Scientix Lesson plan

# Title

Women in Engineering and Science

# Author(s)

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# Abstract

Many of us when we teach or look for information in books, we never find any reference woman, model, if we want to capture the young talent of men and women we must also include all those women who deserve it, to teach students to value all talents.

# Keywords

Engineering women technology science ICT

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# Summary table

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| *Subject* | The didactic proposal "Women in engineering" allows to address the specific curricular content of Digital ICT Tools of 2nd ESO of Technology designing digital posters, while integrating knowledge of other subjects such as Technology, ICT, Mathematics, Science, English, Spanish, Catalonian Language, etc. This transversality means that it can be considered a unit with possible STEAM orientation. |
| *Topic(s) within the subject* | *Women in Engineering and Science* |
| *Key real-life topic* | The historical relationship that women have had in the world of engineering has been based either on the difficulties of being able to develop a knowledge that society considered "men" or on the invisibility of the contributions of those who could save this situation. What we know about History (or what we have been told about History) has largely hidden from us the work and / or contributions of women engineers who have been little known.This project was born out of the need to continue to encourage and make visible the work of these women engineers and at the same time, to vindicate the figure of women and to offer a new image of technology far removed from the androcentric vision that is usually given to us |
| *Age of students* | *12-18, but it could be under 12 too* |
| *Preparation time* | Preparation time: 4hTeaching time: 9h or more depending of the Extension Activities. |
| *Teaching time* | 1h explaining and 8 guidingWeeks before February 11 through March 8, to commemorate International Science Girls and Women’s Day and Working Woman’s Day. |
| *Online teaching material* | ○ Glogster○ Padlet ○ Canvas ○ Prezi. ○ Classroom computer and projector○ Computer for each student○ Classroom: organizer of materials and facilitator of the task○ Google Drive○ Internet● <https://11defebrero.org/> ● <https://sandrauve.wordpress.com/>* [Celebrating women in Science](https://www.sciencemag.org/careers/2018/02/celebrating-women-science)
* <https://11defebrero.org/>
* [Universitats i Recerca: Dones i ciència a la història](http://universitatsirecerca.gencat.cat/ca/03_ambits_dactuacio/ciencia_i_societat/dones_i_ciencia/dones_de_ciencia_i_historia/)
* [Dones i ciència: Debats ICREA - CCCB 2015](http://www.cccb.org/ca/marc/fitxa/dones-i-ciencia/173070)
* Others:
	+ [Les dones més influents en la història de la Ciència](https://val.levante-emv.com/sociedad/2018/02/10/mujeres-influyentes-historia-ciencia/1677888.html)

[Dones i ciència: història per comprendre el passat, xifres per canviar el present](https://cateinf.wordpress.com/2017/02/11/dones-i-ciencia-historia-per-comprendre-el-passat-xifres-per-canviar-el-present/) |
| *Offline teaching material* | *It is about organizing an exhibition with traditional posters and multimedia posters of women scientists and with the videos created by the students to encourage the students to study STEAM careers. We could need A3-paper-posters, glue, adhesive tape, tablets to show the videos, etc.* |

# Integration into the curriculum

*The proposal is aimed at all 2nd year ESO students. The learning is aimed at a ratio of a group-class of 2nd ESO. Split with a maximum of 20 students when it comes to going to the computer room, which is their maximum capacity. Do a transversal and interdisciplinary work of the subjects of Technology, ICT, science, mathematics and English.*

# Aim of the lesson

At the end of the lesson, the students will be able to:

* Develop their communication skills
* Use ICT tools in the results of their teamwork research, in order to be aware of the relevance of women in engineering, as well as the products made for them.
* Give visibility of the value women in engineering and science

# Outcome of the lesson

*In addition, we do a workshop / conference for this purpose is invited to a scientist or disseminator like Sandra Uve (sandrauve@gmail.com) to give visibility to all these women to give an informative talk, and get students involved designed some murals. Another option we also worked on was to invite one of the scientists working on the supercomputer, and came to visit the center for all groups offirst or make a connection with the class through a virtual and scientific meeting.*

# Trends

*Project based learning, collaborative learning, STEM learning, peer learning*

# 21st century skills

*Add here how the lesson plan corresponds to 21st century skills. To find out more:*[*http://www.p21.org/our-work/p21-framework*](http://www.p21.org/our-work/p21-framework) *.*

This didactic proposal incorporates knowledge and skills from:

* 3 languages and STEM areas ([awareness about languages, global technological issues](http://www.p21.org/about-us/p21-framework/256))
* Cooperative teamwork approach
* Search of information from diverse sources and languages; promoting digital literacy
* Analysis of information promoting critical thinking
* Reflection about future jobs

