

CoSA – Center of Science Activities

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Developed and designed by FRida & freD – Das Grazer Kindermuseum and the Natural History Museum, Universalmuseum Joanneum

In cooperation with AVL List, Energie Steiermark, Gesundheitsfonds Steiermark, Graz Tourismus, IV Steiermark, Kammer für Arbeiter und Angestellte für Steiermark, Magna Automotive, Mayr-Melnhof Holz, SFL Engineering, Stölzle-Oberglas, WKO Steiermark.
The Augmented Reality model project was supported by: Klaus Tschira Stiftung.

After a four-year planning period, the Frida & freD - Das Grazer Kindermuseum and the Universalmuseum Joanneum have created jointly the *CoSA – Center of Science Activities* at Natural History Museum. The *CoSA* is a science center, in which technology and the natural sciences can be experienced in an extraordinary way. The target group for visitors is primarily youngsters from 12 years of age. The Science Center is being installed on nearly 1200 m² and 12 rooms on the first floor of the Natural History Museum in the Joanneum Quarter. 13 specially designed thematic areas enable science and technology to be experienced directly by visitors. In Graz for the first time, and uniquely throughout the world, knowledge can be experienced on 250 m² of space by means of Augmented Reality and Gamification. This model project is sponsored by the Klaus Tschira Stiftung.

The idea

The Science Center *CoSA* stands for an easily accessible, interactive and entertaining passing on of knowledge. The goal is to enthuse young people above all for interaction with technology and the natural sciences. The center aims to succeed in tapping into youngsters' daily lives, stimulating them to act and participate themselves. Science is to be communicated on a broad basis.

Getting hands-on

The methods used to teach technology and the natural sciences will be highly varied, but what they have in common is an approach to the themes that is hands-on: the emphasis is always on participating and being pro-active.

Augmented Reality – first time in Graz for everyone, unique worldwide

Over 250 m² floor space, CoSA A(R)dventure is dedicated to the storytelling based use of Augmented Reality. Thanks to the support of the Klaus Tschira Stiftung, which has devoted itself to the promotion of the natural sciences, mathematics and computer science, it has proven possible to realise a future-oriented project promoting the conveyance of knowledge by means of AR story-telling and gamification. Users move between the real and virtual world in order to solve the tasks. The CoSA is assuming a leading role globally when it comes to combining interactive exhibits with AR technology. What's special, too, is that in Graz 18 AR

glasses are in use at the same time. With these special spectacles one immerses oneself in an extended, multi-dimensional world. Up until now, this technology was employed almost exclusively by industry, for example, to test developments or to simulate situations. Through the deployment of Augmented Reality glasses in a museum environment, the Klaus Tschira Stiftung aims to promote young people's interest in science in the long term: they become participants who experience an adventure, thereby discovering a new avenue to acquiring knowledge.

Why does Graz need the Science Center CoSA?

The first Science Center was opened in San Francisco in 1969. Yet in Styria, aside from schools, there are virtually no other offerings that convey science to youngsters and make them aware of it in a practical way. The *CoSA* is thus an essential building block in the future sectors of research, innovation and technology in Styria, helping to consolidate the region as a business and economic location.

