



**inspir**  
**STEAM**

MY NOTEBOOK ABOUT \_\_\_\_\_



Name:

Course:

Year:

My mentor:

I am....

2nd Edition: September, 2018



Printable version:

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Deusto LearningLab, University of Deusto

Web: <http://learninglab.deusto.es/>

Inspira STEAM 2018

Website: <http://www.inspirasteam.net/>

# 1. WHAT ARE THE STEAM?

- Introduction.
- Definition of STEAM.
- Where we find the STEAM in our area.



## IF I WERE...

I propose you a game. Imagine you are an object, for example: a car, a bird, a watch, a book, a football ball, etc. Now, write what you would do if you were that object. When you fill out this sheet, cut it and mix it up with your classmates' sheets. Then, you can play to guess who has written each sheet.

*For example: if I were a PLANE, I would make flying faster; I would have a game zone and a gym zone on the plane so that people could move more.*



IF I WERE \_\_\_\_\_ I WOULD \_\_\_\_\_

\_\_\_\_\_

IF I WERE \_\_\_\_\_ I WOULD \_\_\_\_\_

\_\_\_\_\_

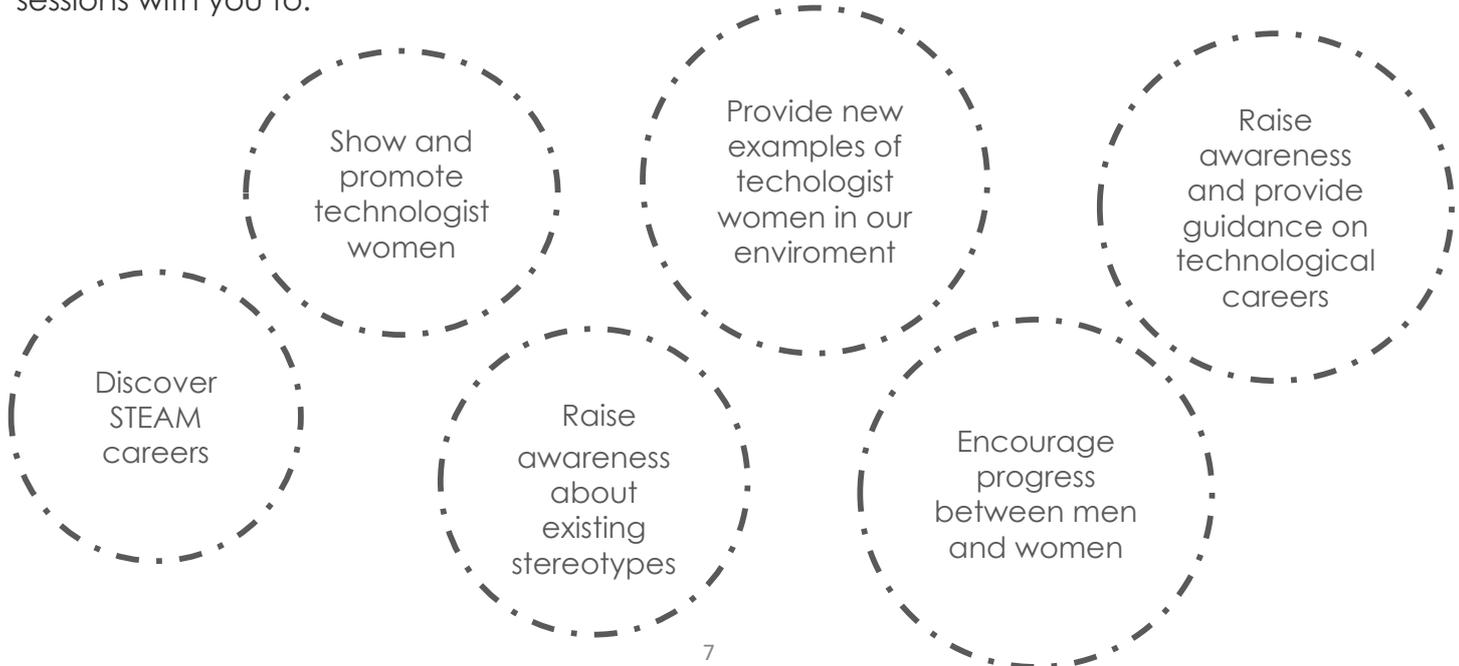
IF I WERE \_\_\_\_\_ I WOULD \_\_\_\_\_

\_\_\_\_\_



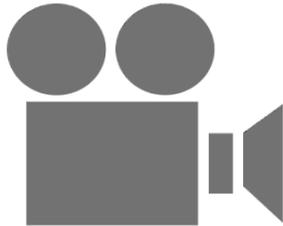
## WHAT IS INSPIRA?

**INSPIRA STEAM** is a project developed in Biscay, Araba and Gipuzkoa, whose aim is to encourage young people, mainly girls, to approach **science** and **technology**. In order to achieve this goal, scientist and technologist women around us are going to work for six sessions with you to:



## WHAT HAPPENS WITH GIRLS AND THE STEAM?

These videos can help you understand the problem:



[Make Whats Next Change](#)

[That place](#)



## WHAT HAPPENS WITH GIRLS AND THE STEAM?



Discussion on the video [Make Whats Next Change](#) in Spanish:

### **We asked these girls what they would like to CHANGE IN THE WORLD.**

- I'm really passionate about climate change.
- I'm worried that there won't be enough fresh water for everybody.
- I want to make sure that we have a self-sustaining environment.
- My interest is to find a cure for breast cancer because my mom had it.

### **And we shared some INSPIRATION.**

Detecting cancer

- Incredible!
- Oh!
- Amazing!

Sources of potable water

- There may be water in the cracks.
- Extracting water.
- Seeing stuff like this...

- I think I'd like to do that.
- It makes me feel restless.

### **Then we gave them the BAD NEWS.**

Odds are you won't solve these problems.

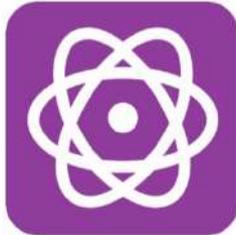
Only 6.7% of women graduate in Science and Technology degrees.

- That makes no sense to me. Why would that be...?
- There is always going to be someone that tells you that you can't do it. I think I can.
- We're as amazing as men, like we can do as much stuff as they can.
- I want my name to be there and be like: "Marley's the one who helped stop climate change issues."
- I will discover a cure for breast cancer.
- We need all hands on deck right now.

**Change the world.  
STAY IN STEAM.**

# WHAT ARE THE STEAM CAREERS?

Science



Technology



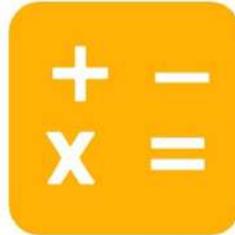
Engineering



Arts



Maths



Write things related to the STEAM careers:

## AND IN YOUR AREA?

Now search for STEAM things that you find in your area and write them down:



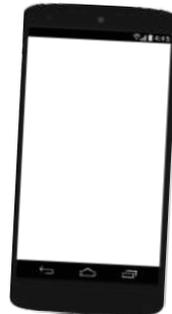
## WHAT ARE THE STEAM careers?

