

Annual report 2024

Science on Stage Europe e.V.

Activities

Activities end 2023-2024 and outlook 2025

Aims according to our statute

- ▶ Promoting science teaching through the dissemination of good-practice concepts for teachers by teachers
- ▶ Organising and promoting international cooperation and exchange between educators through activities that can be attended by teachers from several countries

Impressions from the festival



Teachers
make the
difference!













SCIENCE ON STAGE FESTIVAL

SCIENCE ON STAGE
EUROPE
THE EUROPEAN NETWORK FOR SCIENCE TEACHERS

FROM
TEACHERS
FOR
TEACHERS

SCIENCE ON STAGE
TURKU 2024

#sons2024

















You need a few elements: sugar, water, a fermentation container and a material to cover the opening of the container (the material must be air-permeable). To speed up fermentation, it is useful to have a piece of ready-made vinegar mother, which will shorten the time of creating a new one.

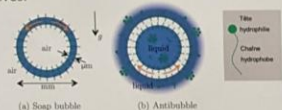
Pour water into the fermentation container and fill it to a maximum of 75% of its volume. Then add sugar (4 tablespoons per liter of water) and mix thoroughly. Cover everything with gauze, fleece or other air-permeable material. Its purpose is to stop dust and fruit flies, and it must enable air exchange. It is best to put the container in a dark place with good air circulation.

After a few weeks after the so-called turbulent fermentation phase, fermentation slows down. Then a thin membrane begins to form, which enlarges over time. This is the SCOBY. When the "Mother" has the desired thickness, remove it from the container, wash, clean and dry it.



Bubble and Anti-bubble

Explore the fascinating world of soap through affordable experiments that highlight the chemical principles of bubble and anti-bubble formation. These experiments involve encapsulating substances and studying the molecular structures of surfactants. You'll be able to observe and understand how an anti-bubble collapses, delve into its optics, and calculate the apparent air layer thickness. Explore the chemical properties, intriguing reactions, and astonishing mechanisms that make soap an essential element in our daily lives.



We created anti-bubbles filled with food coloring, wine, red cabbage juice, tea, mica powders, fluorescent pigments, etc.



In the drawing, we observe with an angle of incidence $> 49^\circ\text{C}$, there is total reflection; the edge of the bubble acts like a mirror



To make the anti-bubble, we use a container and a straw with a diameter of 4 mm, which we place in the solution (composed of water and detergent). By closing the top of the straw with your finger, you lift the straw slightly above the surface of the liquid and then release it, allowing the solution to fall into the straw and creating the anti-bubble.



SCIENCE ON STAGE
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Review Science on Stage festival 2024

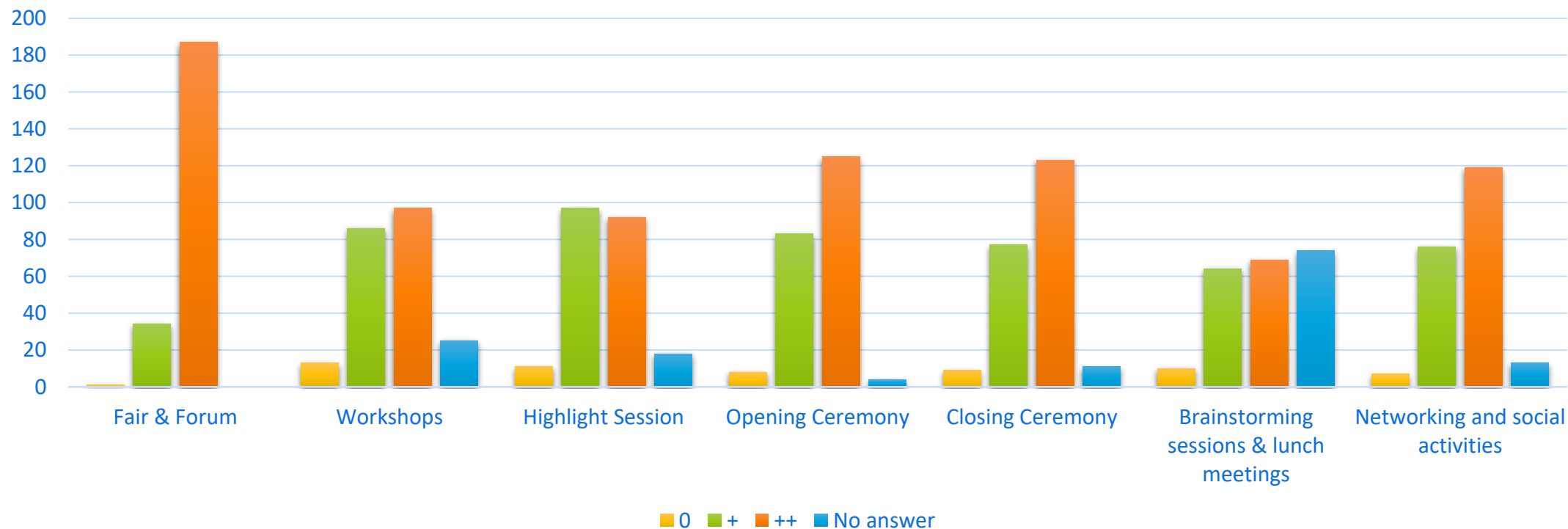
- ▶ “I take the chance to share with you my particular gratitude for your effort promoting science at this high level.
As a science communicator (in my region), I daily meet teachers and students and what is really missing is just motivation, in both of them.

