

FEMALES – Educational Activities

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INTERACTIVE ROLE-MODEL HUNT GAME

FEMALES EDUCATIONAL ACTIVITIES

1st lesson



- 1 At the **first lesson** the educator introduces the FEMALES project to the students
Then the educator introduces the Females game, the mobile augmented reality app and the e-book which were developed through the FEMALES project. They include 50 female scientists from countries all over Europe. The educator explains how students can use the cards and app to learn about female scientists' life, working area and contribution to the world.
- 2
- 3 Then the educator divides the classroom into groups of 4-5 students each and explains the rules of the game.
- 4 The students play the game and the teacher helps them in any inquiry.
- 5 It follows a discussion between students and educator about the personalities that catch their attention. Students are encouraged by their educators to search for more details for them through the e-book with biographies or internet till the next lesson.

2nd lesson



- 1 At the second lesson the educator reminds students the activity of previous lesson
- 2 Before starting the hunt game the educator divides the classroom into the groups of 4-5 students and asks them to download the actionbound app into their mobile phones or tablets (download the app in 1 device for each group)
- 3 Students give a name to their group and enter to the actionbound app by scanning the first QR code.
- 4 Each group of students starts to answer the questions and the challenge starts!
- 5 After all groups answer all questions results about their answers are released. An award is given to the winning group!
- 6 At the end the educator summarizes the learning outcomes of the 2 lessons

Worksheet

FEMALES - Role model Hunt game

After the activity- Homework

Name the scientist and write 3 important things about her



Sketch a female scientist. Write which are the characteristics that inspired you to choose her and why?





Scope of the activity

The scope of the activity is to inspire more girls to study tech and to ensure they don't miss out on tomorrow's best jobs. Moreover to meet women who have challenged stereotypes and turned their passion for technology into rewarding and successful careers.

Number of participants



1 classroom
or
1 school for the event

Selection of participants

12-13 years old

Materials needed

- Internet access
- [Cisco Rock it website](#)
- Materials and actions described below if you want to organize an event



Preparation phase

The educator visits the website of Cisco Rock it and selects some examples of videos for students to attend. In order to select the videos the educator can use criteria such as; women from different sectors, women facing similar challenges as the students in their classroom, women coming from the same country and cultural background etc.

Description of the activity

- 1 The educator gives the students the links to the videos they can attend from the "Women Rock-IT" website.
- 2 Each student select the video (or videos) s/he will attend and hear from some "Rock'in" women who have challenged stereotypes and turned their passion for technology into rewarding and successful careers.
- 3 After 30 min the educator encourages the students to share the points that inspired them more in the video they attended. (The students can also use post-it for writing their thoughts about all these points that cached their attention)
- 4 The classroom discusses about the different professions, challenges, opportunities they can see and reflect to themselves

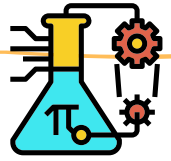


Worksheet

FEMALES - Women Rock-IT

After the activity- Homework

Watch a video of a woman in STEM and make a summary of the main field of work and the way to reach there (eg. what studies, how many years, challenges to overcome etc)



Write the transcript of a video of your imaginary self after 10-15 years having a successful STEM career. What would you say to this video to inspire young girls and boys to follow STEM?



Host an Event on Campus

Cisco digital magazine helps Networking Academies, High School Teachers and Cisco employees produce Women Rock-IT events at the local level.

If you want to organize and host such an event visit the website below

https://www.cisco.com/c/m/en_sg/partners/women-rock-it/emear.html#~events

Steps for hosing an event

- 1 Register.**
Register for a Women Rock-IT event to receive details on how to join.
- 2 Book a venue**
Ensure the venue has the equipment needed (projectors, cables, mic, monitor, PC, etc.)
- 3 Promote.**
To find social media banners to promote the event go to the 'Promote tab' on the Women Rock -IT. Create your own Facebook event to generate interest.
- 4 Invite.**
Invite surrounding colleges, high schools, students, parents and coworkers to register for the event.
- 5 Set a criteria.**
Set a goal. 50% new students. Have 90% of your audience sign up for a course directly after the event. Follow up within 4 months to ensure students have completed the course.
- 6 Contact.**
If you need any information relating to this program.
- 7 Promote speakers**
Announce your upcoming guest speakers with teasers leading up to your event.
- 8 During the event.**
During the event, share the live broadcast on your social media channels.
- 9 Take Photos.**
Take photos of the venue, your speakers, and audience turnout. Note how many students attended and give them certificates of participation.
- 10 After the event.**
After the event, share photos on Cisco's Women Rock-IT Facebook page for everyone to experience and be sure to #WomenRockIT.
- 11 Share resources.**
Share websites and resources. All of the speakers write a blog. Post these and spark conversations for further education.



Scope of the activity

The scope of this activity is that the students and educators analyze and critically think on how news can be presented in a way that promotes equality between women and men. The objective is to promote equality and develop a critical view and thinking on the way media presents women and men.

Number of participants



A classroom
(20-25 people)

or smaller groups of
4-6 students.

Selection of participants

12-18 years old

Additional materials needed

- Newspapers
- Magazines
- Internet access



Preparation phase

- 1 The educator prepares some examples of articles in newspaper, video clippings, or other type of news that don't promote equality (it is proposed to find some scientific news- media as well in order to be more targeted to STEM equality)
- 2 The educator prints any material needed for the activity

Description of the activity

- 1 The educator divides the class into four groups of 5-6 students and gives to each group a piece of news and the worksheet with some guidelines on how to reflect
- 2 The students make dialogue, reflect and debate about it for about 10-15 min
- 3 Then based on the worksheet they try to re-shape the news piece so as to promote equality between women and men.
- 4 Each team presents how they reshapes the news piece to the classroom
- 5 It follows a discussion with the whole classroom on how the issue of gender diversity is dealt in the press and media. Students express their thoughts and reflections



Some notes for the educator

It is important to take into account some aspects regarding news and media.