Create a drawing with all the ideas you can think of about the STEAM careers. At the end of Inspira STEAM, go back to this drawing and complete it with more ideas you have discovered.

A large, light grey rounded rectangle occupies the lower half of the page, intended for students to draw their ideas about STEAM careers.

# IS THERE STEAM IN THESE OBJECTS?

What relationship do you find between these objects and the STEAM careers?





## WHAT I LIKE LEARNING

Describe things that you like learning or doing in class, and if you have any doubt, write down what job you would like to have or what you would like to study in the future.

Do you think that profession or those studies have any relationship with technology?



# MY OPINION ABOUT THE STEAM CAREERS

Complete the following table with 1, 2 or 3 stars in each box. Their meaning is: 1-little, 2-quite, 3-a lot.

	MATHEMATICS	COMPUTER SCIENCE	SCIENCE
I think it is important			
I like it			
I am good at it			

## WHAT I LEARNT TODAY

A large, light gray rectangular area with rounded corners, intended for students to write their learning reflections.

## 2. STEREOTYPES

- Knowing the stereotypes around us.
- Learning to identify them & think about them:  
I don't have to be just like “others expect me to be”.



## DRAW A PERSON WHO WORKS IN A STEAM JOB

How do you imagine a person who works in science or technology?  
How would you describe this person?

A large, light grey rounded rectangle with rounded corners, intended for drawing a person who works in a STEAM job.

## INVESTIGATING STEREOTYPES

Watch this video: [Always #LikeAGirl](#)



My title for this video:

Key ideas:

My reflection:

## INVESTIGATING STEREOTYPES

Watch this video: [Bob – short movie](#)



My title for this video:

Key ideas:

My reflection:



## INVESTIGATING STEREOTYPES

Watch this video: [Disney Gender Stereotypes](#)



My title for this video:

Key ideas:

My reflection:

## INVESTIGATING STEREOTYPES

Watch this video: [Killing Us Softly 4](#)



My title for this video:

Key ideas:

My reflection:

## INVESTIGATING STEREOTYPES

Watch this video: [Monsterbox](#)



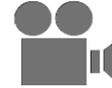
My title for this video:

Key ideas:

My reflection:

## INVESTIGATING STEREOTYPES

Watch this video: [Saga Falabella “Miedos”](#)



My title for this video:

Key ideas:

My reflection:

## INVESTIGATING STEREOTYPES

Watch this video: [SuperLola](#)



My title for this video:

Key ideas:

My reflection:

## INVESTIGATING STEREOTYPES

Discover more videos!



My title for this video:

Key ideas:

My reflection:

## INVESTIGATING STEREOTYPES

Discover more videos!



My title for this video:

Key ideas:

My reflection:

## CHILDREN'S TALES

Choose a children's story that you like. What is the family like?  
How many members are there? Which tasks does each member do?

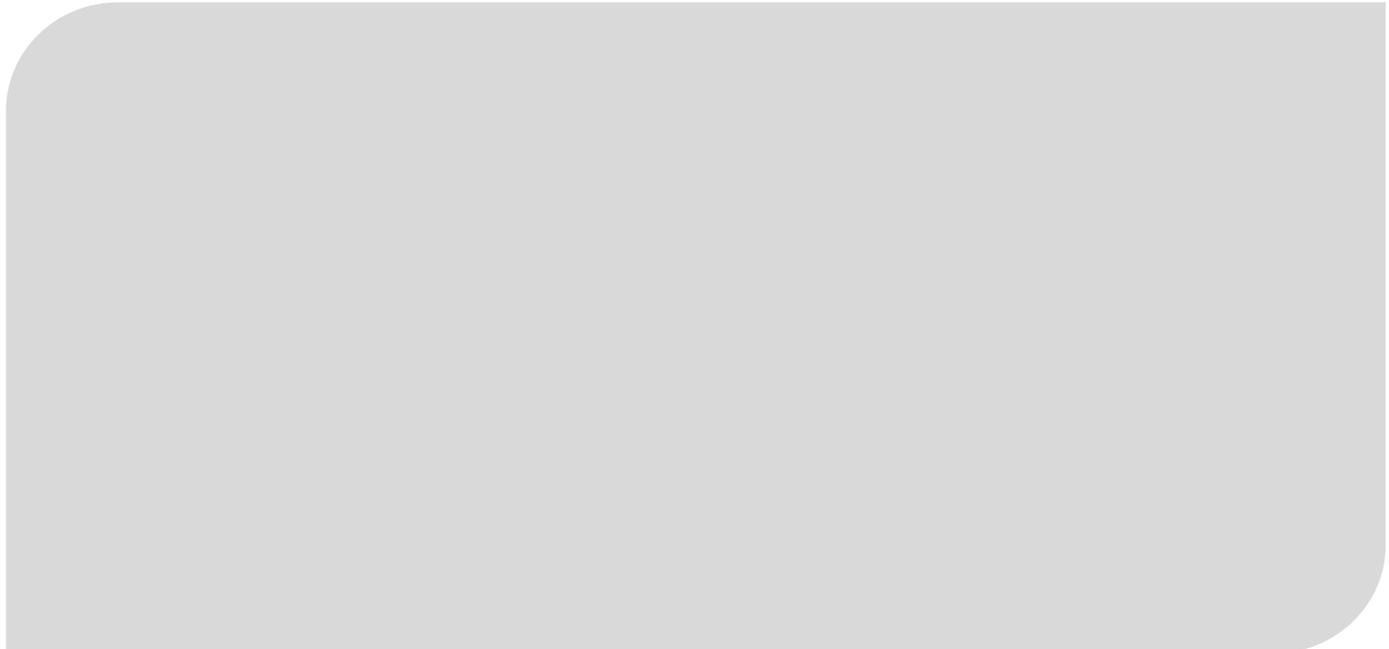
Story's title:

My answers:



## WHAT HAPPENS ON TV? AND IN ADVERTISING?

What are the girls who appear on TV like? Are they heroines? Are they princesses?



## WHAT ARE TOYS LIKE?

Which toys are advertised for girls and which ones for boys?  
What are toy shop window displays like?



## WHAT WOULD A BOY'S PLANET BE LIKE?

Draw or describe how you imagine a boy's planet.



## AND A GIRL'S PLANET?

Now, draw or describe how you imagine a girl's planet.



## AND A MIXED PLANET?

Is a mixed planet better? Describe it!.