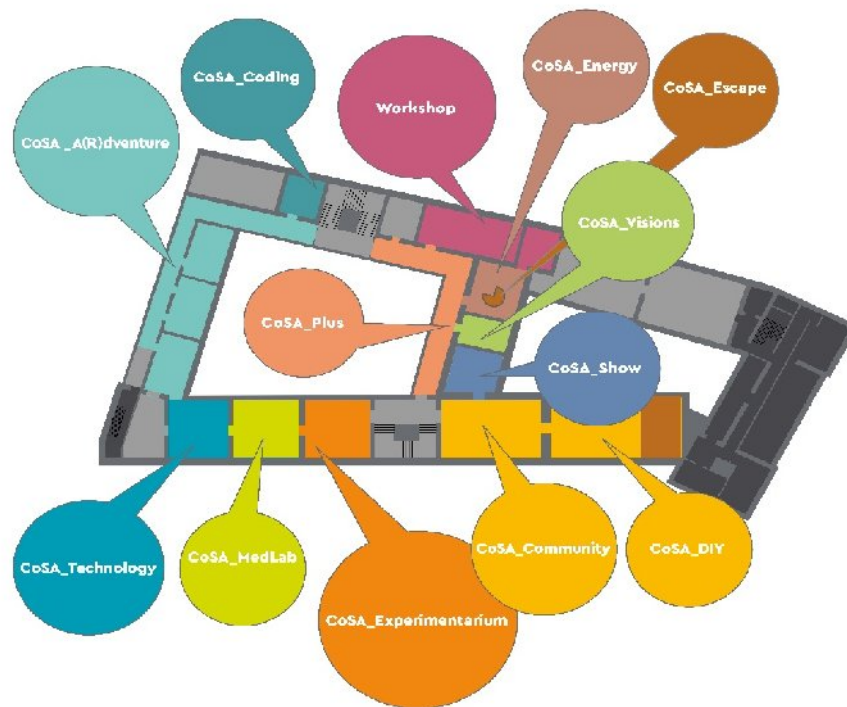
At CoSA, we ...

- help people to overcome inhibitions of deal with complex scientific or technical topics.
- make topics of science and technology accessible at different levels.
- get people enthusiastic about science and technology.
- make science and technology easy to comprehend.
- motivate people to engage in science and technology with a lasting effect.
- get people to think in a solution-oriented way and to act responsibly.
- get visitors to think creatively and to think out of the box.
- show the target audience how to reflect on issues and challenges.
- raise awareness of key challenges of the future.
- get people ready for the future.
- get young people to opt for careers in science and technology.

Areas of knowledges and themes

At each of the entrances to the 13 areas, several questions are put to the visitors as a form of introduction to that room's theme. For each area, the – unusual – motto applies: 'Visitors are encouraged to touch the exhibits', for the emphasis here is on the unhindered exploration of technical and scientific connections and phenomena. Visitors are also informed as to how much time is needed for each respective area.

There are two overarching themes: one deals with ethical questions surrounding knowledge, research and technology, the other deals with career opportunities in the science and technology sectors. In addition, outdoor activities are planned, which will bring science to the broader population and make folks want to learn more about the Science Center *CoSA*.



CoSA_A(R)dventure

With 18 Augmented Reality glasses available simultaneously, visitors can immerse themselves in strange worlds over 250 m² of space. The glasses are combined with hands-on exhibits, and a story guides users through three rooms: *Temple of Rain*, *Aurora Borealis* and *Habitat Red 6*. In these areas, which depict a Maya temple from the past, an arctic research ship from the present day, and a habitat of the future, you move continually between the real and the virtual world. Visitors are aided in solving the puzzle by the AR robot H.I.G.G.S. (Hyper Intelligent Guiding Gadget System) and slowly learn interesting facts about the causes and effects of climate change.

CoSA_Coding

The CoSA_Coding area enables you to do your own programming and so to create digital spaces. It serves as a zone for experimentation, a place to meet people involved in programming, gamification and biohacking. Moreover, events and competitions (e.g. hackathons) in cooperation with the TU Graz are in the pipeline, among other things.

Workshop

The Workshop is a venue to deepen your scientific and technical knowledge and discover something new, a place to try things out and experiment. Both the CoSA and the Natural History Museum hold workshops here, offering continual programmes on geosciences, biodiversity and the environment, or on the themes of light and robotics. In this, visitors are accompanied by an 'interactive, smart host' called ISAAC, which constantly takes measurements in this room on volume, temperature, air humidity etc., informing workshop participants on these data.

CoSA_Energy

The 17 'Sustainable Development Goals' are currently being widely talked about, and in the CoSA_Energy room, there is the chance to find out through play the effects of one's personal behaviour and ways to make the world a better place. The results of a total of seven stations are stored on a lightbulb token and can reflect one's own actions. At the interactive stations for the themes of 'energy', 'mobility', 'smartphone', 'clothes', 'packaging', 'food' and 'leisure time', you can analyse your own purchasing behaviour, take a closer look at your travel habits, or go on a bike ride through Graz. The 'Planet:We' object hanging from the ceiling – which also serves as a globe to take selfies in – reflects visitors, stimulating one to consider one's own actions. In CoSA_Energy, the visitor discovers facts and alternatives, learning more about how global goals affect us all.