In the media too many times we see qualifiers or stereotypes against gender equality, where macho comments prevail or the role of men prevails over that of women. An example is the highlighting news of sports practiced by men to those practiced by the woman. Another example is panels of events full of men and a minority of women or even no women.

In some areas, such as employment, this inequality is more prominent. Factors such as the wage gap, for which women earn less than men for doing the same job and having the same responsibility are important obstacles that, until they are definitively skipped, will continue to prevent us from achieving equality. If we put these words or contexts in the headlines of the news, or give these kinds of ideas, we are misinforming and giving a negative and reductionist image of equality.

Worksheet 1

FEMALES - Press workshop

Order the press headlines given from the most positive to equality to more neutral or negative



Analyze the result and explain why a deformed headline can change the meaning of what is read.



Comment on the headline that you liked the most and the least. How you would change the neutral or negative headlines to promote equality?



Worksheet 2

FEMALES - Press workshop

In which expressions, words, ideas do you find positive equality connotations?

In which expressions, words, ideas do you find negative or neutral equality connotations?

What feelings can arouse to the people involved in these news?

If you found some negative connotations, how could you rephrase- change them in order to be positive?

Worksheet

FEMALES- PRESS WORKSHOP

After the activity- Homework

Do you think there is equality when the reporter writes the new?

What conclusions do you get thanks to the activity?

Have you been surprised by the news have you found?

We know that the media influences society notoriously, but, promoting equality?
Reason your opinion.



Scope of the activity

The main scope of the activity is to provide students with the female scientists' thinking process and encourage them to use the creative thinking method "personal analogy".

Number of participants



A classroom
(20-25 people)

or smaller groups of
6-10 students.

Selection of participants

11-18 years old

Additional materials needed

- room/classroom
- whiteboard
- post-it
- colored markers.
- [flipgrid app](#)
- If applied virtually:
jamboard & breakout
rooms



Description of the activity



45 min

- 1 The educator shares to the students the worksheets and explains them the activity
Students are asked to choose a female scientist from their country or worldwide.
- 2 Then they should make research in the web in order to answer five questions of the worksheet They are given for their research 15 minutes. The aim of this activity is to make them understand female scientists better and by answering the questions as if they were, internalizing their thought process.
- 3 After answering the questions students are asked to write a script on the second worksheet about that scientists which answers all these questions at first person like they were the specific scientist (10min)
- 4 Students are invited to the app "flipgrid" with the title "Prepare the video for your scientist" by using the script, add effects or etc. and upload it to flip grid. (10min)
- 5 Students are asked to watch at least three videos of their friends and give feedback under the videos by analyzing its plus, minus and interesting points. (10min)
- 6 The students and the educator watch 3-5 videos together and give feedback about them by analyzing its pluses, minus and interesting points. The educator emphasizes that it is important to understand these scientists' point of view to understand them and their success better. (15min)

Worksheet 1

FEMALES - If I were her

Why did you want to become a scientist?

How many hours do you work in a day and how is a typical day of yours?

What kind of challenges did you face in your career?

How do you struggle with the challenges in your career?

What do you advise female students who want to be a scientist?

Worksheet 2

FEMALES - If I were her

Imagine that you are this scientist.
Write the script of your video interview

Hi, I am

As you know I am a scientist in the field of

I wanted to become a scientist because.....

I work

So for being a scientist I sacrifice many things,

I overcome these obstacle by.....

My advice to a girl who wants to study in a STEM field and follow relevant career is.....

INTERACTIVE ROLE-MODEL HUNT GAME

Scope of the activity



The main scope of the activity is students to learn about the contribution, life, professional life and challenges of inspiring female scientists chosen within the FEMALES project.

Number of participants



A whole classroom

20-25 participants

Selection of participants

10-18 years old girls and boys

Materials needed

- Females Card Game
- Females e-book
- Females Mobile App
- Actionbound App and QR codes.



Preparation phase

You can do this activity either inside of the classroom or you may choose outside of the school such as the science museum, the garden of the school, etc. at the implementation phase.

- 1 The educator **chooses 6-8 inspirational female scientists** from the list of females project biographies e-book and **prepares questions** regarding personal life, professional life, challenges and main contributions of these scientists
- 2 Then the educator uses the **actionbound software to prepare QR Codes** for each question.
- 3 The educator **prints the QR codes and sticks them to the walls** of the school, classroom or any suitable surface. If this activity is going to be implemented at any other place outside of the school such as a science museum, a gallery, a library, a garden etc. the educator should give further information to the management department to take necessary preparations and cautions.

The activity will take 2 lessons (45 min each lesson, 90 min in total)

THINKING ON FEMALE SCIENTISTS' THINKING?

Some notes for the educator

This is an example of Goals, Aim and Objective to help the educator explain better to the students the difference

Aim:
Make all arrangements for building

Goal:
Complete the shopping centre

- Objectives:**
- to make a profit
 - build a successful shopping centre,
 - pleasing potential shoppers,
 - fitting in with planning authorities,
 - work well in time and in budget

These are 2 examples of working with Plus, Minus and Interesting points (PMI)

Plus Students place all of their positive ideas.	Minus Students place all of their Negative ideas.	Interesting Students put any ideas that they have which are interesting and need future investigation.
<ul style="list-style-type: none"> • What they liked? • What they Learnt? • What they have done well? 	<ul style="list-style-type: none"> • What they did not like? • What they did not understand? • What things could have been improved? 	<ul style="list-style-type: none"> • They also can put questions in this section. • What do you find interesting about this? • What might the consequences of action and non action be? • What else does it make you think about?