## WHAT I LEARNT TODAY

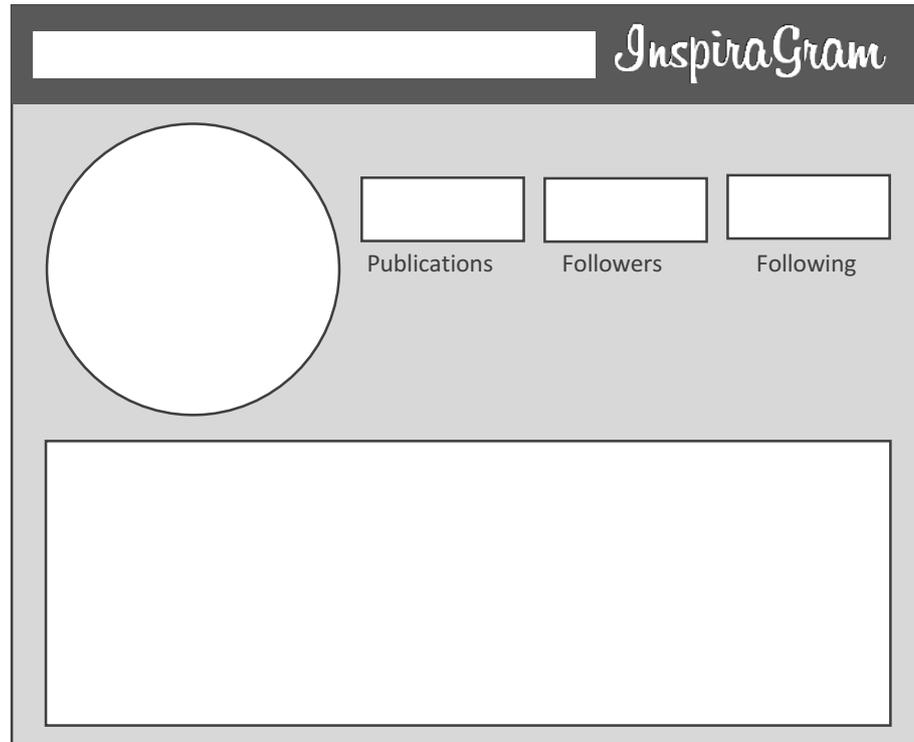
A large, light gray rectangular area with rounded corners, intended for students to write their reflections on what they learned today.

## 3. PROFESSIONS

- Positively value the multiple professions that a person can develop, regardless of their sex.
- Knowing non-stereotyped work situations.
- Knowing different areas of application of technology.

## MY INSPIRAGRAM PROFILE

Design your profile in a social network at the age of 30. What will you be like? What will be your job? What will be your hobbies? Keep in mind that it is a public profile, and anyone can read it. How do you want to be known?



Publications Followers Following

## LOOKING AT THE FUTURE

Now you are studying but someday, you will be able to do what you like best! Let's see what things can be done! Name the professions you know and fill in the table below.

**What professions do I know?**



**What are my family's jobs?**



## DO THEY DO THE SAME JOB?

Look at the pictures and try to relate the people doing the same job. Then choose the one you like most and think about the kind of things that are done in that profession.



## EXAMPLES OF PROFESSIONS IN MAGAZINES

Work in small groups on a mural with pictures of magazines representing professions you know. Then take a picture of your mural, print it and paste it here.

Paste the picture  
of your mural here

## PROFESSIONS IN WHATSAPP

Do you know what emoticons are? They are a series of drawings that allow us to combine text with images to send messages on mobile devices.

Sure they are familiar to you!

In the latest updates emoticons of different races have been incorporated and now profession emoticons performed by both men and women are also being included. Check out some of the new emoticons!

## PROFESSIONS IN WHATSAPP

What do you think about these new emoticons being created? Do you think that there should be the same emoticons for boys and girls?

Think about these questions in group and then draw an emoticon that looks like you doing the profession you like most.

Dare to discover all the emoticons that are on the mobile devices around you to see if these emoticons and the new ones are really present.





## WHAT JOBS DO THE PEOPLE AROUND YOU ACTUALLY DO?

Talk to your schoolmates about the jobs your family members do. Is any job repeated? Draw your family in their respective jobs.

## WHAT PROFESSIONS EXIST?

There is a huge list of professions; read it and write the ones you like or those have surprised you the most.



- \_\_\_\_\_
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## THE ISLAND

“You have gone on a study trip by plane; on your return trip you have been surprised by a storm and the plane has had to divert. You don’t know how long you have been flying, but in the end you have managed to land. When you get off the plane you realize that the two pilots and the two flight attendants are injured...

Apart from all your group, other passengers on the plane are: a retired teacher, his wife who was an architect, his two twin grandchildren, a 30-year-old unemployed man who had a nervous breakdown at the time of the accident, his partner who is a journalist, a business woman, a hospital warden and a couple, man and woman, both veterinarians. The radio and all the aircraft's devices are broken. You do not know where you are, it looks like an island and you are completely alone. It's getting dark and you have to prepare for the night. ”





## THE ISLAND

Now, you have to agree and decide what you are going to do and how you are going to organize for the night. Write down the decisions taken here:

**Continue the story!**

## THE ISLAND

“It has been several days, and you realize that no one is going to come in your search, so you have to organize your new life. You have to build a new village, a new society. Fortunately, you have seen that there are horses, cows, sheep, etc. on the island; it also seems that the land is cultivated, so at least you will not die of hunger”.

Now, you have to make a list of the jobs that you consider essential to survive on the island and the tasks that each person on the island will have to do.

## WHAT I LEARNT TODAY

A large, empty, light gray rectangular area with rounded corners, intended for students to write their reflections on what they learned today.



## 4. WOMEN IN HISTORY

- Appreciate the achievements, discoveries and contributions made by women throughout history.
- Learn about women who have made great breakthroughs and have barely enjoyed recognition for their merits.

## REMARKABLE WOMEN THROUGHOUT HISTORY

# AUGUSTA **ADA BYRON**



- Brilliant English mathematician.
- First scientific woman in the computation world.
- She observed the capacity of a machine (it later became the computer) to develop mathematical calculations.
- She was the daughter of great poet Lord Byron.

## REMARKABLE WOMEN THROUGHOUT HISTORY

### MARIE CURIE



- She studied mathematics in Paris and had her class' best record.
- She met Pierre Curie and both worked together in the field of magnetism.
- She became the first professor woman at the University of Paris.
- She was awarded the Nobel prize in physics (shared with her husband) and in chemistry (on her own).
- She died blind due to radioactivity.

## REMARKABLE WOMEN THROUGHOUT HISTORY

# HYPATIA OF ALEXANDRIA



- She contributed to developments in mathematics.
- Her works in philosophy, physics and astronomy were considered a heresy and she was murdered for that.
- Her image is considered a symbol in favour of science.

## WOMEN IN SCIENCE

You can follow this QR code to find out about many more scientific women and can download a card game to get to know them better.



## FINDINGS

# THE ASTROLABE

The astrolabe is an ancient instrument to identify the position of stars in the sky.

Astrolabe is a greek voice, which could be translated in English as 'star taker'. The astrolabe was used by astronomers, navigators and scientific people in general to position a star and observe its movement, and to determine local latitude given local time (and vice versa).



**BIOGRAPHY:** it was invented by **Hypatia of Alexandria**, a mathematician, physicist and philosopher who lived in the 4th century. She was the daughter and disciple of astronomer Theon. Hypatia is the first woman mathematician in history who is known in a reliable and detailed way.



## FINDINGS

# BULLETPROOF VEST

In 1965, Dr. Stephanie Kwolek invented a synthetic fibre called poly-p-phenylene terephthalamide, best known as Kevlar, which outperformed in a factor of 5 the strength of iron. It is used to produce bicycle wheels and bulletproof vests. Thanks to this finding made by a woman, thousands of lives have been saved.