And **the best way to boost motivation is meeting and sharing with colleagues**, something that AI will never provide educators with, whilst SonS does. David told us many times, and if I look back to my career **the Sons festivals have been the highest point in terms of enthusiasm, eagerness to learn, sharing and talking about science.”**

Federico Andreoletti, Italy

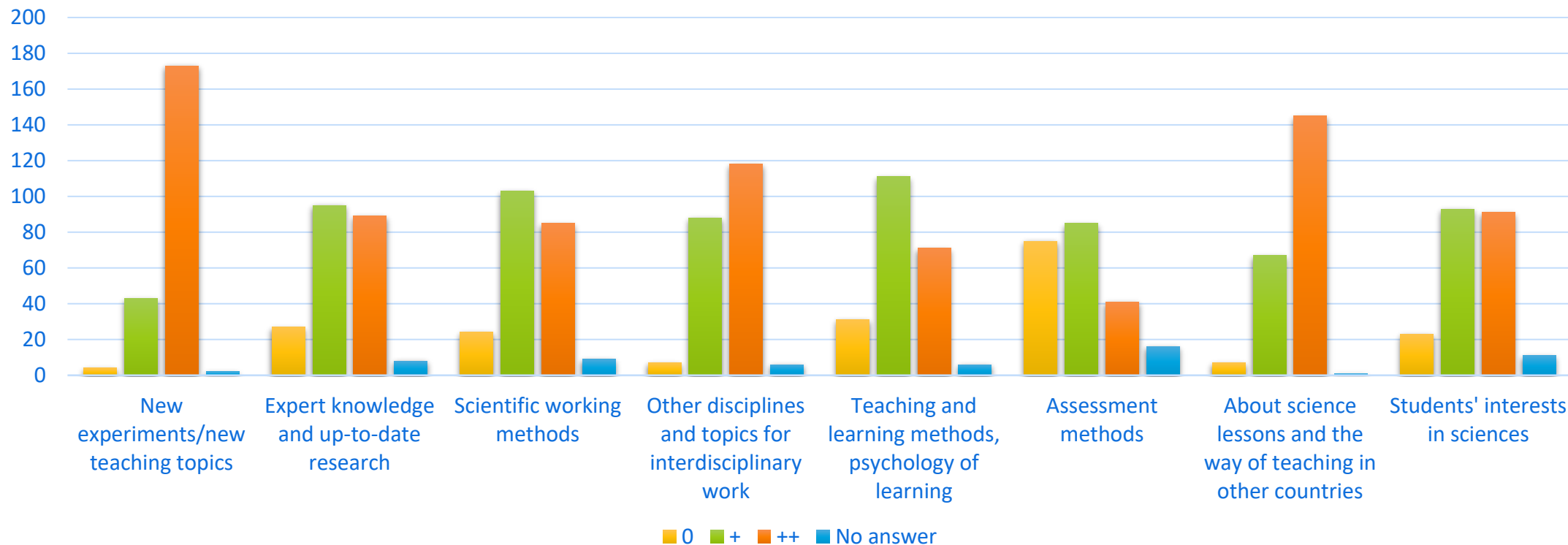
Results of the posttest

Please rate the following components of the Science on Stage festival