# Activities

|  |  |  |
| --- | --- | --- |
| Name of activity | Procedure | Time |
| A1 | **Why are not there more women engineering?****Session 1: Introduction**Reflection and large group debate on the role of women in science:● How many engineers/scientists do you know?● How many women scientists/engineers?● Why do you think this is happening?Formation of groups of 2 or 3Reading an article in English about it, thinking and debatingLogout:What do you think should change in our society today in order for there to be a balance?**Session 2: We know the reality / the present**Talk to a woman scientist or watch a documentary or movieReading and interpreting the news about the statistics of women scientists: making graphs to make a mural in class.Research and explanation on the HYPATIA ProjectLogout:Are you tired of studying for a STEAM career? Do you know someone who would like / could do it? What qualities or abilities do you think you should have?**Session 3: We do to learn**Research how many women scientists/ engineers have existed and have had or are recognized:Preparation of a collaborative document (gdocs) with a list of women engineers / scientists. The document will include a table with the name and surname, the date of birth and death and the relevant work of the engineer/scientist.When they have done the research, show them the letters from the women engineers /scientists and complete the document.Choose the scientist you want to studyLogout:Do you think women’s inventions are less relevant than men’s? Do you think that the discoveries of women engineers or scientists are less important than those of men engineers or scientists?Session 1* [Scientific article](https://www.sciencemag.org/careers/2018/02/celebrating-women-science)
* [News 1](https://www.infobae.com/tendencias/2017/12/27/mujeres-en-la-ciencia-solo-el-28-de-los-investigadores-cientificos-en-el-mundo-son-mujeres/)

Session 2* [documental or film](https://11defebrero.org/materiales/libros-y-peliculas/)
* [Scientific women report](http://www.ciencia.gob.es/stfls/MICINN/Ministerio/FICHEROS/Informe_Cientificas_en_Cifras_2015_con_Anexo.pdf)

Session 3* [Game cards-scientist women](https://mujeresconciencia.com/2015/09/09/el-juego-de-cartas-mujeres-de-ciencia/)

<https://11defebrero.org/> | 3h |
| A2 | **Research and oral presentation****Session 4: We are looking for information!**Search for information about the chosen engineer/scientist, following a short script in which they are asked to find their date of birth and death, nationality, discoveries/inventions, why she is known, ...Preparation of a digital presentation (prezi, gloster, canva, or google presentations) with the information found.Logout:Reflection on the difficulties they have had in finding this information and what information they have not been able to provide.**Session 5: We present the chosen engineer/scientist**Oral presentation of the digital presentationCo-evaluation with co-rubricsLogout:How did I do that? Have I tried my best? What can I improve on?**Session 6: We make a multimedia poster**With the information found in session 4, making a multimedia poster with tools such as Glogster or Padlet or before mentioned. | 3h |
| A3 | **We share the results of our research.****Session 7**Viewing some examples and transforming your poster into a more captivating oneHomework (poster) to the ClassroomStart of the 1-minute video to encourage the study of STEAM among female students: Script and Ladder.Logout:Which poster did you find most interesting? Do you think it can be a good role model? What difficulties did you encounter in starting the video?For session 7Examples of posters: (how to modify with the same elements to captivate the public)

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| --- | --- |
| [Exemple 1](https://padlet.com/17rogatinaali/iyzuisbazltn) (padlet) | [Exemple 2](https://padlet.com/blayacri/7k6ac1f14am9) (padlet) |

**Session 8**Script completionVideo recording and editingHomework assignment in the ClassroomLogout:Do you think these little visual capsules will offer girls a different view of STEAM studies?**Session 9**Exhibition assemblyViewing of all the work of classmatesIndividual assessment of the activity and the implementation process | 3h |
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# Assessment

*Observation of information search activity. Rubric A1*

*Assessment of the critical sense of the information obtained*

Self-assessment and co-assessment rubric.A3

# Student feedback

At the beginning, students assess from 1 to 4 the interest of the topic (introductory activity A1) following by the interest and development at the end with a formulary rubric and a corubric to evaluate their partners.

# About Scientix

Scientix, the community for Science education in Europe, promotes and supports a Europe-wide collaboration among STEM (Science, Technology, Engineering and Mathematics) teachers, education researchers, policymakers and other STEM education professionals. If you need more information, check the [Scientix portal](http://www.scientix.eu/home), or contact either the Scientix National Contact Point or Scientix Ambassadors [in your country](http://www.scientix.eu/in-your-country).