**BIOGRAPHY: Stephanie Kwolek** was born in New Kensington (Pennsylvania, USA). Since she was a child, her ability for nature and science stood out and although she thought she could become a designer, she enjoyed her science and mathematics classes very much so she ended up developing her academic career in science.

## FINDINGS

# WiFi



WiFi is extensively used nowadays; it is a connectivity mechanism that allows connection among different devices in a wireless mode.

Hedy Lamarr, in 1941, patented a secret communication procedure that dynamically changed its emission frequency so as not to be easily interfered by the enemy. Now, it is used in wireless communications and is known as WiFi. Thanks to it, lots of wireless devices are able to connect to the Internet.

**BIOGRAPHY:** Hedwig Eva Maria Kiesler, best known as **Hedy Lamarr** (Vienna; November 9th, 1914 - Orlando; January 19th, 2000), was an actress and inventor, born Austrian but became naturalized as North American.



## FINDINGS THE DISHWASHER MACHINE

In 1850, Joel Houghton patented the idea of making a dishwasher machine that never came to life. About 30 years later, a woman patented and produced the first machine able to wash the dishes in an automated way. That woman, Josephine Cochrane, was a high class lady, who put to market one of the most used home appliances, thanks to her vigour and determination.

### BIOGRAPHY:

**Josephine Garis Cochrane** was born on March 8th 1839 in Ashtabula County (Ohio, USA). Having lost her mother, with her only sister away from home, Josephine was raised by her father, John Garis, a hydraulic engineer that instilled in her the interest for mechanics and engineering. Josephine Cochrane funded the Garis-Cochran company, one of the remote origins of the Whirlpool enterprise.



## FINDINGS THE WINDSCREEN WIPER

**Mary Anderson** invented the first windscreen wiper for a vehicle in 1903, when cars were not even popular. She was part of a selected group of transgressive women, who definitely ended with the rule that obliged women to register their inventions in the name of their husband, father or brother.

### BIOGRAPHY:

She was born in Alabama (USA) in 1866. In 1903, while traveling in the tram, she observed how the driver needed to get constantly out to clean the snow and ice from the window pane. Mary came up with several solutions, neither of which seemed satisfactory. But finally she developed an idea that she wrote down on her sketch notebook. She devised a rotatory arm, equipped with a rubber sheet that the driver could activate using a lever. The windscreen wiper became a standard mechanism for all vehicles in 1916.



## WHAT I LEARNT TODAY

A large, empty, light gray rectangular area with rounded corners, intended for students to write their reflections on what they learned today.



## 5. TODAY'S STEAM WOMEN

- Discover new models of STEAM women that are contemporary and close to us, making them visible and appreciating them.
- Accept that I can choose any job I want.

## TODAYS' RELEVANT STEAM WOMEN

# SHERYL SANDBERG

Find her  
picture and  
paste it here!



**Economist, COO Facebook**

1969, Washington, USA

Nowadays she is operating director at Facebook and probably one of the most powerful women in the technology sector and in business in general. She is the writer of the book "Lean In" in which she reports the scarce female representation in management positions. She has also created the "Lean In" movement with the aim of creating workgroups, also committing men to allowing the professional development of women.

## TODAYS' RELEVANT STEAM WOMEN

# SUSAN WOJCICKI

Find her  
picture and  
paste it here!



**Historian, CEO YouTube**

1968, Santa Clara, USA

She is the executive director of Youtube, owned by Google and the largest video platform in the world. Previously she worked as a marketing director at Google. She studied History and Literature at Harvard University.

## TODAYS' RELEVANT STEAM WOMEN

# PILAR MACHÓN

Find her  
picture and  
paste it here!



**Philologist, Amazon**  
Seville, Spain

She studied English philology and holds a PhD in Computational Linguistics from Stanford University (USA). Together with other colleagues and a team from the University of Seville, she developed a voice recognition program with artificial intelligence: a human image capable of talking in various languages through a mobile phone. Nowadays she works in Amazon as a senior manager in person-machine communication projects in intelligent contexts.

## TODAYS' RELEVANT STEAM WOMEN

# MARINA UMASCHI BERS

**Communication Scientist, Professor and  
Researcher**  
Argentina

She has a degree in Communication Sciences and a PhD from MIT's Media Lab.

She lives in Boston and is a teacher and researcher at Tufts University, on an interdisciplinary program in Education, Children's Psychology and Computer Science.

She is the creator of Scratch Jr. and co-founder of Kinderlab Robotics, creator of KIBO. Her recent research is centered on how new technologies such as robotics and programming can be successfully used to promote, not only STEM but also socio-emotional development and the arts, at schools as well as in all areas of life.

Find her  
picture and  
paste it here!



## TODAYS' RELEVANT STEAM WOMEN

# LISSETTE TITRE

**Computer Animation, Videogames developer**  
USA

She is artistic director and developer of videogames; she creates her characters by means of 3D digital modelling so characters move like real people, with their extremities moving in a realistic manner and with convincing facial expressions. Lisette has contributed to some of the most important games in industry like Tiger Woods Golf, the Simpson, the SIMS 4 and Transformers Age Of Extinction for Android and iOS.

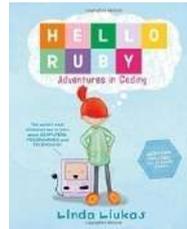
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paste it here!



## TODAYS' RELEVANT STEAM WOMEN

# LINDA LIUKAS

Find her  
picture and  
paste it here!



**Programmer, narrator and illustrator**  
1986, Helsinki, Finland

Linda is the writer and illustrator of Hello Ruby, a book for boys and girls about the capricious world of computers. She is also the founder of Rails Girls, a world movement to teach programming to girls.

## TODAYS' RELEVANT STEAM WOMEN

# MAYIM BIALIK

Find her  
picture and  
paste it here!



**Neurobiology, Actress**  
1975, California, USA

She is an actress, writer and PhD in Neuroscience. She is well-known by her role as a teenager in Blossom in the 90's, and as a neurobiologist in The Big Band Theory. She studied neuroscience at the University of California in Los Angeles (USA).

## TODAYS' RELEVANT STEAM WOMEN

# AYAH BDIER

Find her  
picture and  
paste it here!



**Computer Engineer and Sociologist, Founder and CEO of littleBits**

1982, Montreal, Canada

Bdeir defines herself as an engineer from the University of Beirut (Libano) and an interactive artist. She is considered one of the main leaders of the open source hardware movement.



## TODAYS' RELEVANT STEAM WOMEN

Fill in these factsheets with the description of three women that are relevant in the STEAM areas.

Name:

Job:

Description:

Name:

Job:

Description:

Name:

Job:

Description:





# A STEAM WOMAN'S AGENDA

How do you think the agenda of a woman with a STEAM job is?

Name of STEAM woman:				Profession:			
----------------------	--	--	--	-------------	--	--	--

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY



# A STEAM WOMAN'S AGENDA

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY

## WHEN I GROW UP I WANT TO BE ...

- Computer Engineer
- Robotics Engineer
- Biomedical Engineer
- Textile Engineer
- Scientific Communicator
- Mathematician
- ... and more!





