



**Title:** MECHATRONIC ENGINEERING MY FUTURE PROFESSION

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**Team Number:** 17074B

**Location:** Barranquilla/Atlantico/Colombia



We are a group of girls who love to share together a common passion as robotics, our team consists of: Laura, Sofia, Gaby, Helena and me, my name is Mariangel, and since two years ago I decided that I will be a mechatronics engineer, I searched the internet for robotics school in my city but nothing I found one, thank God came out in the news of a team that won a great prize in the world robotics, that team was part of the IQ foundation, That's how I investigated the foundation and I presented to my mom my research about it to help me enrolling there, although they tell me that I am small to have already thought my future, I think it is not so, my passion for engineering, to build things has always been in me, it is something that drives me to study more, to seek answers to the questions that arise.



We chose the career of mechatronics engineering because it is very related to robotics, mechatronics engineering is the union between mechanical engineering, electronics and robotics, hence it is our selected STEM career. Little by little Mariángel has made us fall in love with this career that she decided to study, and maybe in the future we will also choose it as the professional career we will study.

Mariángel already had a lot of explanations and information from the internet about this career, so we are going to use them to write this challenge. We found that mechatronics engineering has its origin in the 80's, one of the precursors of mechatronics was Alan Turing, and in 1936 he made the first research in the area of computing by creating the Turing machine. But who created mechatronics was the engineer Tetsuro Mori in 1969

Mechatronic engineering arises from the interrelation of various branches of engineering that have in common the design, experimentation and manufacture of parts related to automation, in this case here is robotics.



In the foundation we learn robotics, one of the parts of mechatronics engineering, which we love, we have learned mechanical and physical

concepts that we had seen before, but we had no idea why they were, such as when we were taught the concept of speed: We did an experiment: previously we had been taught how to measure with flexometer (used to measure lengths, in this case distance) and the use of the stopwatch on the cell phone (used to measure time). We chose a certain distance in our backyard, and measured it with the flexometer, then Sofia, Gaby and Laura ran that distance while Helena carried the stopwatch counting the time it took them to run that distance. Sofia was the fastest, she arrived in 4 seconds, then to calculate the speed, we divided the distance covered 11.38 meters by the time it took Sofi to run it and we got 3 m/s, so we learned this concept, we had seen it many times before, because we have been running since we were 2 years old, but we didn't know its name or its formula to

