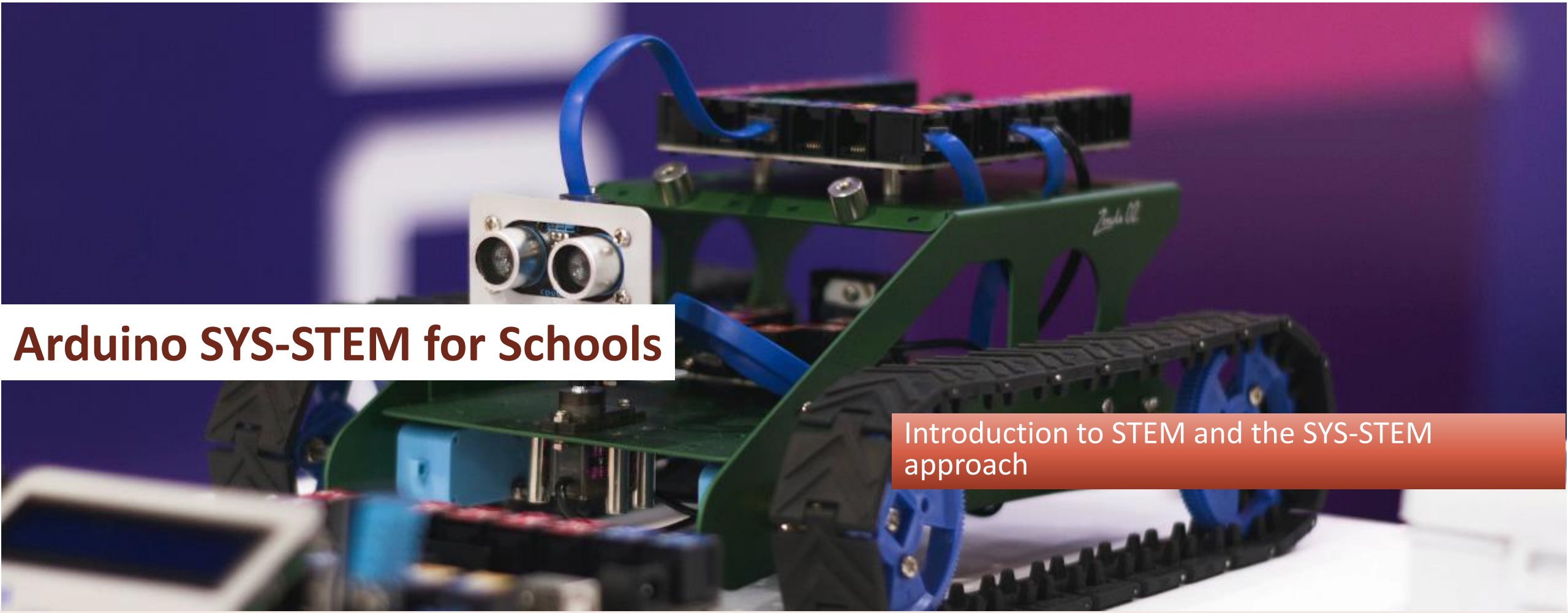