**NOTE: INTERVIEW A STEAM WOMAN IN YOUR AREA**

You are a journalist in a scientific magazine, and you need to interview a STEAM woman in your area. Here are some clues:

- Name
- What is your job?
- What value do you add to your company? And to society?
- How do you remember your life as a student?
- Have you always known what you wanted to do?
- Why did you choose this job?
- What do you like about your job?
- What do you like to do in your free time?
- Add any questions you are most interested in as a journalist.

You can use the following page to write your report!



# NEWS

INTERVIEW TO THE MOST  
POPULAR STEAM WOMAN  
AT THE MOMENT

Take a photo  
and place it  
here!



**DISCOVER MORE STEAM WOMEN!**





## WHAT I LEARNT TODAY

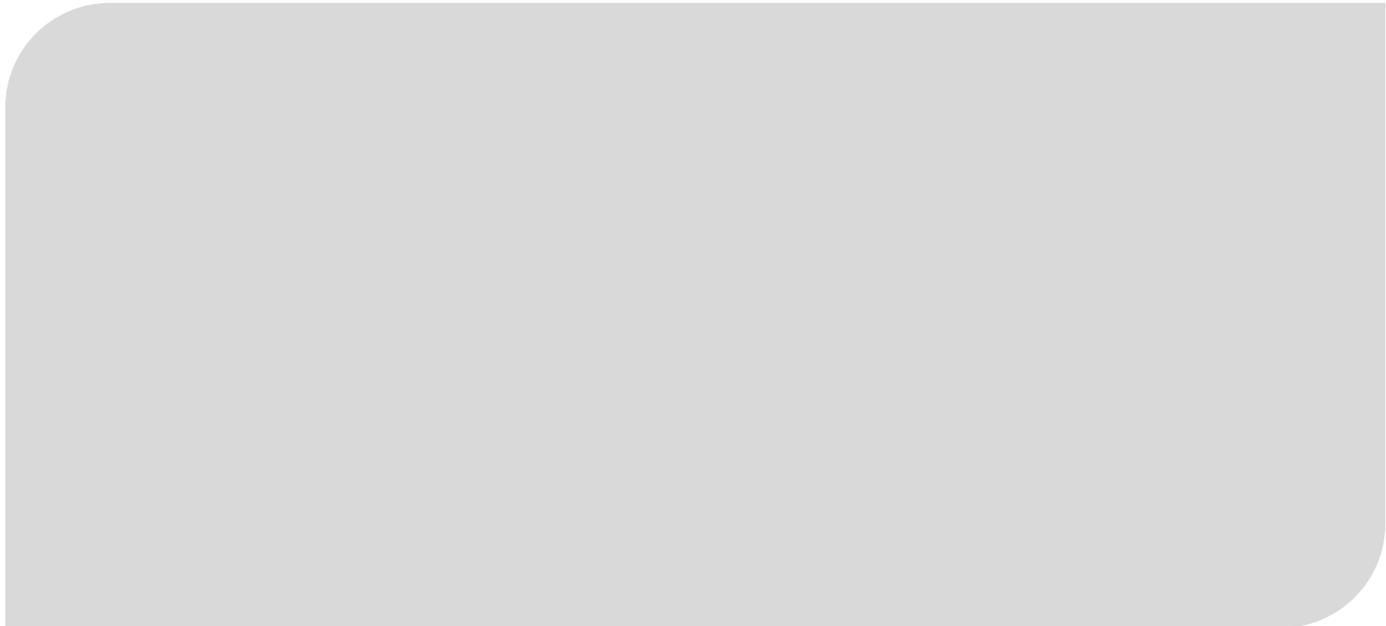
A large, empty, light gray rectangular area with rounded corners, intended for writing notes or reflections.

## 6. #STEAMgirls

- Identify STEAM examples in our area.
- Think and comment on what we have seen in previous sessions.
- Agree that I can decide what I want to do in my future.

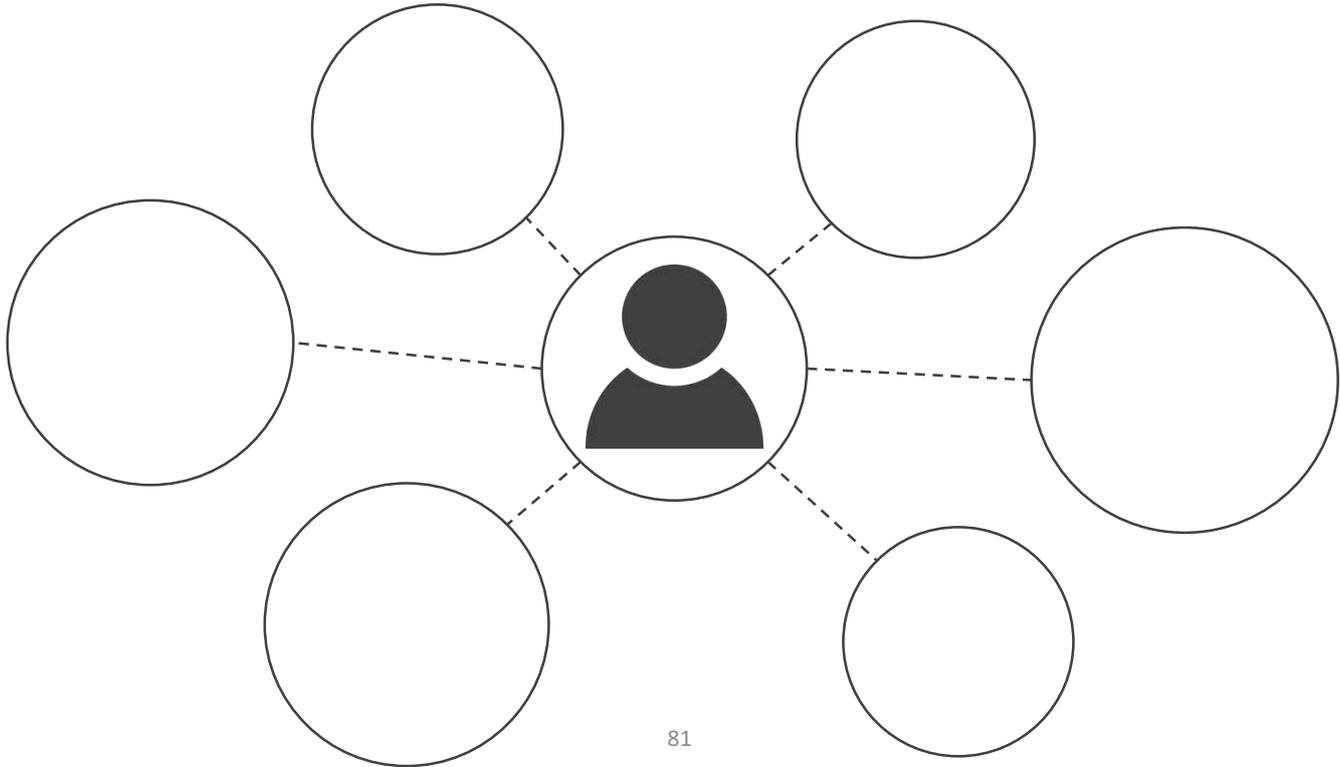
## WHAT IS MY NEIGHBOURHOOD LIKE?

