Schedule for the visit of the Erasmus teachers on thursday, january the 26th

10.15h. Welcoming. Teachers and headmaster. Library

Introduction to the Headmaster (or Chief of studies) of our High School. Presentation of our High School.

Students: We are **Julian and Xaime M.** We are 15 years old. And we are in the 4rd course. We are going to show you a presentation to introduce our High School to you. Amongst the information, we have set some photos or videos that we think are representative of our school.

In the first slide we have soma data from our high school:

Data: number of pupils (208), number of teachers (about 20), ages of the students (from 12 to normally 16 years old, although we have a little number of pupils 17 or 18 years old), 4 courses, 9 groups. The next photo is of two of our pupils in a students scientific congress, thanking Salva Bara, the rapporteur, for his speech about light pollution.

Students: We are **Inés and Carmen**. We are 13 years old and we are in the 2nd course. In the second slide we are going to show you the main facilities of our school.:

We have a library, an old gymnasium converted into two classrooms, we also use it as a reunion center. We also have 9 big classrooms, one for special education, one for a small group, a technology workshop, a laboratory, an special aula of arts, another one for music, an staff room, some space for meetings and a canteen.

The image is one group of our pupils, who belongs to the reading club when they visited EXPOTAKU, an anime, cosplay and gaming fair in Coruña.

Students: We are **Paula and Paula.** We are 13 years old and we are in the 2nd course. In this slide we can see a short history of our high school.. In the slide number 3, we show you where we are located and the surroundings of our high school. The high school is named after our neighbourhood. We are very close to the sea (we can see it from some parts of the high school, like the library), near to the old harbour of Ferrol, Ferrol Vello, our neighbourhood, (Old Ferrol in Galician) is the oldest part of the city.

We are located in Ferrol Ría, about 10 minutes' drive from our magnificent exterior ocean beaches: Doniños, San Jorge. In the next image you can see that.

Most of our pupils come from our neighbourhood, but we have also some pupils from the rural area. We have pupils from very different cultural and socioeconomic backgrounds

Students: We are **Antía and Iris.** We are 13 years old and we are in the 2nd course. In this slide we can see a short history of our high school.

- Our school was created as a Primary School in 1983, due to the baby boom.

- The owners of the land were the Oblatas, a female religious order that gave it to the educational board as long as it is used for educational purposes.

- In 1996, it became a middle school due to changes in the educational system.

- When our pupils finish their period at our High School they obtain high school diploma, and they can opt for a Bachaulerat or Vocational training.

Minute 9.23. The next video is a little part of the farewell video of the students of the promotion of 2018. This was in carnival, when they represent a well known song. If you feel melancholic, we can show the rest of the video.

Students: **Helen and Diana.**

We continue. Some of the programs that we are involved in are:

We used to have a Bilingual program (two subjects, Technology and Chemistry, apart from English, are mainly taught in english), but now in the pandemics we don`t do it since we are not allowed to separate classes.

- ARCO (extra support for children with learning difficulties in classroom)

- TEI (Titoria entre iguais) (peer tutoring), also cancelled during the pandemics

- Reading clubs (children, manga, families and teachers)

- STEM club (LEGO league, programmation, Stratospheric probe, robotics, water analysis, origami)

- Program of mediation among equals as an alternative conflict resolution

Next we show you our kids participating, with the science club in the LEGO League. Also we show a video that we have filmed and edited in the Science club.

Students: We are **Julian and Xaime M** We are 13 years old and we are in the 2nd course. In this slide we can see a short history of our high school.

To conclude, we are going to show you how we have participated in some European programs.

Erasmus + K1: Robotics program (Lebadea, Greece and Cardiff, Wales)

Erasmus + K2: Creative schools (Greece, Romania, Spain, Turkey and Wales). This is the final year of the program. In the first year, just before and during the pandemics, we prepare some videos in the subjects of Technology and Chemistry. Firstly, we prepare a script, that we show to the pupil that is doing the exposition with an app acting like a teleprompter. After that, we film our mates acting. At the end of the process, we edit the video with Camtasia, and we obtain these videos. Here one example explaining one of the elements of the periodic table, filmed and edited during the pandemics.