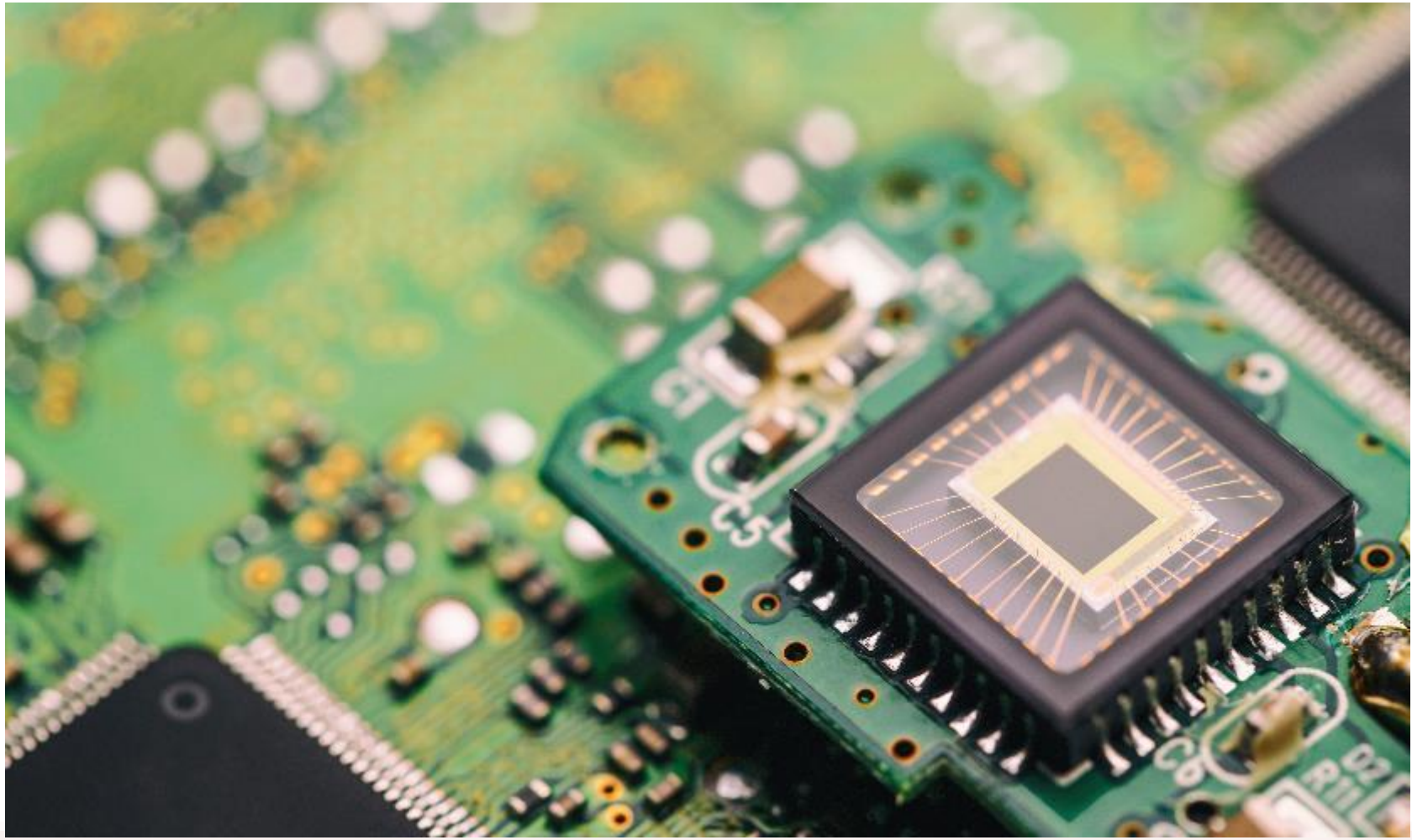