2024



Results of the posttest

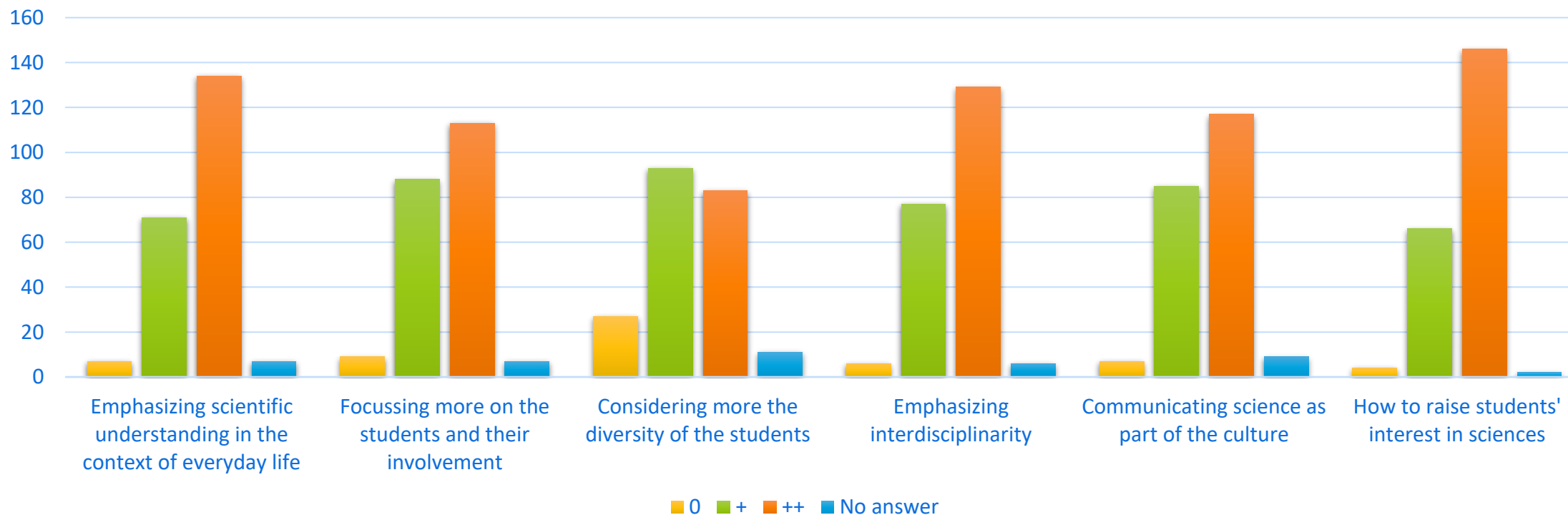
Through my participation at the Science on Stage 2024 festival I increased my knowledge in



*Results without ranking the statements. Detailed results are analysed in the long-term evaluation (approx. 9 months after the festival).

Results of the posttest

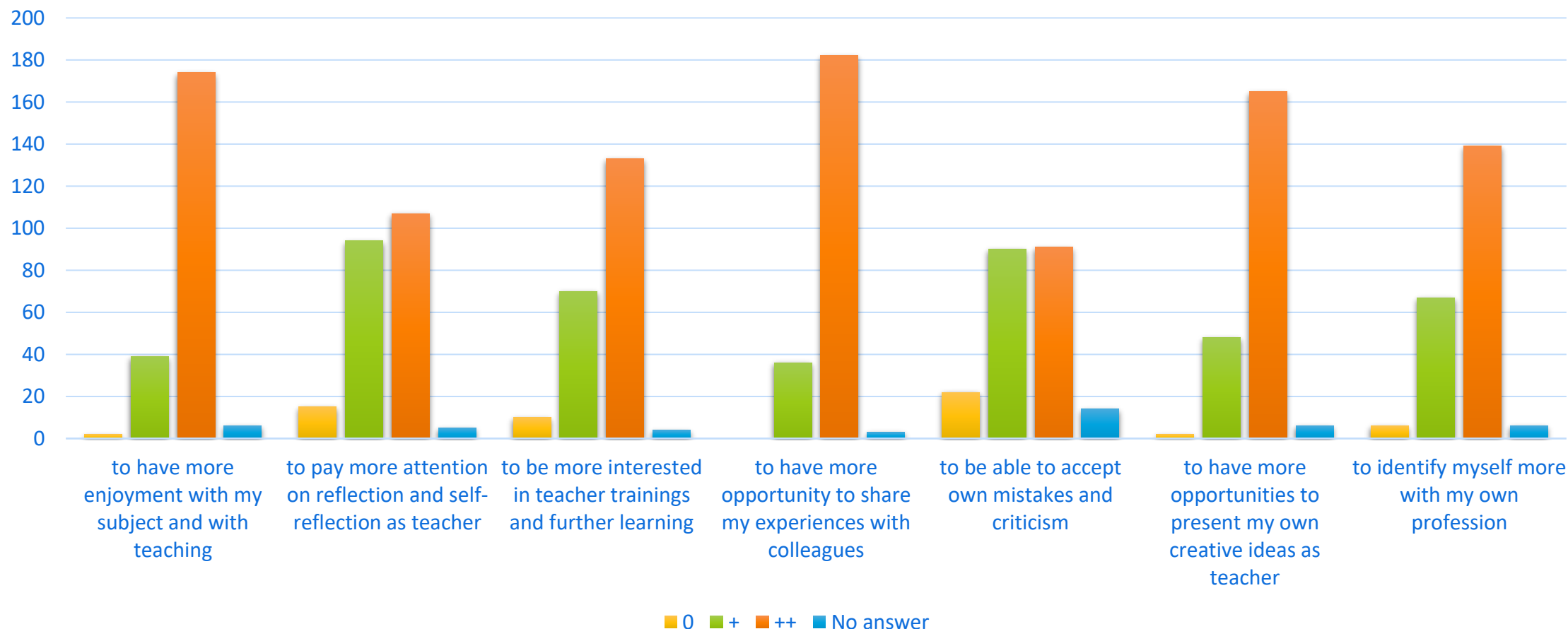
Through my participation at the Science on Stage 2024 festival I got new inputs on



