



Luxembourg



SPACE AND SCIENCE FOR SCHOOLS

Primary

Trainings, school projects and inspiring educational resources to use in the classroom



INSPIRING TRAININGS

As a educational network, ESERO helps you integrate science into your teaching a fun and interactive way.

Our training sessions provide you with practical tools to engage with your students, actively involve them in their learning process and spark their scientific curiosity.

Every year, we offer continuing educational courses specially designed for teachers and educators. Delivered in Luxembourgish, French and English, all tranings are accredited by the IFEN.



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OUR TRAININGS CATALOG

Mission X: Train Like an Astronaut

An international school project focused on physical fitness and healthy food. Students aged from 8 to 12 learn through play about the importance of an active and healthy lifestyle.

Coding with Astro Pi :

Teach the basics of coding by sending a message to the International Space Station.

Sustainable Development in primary schools :

Teach climate change topics to Cycle 3 and 4 students.

Rocket science :

A popular STEM resources pack: launch a rocket, build a solar-powered rover, simulate a moon landing and learn about different materials.

Science Discovery for cycle 3 and 4:

Fun and educational resources about shooting stars and meteorites, plant growth conditions and robot programming.

Explore life on Mars with a martian rover :

Learn the basics of programming through a game set on Mars. Take on a series of mini-challenges and search for life by programming the rover's movements.

Learn the basics of 3D design :

Design a lunar base after discovering the living conditions on the Moon.

James Webb Telescope and exoplanets :

Discover the missions and components of the James Webb Space telescope, illustrated through experiments on thermal protection and infrared light observation.

Mathematics in Cycle 3 and 4 through nature observation :

This course shows teachers how to use the environment to teach mathematics in a practical, fun and engaging way.

The Euclid satellite and dark matter :

Explore the groundbreaking satellite, designed to map the geometry of the universe and investigate dark energy. Learn about its cutting-edge technology, its role in cosmology and how it collects data to trace the distribution of galaxies and cosmic structures.



PROJECTS



MISSION X

Mission X is a free project that invites students aged from 6 to 14 to train like astronauts through physical exercises during PE classes or simple space-themed science activities.



CLIMATE DETECTIVE JUNIOR

Students complete environment-themed activities and earn badges for each one! The more we learn about our planet, the better we can protect it!



ASTRO PI MISSION ZERO

Students learn the basics of programming by creating their own colorful, custom image and sending it to the astronauts aboard the International Space Station (ISS)!

MOTIVATING SCHOOL ACTIVITIES

MOON CAMP

Step into the role of space adventurers with your students and imagine your own lunar or martian base. Choose the topic and format that best suit your class and let your creativity shine!



WATER ROCKET CHALLENGE

In teams of 2 to 4, participants built their own water rocket with the help of our educational guides and launch it three times, adjusting different variables to get as close as possible to the target 70 meters away.





MISSION X

Age group: 6-14 years

Timeline : January to May



Free



Mission X raises awareness among young people about the importance of a balanced diet and regular physical activity to stay healthy. Inspired by astronaut training, this program helps students understand how healthy habits can have a positive impact not only on their daily well-being but also in extraordinary contexts such as space missions. Complete physical exercises and earn steps to help mascots Luna and Leo walk to the moon.

★ Why participate?

The goal of Mission X is to raise awareness among young people about the importance of a balanced diet and regular physical activity to stay healthy.

Inspired by astronaut trainings, this program helps students understand how healthy lifestyle habits can have a positive impact not only on their everyday well-being but also in extraordinary situations such as space missions.

Your students will learn the importance and principles of healthy eating and exercise in an exciting context, while earning points by completing activities during their PE lessons.

👤 How does it work ?

- An international challenge :

Starting in January, students take part to earn points and help Luna and Leo move closer to the moon.

- Total flexibility :

You choose the missions and the timing that best fit your class.