Arduino SYS-STEM for Schools

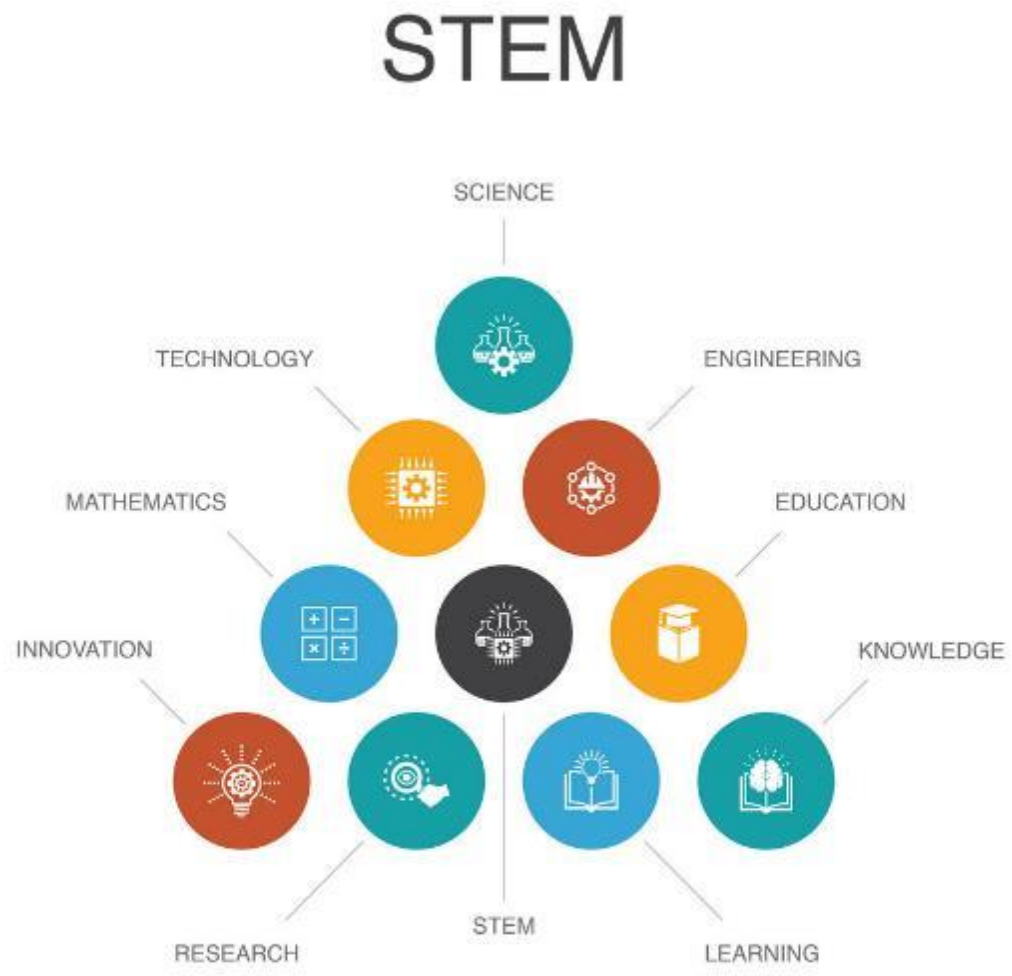
Introduction to STEM and the SYS-STEM approach

SYS-STEM – Arduino SYS-STEM for Schools
Erasmus + Key Action 2 Strategic partnership - 2019-1-ES01-KA201-064454

WHAT IS STEM?



- It is a new way of teaching technology-related subjects.
- Practical and theoretical teaching.
- Hands-on minds-on lessons.



S IS FOR SCIENCE

- If you are interested in living being and nature: Biology

- If you are interested in explosions and odd reactions: Chemistry

T IS FOR TECHNOLOGY

- You could create a robot that does your homework for you: Robotics

- You could create apps like Facebook and become a milionnaire: Internet Technologies

E IS FOR ENGINEERING

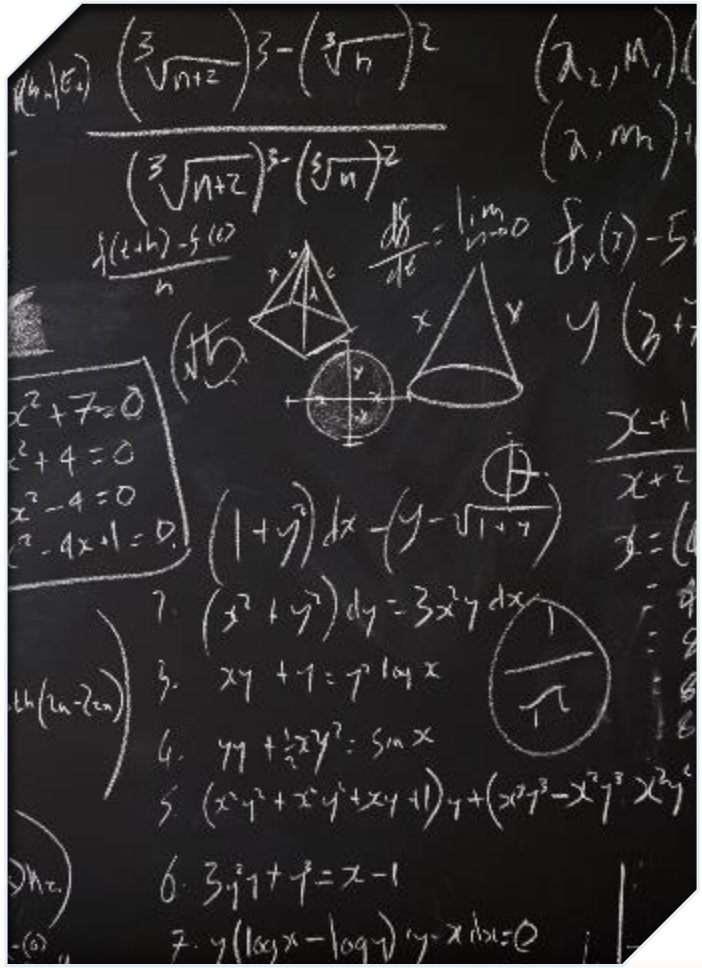
- If you want to learn how to build houses and skyscrapers: Civil Engineering