*Results without ranking the statements. Detailed results are analysed in the long-term evaluation (approx. 9 months after the festival).

Results of the posttest

The Science on Stage 2024 festival helps me



*Results without ranking the statements. Detailed results are analysed in the long-term evaluation (approx. 9 months after the festival).

National festivals 2023

- ▶ Selection of national delegations for the European Science on Stage festival 2024
- ▶ 26 member countries had organised a national festival
- ▶ 8 organised a written selection procedure
- ▶ SonSEu provided a flyer template for the countries
- ▶ Shared via SonSEu website at www.science-on-stage.eu/national-events as well as via Social Media

Virtual events & webinars by SonSEu 2024

Date	Event
5 February	Webinar "Science for all: Breaking barriers and building bridges"
7 February	Webinar for NSCs - how to prepare your delegation for Turku
20 February	Webinar for delegates for #sons2024
22 October	Webinar: AI in STEM Education – New teaching resources for younger students
14 November	Webinar: Save our nature - Let's explore together!
27 November	Webinar "It's not magic, it's science you don't see Part 7"

National activities

- Conferences, materials, workshops and webinars...
- Tell us about your national events so that SonSEu can promote them!

FROM OUR COUNTRIES 07.11.2024

SonS Ukraine looks back at the summer 2024

The summer of 2024 passed rather fast and of course, the highlight of the summer end had been the International Science on Stage Festival in Turku, Finland. That became a really impressive event for all STEAM teachers. Ukrainian participants (the best teachers from our country) came to their cities overwhelmed with ideas for new projects and possibilities for the new collaborations with their colleagues from Europe. Together with the Institute for the Modernization of the Content of Education (Ministerial Structure of Kyiv), it was decided to organize an All-Ukrainian online Seminar on September 24, 2024, where the SonS members demonstrated their projects so the best projects from their colleagues from Europe. The point is that we have never missed the chance to spread our absolutely positive emotions concerning the Fair of STEM teaching innovations. There were 157 followers (from 15 Ukrainian Regions) during that two-hour event, and it was greeted by outstanding Mr. David Featonby.

SonS Italy at the Mirabilandia amusement park teacher seminar

On Sunday 13 October, the annual seminar for teachers was held in the Mirabilandia amusement park. More than twohundred teachers participated. On that occasion, the activities of Science on Stage were presented, a video shot in Turku was shown and the project "A Cup of Coffee" by Giorgia Messori and Susanna Zoboli, awarded at the past European Science on Stage festival in Turku, was presented.



© Science on Stage Italy

A prize for Food, Cooking and STEM

A group of secondary school students and their teacher Nuria Muñoz, who is an ambassador of Science on Stage, participated in an International Science Fair, called 'Open Science Cambre' that took place in Cambre, A Coruña (North of Spain) on the 21st and 22nd of September. A hundred projects were presented by more than 400 participating students and 100 teachers from all over Spain, Turkey, Mexico and Colombia.

Nuria and her students presented the teaching material Food, Cooking & STEM and did various experiments from each book. They also gave the public the opportunity to download the books through a QR code. This project was a success among the audience and was highly valued by the jury, which awarded one project for each SDG. Food, Cooking & STEM was awarded with the SDG 2 ZERO HUNGER AWARD.

The OPEN SCIENCE CAMBRE is a fair organized from STUDENTS to STUDENTS. The educational resources are free. Science is shared and disseminated, in which citizen science has a great role. Therefore this fair is the ideal setting to spread the word about Science on Stage and its teaching materials.