Draw and describe the way from your home to your school, what is it like? what type of people do you meet? What do those people do? The places you pass on your way, etc.

A large, light grey rounded rectangle occupies the lower half of the page, intended for a student to draw and describe their neighborhood.

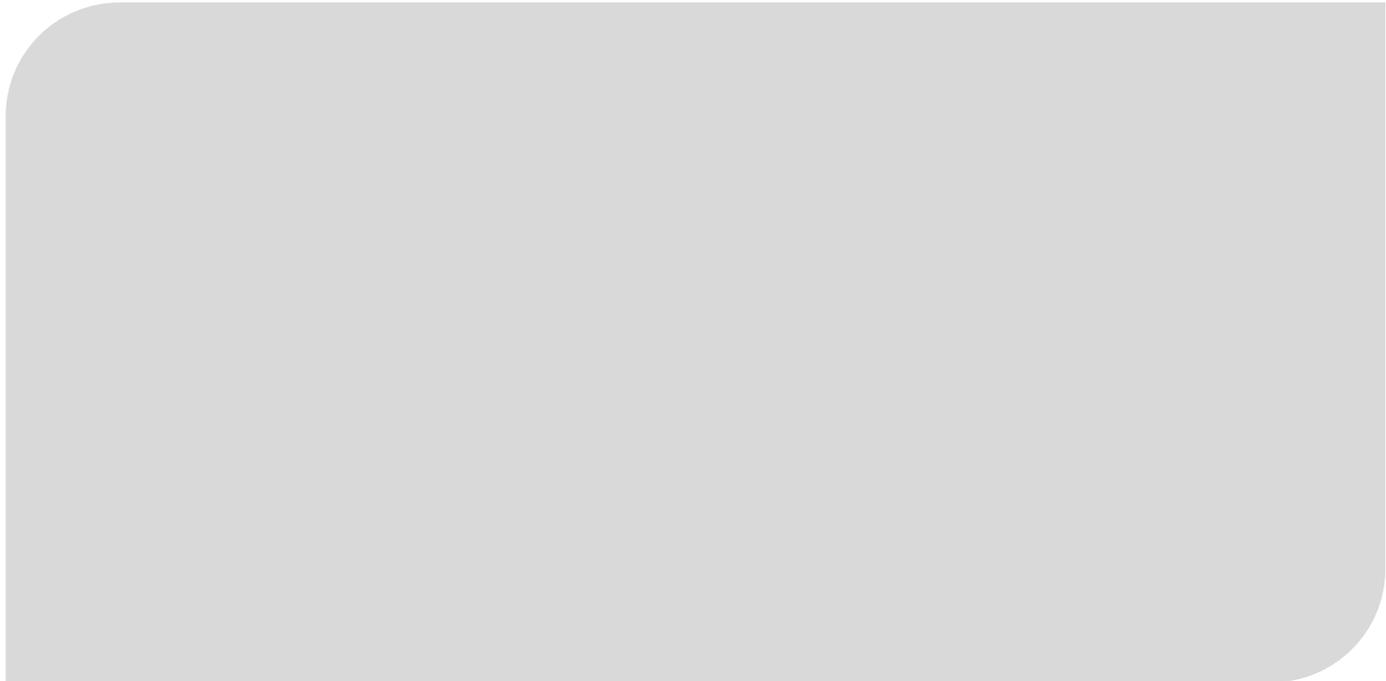
## WHAT IS THE PLACE WHERE I LIVE LIKE?

Where do you find STEAM models? Who are they? Why do they inspire you?



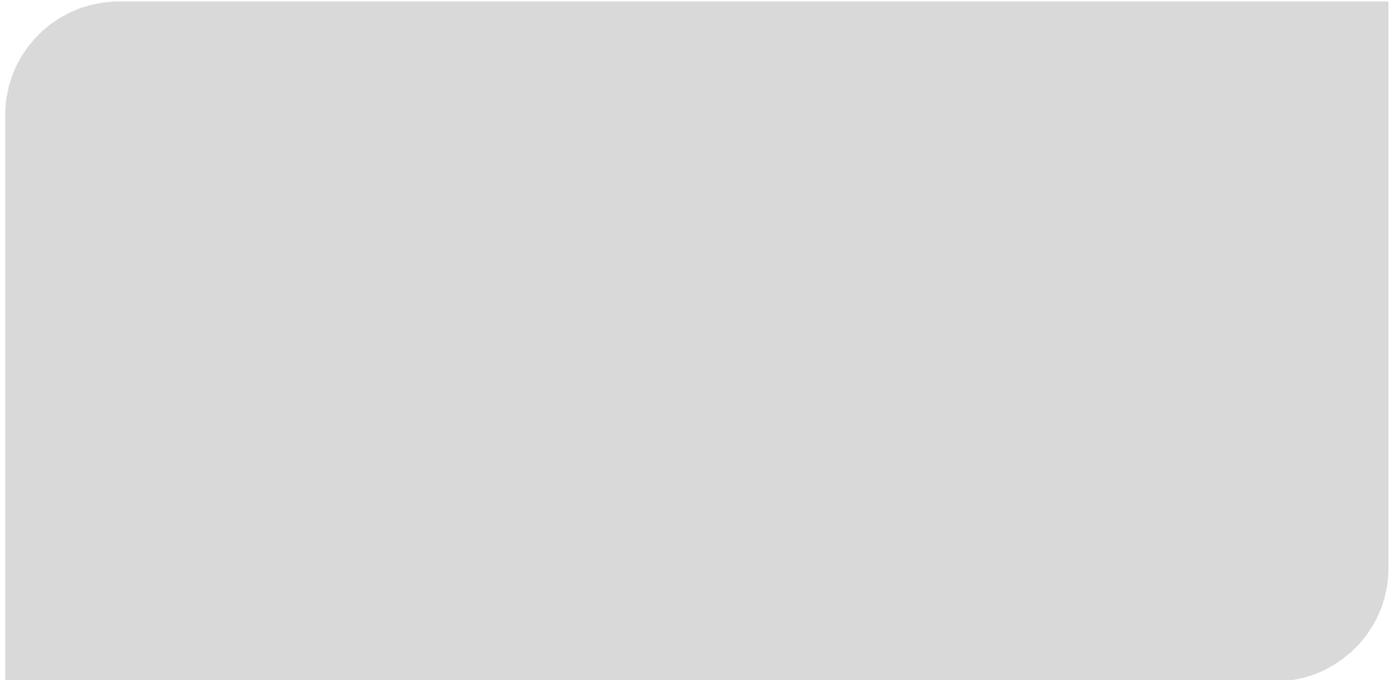
## STEAM SKILLS

What skills does a STEAM person need?



## AND ME... IN THE FUTURE I WANT TO INVENT...

What are you going to imagine, create, invent, develop?