- If you would rather build airplanes or even rockets: Aerospace Engineering

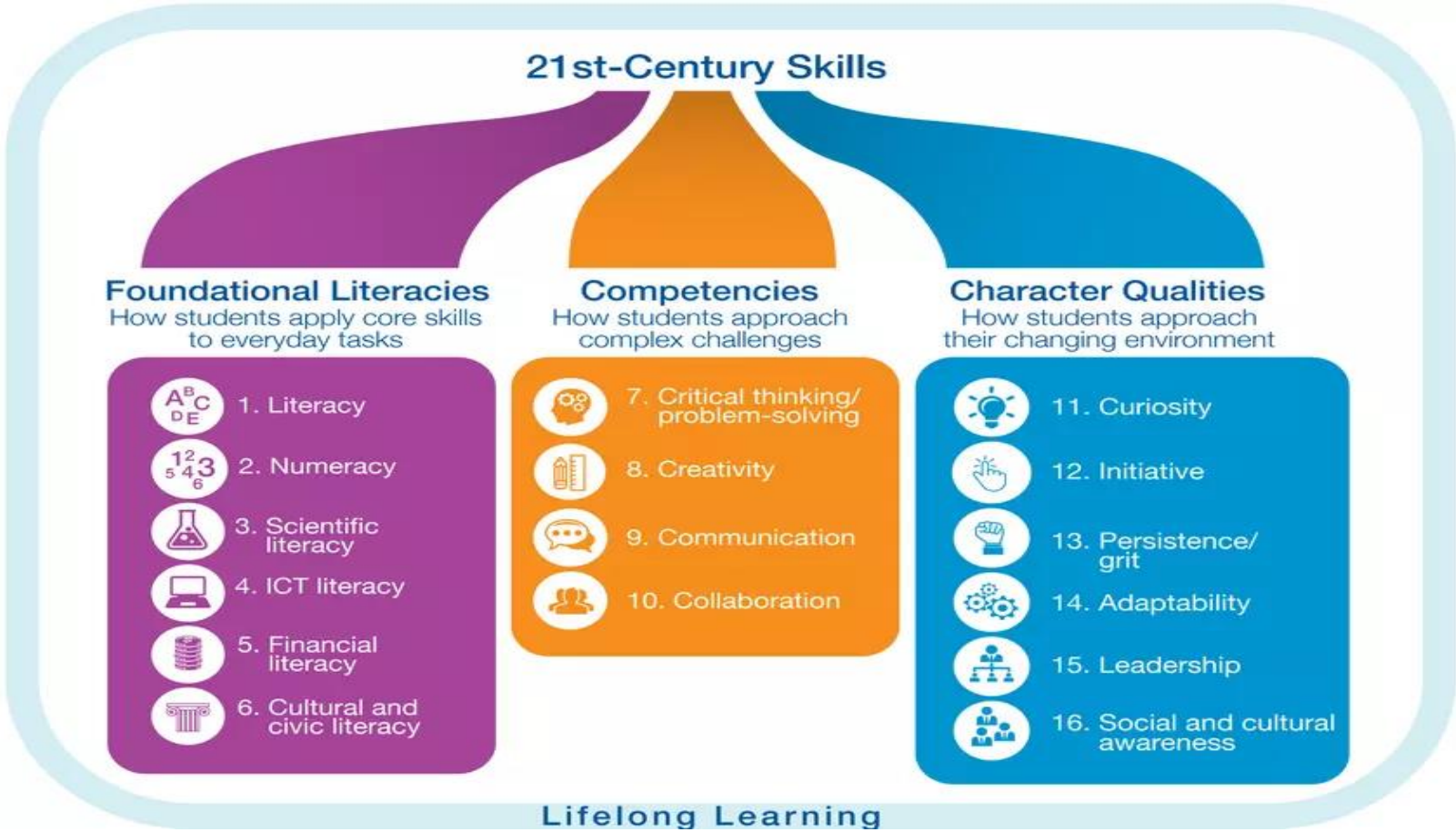
M IS FOR MATHEMATICS

- Mathematics are the basis of all science including the previous 3.

- If you are good with numbers and you love finding x then this is definitely for you!