National activities

- Translation of the Irish festival booklet in German and French

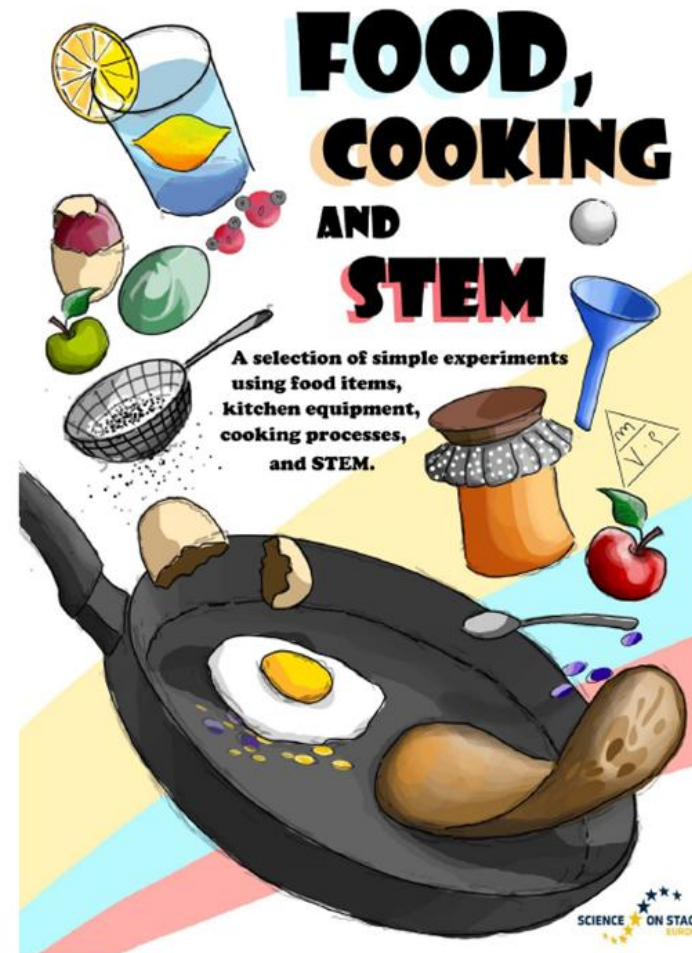


Adaptation et traduction française.
Science On Stage Belgique.
Grâce Urbain & Philippe Wilock



National activities – Food, Cooking and STEM

- ▶ Food, cooking and STEM
- ▶ Hands-on experiments
- ▶ Follow-up from the Prague festival
- ▶ Available on our website
 - ▶ Six editions are already published
 - ▶ Section 1: Experiments with Food Items
 - ▶ Section 2: Chemistry
 - ▶ Section 3: Eggs-Experiments
 - ▶ Section 4: International STEM Recipes
 - ▶ Section 5: Kitchen Gadgets
 - ▶ Section 6: Smart Leftovers
 - ▶ To contribute: da.featonby@gmail.com



Outlook new project: Money Experiments

- ▶ Experiments you can do with money (paper and/or coins)
- ▶ Starting in 2025
- ▶ We will put more information on the SonS website
- ▶ If you are interested to contribute, contact David:
da.featonby@gmail.com

National activities

- ▶ Resources “The Science behind Magic”
- ▶ Magic "tricks" which are in fact demonstrations of hidden science
- ▶ Experiments for different age groups which encourage students to engage with science on a different level and introduce a sense of wonder
- ▶ By Adrian Allan, David Featonby, Paul Nugent, Rute Oliveira



National activities – AI in STEM Education

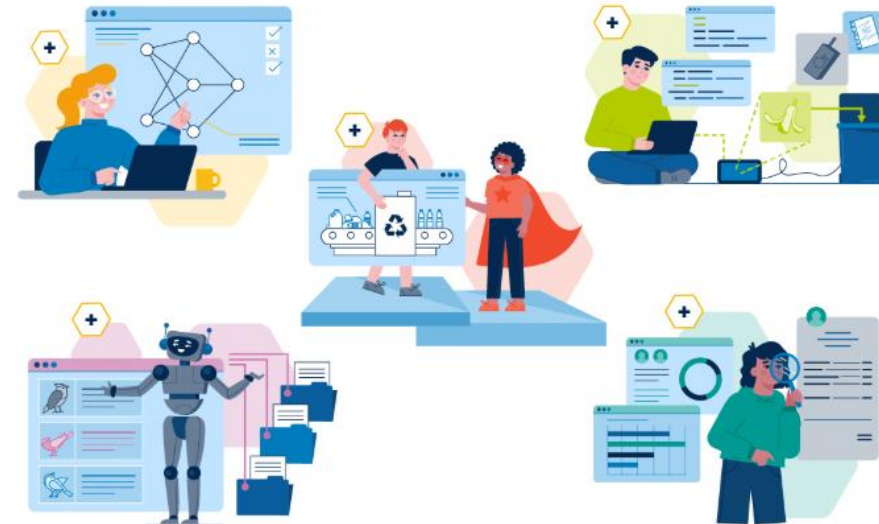
- ▶ Online resources AI in STEM Education
- ▶ Teaching units for beginners and advanced
- ▶ From primary to secondary school
- ▶ Understanding, applying and coding AI
- ▶ Open Education Resources
- ▶ Supported by: 

future >>
engineer



[Back to main page](#)