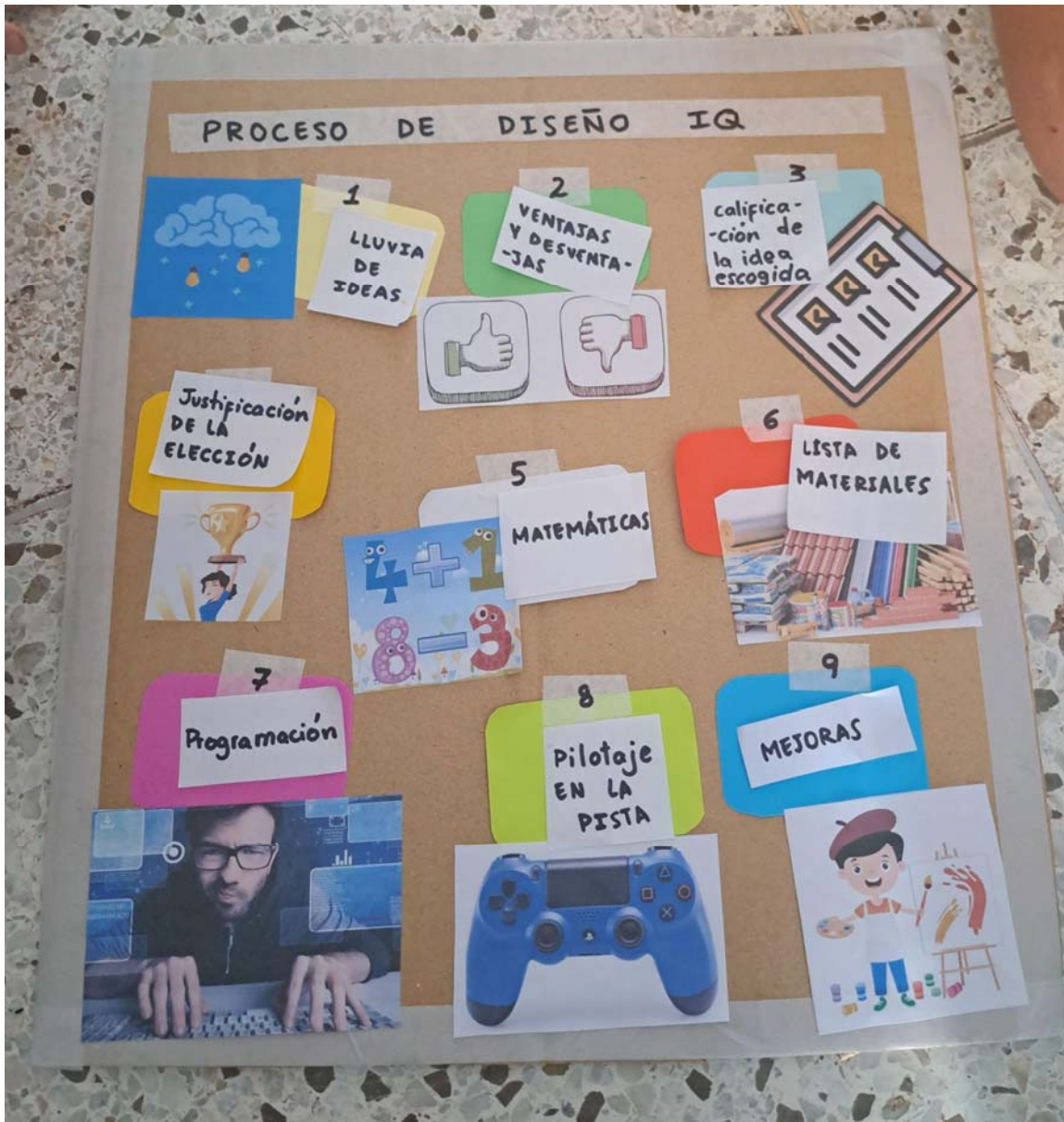
Así:  $v = \text{distancia} / \text{tiempo}$   
Distancia recorrida: 11,38 metros  
Tiempo gastado: 4 segundos  
Velocidad =  $11.38 \text{ m} / 4 \text{ s} = 2.8 \text{ m/s}$



Corrimos en esa distancia y nos gastamos 4 segundos en recorrerla.

calculate it.

Every time we go to design a mechanism for our robot, we apply the design process we have been taught:



And in mechatronics engineering they apply a methodology or design process when they build the parts with automation, before starting to build, the application of the part is determined, the restrictions of size, weight, in short its characteristics, then the engineers are dedicated to work together giving ideas of how the part should be, that is brainstorming, each one presents a report or project that must contain the advantages and disadvantages of his idea, Also the mathematical calculations, that is why you have to study a lot of

mathematics in this career, they are needed to do things well, as the important thing is that the parts are designed automatically, ie a robot to make them because they must be programmed, before selling them should be tested and if everything is fine then sold, if not you must find where the error is and fix it. This is called iterative design process, because you must return to the beginning and brainstorm again.

The competences in VEX robotics, have prepared us for our future career because now we have more knowledge in mathematics, physics, programming, we have learned to document what we do following the orderly steps of the design process, that is why now every time we are going to make a decision first we start to think what are the ideas we have at hand (brainstorming), then we see if they are useful to solve the problem (constraints), we analyze the pros and cons and justify our choice, if we follow these steps we have found that the errors are less each time, it does not mean that we do not have errors, but if we have been decreasing.

In the competitions, they prepare us to manage the public as well, and we know that in our future if we want to be engineers we are going to be bosses, and we will have people that we are going to give orders to, so we are learning how to do it in the best way. Documenting everything we do in the engineering notebook has taught us to keep order and to write better. Laura at the beginning had a terrible spelling and little by little she has been improving, Sofia did not know how to express her ideas well and now she is an expert, Helena loves programming but did not know how, now she knows it and is happy, Gaby was very shy to express herself in public and now she is the one who appears more in the photos and videos of our team, and I Mariangel see that I made the best decision by telling my mom that I wanted to study robotics in the foundation and participate in the competitions because now more than ever I want to be a mechatronics engineer.

we have used the following resources in our research:

<https://macuspana.tecnm.mx/assets/archivos/revista1.pdf>

<https://teinco.edu.co/resumen-historico-de-la-ingenieria-mecatronica/>

<https://guiademecatronica.com/historia-de-la-mecatronica/>