- Interactive tracking :

Record your progress online and discover how other classes around the world are doing.

🏆 The missions

The activities are divided into two main categories :

- Physical activities, which help students develop athletic skills such as strength, endurance, coordination and spatial awareness.
- Scientific activities, focused on STEM (science, technology, engineering and mathematics) allowing students to build scientific reasoning and teamwork skills.

Here are some examples of activities:

Physical activities

Astro-run
Return to base
Build an astronaut body
Jump to the moon !

Scientific activities

Living Bones, Strong Bones
Taste in Space
The Bionic Hand
Space Farmer

Prizes :

- Free posters and stickers for all participating classes
- Certificates for students at the end of the project
- Special prizes for the winners.

For more informations, visit <http://trainlikeanastronaut.org/en/>



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CLIMATE DETECTIVES JUNIOR



Age group: 8-12 years

Timeline : September to June



Climate Detectives challenge students to make a difference by engaging with Earth's environment to help protect it.

As part of this project, students will carry out Earth-focused activities, collect evidence of their findings, and earn badges for each activity!

The more we know about our planet, the better we can protect it!

★ Why participate ?

By taking part in the Climate Detectives Kids project, young students will get familiar with Earth science and the environment through selected learning resources and hands-on activities and will understand the importance of respecting our planet.

🧑 How participate ?

- Choose from the 11 suggested activities or create your own and submit a description and a photo of your project.
- Teams that submit one activity will receive a silver badge. If teams complete two activities, they will earn a gold badge along with a virtual certificate in recognition of their detective work to understand and protect our planet.
- Visit your team's virtual gallery and share your project with family and friends!

🧑🏻👧 Some activities examples

- Understanding the water cycle
- One year on earth: understanding the seasons
- Understanding the difference between weather and climate
- Exploring the effects of melting ice
- Earth under a lid: understanding the Greenhouse Effect
- Astrofarmer: discover what influences plant growth

Practical informations:

- Completely free activity
- We can come and do the activities with you in your classroom.
- Each participating student receives:
 - Climate Detectives sticker
 - Paxi mascot sticker
 - An ESA sticker
 - Participation badges

For more informations, visit <https://climatedetectives.esa.int/kids/>



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ASTRO PI - MISSION ZERO



Age group: : 8-12 ans

Timeline : September to May



Astro Pi Mission Zero introduces young people to programming through a unique opportunity: sending a message into space! Students will learn to code by creating a personalized image inspired by nature on Earth or elsewhere in the universe, which will be displayed on a computer aboard the International Space Station (ISS).

Mission Zero is open to everyone, including complete beginners. No special equipment or knowledge is needed. All submissions will be run on the ISS for 30 seconds and each participant will receive a certificate showing exactly when and where their code was executed.

A one-of-a-kind memory of their contribution to space exploration !

★ Why participate ?

Since 2020, coding skills have been developed alongside mathematics in Cycles 1 to 4 of primary school. They are part of the competencies assessed during the common tests conducted as part of the orientation process toward secondary education.

This new subject helps bridge the digital gap between school and a rapidly evolving society.

Learning this "new language" means training students to break down complex problems into a series of simpler ones.

This way of thinking, known as computational thinking, can be taught in a playful and age-appropriate way.

While the goal is not to train future computer scientists, introducing coding in school may very well inspire future careers in a growing field.

Practical informations:

- Free participation
- Participation certificate emailed to each student
- 60-minute session duration

For more informations, visit <https://astro-pi.org/en/mission-zero>





MOONCAMP



Age group : 6 -12 yars

Timeline : September to June



Free

Join the Moon Camp and bring space into your classroom!

Take on a new role as space adventurers with your students and imagine your own lunar or Martian base. You can, for example, draw or design a habitat on the Moon's surface or go beyond the Moon and explore other worlds in our solar system.

Choose the topic and format that best suit your class and let your creativity take flight!

★ Why participate?

Space is a highly motivating topic for students.