AI in STEM Education
Understanding, applying, coding



National activities – AI in STEM Education



Machine Learning in School →

- SECONDARY SCHOOL
- MATHEMATICS, COMPUTER SCIENCE
- MACHINE LEARNING, ARTIFICIAL INTELLIGENCE

Interactive learning units on artificial neural networks



Recycling Smart →

- SECONDARY SCHOOL
- NATURE AND TECHNOLOGY, COMPUTER SCIENCE
- ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, CODING, ROBOTICS, SUSTAINABILITY

Constructing and coding a smart recycling system



First Steps in AI and Data Analysis →

- PRIMARY SCHOOL, SECONDARY SCHOOL
- NATURE AND TECHNOLOGY, PRIMARY SCHOOL, SCIENCE, MATHEMATICS, COMPUTER SCIENCE
- ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, DATA ANALYSIS

Getting to know Big Data and generative AI



STEM Resources 4.0 →

- SECONDARY SCHOOL
- NATURAL SCIENCES, MATHEMATICS, BIOLOGY, COMPUTER SCIENCE, CHEMISTRY
- ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, CODING, STEAM

Creating educational resources in class using AI



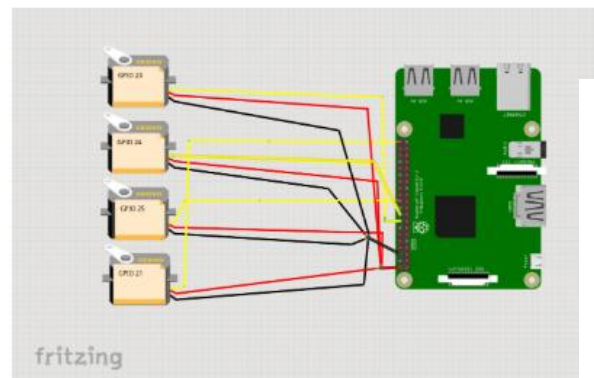
EcoKids Teach AI →

- PRIMARY SCHOOL
- NATURE AND TECHNOLOGY, PRIMARY SCHOOL, SCIENCE, COMPUTER SCIENCE
- ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, CODING, SUSTAINABILITY, ROBOTICS

Making recycling fun with AI superpowers

Step C: Robotic design

Coral USB, which can accelerate machine learning, can be connected to any USB port on Raspberry Pi. Similarly, the webcam is connected to the USB port. The servo motors are connected to Raspberry Pi as follows: The black cables of the servo motors are connected to GND on the Raspberry Pi, the yellow cables are connected to the GPIO pins (23, 24, 25 and 21) specified on the servo motor, and the red cables are connected to 5V.



© Selçuk Yusuf Arslan/Science on Stage
The circuit from Step C: Robotic design

Task 2 – A virtual learning space

A VR environment/metaverse will be created (visit [EcoKids VR space via Frame](#) to view an example). In this space, the teacher uploads songs and interactive games about recycling for students to test their knowledge of waste separation. There are also videos about AI and visual programming. Here, students upload their photos dressed as EcoKids and showcase all the activities promoted during the project. It's like a world of EcoKids that they can explore even while at home with their families.



© Cláudia Meirinhos

Quantum Computing in STEM Education

- ▶ International project launched in spring 2024 by Science on Stage Germany
- ▶ 20 teachers from 15 countries develop teaching material
- ▶ Publishing in 2026
- ▶ Teaching material testers wanted to ensure applicability in class
- ▶ Information:
www.science-on-stage.eu/quantumcomputing



Save our Nature – Let's explore together

- ▶ International project with 15 primary school teachers
- ▶ Experiment and explanatory videos for teachers to show experiments and scientific phenomena
- ▶ Additional materials containing experiment guides and worksheets, as well as explaining the scientific background to the experiments
- ▶ Includes aspects on differentiated learning, career orientation in primary schools and the connection to sustainability
- ▶ Publishing by Science on Stage Germany early 2025



National activities - Resources

- ▶ Many printed resources still available
- ▶ Coding in STEM, Football in STEM, Smartphones in Science Teaching, different languages online available
- ▶ Order at info@science-on-stage.eu
- ▶ Recorded webinars in our YouTube channel



National activities - Resources

- Good practice examples from the European Science on Stage festival 2022

Finding Water in the Universe







Overview

- PRIMARY SCHOOL
- ASTRONOMY, PHYSICS, BIOLOGY, CHEMISTRY
- FESTIVAL
- ENGLISH

Activity 1: Modelling of the origin of water on Earth

Materials

Plastic film
Soil
Two trays

Method

1. With the help of plastic film, we simulate the meteorites by making small balls with clay, some soil and water. Then we place them in the freezer overnight to solidify.
2. We prepare two trays with soil. We throw "the frozen meteorites" in one of the trays. The tray which has had the impacts, increases in mass, when compared to the other tray.
3. Once "the meteor shower" is over, we cover that tray with plastic film and place it in the sun. The water evaporates and gets condensed on the film, thus simulating the existence of water in the atmosphere.

