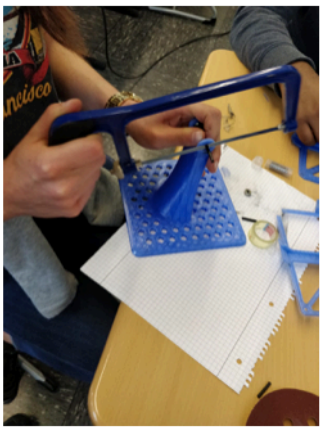
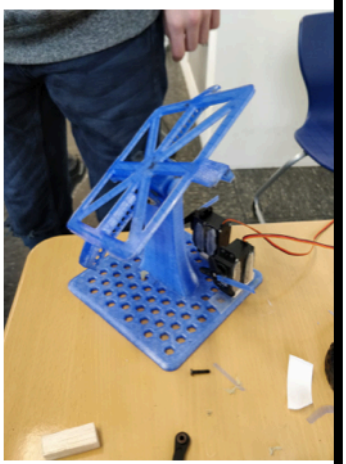
The Solar Tracker- An Erasmus+ Project:

Have you ever wondered how cars without fossil fuels could work? Or whether it was possible to drive only through solar energy?
These are the questions that we dealt with during the Erasmus+ project together with the Italian school Galileo-Galilei and the Greek partners.
Many aspects were of great importance here:
For programming, we use Arduino, which is a small computer whose control processes can be easily programmed and customized. So it is possible that the Arduino solar tracker can read the light sensors and align the solar cell in the optimum direction.
However, the solar panel had to be mobile enough without being unstable.
In order to use solar energy as efficiently as possible, we wanted to be able to move the solar cell both forward and backward, as well as to the left and to the right and to align itself with the help of sensors of the sun.
To achieve this mobility, we constructed various prototypes:
At first we tried to move a slab of light wood (balsa wood) in the desired direction. This served only to illustrate the idea and thus helped in the development of other models.
As a second idea we tried the construction of a ball joint. Here, however, we already noticed during sketching that this was a relatively unfavorable model, because the ball made the solar panel movable, but an uncontrolled rotation could not be prevented by the servomotors. Various prototypes then stated that the use of a universal joint makes sense, as it has stability but is still mobile enough to be steered in the desired direction by the servomotors.
Developing a working model was a tedious process as various prototypes had to be tested and subsequently improved. For accurate construction, the 3D printing technique was used here, which was a great advantage because countless models could be created within a very short time.

THE AGILITY OF THE SOLAR PANEL- THE CARDAN JOINT:



The programming of the necessary functions consists of two different parts, in which an Arduino is necessary in order to connect the different components and unite them to a functioning solar car.
On the other hand, the app for controlling the mobile had to be designed and written. Here, we used App Inventor, a free program that greatly simplified the design of an app and created a remote-controlled mobile from the solar tracker.
In collaboration with numerous projects from Genoa and Amaliada, the Erasmus+ project focuses on a sustainable and green future, and hence the use of renewable energy.
This was also the main topic of our exchange with Genoa. During our visit we got a lot of information from the other students, who involved us in their projects by demonstrating various inventions
including their solar tracker. Furthermore presentations by professionals, such as an engineer and associate of a solar company, deepened our knowledge.