

E-SOC Lesson Plan

Learning Objectives:

(SMART)

Learning outcomes:

By concluding this session/class participants will have:

In this lesson, students will be introduced to the important role women had in the society.

This main idea of this lesson is:

- encourage your students to learn more about the accomplishments “Women In STEM”.
- To raise awareness of the lack of women in science, and encourage students to consider why this might be so.

Time: The lesson can be divided in two
Lesson 1: Challenge 2. Extraordinary women scientists 4 videos. 45 min (video 1,2,3,4)

Lesson 2. Extraordinary women scientists 4 videos (video 5,6,7 and 8)

Another option: The teacher can choose to do just Lesson 1 and the students to choose 4 out 8 videos.

Learning Outcomes:

- Comprehension
- Application
- Synthesis

Knowledge:

to form attitudes corresponding to the subject discussed in the lesson

Skills:

to identify skills that will engage more girls in STEAM

Attitudes:

to demonstrate a change in approaching gender bias in STEAM class



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- Evaluation
- Knowledge

Target group:

Secondary School Teachers
School students (choose from 12-15)

Activity Title & number	Short description of the activity	Resources needed	Time 2hs in total
<p>1. Challenge: Women make up a small share in STEM</p>	<p>1. Give information to students to read the information on page: https://www.catalyst.org/research/women-in-science-technology-engineering-and-mathematics-stem/</p> <p>Despite some positive changes, a gender gap in STEM persists around the world. This gap begins in education, fueled by gender stereotypes and expectations regarding “women’s work.”</p> <p>2. Let students discuss what they found, and what they found surprising in small groups, or as a class. 5 min</p> <p>3. In pairs or small groups, ask students to make a list of possible reasons. 5 min</p> <p>Answer: Comparing the provided data and comparing in Global/Europe/Canada</p>	<p>Internet, laptops webpage: Statistical data provided on: https://www.catalyst.org/research/women-in-science-technology-engineering-and-mathematics-stem/</p>	<p>10’</p>

	<p>and USA Women Make Up a Small Share in STEM.</p>		
<p>2. Extraordinary women scientists and entrepreneurs.</p> <p>Video series from Science History Institute- Headquarters in Philadelphia, USA and in Europe (France).</p>	<p>The students are divided into 5-6 groups (depending on the class size) and are given task to watch 15 min video series and to read the short bibliography and fill in the worksheet. Each group can watch a different video. -8 different videos in total.</p> <p><i>The Catalyst Series: Women in Chemistry.</i> The videos celebrate the catalytic effect of eight extraordinary women scientists and entrepreneurs, and highlight their ambition, courage, and life-changing, chance-taking, thrill-seeking love of science. https://www.sciencehistory.org/learn/women-in-chemistry</p> <p>1. Nancy Chang – Cofounder and former CEO of Tanox “Follow your heart, follow your passion” https://www.youtube.com/watch?v=6Hg5hGVH7mo&t=16s</p> <p>2. Uma Chowdhry -Retired senior vice president and chief science and technology officer of DuPont</p> <p>“I had the courage to dream the impossible.” https://www.youtube.com/watch?v=U-j5oFie58&t=4s</p>	<p>Laptops, Internet Worksheet 1</p>	<p>For each group 25'-30'</p>

	<p>3. Mildred Cohn- First woman president of the American Society for Biochemistry and Molecular Biology</p> <p>“I didn’t intend to be an assistant for the rest of my life; so I started a new field of research.”</p> <p>https://www.youtube.com/watch?v=8bV1Gu9Iy1Y&t=7s</p> <p>4. Mary Lowe Good- Former president of the American Chemical Society, undersecretary for technology in the U.S. Department of Commerce under President Bill Clinton</p> <p>“You’ve got to take the opportunities as they appear. ”</p> <p>https://www.youtube.com/watch?v=TkS3nB529eo&t=8s</p> <p>5. Kathryn Hach-Darrow-Cofounder of the Hach Chemical Company</p> <p>“The water on this planet is all that we have. It needs to be cared for.”</p> <p>https://www.youtube.com/watch?v=e2szFhjDagY&t=1s</p> <p>6. Paula Hammond- David H. Koch Professor in Engineering at MIT</p> <p>“I learned to not be intimidated by the problem.”</p> <p>https://www.youtube.com/watch?v=H2PgDzQClgY</p>		
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	<p>7. Stephanie Kwolek- Former research associate at DuPont and inventor of Kevlar</p> <p>“I don’t think there’s anything like saving someone’s life to bring you satisfaction and happiness.”</p> <p>https://www.youtube.com/watch?v=L1pepaAdkWA&t=4s</p> <p>8. Kiran Mazumdar-Shaw - Founder, chair, and managing director of Biocon Limited</p> <p>“I managed to do things with a lot of common sense, a lot of determination, and a lot of foolish courage.”</p> <p>https://www.youtube.com/watch?v=PtbN2ky7Ff0&t=2s</p>		
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WORKSHEET 1:

Women make a small share in STEM, but they can make a significant contributions to chemistry, engineering, life sciences.

Task 1. Women in STEM. 10-15 min.

What does statistical data present about the number of women at STEM workforce

Read the provided information from the following web page:

<https://www.catalyst.org/research/women-in-science-technology-engineering-and-mathematics-stem/>

1.1 Discuss what you have found regarding the number of women in STEM workforce in global/ in Europe/ Canada and USA. 5 min

1.2. In pairs or small groups, make a list of possible reasons for the statistical data you have found. 5 min

Task 2. Get acquainted with the extraordinary women scientists and entrepreneurs and their work.

The Science History Institute in Philadelphia and France presented videos *Women in Chemistry*: The individuals featured—**Nancy Chang, Uma Chowdhry, Mildred Cohn, Mary Lowe Good, Kitty Hach-Darrow, Paula Hammond, Stephanie Kwolek, and Kiran Mazumdar-Shaw**—work in a variety of scientific careers and come from different generations, countries, and racial and ethnic backgrounds. All have made significant contributions to the chemical sciences.

2.1 Watch the video for one of the women scientists from the following page:

<https://www.sciencehistory.org/learn/women-in-chemistry>

2.2. Identify the skills, strengths and qualities of women scientists. What personal character, values do you think are useful and helpful?

2.3 Discuss the rewards of the careers such as opportunities to make fundamental contributions to the science world, professional activities and etc.

2.4. How you should comment on some of their quotes:

“Follow your heart, follow your passion”

“I had the courage to dream the impossible.”

“You’ve got to take the opportunities as they appear. ”

“I managed to do things with a lot of common sense, a lot of determination, and a lot of foolish courage.”

“I don’t think there’s anything like saving someone’s life to bring you satisfaction and happiness.”