Activity 2: Water collection by combustion

Materials

Paper
A large glass or metal container with a lid
Matches/lighter

Method

1. We burn some paper in a container.
2. We place ice on the lid and hold it over the fire so that the heat will reach it, but not the flames.
3. After a few seconds, we are able to observe the water droplets that form on the lid.

Important note: Students need to work under the supervision of the teacher and in accordance with fire safety regulations.

Competitions – Final Future League

- ▶ Competition for teachers and students: Projects for the realization one or more of the 17 UN Sustainable Development Goals
- ▶ 10 finalist teams (primary and secondary school) from 9 countries
- ▶ Event took place 24 November 2023 in Berlin
- ▶ Proudly supported by SAP, organized by Science on Stage Germany



Competitions – AI Challenge

- ▶ Competition for teacher and student teams
- ▶ Application deadline: **23 February 2025**
- ▶ Develop a project with your students and document the implementation in English in the form of a poster and short film (max. 2 minutes)
- ▶ www.science-on-stage.eu/ai-stem-challenge
- ▶ International final on 6 June 2025 in Berlin
- ▶ Organised by Science on Stage Germany
- ▶ Supported by Amazon Future Engineer



Teacher exchange – Take a Workshop – Grant for NSCs

- ▶ Criteria
- ▶ Inform your delegates about Teacher Exchange
- ▶ Think of inviting a teacher from the festival in Turku to present his/her project in your country



Programming grant

- ▶ Possibility for **grant application € 175**
- ▶ for seminars and workshops aiming at teachers' professional development in the field of coding
- ▶ cover expenses such as travel costs for speakers and material costs for the event
- ▶ www.science-on-stage.eu/project/coding-our-future
- ▶ Organised by Science on Stage Germany
- ▶ Supported by Amazon Future Engineer



National activities

- ▶ Report from Latvia



National activities

- Report from Switzerland



National activities

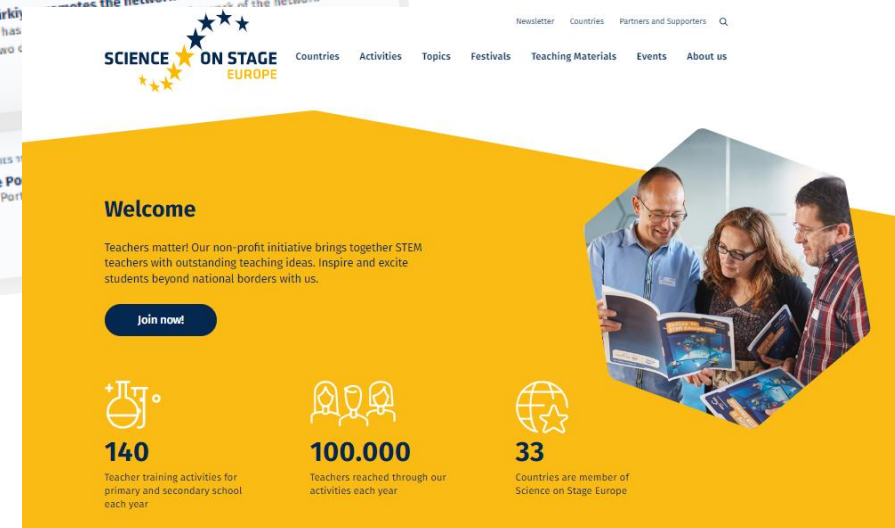
- ▶ Report from Belgium



PR for Science on Stage

Websites

- ▶ SonSEu website
 - ▶ Constantly updating
 - ▶ Feedback & input welcome
 - ▶ Your countries side
- ▶ Your own national country website