Table 1: The example of PMI (Plus-Minus-Interesting) Chart

PMI (Plus- Minus- Interesting) Chart Template		
Topic: - Use of Multimedia in classroom instruction		
Plus Advantages/Benefits/Strengths/ Positives/Good things	Minus Disadvantages/Deficiencies/ Weaknesses/Minuses/ Negatives	Interesting Implications and possible outcome/Attention- grabbing/Out of the ordinary/Appealing
Provide Drill and practice to master basic skills. +5	Time consuming. -2	Multimedia is a combination of text, graphics, sound, animation, and video, interactive electronic or digital means of manipulation delivered to the user. +4
Attractive and entertaining strategy, bring virtual world in classroom. +4	Very expensive. -3	Multimedia is all about communicating in several ways. +3
Improve problem solving abilities. +5	Complex to create. -3	Use multimedia for wrong purposes (like piracy, pornography) -5
Provide access to multiple educational resources. +5	It is not always to configure. -4	All students collaborate at one place, by creating one shared product between them. +4
Total +19	-12	+6

THINKING ON FEMALE SCIENTISTS' THINKING?

FEMALES
EDUCATIONAL ACTIVITIES



Scope of the activity

The scope of the activity is to make students think on a scientist's thinking and help them to see the thoughts beyond action. The objective is to show that being a female scientist requires a mindset. Students explore this mindset through interviews of female scientists and De Bono Thinking Tools.

Number of participants



A classroom
(20-25 people)

or smaller groups of
6-10 students.

Selection of participants

11-18 years old

Additional materials needed

- room/classroom
- whiteboard
- post-it
- colored markers.
- Interview
- If applied virtually:
jamboard & breakout rooms



Preparation Phase

The educator reads the interview which was carried out with a female scientist from <https://www.higheredjobs.com/HigherEdCareers/interviews.cfm?ID=311>.

Description of the activity



1

The educator shares to the students the workshops and asks them to read an authentic interview which was carried out with a female scientist from <https://www.higheredjobs.com/HigherEdCareers/interviews.cfm?ID=311>.

*It can be translated via the translate button on the web for all countries.

2

Then the educator explains the differences between aims, goals and objectives (look at the notes for the educator)

3

Then the educator divides the students in groups of 4-5 students and they are asked to answer some questions on worksheet as individuals and as group (check the specific mark on the worksheet)

4

In the end all the classroom discusses and answers the last question of the worksheet.

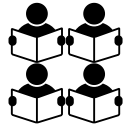
Worksheet

FEMALES - Thinking on females scientist thinking

Analyze the effective factors that cause the lower number of women in STEM fields according to Paula K. Kleintjes Neff who is a Professor of Biology at the University of Wisconsin Eau-Claire. Do you agree with all these factors? (individually)



Analyze the aims, goals and objectives of the female scientist Paula K. Kleintjes Neff. Provide evidence for your analysis from the interview. (in groups)



Goal (the ultimate destination) is.....

Aim (the general direction) is....

Objectives (recognizable points of achievement along the way) are...

What are the consequences of being a female scientist according to Paula K. Kleintjes Neff? Provide evidence for your answer from the interview. (individually)



What are the Plus, Minus and Interesting points (PMI) of being a female scientist according to Paula K. Kleintjes Neff? (whole classroom)



Scope of the activity



The scope of the activity is students to learn about female scientists through playing jeopardy game. The main information that they will learn is about name, inventions and challenges of female scientists.

Number of participants



A classroom
(20-25 people)

or smaller groups of
6-10 students.

Selection of participants

12-18 years old

Additional materials needed

- room/classroom
- computer
- Internet access
- whiteboard
- [Jeopardy game link](#)



Description of the activity



45 min

- 1 The educator asks the students to read about 10 female scientists found in <http://www.takepart.com/article/2015/06/14/10-female-inventors-you-need-to-know> for 20 minutes.
- 2 Then the class is divided into teams of 4-5 students and play the game. In jeopardy game there are three categories; name, inventions and challenges. In each category there are five questions pointed between 100-500. Every time students answer a question they gain points. The game can be reached via the link: <https://jeopardylabs.com/play/female-scientists-2>
- 3 After the game the team that has won the more points gains the award
- 4 After the lesson the educator asks students to choose their own 10 female scientists and prepare their own jeopardy game into the website <https://jeopardylabs.com/>

Worksheet

FEMALES - Let's play jeopardy game

Read about 10 female scientists by using websites below.
Take Notes about the important points.

<http://www.takepart.com/article/2015/06/14/10-female-inventors-you-need-to-know>

https://en.wikipedia.org/wiki/Grace_Hopper

<https://www.inventricity.com/nancy-johnson-inventor>

https://en.wikipedia.org/wiki/Ann_Tsukamoto

https://en.wikipedia.org/wiki/Radioactive_decay

<https://www.history.com/this-day-in-history/curies-isolate-radium#:~:text=Pierre%20Curie%20joined%20her%20in,chemically%20isolate%20radium%20from%20pitchblende>

Worksheet

FEMALES - Let's play jeopardy game

After the activity- Homework

Choose at least ten female scientists except the ones in the classroom activity and prepare a jeopardy game by using these scientists' information.
Take Notes about the important points that you will use in the game here.

Woman in science Card Game Activity

FEMALES
EDUCATIONAL ACTIVITIES



Scope of the activity

The main scope is students to get to know some names of female scientists and their field of work through playing the card game "Women in Science" and do further research on their work.

Number of participants



A whole classroom (20-24 students)
The educator can either divide the class in teams and each team play all together as one player or students can play in their group simultaneously by printing having more sets of cards of the game. Each card game set can be played by 2-4 players.

