listening
25. Stay focused on your task and encourage others to do so as well
26. Evaluate your individual work and the group's work

Organizing the Teams:

We will be working in groups. Each table is labeled for groups 1-4. Please gather your supplies needed for this activity, which you will find on your individual desks. As soon as we are all at our appropriate stations, we will look at our assigned roles. (Teacher has pre-assigned each role based on student ability/strengths/weaknesses)

The roles are as follows:

1. Coalition Group Chairperson
 - a. This person is the team leader/founder of the coalition group, in charge of keeping the group organized and making sure rules are followed
2. Minute-Taker
 - a. This person is in charge of taking notes
3. Time Keeper
 - a. This person is in charge of keeping the group on task and giving time reminders
4. Spokesperson
 - a. This person is in charge of presenting the petition to the committee (class)
5. Cheerleader
 - a. This person is in charge of encouraging and ensuring participation by all group members

Teacher Monitoring: While each Coalition Group is responsible for carrying out their roles and monitoring and recording their individual and group progress, the teacher is responsible for helping the students with questions and issues that may arise during the activity as well as assessing individuals and teams on how they work together in a group and whether or not they achieved their end-goal. The teacher will do spot-checks for each group by walking around the room. Notes can be made on individuals and groups by using either a clipboard method, or for those with higher-tech tools, a PDA may be used.

Whatever the method, the teacher should have clear-set criteria for assessment (See Individual Group Check List).

Coalition Group Self and Team Monitoring: This will be done by each team member filling out a form to assess their own success in working with the group as well as a peer evaluation form after their journal and petition are complete (See Individual Group Check List). I would also encourage a space for additional comments to assess what could be done better, or what was done exceptionally well. The comment section should only be used for praise or constructive criticism, and not for cruel or demeaning comments.

Assessment/Closure:

Each Coalition Team will be assessed based on the following four things:
Individual Group Checklist, which is filled out by the teacher
Group Work Evaluation, which is filled out by the Coalition Team Members
The petition to change the working conditions
Verbal explanation given by the Spokesperson with convincing, supporting evidence
Actual format of the Petition
Is it labeled (titled)?
Is there ample space for signatures?

Adaptations:

For students who need extra help, they should have previously been placed in a cooperative group that would benefit them (i.e., students of varying abilities). They should also be assigned to a task that the teacher knows they are able to perform. For instance, if the student is not strong in writing, he/she should not be assigned the role of Recorder. However, for confidence, I would probably assign this student the role of Coalition Chairperson if at all possible. The teacher should also provide extra attention/monitoring to any students who may require additional help.

Additional Vocabulary Words

1. Chairperson: the presiding officer of a meeting or an organization or committee
2. Cheerleader: one that calls for and directs cheering for a person or group of people
3. Coalition: a temporary alliance of distinct parties, persons, or states for joint action
4. Minute Taker: Person who writes down notes during a discussion or meeting
5. Petition: a formal written request made to an official person or organized body
6. Spokesperson: a person who speaks as the representative of another or others often in a professional capacity
7. Timekeeper: a clerk who keeps records of the time worked by employees (or group)

Technology Option:

Use <http://www.ipetitions.com/start-petition/> to create an online petition to email to friends and family.

Resources:

<http://globetrotter.berkeley.edu/conversations/Pauling/>

http://nobelprize.org/educational_games/peace/nuclear_weapons/index.html

<http://pws.ctbto.org>

www.achievement.org

www.almaz.com/nobel

www.harvardsquarelibrary.org/unitarians/pauling.html

www.nobelprize.org

www.orst.edu/dept/lpi

www.orst.edu/dept/special_collections/ahp

www.paulingexhibit.org