Moon Camp offers an open format, with no restrictions on the tools or design techniques used.

Moreover, it fits perfectly into the primary school curriculum, covering subjects such as art & design, science discovery, and human biology.

👤 How to participate ?

In the future, to allow astronauts to stay on the Moon or other planets for extended periods, new infrastructures will need to be developed to tackle major challenges.

These challenges include protection from radiation and meteorites, energy production, water extraction and recycling, food production and much more.

Your project can be presented in the format of your choice:

- A lunar or Martian base in the form of a drawing
- A lunar or Martian base built with LEGO
- One of the Moon Camp activities designed for primary schools

Practical informations:

- Completely free activity
- We can come and do the activities with you in your classroom.
- Each participating student receives:
 - a Moon Camp sticker and a Paxi mascot sticker
 - a certificate of participation

For more informations, visit <https://mooncampchallenge.org/>





WATER ROCKET CHALLENGE



Age group : 8 -12 years

Timeline : Launch in May



This project involves building and launching a rocket powered by water, aiming to get as close as possible to a target located 70 meters from the starting point.

In teams of 2 to 4, participants build their own water rocket with the help of our educational guides and launch it three times, adjusting different variables such as air pressure, the amount of water or the launch angle to get as close as possible to the 70-meter target.

★ Why participate ?

Water rockets are an excellent educational tool that combines fun with scientific learning.

Building and launching them allows students to explore fundamental concepts such as:

- *Physics and motion*: A hands-on illustration of Newton's third law (action-reaction) and the forces affecting trajectory, such as thrust, drag and gravity.
- *Aerodynamics*: The impact of fins, nose cone and overall shape on stability and air resistance.
- *Experimentation and problem-solving*: Development of critical thinking through observation, data analysis and prototype improvement.
- *Teamwork*: Collaboration and idea sharing to design, test and optimize rockets.

This interactive project sparks curiosity and encourages science learning in a fun and engaging way for all age groups.

🧑 How to participate ?

The following conditions must be met for a team's registration to be accepted:

- Teams of 2 to 4 students aged 8 to 12.
- Teams must be made up of students attending a primary or secondary school in Luxembourg.
- Each team must be supervised by an adult mentor.

Team members do not need to attend the same school, but the mentor must accompany the students on launch day.

Practical informations:

- Completely free activity
- Equipment provided to teams: a bottle nozzle, a rocket launcher and a bike pump
- Attractive prizes:
 - Trophy for the top 3 teams
 - ESA stickers
 - The winning team will receive a water rocket launcher worth €100