Students: We are **Sebas and Antón**. We are 13 years old and we are in the 2nd and 1st course.

This year in the K2 program we have worked in the evaluation of the creativity of an activity of our Science club. We have assessed the activity of videogame creation with a tool created by our friends of the 4th Gymnasium of Lebadia. The teacher of the activity was me, and I asked the teachers if I could teach my mates to program

videogames during the first seasons of the Science club this course and of course I did! In the next video you can see one of the games one of my pupils made. If we have any time, I will show you more later.

In the next image we have the rubric to evaluate this activity, made by our friends of Lebadia

Groups of teachers from Wales and other Erasmus countries coming to our High School (you are the fourth one, so we are kind of specialist).

The final video is the galician poem we send them, edited with images from Ferrol and Lebadea and greek subtitles and the response of our friends for Lebadea. They say in spanish: Ferrol, te quiero.

10.30h Laboratory. Before going to the laboratory we go to the main entrance of the school.

Students: **Julian and Xaime M.**
We have made a lot of 3D printing during the five last years. We start here showing you a little exposition that we have here. We have some Heads of Pascua Island, some buildings, everything printed in our 3D printers. We will see more in the laboratory. But before going there we want to show you this Solar System on 3D that we have in the corridor. We printed all the planets in 3D in halves. We try to do the size of the planets in scale. We scale them to make Jupiter as big as our printer let us, and after that we scale the rest of planets. But we must use a different scale to the interior planets. If not they are tiny compared with the exterior ones. The sun in scale will fill the half the door of the entrance.
The distances on the corridor are in scale also. We glue them and the rings and try to set the rings with hot steel bars. We try also to tilt the axes with the correct degrees that they really have. We painted with tempera, watching real images on the internet.
Before going to the laboratory, one copy of the poems from Rosalia de Castro, the biggest galician poetess, in galician and greek, that we gave as a gift to our friends of Lebadia.
Now we are going to the laboratory

10.35h. Jorge
We have three printers. The first one was given by the galician government to all the high schools. It is a prusa model, designed in Spain. We have changed a lot of things of the 3d printer because it doesn't work properly. We even change the engine of the PLA not to weigh in the axes that are moving.
Also we have print new pieces to improve the ones of the printer, a layer fan, we change also the extrusor and right now we are changing the bearings. We also grease the different parts and we have to fix regularly the wires that connects to the plate. We solder everything and get the different material with the money of the science

club. But after all this work in there, it doesn't work nowadays. One piece is broken and we have to print with the new 3d printer this piece. We fixed it during the pandemics and was used to prepare masks for our sanitary system at the beginning.

We bought the second one, a creality ender 3 just before the pandemics. We use it a lot, making hundreds of masks, night and day at the beginning of the pandemics. A group of teachers and Technological workers from different companies made masks at home and we take them to the hospital, to provide their personal and the ill people.

They work very easily. The PLA is heated in the fusor and is moved in the three directions with the three engines connected to the board. We have also to heat the bed in order to get the pieces stuck in the same place.

Last year we have bought the third one, again a creality ender 3. It works better and more quietly.

Any questions

10.40h. Students: **Julián and Mateo**

We normally design with Tinkercad. We have used it, for example, to participate to the challenges of the OSHWDem (Open Source Hardware Demostration) fair that is celebrated in La Coruña every year. One of the challenges of the fair is to give an idea to the people to collaborate, making your own designs, but make them compatible with the designs of the others. Try to build something big with little pieces of a lot of participants.

Four years ago it was hexagons with different designs to fill a wall, to tessellate a wall and we can't participate but we print some of them. Three years ago we participate designing different gears. We have the model and we have to respect the size but we can change the rest of the design. We take a lot of gears to the fair. (Show them the models we print and how to design)

Two years ago in the science club we designed different buildings like a Parthenon or the Eiffel tower.