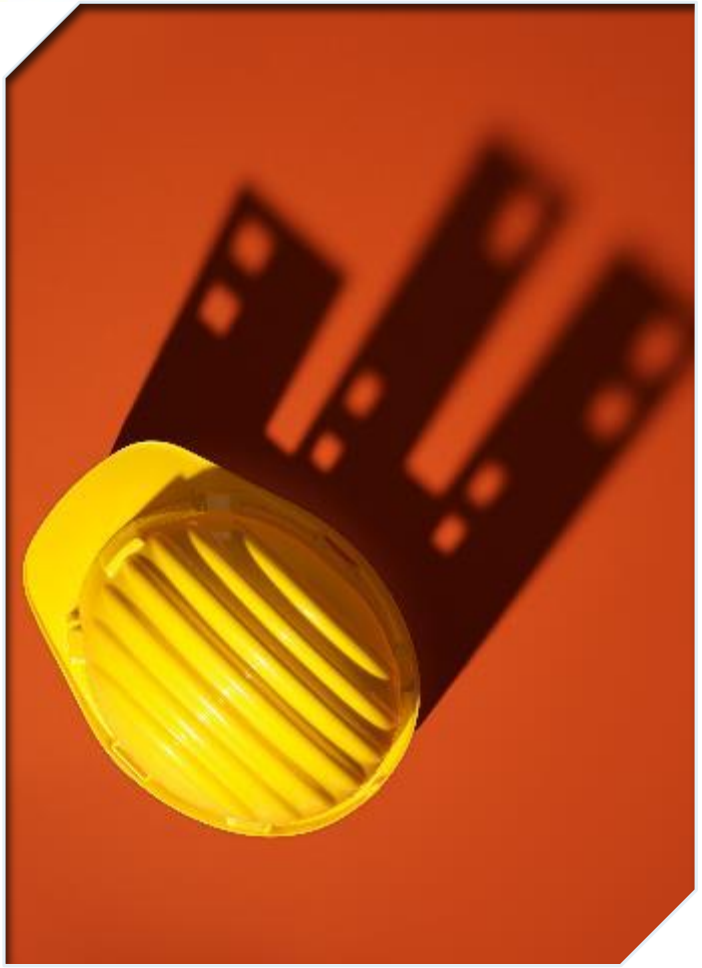


- All in all, what STEM education aims to do is to better prepare you for the future!



“EDUCATION IS THE FOUNDATION FOR YOUR FUTURE. STEM EDUCATION IS THE LEVELER FOR ALL TO BE SUCCESSFUL IN THE FUTURE NEEDS OF HUMANITY.