Selection of participants

7-18 years old
Ideally 10-18 years old

Additional materials needed

- Copies of the game (The card game is available to download, print and play, in the site of launa games (the creators). One may also buy copies from the website)



Preparation Phase:

- 1 The educator prints or buy either 1 or 5-6 sets of cards of the game "Women in Science". This depends on how the classroom will play the game (see number of participants).
- 2 Prepare for the scientists illustrated some extra info texts or some links for further research on the work and life of them. Print these extra info texts

It is estimated that the activity will be concluded within 2 lessons (45min each)

Woman in science Card Game Activity

FEMALES
EDUCATIONAL ACTIVITIES

1st lesson

- 1 The educator introduces the activity and especially the game instructions to the students.

The game is made up of cards representing 44 female scientists in 5 different disciplines, plus special cards that allow you to clone scientists, steal them from other players, or pick up desirable scientists from the discard pile. Each player starts with a hand of 6 cards. Your goal is to collect 4 scientists in the same field (represented by background color), forming a "lab". The first player to have 3 labs wins the game. This is not quite as easy as it sounds – each turn you may only draw one card, and with a hand limit of 6 you are repeatedly forced to choose which promising scientist to discard. In addition, other players can play the "prestige" card to steal 2 scientists from an already-completed lab of any other player
- 2 -If the educator has decided to play with only one set of game s/he divides the classroom into 4 groups and instructs the student in each group to play all together and decide all together for their movements into the game.

-If the educator has decided to play with more sets of game s/he divides the students into groups of 3-4 persons and gives one set of the card game to each group.
- 3 Before starting playing the educator asks the students to write down the names and read aloud the small text describing each scientist of their completed labs when they finish each round.
- 4 Then the students start to play for about 30 minutes

After the game the educator initiate a discussion on the different labs and scientists the students learned through the game.

The educator gives to the students for homework the extra info texts or links in order to read more or make a search on the internet about their completed lab scientists. The educator also gives the a worksheet and encourages them to prepare a short presentation or drawing of this women lab or even to imagine some stories if these scientists were really working together.



2nd lesson

- 1 The students present their work on the scientists of their completed labs in the classroom. Each student has about 3-5min for the presentation
- 2 Then all together discusses about the most inspiring role models



Worksheet

FEMALES - Women in Science game

LINKS for further reading

Read or watch the information/videos in the following links

(links will be added by the educator)

Keep useful notes here

Worksheet

FEMALES - Women in Science game

After the activity- Homework

Write the names of the scientists of your lab and the fields each ones work

Prepare a short paragraph for the presentation of the women scientists of your lab

Draw the women working in the lab

Write a true or imaginary story that could have happened in this lab



Scope of the activity

The main scope of the activity is to learn extraordinary women and their accomplishments through the Who is she guess game

Number of participants

A classroom (20-25 students)



The "Who is She" game is initially played by 2 people.
-In the context of the class it can be played by two teams changing persons in each guessing.
-Educator can also divide the students in smaller groups of 4-8 students to playing the game this way

Selection of participants

7-18 years old

Additional materials

- [Who is she game](#)



Preparation Phase

In case you don't want to buy the game it is important to use another resource or create your own cards.

- As a resource you can use the "Females" game (download it from our [website here](#)) or the game "Women in Science" (download it from [this link](#))
- If you decide to create your own cards consider to do it together with the students in order to engage them more (see the worksheet in the next page).

Description of the activity

1

The educator introduces the activity and especially the game instructions to the students. The players must guess the identity of women by asking about their accomplishments and not by their appearance (as in the well-known classic version of the game "who is who?"). The "Who is she?" game includes 28 biography cards of extraordinary women from several professions.



2

Then depending on how the educator wants to play the game the students are arranged in tables of 2 people or in teams of 5 or other (look at the point "number of participants"). They are given the cards of the game and they play as many rounds as they can in the given time (about 30min).

3

The students are encouraged to choose their favorite personality role-model and research more about her in home and create a card for the "Who is she" game with her details.

Prepare a card for the who is she game

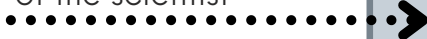
Put here one or more symbols for each field she has worked in



Draw here the scientist



Write here the name of the scientist



Put here one or more symbols about awards or accomplishments



Put here one or more symbols about challenges



Women that changed science: match with a laureate- read the story

FEMALES
EDUCATIONAL ACTIVITIES



Scope of the activity

The main scope of the activity is students to learn about some inspiring female Nobel Prize laureates and their stories. Moreover to reflect themselves and select a role model.

Number of participants



A classroom
(20-25 students)

Selection of participants

12-18 years old

Additional materials needed

- Internet access
- Computer/ projector
- Link to the Nobel laureates
<https://www.nobelprize.org/womenwhochangedscience/stories>
- Link to the quiz
<https://www.nobelprize.org/womenwhochangedscience/quiz>



Description of the activity

- 1 The educator introduces the activity and asks them to visit the website of Nobel Laureates.
- 2 The students are given 20min to explore individually the stories of women scientists and laureates of Nobel prize.
- 3 Afterwards the educator projects the link with the quiz. S/he defines the answers to the 3 questions appeared in the screen and before check for the answer s/he asks students if they have met during their reading a scientists with these characteristics. The students who respond correct with the name of the scientist win one point.
- 4 In the end of the lesson the educator discusses with the students about who scientists were more known and who inspired students through their stories.



Some notes for the educator

This online experience works as a source of information and as a "game-quiz". By entering the special site "Women who changed science" (within the site of the Nobel Foundation) the participants can answer 3 questions, which will lead them to the woman scientist and following an "online" journey through her life and her discoveries. This activity can be given also as "homework" for students and during the lesson each student to present his/her favorite female laureate and her work.