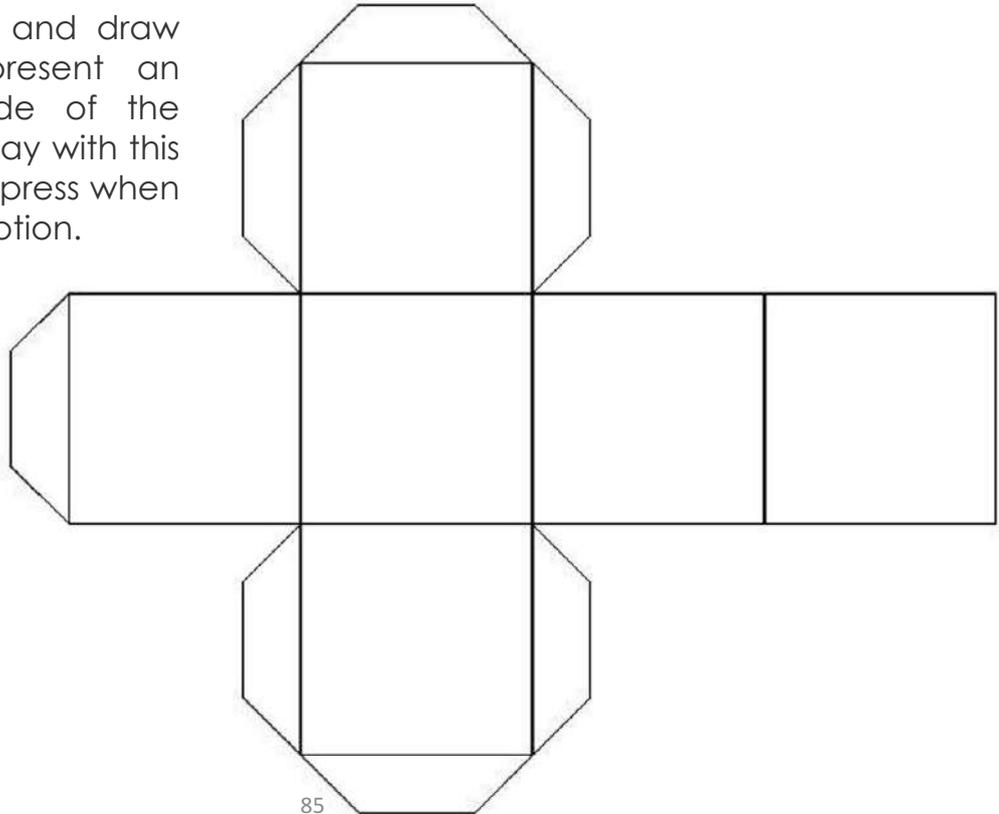
A large, light grey rounded rectangle with rounded corners, intended for a student to write their response to the prompt.



inspira

## THE CUBE OF EMOTIONS

Cut out this template and draw an emoticon to represent an emotion on each side of the cube. Then, you can play with this cube of emotions to express when you have felt each emotion.





inspira

## WHAT I LEARNT TODAY...

A large, empty, light gray rectangular area with rounded corners, intended for students to write their reflections on what they learned today.



# EXPERIMENTS

And your adventure begins right now.

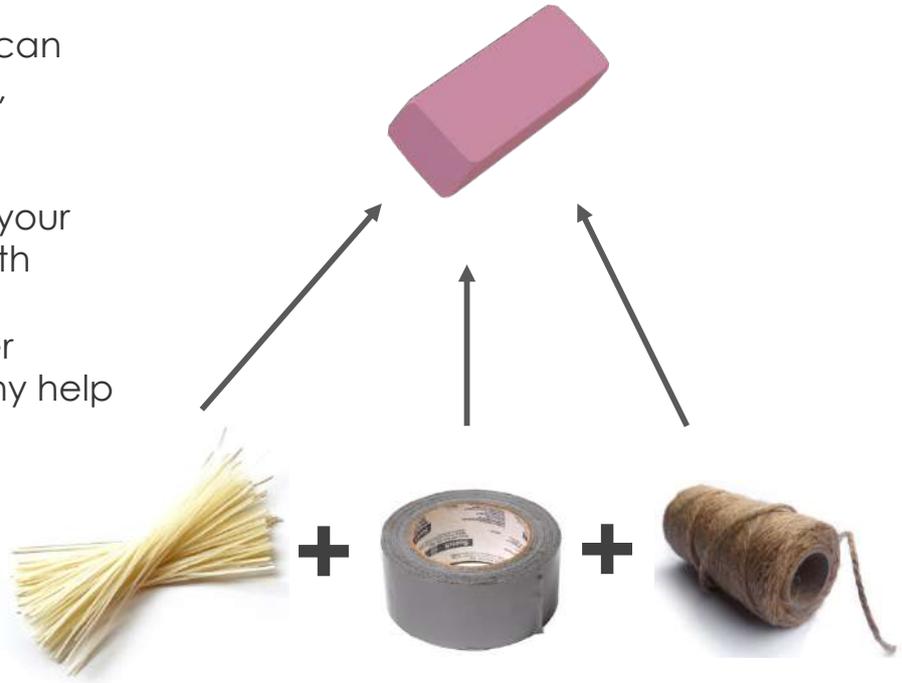
You will find a few games so you can have fun while you learn, and there are also some blank sheets that you can fill in yourself as you want.

See you soon **#STEAMgirls!**

## SPAGHETTI CHALLENGE

With these elements, build a structure that holds itself and can hold an object on top (eraser, sharpener, etc.)

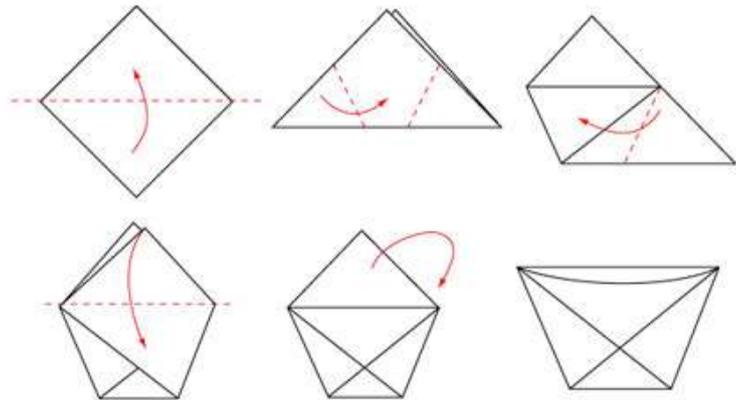
You have 20 minutes to build your structure. Then, compare it with those of your classmates. The structure that stands up longer without falling over without any help will be the winner.



# ORIGAMI

Tear off one of the blank sheets from this pad to build a glass. Follow the instructions in the drawing and check if it can be used for drinking water.

Try to find different materials inside the classroom or at home and make another glass. Which material holds better?