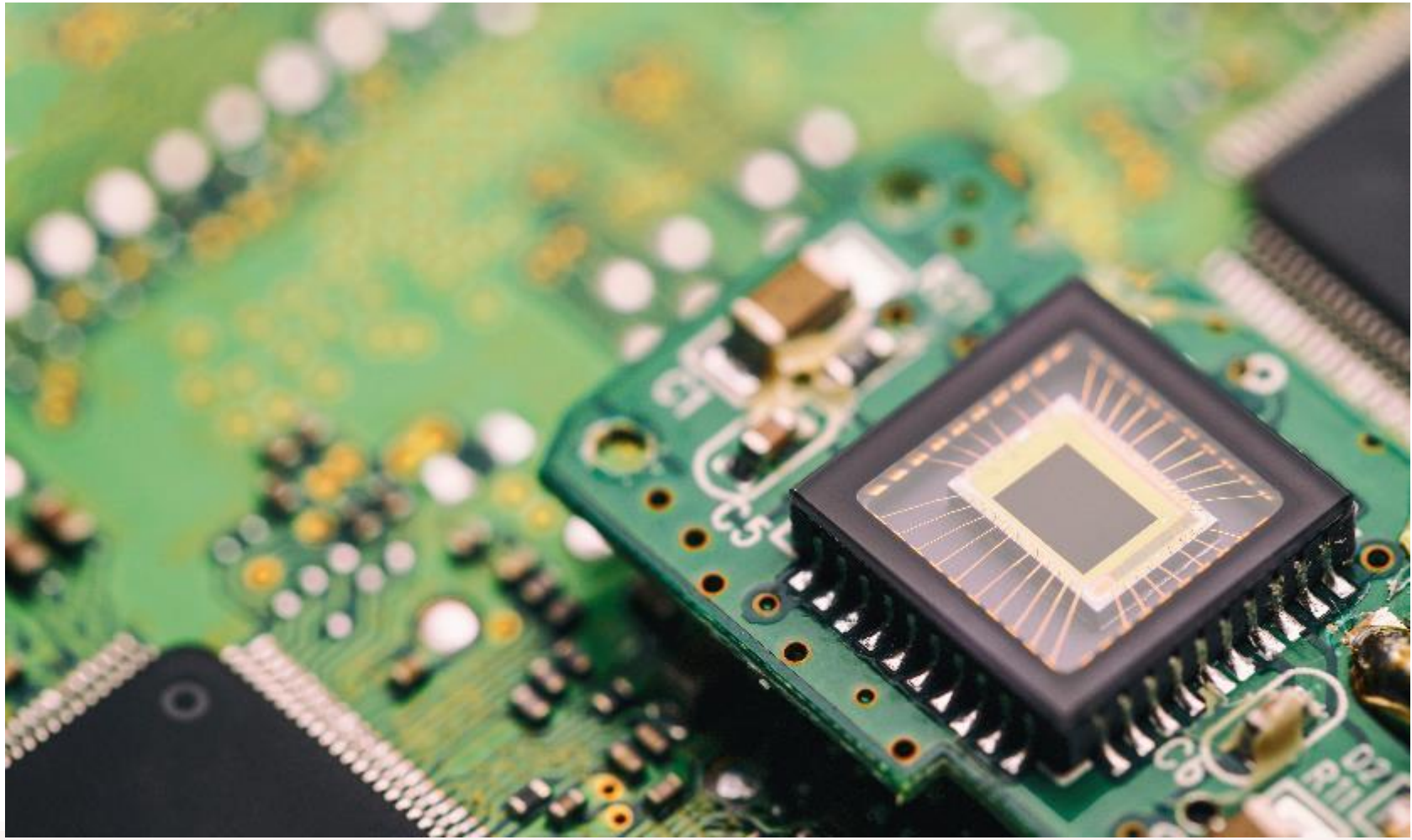
— IAN R. MCANDREW, TEACHER AT THE CAPITOL TECHNOLOGY UNIVERSITY



STEM EDUCATION ANSWERS THE FUTURE NEEDS OF HUMANITY

- New social and technological challenges.
- It helps you help build the future.

WHAT IS THIS ALL FOR?



- First: there is a great lack of engineers. Which means there are a lot of jobs on engineering related proffessions.

- Second: science related job positions pay more. On average 1/3 more than other jobs.

- Third: you will have a direct impact on the world. You will help make it a better place.