Girls in STEM Science Days



Etkinliğin Amacı

The aim of the activity is to inspire young girls to get into science, technology, engineering and mathematics (STEM) subjects, give them information about the many possibilities of the fields of physics, astronomy, and computer science, stimulating scientific professions and explore gender equality by opening opportunities and avoiding clichés that separate women from scientific and technological environments.

Number of participants



A classroom
(20-25
students

or a group of
students

Selection of participants

12-18 years old

Additional materials needed:



Girls Days, Science nights and similar events exist in many European countries in different formats and the educator just has to register his/her classroom in the event. For example:

- [Bringing female scientists into the classroom](#)
- [Girls in science day- Speed dating with women scientists](#)
- [International day of women in science](#)
- [Science in your future](#)

Description of the activity

Participating in an event like the ones illustrated above is not restricted to a lesson activity. Most of these workshops includes either presenting the work of students in a specific topic or attending a series of workshops, talks, etc.

In order to present the work of students the educator together with the classroom or a group of students should prepare a presentation, a talk, a craft, an act, an activity, etc

In order to attend such an event most of the times there is no need for preparation.

The example of Girls in Science day- Speed dating

The event consists of a series of workshops that are held in classrooms, complemented by a visit of scientist and hands-on activities. In addition to the workshops, the girls also have the opportunity to speed date with 15 women with education in physics, astronomy or computer science. They narrate from their own experience what it is like to work in an innovative business, academic world or science.

Female Science Journal: Interview a female scientist

FEMALES
EDUCATIONAL
ACTIVITIES



Scope of the activity

The scope of this activity is that the students get to know in person a female scientist and learn all challenges, achievements, honours and awards and inspiring moments of her life. It is very important that they also learn how she overcame difficulties, challenges and obstacles. After the interviews students can write and publish them in a school journal to "spread the word".

Number of participants



A classroom
(20-25 students)

or smaller groups
3-4 students per
interviewed scientist

Selection of participants

13-18 years old

Additional materials needed

- Internet access
- Computer
- Recording or video shooting devices (optional)
- Printer (if needed)



Preparation Phase

The educator has to come in contact with some female scientists and ensure their commitment to respond to the interviews and interact with the students. In order to find scientists the educator can search in nearby universities, tech companies, internet, organizations promoting women in science etc.

Description of the activity - Preparation Phase:

- 1 The students are given in groups the task to interview a specific female scientist
- 2 The students prepare the questions for the interview, researching references and resources about the scientist in order to make them more "targeted".
- 3 The students take and record the interview (in person or online or written).
- 4 The students prepare a story for the Female Scientist Journal combining interview answers with their previous research.
- 5 The students prepare the outline and final template of the Journal and their interviews
- 6 Publishing (printing) and distributing the journal in the school and if possible outside it.



45 min

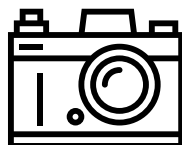
Worksheet

FEMALES - Interview a female scientist

Write a short bio of the scientist (name, date of birth, studies, field of work, awards)

Write 3 questions about her early age (before starting work)

Write 3 questions about her work/life/experiences till today



Don't forget to take a photo of her!!!

Rosalind Franklin and the DNA double helix model

FEMALES
EDUCATIONAL ACTIVITIES

Scope of the activity

The main aim is students to learn historical facts about the contribution of Rosalind Franklin in the discovery of the double-helix model of DNA as well as the controversy about sexist and other discriminations she faced. In the meanwhile the students become aware of the scientific techniques and results of molecular biology and crystallography. A similar activity can be envisioned for other legendary personalities like Marie Curie, Ada Lovelace etc. We propose Rosalind Franklin as an example because it covers a lot of different aspects of gender equality and "women in science".

Number of participants



A classroom (20–25 students) divided into 2–4 persons per thematic group

Selection of participants

12–18 years old

Additional materials needed

- Internet access
- Computer
- Pipe cleaners and beads
- Printer (if needed)
- Resources



Preparation Phase

The educator selects resources of the different aspects of the life and work of Rosalind Franklin like: family life, personal challenges, colleagues and relations to them, her work on DNA, other important contributions in structure of biomolecules, advancements in crystallography, the Nobel-Prize dispute, professional career, personal views.

Description of the activity

- 1 The educator divides the students in groups of 2–4 persons that will work on a specific subject (life, work, DNA, challenges etc) each. The task of each group is to read the relevant resources and create a presentation for the given subject. The students can create crafts (eg. 3d DNA model, a collage, a comic) or write a story, or create a video within 20 minutes
- 2 Then all students exhibit their creations and have 10 minutes to walk around and see creations of the other teams.
- 3 At the end the whole classroom discusses the results of each group's presentation



Rosalind Franklin and the DNA double helix model

Additional activity

Either in the same lesson (if there is enough time) or in another lesson or as homework the educator can give instructions to the students on how to create a 3D DNA model



In the internet there are also resources on how to create it with other kind of materials. However in the easiest one is by using **pipe cleaners and beads** connecting them according to the resource below:

https://www.youtube.com/watch?v=GJRHOpx8d_A

If a 3D printer is available in the school, 3D printing of a DNA is another option.

Also the students themselves can propose creative alternative ways to construct it.

In any case, it is very important that the students understand the basic elements of the structure (double helix, base-pairing, chemical bonding) and its functionality (transcription, translation).



Worksheets

FEMALES- Rosalind Franklin and the DNA double helix model

Homework

What point of the life or achievements of Rosalind Franklin did you find exciting?

Do you think that today female scientists have relevant challenges to overcome? How can they cope with challenges like those that Rosalind Franklin faced?

Make a drawing of the DNA double helix model



Scope of the activity

The aim is to let students get in touch with the current scientific reality. Encourage female and male students to undertake STEM careers without being hindered by gender stereotypes and other difficulties.