Last year, connected with our Erasmus program, we encourage our pupils to create some kind of design to try to foster the friendship between our countries.

Here a demonstration of design a heart shape with the names of the countries, for example.

Also for designing in 3D, in the subject of technology, we also learn to design with sketch, that we get in the same package of google drive for schools.

10.45h. Jorge

After we get the design, we export it as an stl file. To print it we are using mainly two programs: Repetier Host for the smaller print and we are starting to use Cura, that has plenty more possibilities. We need a better computer to run the Cura program, and we have just started with it. Both programs convert our stl file in a gcode, prepared to charge in the 3d printer and just print.

We always try to make sense of the pieces we print, try to collaborate with other areas of knowledge. We are trying to learn with 3D models in other subjects.

For example, we are learning to print parts of the landscape. We obtain the stl file with Terrain2stl. You select the part that you want to print and can change the z axis. This is perfect to learn Geography. We are going to ==show you how to get the model of Artabrian Gulf==, where Ferrol is located. Other ideas is to get urbanism of 3D Ferrol, 3D zone, perhaps some ideas of printing representative zones of earth like Himalaya range or island.

10.50h. Students: **Carla and Paula**

Related to Biology, apart from the solar system that you have seen, we have printed models of the prokaryotic cell, and both eukaryotic kinds of cell: animal and vegetal cell. In these models we also would want to incorporate Augmented reality (AR).

Our intention is to record one video explaining every organelle. When we go with our ipad over the cell when we are over a concrete organelle, one video of one of the kids explaining this organelle is going to appear.

10.55h. Students: **Mateo and Sebas**

As we said, we are trying to use the 3D in other fields, to learn with 3D models in other subjects.

For example: in language we have made an image of Rosalía de Castro, biggest poetess of Galicia, we are thinking in doing images of other well known writers. We print an anemometer to science classes, different representative buildings (Athens parthenon, Roman Panteon, Eiffel Tower) to the History classes, different classic greek styles doric, ionic and corinthian, famous statues like the Venus de Milo or David from Michelangello.

To the classes of chemistry we developed this s and p orbitals, these patterns to draw organic compounds, these dices to play with the formulation, different kinds of dice and solids to Maths. The brachistochrone is the curve of fastest descent.It is not a straight or polygonal line but a cycloid.

We have printed also letters and numbers for the special needs pupils, with magnets to put in magnetic whiteboards. Also Braille alphabets.

We have also made the cup for the winners of the high school football trophy and design and print a keychain for every student. Here we have some for you.

11.00h. Students. **Paula, Mateo and Carla**

Our school is also participating in the NOSA. It is the Galician Spacial School Agency. We send every year a probe to the stratosphere where we include different projects that 6 high schools from different parts of Galicia have prepared all year long. After the launching, we recover the probe and we analyse the data that we have obtained.

This year our probe reached more than 36000 m.

Video

Our school included a muon hunter, a muon detector, like a Geiger counter like the one we have here.. Muons are elementary particles that are created in the high atmosphere when the cosmic rays, mainly protons that came from outer space, crash with the molecules of the atmosphere. The muons can reach us here as we can prove with our Geiger detector.

We obtain this curve, completely equal than the theoretical, and with this experiment we can also demonstrate Einstein's Special Relativity, cause muons have a very short life (2,2 microseconds) but this is measured from our reference system. They are created as an average at 15 km high and in this short life time only be capable to travel about 500 m before get disintegrated, but we can detect them downhere. As their velocity is very close to light speed, their proper time is much longer than the one that we measured from outside , and in this way, they can reach the ground.

We have prepared two articles about our experiment an we have exposed them in a congress held in February in Santiago de Compostela. Last year we made another one about the winds in the stratosphere.

Technology workshop
Welcome to the Technology workshop. In the last few years we have worked a lot in the field of programming and robotics. We have participated in First Lego League with Lego robots three times, and we won that prize over there.
With the pandemic and the need of safety distance we had to slow down because working in groups is being difficult and the workshop is small, but we are doing our best.
Here you are an amazing group of students that volunteer to participate in this visit.
They are eager to show you their work and practice their English.
Please, feel free to go around and ask them about their projects.