PROBLEM:

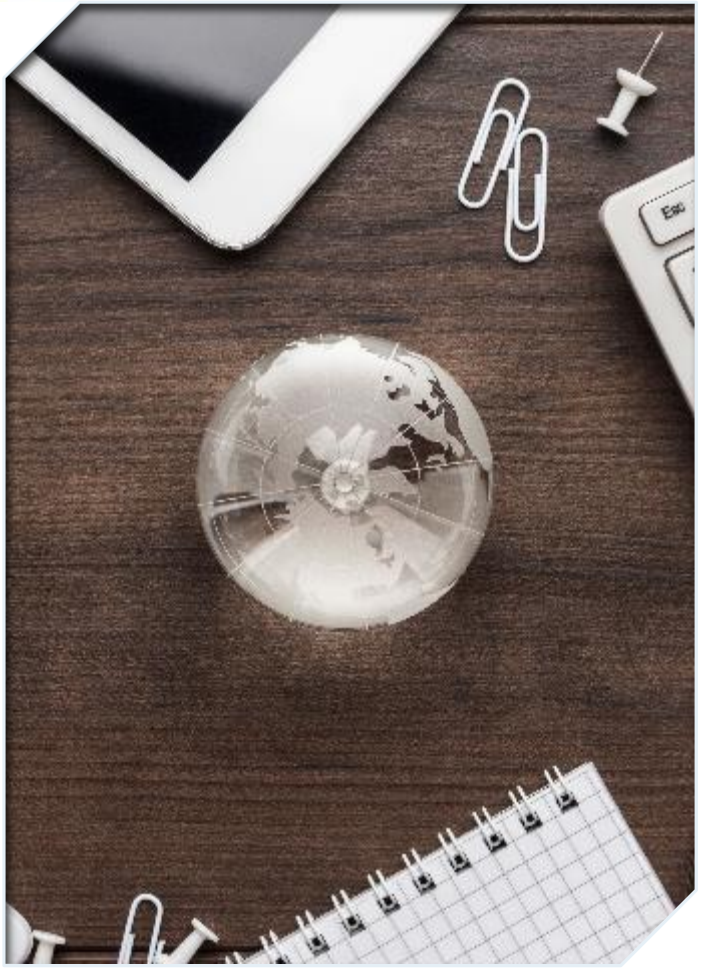
STEM EDUCATION IS GOOD, BUT IT REQUIRES INVESTMENTS AND MATERIAL

SYS-STEM SOLUTION:

USING ARDUINO AND DISTANT ARDUINO LABORATORIES

WHAT ARE ARDLABS AND DISTANT ARDLABS?

- Ardlab is an Arduino based laboratory that allows you to perform STEM experiments.
- A remote ArdLab has the same capabilities as in person labs but allows users to perform experiments from their homes or classrooms regardless of the distance.
- All you need to experiment in STEM is a computer and an internet connection.



THE ARDLAB HUB

- The ArdLab Hub is a point that allows users to locate and connect to ArdLabs from a distance. In these Arduino Labs you have exactly the same facilities as in your school's technology lab:
  - You can make a reservation for a time slot in any one of the available ArdLabs.
  - You can make all the experiments you like online.
  - You can share all your creations with the community.

THE SYS-STEM PROJECT

- Partners from 4 countries (Spain, Italy, France, Greece)
- Our aim: promote and render STEM education accessible to all students through ArdLabs.
- Our goal: give all STEM students the opportunity to enjoy their education without constraints.

THE SYS-STEM METHODOLOGY

- The course was created with flexibility in mind: there is no time limit.
- It is divided in modules, each of which is structured this way:
  - Introduction
  - Learning objectives
  - Main content with real life examples
  - Exercises and self-assessment

OVERVIEW OF THE CONTENT

1. **Arduino basics + basic devices**: learn to use Arduino and its features.
2. **Digital inputs, outputs and interruptions + analog signals**: learn about analog and digital devices and how to use them.
3. **First programs**: this module will initiate you to Arduino sketches and its structure.
4. **Variables and expressions**: here you will learn to use variables, constants, qualifiers and mathematical expressions.
5. **Decision making and control functions**: this module will cover decision making and loop instructions in C and C++.

OVERVIEW OF THE CONTENT

6. **Liquid Crystal Display (LCD)**: this module will teach you about LCD types, usage and prototyping.
7. **Servo and continuous servo**: here you will learn how these tools work and can be used.
8. **DC Motor**: this module will cover all matters related to DE motors from connection, to usage and to programming.
9. **Sensors**: a collection of presentations and documents to understand all types of sensors.
10. **Real world examples**: here we provide you with real examples that will give you a practical application to your knowledge.

THANK YOU