Number of participants



A classroom
(20-25 students)

Selection of participants

12-18 years old

Additional materials needed

- classroom
- chairs in a circle
- whiteboard
- post-it
- colored markers



Preparation Phase

The educator selects and invite a woman or man in a STEM career who takes students seriously, by treating them equally, makes students feel involved and interested in the matter. Particularly for young female learners, having a living evidence of a female who managed to achieve great success in her career and in a field commonly considered difficult, confers confidence.

It is also important the educator to create a relaxed context and give the opportunity to both the scientist and the students to have an informal dialogue, in which the students feel free to question, ask, and talk about their difficulties.

The length should not exceed 35 minutes overall in order not to lose the attention of students; this modest duration will make the meeting even more incisive and memorable.

If you need extra input you can visit the Reference below on how to design inspiring events for girls about STEM careers

<https://www.pcmag.com/news/how-to-design-events-to-inspire-girls-about-stem-careers>

Description of the activity



- 1 Form a circle with the chairs. The speaker will be in the center (an optional whiteboard, with colored markers, might be useful to keep the attention of students by drawing, according to the size of the room). The communication method must be in accordance with the age of the group.
- 2 The speaker starts by briefly introducing her/himself and by asking the students to say their name and if they like STEM subjects and which one they prefer and the one they dislike. The woman in STEM career is supposed to talk about her path starting from the school years and talking about how she performed in STEM subjects, what she didn't like and talking about her difficulties and how she overcame them up to choose one of these disciplines as a career (she could use the whiteboard to list difficulties and solutions and make other links). During the speech the scientist should try to hook the audience by asking feedback about difficulties in STEM subjects she is exposing to make the students feel closer to the speaker and afterwards talk about the ways she/he arrived at a high-top career despite hitches and worries.

She should then stress the meaning of her job, what of STEM disciplines fascinated her at the beginning as to make them a job later; the scientist should ask the students what makes they feel enthusiastic and passionate and then talking about how this field of work makes her feel that same way (she/he could write all this part in a schematic way on the whiteboard).

It must be stressed the importance of STEM careers since they make the world progress. A reference could be made regarding gender stereotypes, how they have made the path a little more difficult but also how the spread of women in the scientific sector, thanks to their competence, versatility and precision, is making gender stereotypes more and more a minor obstacle. An important mention to do regards cooperation between colleagues, between men and women, between women, and between men because that is what makes the job even more exciting. Teamwork simplifies the biggest obstacles, so it is important to help each other, not to be afraid to make mistakes and ask for support, especially in the scientific field where not everything is still exact and infallible.

The speech should be maximum 25 minutes. It is much better if it is shorter and the students ask their questions afterwards or during the speech
- 3 At the end she leaves free space to the students for questions, observations, curiosities etc. and a informal dialogue starts.

Worksheets

FEMALES - Meet female scientists

Did you enjoy the talk?

What was the most inspiring point of the life of career of the scientist?

Reflect yourself. How will you deal with the challenges she faced?

Draw yourself working in the field of this scientist

"Who is the inventor" game

Scope of the activity

The scope is to create awareness in students about how women have and continue to improve the world with their inventions. The game is a mean to entertain girls and boys, make them curious to learn and deepen the stories of these women and of science, by also working in a team, in order to instill the idea that one day they might be like those scientists.

Number of participants



A classroom
(20-25 students)

Selection of participants

12-18 years old

Specific materials needed to implement it:

- Computer
- projector/IBW to show the images of women scientists and inventions or cards representing scientists and inventions to stick on a whiteboard.



Preparation Phase

The educator selects and choose images of female inventors who played important role in the development of technology or sciences (e.g. Ada Lovelace). S/he selects 2 types of images; one is the image of the scientist and the other is the image of the device or other stuff she has invented.

The educator either prepares a presentation in computer to project on a wall or print the images in order to be able to stick them on the whiteboard (for the 2nd lesson)

Resources for the educator:

- images and short info from the cards of the FEMALES game
- e-book of Females project with the extended biography of women in STEM
- e-book with extra resources of Females project
- other web resources (eg. <https://eu.usatoday.com/story/money/2019/03/16/inventions-you-have-women-inventors-thank-these-50-things/39158677/>)

The activity will be concluded in 2 lessons (45min each)

“Who is the inventor” game

Description of the activity - 1st lesson

1 In the beginning the educator shows images of women who contributed to scientific innovation in history (e.g. from Hypatia of Alexandria to Andrea Mia Ghez). These women are introduced to students by contextualizing their era and talking about their life, the difficulties they had to face and the field of STEM knowledge to which they approached. At this part the educator can use also a presentation or videos or images to help students imagine all these aspects of life of these women.



2 Afterwards the students discuss each other about what possible discoveries and innovation they have brought for the society. The educator is called to foster the dialogue and the exchange of opinions among the pupils by making reference to what she/he just explained about the life of the women and by adding some details on STEM disciplines; the most common ideas in the class must to be written on the whiteboard associated to the name of the scientist they heard about before.

Description of the activity - 1st lesson

1 In the next lesson the educator will show images of inventions attributed to the mentioned scientists and inventors explaining what they are but without disclosing the name of the discoverer. The students can be divided in two teams and they are called to associate each invention to the scientist and base their choice on what they have learnt during the lesson; through the whiteboard or the IBW they can match the pics belonging to the groups of inventions and of scientists. The team which will have guessed more will be the winner. A little competition will stimulate the pupils to better get from what they have heard by the teacher and to reason together as a consolidated group.



2 At the end, the teacher will reveal the solutions and explain how the scientists arrived at that invention/discovery/result, expose the scientific implications and the impact that it had had in the world.