10.30h-11:55 Students:

1. **Video game programming. Antón y Diego**

2. **Lego Robot. Obstacle course. Valentina y Alba**
   ● Hello, my name is .... and this is.......
   ● This is a Lego robot. We built it in the Science Club.
   ● It has two big motors, and a small motor for the arm.
   ● We are using the ultrasonic sensor. This sensor detects obstacles.
   ● If the robot detects an obstacle at less than 10 centimeters, it goes back, rotates, and moves forward.
   ● That way, the robot avoids the obstacle.
   Demonstration

3. **Hat with sensors. Julia y Quique**
   Hello, my name is .... and this is ……
   ● We are going to show you a hat for cyclists that detects obstacles when they are riding.
   ● It has an Arduino controller
   ● In the daylight, when an obstacle is detected, an alarm sounds.
   ● At night, when an obstacle is detected, a red led illuminates to indicate that something is too close.
   ● In order to detect obstacles, it has an ultrasonic sensor.
   ● The sensor is located on a motor that makes a 180º degrees turn. That way, it can detect an obstacle that comes in any direction.
   ● It also has an ultrasonic sensor in the back.

   Demonstration

4. Line follower. Claudia e Ízan

Hello, my name is .... and I am going to show you another robot.
- This is a line follower, it was designed by a teacher from Ferrol
- It includes an Arduino controller.
- It has two light sensors.
- When the right sensor detects black, it turns right
- And when the left sensor detects black, it turns left

Demonstration

5. Microbit. Rock, paper and scissors. Pereda y Ferreño

- Hello, my name is .... and this is….
- In the Science Club, we have programmed a Microbit.
- It is like a little computer. You have the hardware, with two buttons and a matrix of leds
- Then, you program the Microbit on the computer. You can use different programming languages: Phyton, Scratch or Makecode.
- These Microbits were programmed with Makecode. Here you are the code (les señaláis el programa en la pantalla del ordenador)
- It is a rock, paper, scissors game. When you shake the microbit, it generates a random number from 0 to 2.
    - If the number is 0, the rock will be displayed
    - If the number is 1, the paper will be displayed
    - If the number is 2, the scissors will be displayed

    Demonstration
    Would you like to try?

6. Holographic pyramid. Elías Bringa and Iván Ramírez

- Hello, my name is .... and I am going to show you how a holographic pyramid works
- An hologram is a three-dimensional image made up of light.
- In the workshop we built this pyramid with adhesive tape and transparent plastic sheets.
- To see the hologram, you need a video where four identical images are displayed.
- When you put the pyramid in the center of the screen, the four faces reflect the light of the screen, and the hologram appears in the pyramid.

    Demonstration
    Would you like to try?

7. Library. Reading club. QR codes. Tomás y Jose

- Hello, my name is ……… and this is……..
- We are going to show you how we create the reviews of the books of our library.
- First of all, we read the books.
- Then, we discuss the book and we agree the review.
- After that, we write the review in Google Drive
- Then we create a QR code with a webpage
- Then, we printed the QR and paste it on the book
- If you want to see the review, you only have to point the camera of your phone or the Ipad and the review will appear on the screen.

CFR Robots.

Hello, my name is .... and I am going to show you some robots.
- This is called K-bot. It was designed by a group of teachers from Ferrol and it was built by the students in the technology class.
- We have three different versions.
- This is the first one,
- The second version has better buttons
- The third version and more compact and includes bluetooth
- All of them have a nano Arduino controller.
- To program this robot you only have to press the buttons: Forward, backwards, left and right. And then, the start button.
  Demonstration

Code.org
Hello, my name is ....
Code.org is a web to learn programming.
It is like a game.
The angry bird has to reach the pig
Here you have blocks with instructions
You have to put the blocks in the right order
If you win, you will have a more difficult challenge

12.00h. Canteen.

12.30h. It is over!!