National country websites



European ambassadors

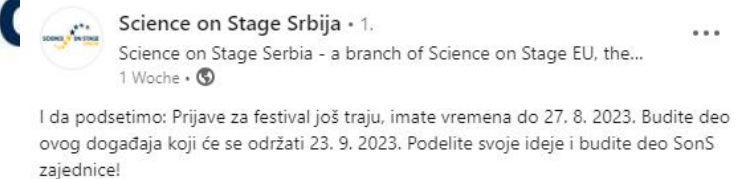
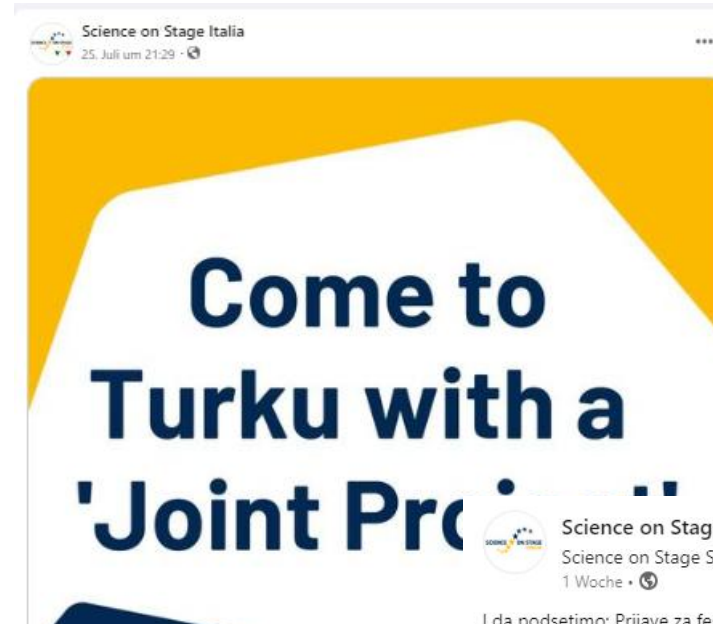
- ▶ SonSEu Ambassadors
 - ▶ Rute Oliveira, Portugal
 - ▶ Marco Nicolini, Italy
 - ▶ Selçuk Yusuf Arslan, Turkey
 - ▶ Jane Shimizu, Ireland
 - ▶ Astrinos Tsoutsoudakis, Greece
 - ▶ Kulvinder Kaur Johal, UK
 - ▶ Nuria Muñoz, Spain

The European Ambassadors are willing to help with projects and events in countries other than their own to support the aims of Science on Stage.



Newsletter & Social Media

- ▶ Keeping your target group up to date
- ▶ Upload pictures and videos
- ▶ Share SonSEu content or content from other member countries
- ▶ Use provided content
- ▶ Or be part of our social media work



Partnerships

Partnerships

- ▶ Main supporter:

- ▶ Federation of German Employers' Associations in the Metal and Electrical Engineering Industries (GESAMTMETALL)



- ▶ Further supporters:

- ▶ Vernier Science Education



- ▶ Amazon Future Engineer



Partnerships within EU projects

- ▶ EU STEM Coalition



- ▶ Code4Europe CodeWeek. 

- ▶ Exchange with European Commission



Priorities for 2025

National festivals and preparation for #sons2026

- ▶ **Guiding themes**
- ▶ STEM for the youngest
- ▶ STEM education for sustainable development
- ▶ AI in STEM education
- ▶ Equity and inclusion in STEM education
- ▶ Self-directed learning in STEM education
- ▶ Career Orientation in STEM Education
- ▶ Low-cost experiments in STEM education
- ▶ Collaborative projects
- ▶ STEM for Teachers in Training

National festivals and preparation for #sons2026

► Criteria

- An ideal Science on Stage project:
 - is from teachers for teachers,
 - promotes inquiry-based learning,
 - has a high relevance to everyday life
 - is easy to implement in everyday school life and can be financed with reasonable means
 - promotes education for sustainable development (ESD)

Privacy

Privacy

- ▶ Subject matter and objectives of the GDPR:
 - ▶ Protection of the fundamental rights and freedoms of natural persons and their right to the protection of personal data
- ▶ Protection of individuals regarding the processing of personal data.
- ▶ Exception: processing of personal data carried out exclusively for personal and family activities
- ▶ Relates to every member country of the European Union
- ▶ Effective May 25, 2018
- ▶ Complete guide to GDPR compliance: <https://gdpr.eu/>

Privacy for NSC activities

- ▶ When organising events/workshops, etc.:
 - ▶ Give detailed information for which purpose you collect the data (registration info),
 - ▶ How long you will store it and,
 - ▶ If data is transferred to third parties:
 - ▶ Give information to which party (e.g., hotel for booking, social media for PR, partners like SonSEu or festival organiser etc.)
 - ▶ Check measures to protect the data (e.g., digital safety measures to protect from external attacks, measures that protects you from unintended deletion, backups, processing documentation, etc.)
- ▶ Privacy statement at national website and also at social media channels
- ▶ **Check information that are given on websites of the government or national data protection authority (many templates available).**

Thank you for your attention



THE EUROPEAN NETWORK FOR SCIENCE TEACHERS

Main supporter:



Further supporters:



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