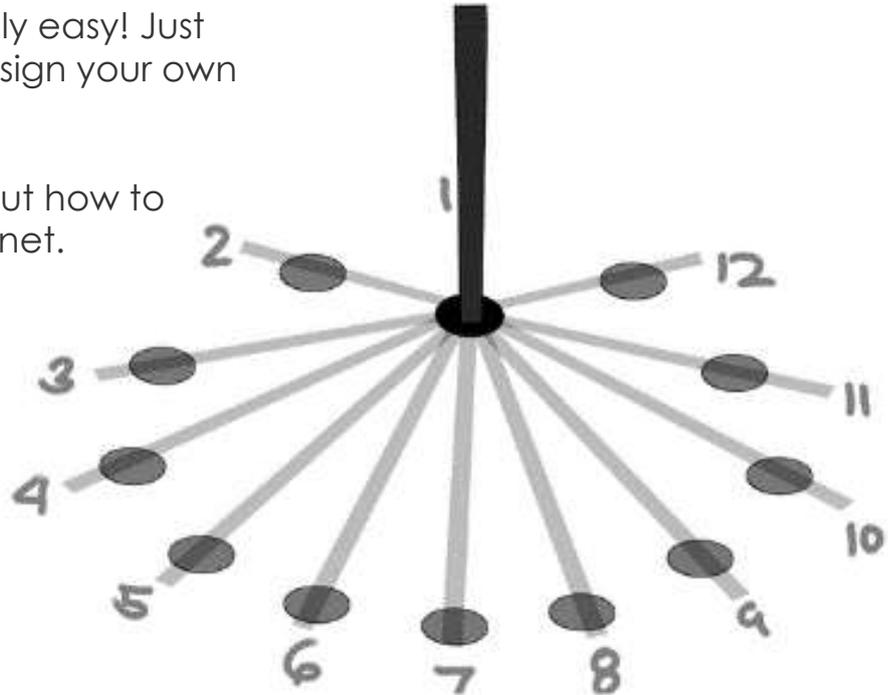


## SUNDIAL

Making a sundial is relatively easy! Just follow the drawing and design your own sundial.

Find more information about how to build a sundial on the Internet.

You can do it!

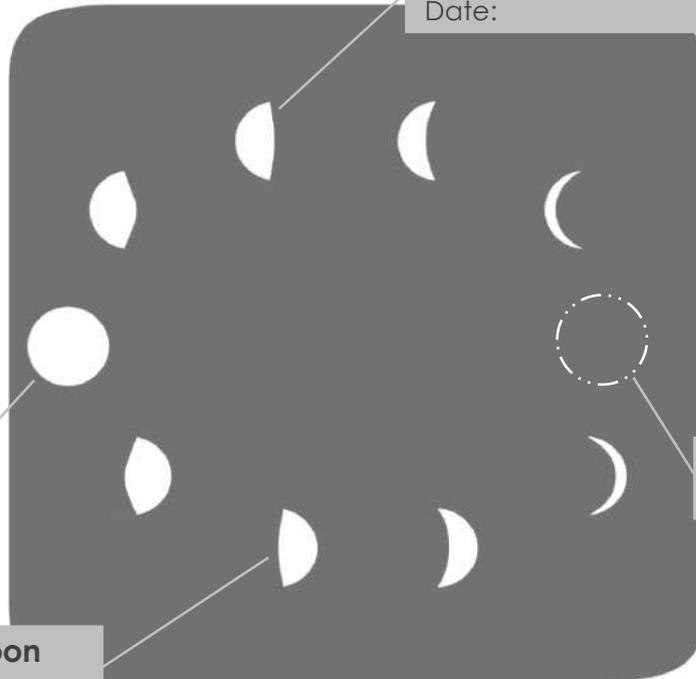


## THE PHASES OF THE MOON

Do you know how long the phases of the Moon last?  
Write down the date in which you see the moon like in the drawing and **calculate it!**

**Full Moon**  
Date:

**Waxing Moon**  
Date:



**Waning Crescent**  
Date:

**New Moon**  
Date:

## DO YOU KNOW WHERE THE STORM IS?

To know how far a storm is, and also whether it is approaching or moving away, it is quite simple: just count the seconds that elapse from the moment the lightning occurs until you hear the thunder again. The time difference between both phenomena is because light travels at a speed of 300,000 kilometers per second and sound travels just at 331 meters per second.

Now, when there is storm you can collect data.

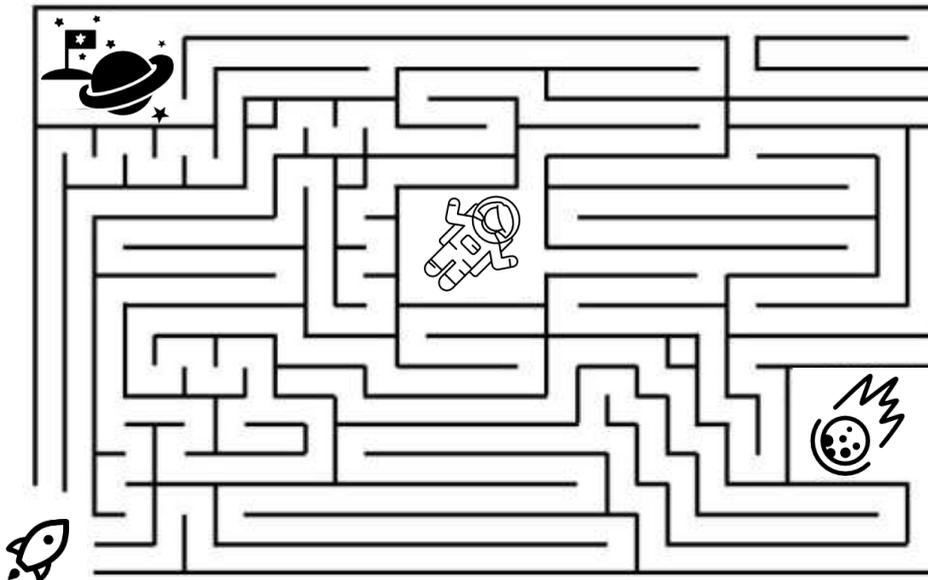
**Write them down here!**

LIGHTNING [HOUR:MIN:SEC]	THUNDER [HOUR:MIN:SEC]	TIME ELAPSE [SECONDS]

## LABYRINTH

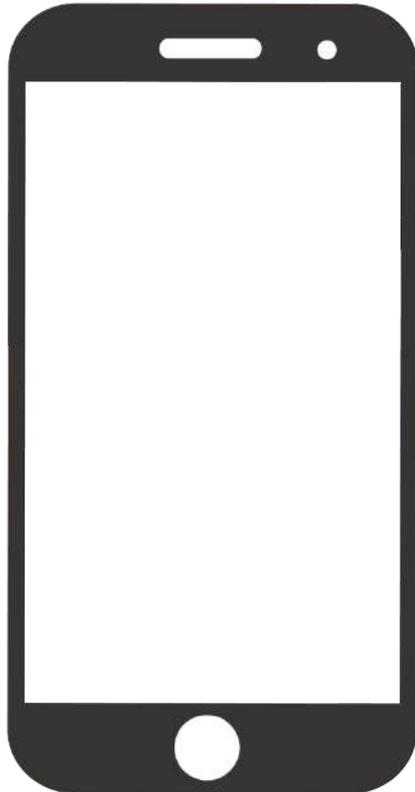
Labyrinths can contain stories! You must free the astronaut and then go to the new planet together. But be careful not to break the rocket.

**What story does this labyrinth tell us?**





## DESIGN YOUR OWN MOBILE APP



Do you like mobile applications? Make your own app! You can add whatever you want and even design your own buttons.

What app will you design?















