CoSA_Escape

The historical show mine in the Joanneum's main building can still be visited, though it has been integrated into the CoSA and now plays the role of an 'escape room'. The goal is to solve tasks using different scenarios that enable one to leave the room. This will open year-end 2019 and is concerned with resources from the past, present and future.

CoSA_Visions

In this section, the questions of where we come from and where we are heading towards are examined, as is mankind's inquiring mind. By means of a video installation filling an entire room, we are transported to those regions as yet largely unexplored and untouched by humans: the deep ocean and outer space. Visitors are invited to day-dream, to conjure up visions, to lose themselves in time and place.

CoSA_Show

Here physics and chemistry experiments are carried out, which visitors can take part in. The various experiments are packed in several stories – so, for example, in 'The Concert' we accompany two conductors, one female and one male, who face certain challenges on a concert evening and who are given support by a janitor with scientific knowledge. The diverse thematic focal points ensure both fun and entertainment. And that includes the chance to join in – with surprises included!

CoSA_Plus

This special exhibition area mounted along the corridor contains varying presentations that show implemented examples and results from science, research and technology. At the opening, patrons, endorsers and sponsors will explain their personal motives for supporting CoSA.

CoSA_DIY

Here you can actually try out everything, both with the available materials and the support of a DIY expert on hand to offer tips and tricks. You can also bring your own materials and work on your own or under guidance in workshops. The location provides working spaces for you to try out sawing, soldering, working with wood, metal and much more besides. At the same time the DIY room serves as a venue for swapping ideas with other DIY enthusiasts, visitors, and experts, too.

CoSA_Community

This space not only invites you take a break, network, brainstorm or chill; it also establishes links to scientific institutions, companies and universities. Guests present their ideas here; school pupils write their pre-university essays. At the terminal titled 'What's the right job for me?', jobs in the natural sciences are presented, and youngsters can discover their talents and interests by taking a careers test. Under the motto of 'Courage is rewarded', young entrepreneurs and their ideas are presented on their success. These examples aim to encourage others to be bold and to show that it's also possible to set up your own company with a good idea.

CoSA_Experimentarium

On the basis of 45 experiments, visitors delve into the absurd 'Cabinet of Knowledge', an invitation to browse and do research. Here, in a playful manner, you can learn intriguing facts from physics, chemistry and mathematics and acquire historical knowledge, illustrated by means of classic examples of scientific phenomena. The new insights gained range from an encounter with Schrödinger's Cat and an aquarium with genetically modified fish to optical illusions. Something extra's on offer in this room: experiments can be recorded at six photo stations and immediately sent to your mobile phone as a memento.

CoSA_MedLab

Dip into the world of medical research and slip into a new role as a doctor, laboratory assistant or scientist: based on different scenarios, the challenge is to recognise illnesses and what triggers them, to understand human body functions, and to develop methods to heal patients. Those interested can 'do the rounds', take blood samples, carry out examinations, do research in the lab and make diagnoses. In this way, various methods, procedures and facts are revealed, as are the people behind these processes, too. It's not only having to disinfect one's hands at the entrance and the white doctor's gown that gives this area the feeling of a hospital. There are also surgical instruments such as microscopes and interactive medical methods of analysis that can be tried out. One of these surgical tools enables the smallest and most careful interventions and is used in minimally invasive healthcare. This was developed specially for the CoSA in collaboration with Selmán Uranüs and the Medical University of Graz.

CoSA_Technology

The ideas and innovations of technicians have long brought many achievements to mankind. Many of those arose through trial-and-error, successes or failures. In this room you are instructed in how to develop a vehicle yourself; you learn the individual components and at the end can carry out a virtual test. Only then will it come out whether the wagon wheel made of wood was really a good choice for a car with an electric motor, for example. The theme of bionics reveals why nature is often a good model for technical innovations. Concerning the vehicle's design, you can engage with questions about individual needs as they apply to mobility. In a Future Chat, you can exchange ideas with other visitors and reflect on issues of mobility in the future.