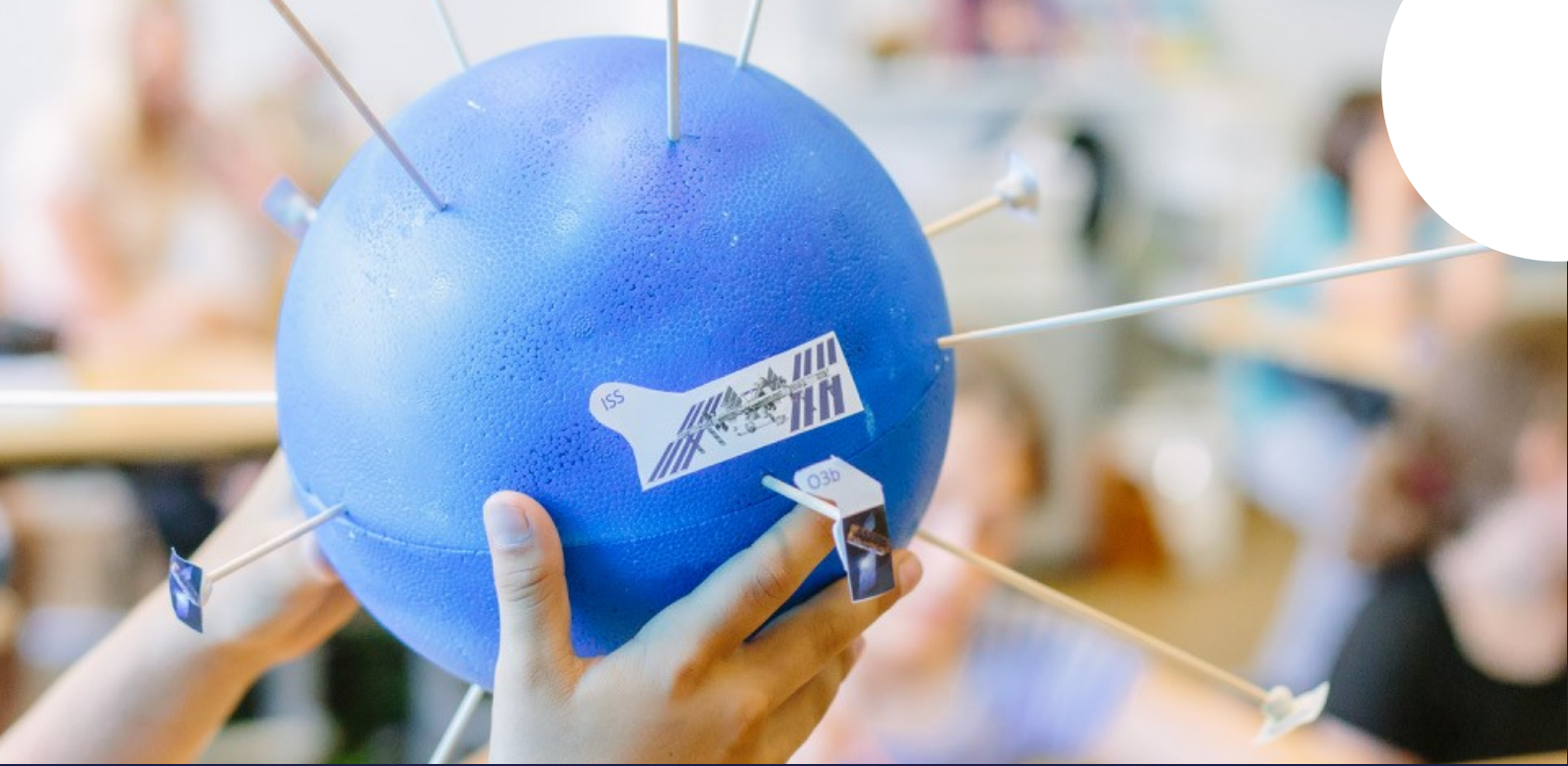
For more informations, visit <https://www.esero.lu/school-projects/water-rocket-challenge/en>



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SPACE GOES TO SCHOOL

The universe is full of fascinating mysteries: What is a galaxy and how vast is it? How do black holes form and what secrets does our Milky Way hold? Why do stars twinkle in the night sky and could there be other forms of life elsewhere in space? What do asteroids really look like and what extreme conditions exist in the cosmos?

If your students are fascinated by the infinity of space, planets, rockets and stars, offer them an immersive experience!

Invite a passionate space expert into your classroom for an interactive session where every question gets an answer and curiosity drives learning.

Age group: 10+ (Cycle 4)

Duration: 1 hour

Date: To be arranged based on your availability

Languages: LU, FR, DE, EN

Price: Free of charge

For more information, visit esero.lu/sgtsen



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ABOUT ESERO LUXEMBOURG



ESERO Luxembourg is a project by the Luxembourg Science Center, funded by the European Space Agency (ESA), the Luxembourg Space Agency and the Ministry of National Education, Children and Youth.

Our mission is to spark students' interest in science and technology by using space as an engaging and inspiring learning context. In this way, space becomes more than just a source of fascination it becomes an integral part of their daily lives and educational journey.



CONTACT US !



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