Worksheets

FEMALES - Who is the inventor game

Match the inventors with their invention



Tabitha Babbitt



Margaret Knight



Hedy Lamarr



Jeanne Villepreux-
Power

Paper-bag-
making machine

Aquarium

Circular saw

Wireless
transmission
technology

Draw an invention you could think for solving a todays problem
What would it be its name? What will be its functionality? What materials will you
use to create it? How will it solve the problem it addresses?

Say yes to STEM with Ozobot

FEMALES
EDUCATIONAL
ACTIVITIES

Scope of the activity

The activity aims to use robotics as a means of capturing students' attention to the subject activity: A career in STEM fields. Educational Robotics adds value to students' way of learning, the digital ones, by:

- Providing a learning practice that is engaging, inspiring and fun.
- Offering a highly interactive "hands-on" experience.
- Helps students to develop an intuitive understanding of physical concepts in science and math, to excel in those fields and to consider careers in science and technology

It is very important to encourage girls to take part and have a positive attitude towards STEM subjects in order to prepare them for technological advances and new career developments in the future. Thus the activity aims to bring careers and studies in the fields of Science, Technology, Engineering and Mathematics (STEM) using Ozobot robots.

Number of participants

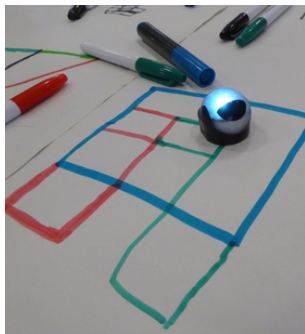


14-18 students

Selection of participants

10-18 years old

Additional materials needed



- 1 Ozobot for each group of students
- 1 Marker for coding per group
- 2 Plain white paper per group
- worksheets



Preparation Phase

The educator and the students should have a basic familiarity with Ozobot. If this is not the case then it is good to have some prior work in another lesson or outside the class (as an extra activity or as homework) in order to become familiar.

The educator should also prepare all the material needed (look at additional material needed) in order to have them for each team.

Description of activity



- 1 Students are asked to read about ten female scientists found in <http://www.takepart.com/article/2015/06/14/10-female-inventors-you-need-to-know>
- 2 Then the educator shows them how to calibrate the robot, as well as how to draw a line that Ozobot can follow. The class is grouped into teams of 4-5 students and they are given some time for "free play" to try out the robot following the links below:
Color Code Reference Sheet: <https://files.ozobot.com/stem-education/Ozobot-Color-Codes-Chart.pdf>
<http://ozobot.eu/wp-content/uploads/PDF/ozobot-ozocodes-reference.pdf>
<https://ozobot.com/create/color-codes>
<https://www.youtube.com/watch?v=2wgBxEIvlnQ>
- 3 After that, the educator gives them a link with information about the women in STEM <http://www.takepart.com/article/2015/06/14/10-female-inventors-you-need-to-know>
The educator put them in pairs and give to each student one worksheet. S/he asks each group to work on the questions raised in the worksheet.
Depending on the level of independence, continue going over the sheet question by question or release them to work on their own with their partner. Once both students in a pair show you a correctly completed sheet, give them an Ozobot to use on their path.
- 4 After the game has finished the teacher asks students to choose their own model female scientist which can inspire them in choosing future careers.
- 5 Conclusion on activity:
Either independently or in pairs, discuss and then write about the following:
 - What are my personal skills and attributes?
 - How might they be useful in the workplace / in a job?
 - Which ones do I need to develop further / work on?

Worksheets

FEMALES - Say yes to STEM with Ozobot

Let's learn about:



Something special to know about her is:

(invent your own code!)

Where the female STEM was born?(use the code for the country)

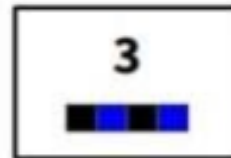
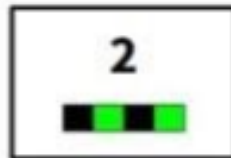
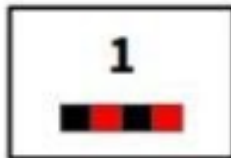


How many fields did the scientist contributed to?

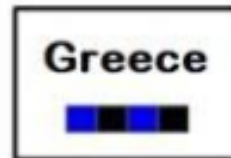
Which is the field of the scientist you chose?(use the code for the field)

Make Ozobot flash your favorite color!

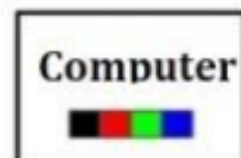
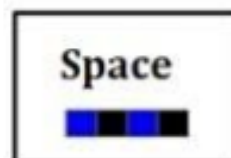
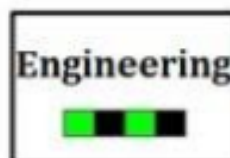
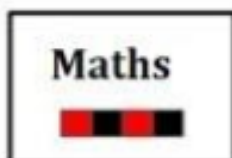
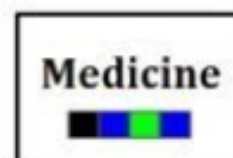
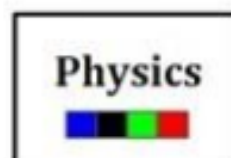
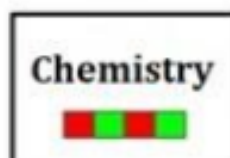
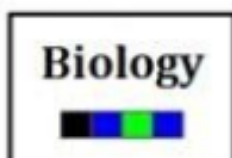
Number Codes



Country Codes



Field of the scientist Codes



Let's play The Postman!

FEMALES
EDUCATIONAL ACTIVITIES

Scope of the activity

The aim is to make students learn more about different female scientists through playing "The postman game". By playing this game, the students will acquire important knowledge on STEM females and become more aware on the outstanding achievements of women during the centuries.

Number of participants



15-20 students

Selection of participants

students
aged 10+

Specific materials needed to implement it:

- classroom
- chairs in a circle
- computers
- internet access
- cards of Females legends or worksheets.



Preparation phase

For this game, a small space must be delimited for each person, apart from the postman one : either a chair for each person (or something to sit on), or simply a circle, a rope or a circle drawn on the floor with chalk. or on the sand.

The educator has to create the worksheets with the information about each women in STEM or else s/he can use the cards from the FEMALES game

Description of the activity

- 1 The educator will make a brief introduction of the most famous women scientists within 10 minutes
- 2 Then the students receive the information about the Women Scientists on worksheets and have 10 minutes to get used to them. If they have doubts, the educator resumes the information and explains it in their own way.
- 3 Each student will choose a playing card with one of the women scientists.
- 4 Then students are invited to play the "Postman" game as a whole group and to answer all the questions during the game.



Description of the game

- 1 Players are seated in a circle and each has the chosen playing card in his hand.
- 2 A player, who is the postman, is standing in the center. He says loudly and clearly, "The mail has arrived."
- 3 The other players ask, "For whom?"
- 4 The postman answers: "For all those who..." and invents something: " The letter IS for those who marked the evolution of Biology; The letter is for those women scientists who were born in Turkey; The letter is for those who contributed to the field of medicine. "
- 5 The recipients of the "letter" must get up and change places as soon as possible. Meanwhile, the postman is trying to find a place. The one who is left without a seat (place) becomes a postman and brings the next letter and the game resumes from the beginning, with the specification that he brings the letter to women from other fields, so that the same name is not repeated again.
- 6 The game ends when all the children have played the role of postman.

Other Rules

- * You cannot change the seat with your neighbor
- * The recipients run to change location (speed - reaction)
- * One cannot remain seated if the "letter" is addressed to them (honesty)
- * They cannot touch (collide with) other players (respect non-violence)
- * You can't hand in the same letter twice (concentration and creative thinking)

Tips!

For the first time, the teacher can play the role of the postman, in order to help children understand the logistic of the game. Letters must be age-appropriate. The teacher must insist on the dynamics of the game and on following of the rules. He will make sure that the postmen are not always the same (the following rule can be introduced: no one can be more than 3 times a postman), and that each child is a postman at least once.

The teacher reminds the security rules: players tend to be very enthusiastic and rush to the seats without paying attention to each other. Risks of rollovers and falls.

Female Legends of Science with Tubitak Science Fair Events.

FEMALES EDUCATIONAL ACTIVITIES

Scope of the activity

Introducing women who engaged in society and science in the national/international arena with Tubitak Science Fair Events.

Science fair is an activity organized within the framework of the program objectives and consists of sub-projects prepared in the desired areas by following the project preparation processes by 5th-12th graders. It is organized by 9th-12th graders in our school.

Sub-project is the name given to each project prepared by the students to be exhibited in the science fair under the guidance of the advisor. In addition, financial support is provided to each project in proportion to its budget.

Number of participants

3-8 students, 1-3 teachers

Selection of participants

12-19 years old

Description of the activity

It is a project activity in which the students examine the work done by female scientists, which have been a source of inspiration in the field of science, comprehensively, and reveal general findings on the subject.

The steps to be examined while preparing the project should be in the following order.

- Determining the research topic / question
- Keyword identification
- Searching for resources
- Synthesizing resources
- Poster preparation

Organization of a Fair Event

Organization of the Fair Event:

Partners of approved and supported projects (parents, students, participants etc.) are informed. Necessary preparations for fair organization are made under the guidance of advisors. The fair is held on the specified dates in the appropriate format.

The link below contains a sample which was organized last year.

http://sukranulgezen.meb.k12.tr/icerikler/tubitak-4006-bilim-fuarlari_7712079.html

Evaluation sheets

FEMALES EDUCATIONAL ACTIVITIES- STUDENTS

Did you enjoy the activity or not? What was the part of it you liked the most and what was the part you liked less?

Did you learn something through the activity? If yes, what was that?

Has the activity changed your mind about women in science and in what way?

Did the activity inspire you to get engaged in a STEM career for yourself? If yes, how did it achieve this?

Evaluation sheets

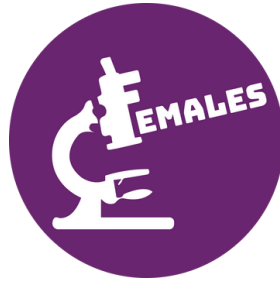
FEMALES EDUCATIONAL ACTIVITIES - TEACHERS

Was the activity easy to implement?
Are there any points for improvement?

Did you find the activity valuable for the students?
Which is the biggest strength and weakness of the activity?

Did your students enjoy working on this activity?
Did they feel more motivated to investigate further after it or not
and why?

Did the students get interested in the STEM world and inspired
to follow STEM careers after the activity? If they did, explain the
reasons.



The project "FEMALES- Female legends of Science" is based on the values of gender equality and non-discrimination between women and men in the fields of science, technology, engineering, mathematics, innovation and innovative entrepreneurship.

According to surveys, women make up only 33% of researchers, 28% of doctoral students in engineering and construction, 21% of computer science, 21% of senior researchers, 28% of board members, 22% of the leaders of the board.

The objectives of the project are:

- to highlight the important role of women scientists in STEM (Science,Technology, Engineering and Mathematics)
- to fight stereotypes of students and teachers for women scientists
- to encourage girls through role models women to pursue STEM careers
- to enhance skills and competencies for the STEM career by all students (boys and girls)
- to enrich teachers' skills in the integration of girls in STEM

For more information about the project visit our website

<https://www.femalesproject.eu>

FEMALES project is co-funded by the Erasmus+ program.

