Herzlich willkommen!
Welcome!

WELIOS® - The unique hands-on museum in Wels - an extracurricular educational facility in Wels – The Science Center in Wels

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Biomass

Solar energy

Hydropower

Wind energy

Geothermal energy

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RENEWABLE ENERGIES

1. **Solar Energy**: Utilization of sunlight for electricity and heat generation.
2. **Wind Energy**: Use of wind power to generate electricity through wind turbines.
3. **Hydropower**: Utilization of the energy from flowing or falling water sources to generate electricity.
4. **Biomass**: Use of organic materials (such as wood, plant waste) to generate energy through combustion or fermentation.
5. **Geothermal Energy**: Utilization of Earth's heat for electricity generation or direct heating.
6. **Marine Energy**: Utilization of energy from ocean waves, currents, and tides to generate electricity.

- These renewable energy sources help reduce greenhouse gas emissions and contribute to sustainable energy supply.

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Jouli experiments…

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WELIOS® - Goals

Education

- Awaken interest and enthusiasm for science and technology in people of all ages
- Raise the level of education: Leisure activities away from TV and Playstation, smartphone
- Discover and promote talents
- Sensitising people to energy and the environment

Economy

- Future prospects for the environment and technical professions
- Strengthening training centres in Upper Austria for technicians and scientists
- Partner of schools/technology & business

Tourism

- Enrichment of Upper Austria with an attractive tourist attraction

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WELIOS® - In general

- Unique science centre in Austria
- Extracurricular educational facility
- Cooperation with industry: for permanent and special exhibitions, workshops, promotion of young talents
- Approx. 180 hands-on exhibits
- 3,000 m^2 of exhibition space on the topics of science and technology and in particular "renewable energies“
- Number of employees: approx. 15-20 → always looking for new employees & interns
- Number of visitors: approx. 40,000 per year

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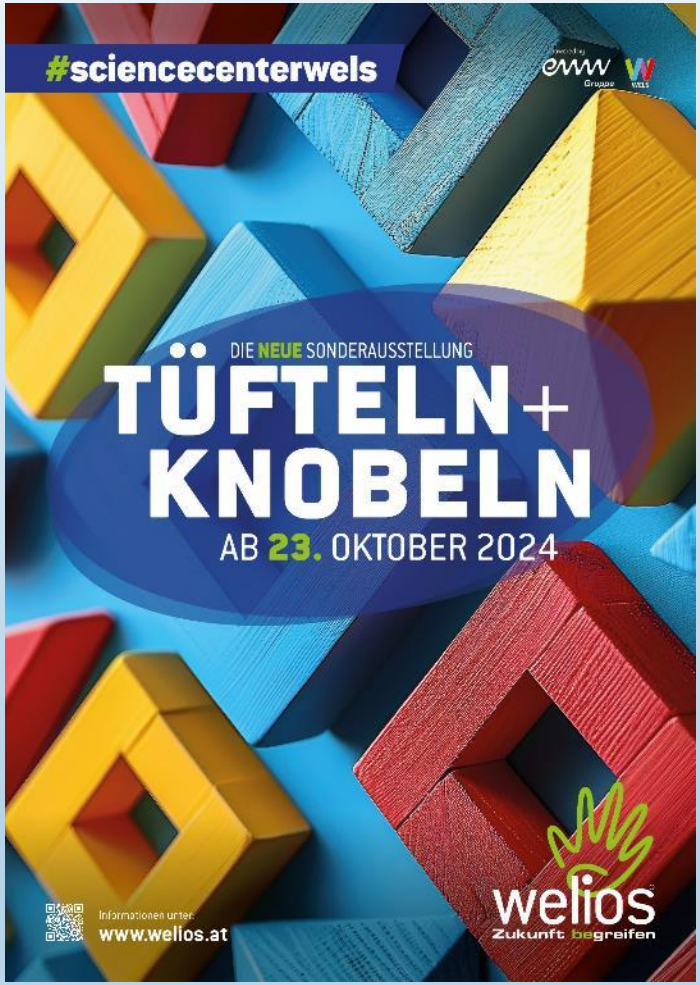
WELIOS® - Structure



1st exhibition floor

Permanent exhibition

- Room of illusions
- Mathematical centre
- IT science corner
- „Construction site“

2nd exhibition floor

Permanent exhibition

- Road of flying
- Electrical island
- Photovoltaic + wind energy
- „EinzigARTig“ - Uniqueness

Ground floor: Special exhibition

- *Coming soon:*
  Fiddling + Puzzling

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EXPERIENCE
science & technology

Tell me and I will forget it.

Show me and I might keep it.

Let me do it and I will be able to do it.

(Lao Tse, old Chinese saying)

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Why are you here today?

Teacher learning activity:

1) Get to know methods to involve all pupils in the lessons.
2) Especially foster the talented ones.

How can a museum/science center help?

1) Pupils are not in school. experience, social event, different guides, reflected information
2) Big exhibits, big and real paintings, …
3) Different approach to topics than in school

Example:

 There is one big global problem: **climate change**

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What can we do?

Not only combating and fighting the climate change, but

PREVENTION!!!

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WORKSHOP - How to explain climate change?

Climate change is the greatest challenge of the 21st century and is therefore also a decisive issue in the lives of all people.

According to a **joint publication by the *German Climate Consortium*** (DKK; December 2023), the German Meteorological Society, the German Weather Service, the Hamburg Extreme Weather Congress, the Helmholtz Climate Initiative and Klimafakten.de, there are **five core pieces of information on climate change**:

1) It is real.
2) We are the cause.
3) It is dangerous.
4) The experts agree.
5) We can still do something.

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WORKSHOP - How to explain climate change?

- Activity 1 - The Earth in the Solar System: What makes our Earth a habitable planet?
- Activity 2 – The Earth is irradiated: Why is the Earth not getting hotter and hotter, even though it is constantly exposed to the Sun?// What role do ice surfaces play in the temperature of the Earth?
- Activity 3 – The Earth, a Radiating Planet: Can we make the heat radiation of the Earth visible?// Which materials are transparent to visible light, which to infrared radiation?
- Activity 4 – The Keys of the Earth's temperature: What influence do greenhouse gases have on the Earth's temperature?

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WORKSHOP - How to explain climate change?

- Activity 5 – The Effect of Greenhouse Gases: What effect do greenhouse gases have on the Earth's temperature?
- Activity 6 – The Rise in Sea Level: How does climate change lead to a rise in sea level?
- Activity 7 – Climate Zones and Climate Change: How do the Earth's climate zones develop and what impact does climate change have on their expansion?
- Activity 8 – The Oceans as a Climate Buffer: How do the oceans protect us from even greater climate change?
- Activity 9 – The Acidification of the Oceans: Why does CO_2 make the oceans acidic and what are the consequences?

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WORKSHOP - How to explain climate change?

- Activity 10 – Consequences of Ocean Warming: Why does ocean warming increase global warming?
- Activity 11 – Tipping Points: When the Climate Changes…: Will climate change at some point be unstoppable?
- Activity 12 – Tipping Points: Achilles' Heel in the Climate System: What are tipping points and how are they connected?

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WORKSHOP - Examples

- Oceans How they are involved?
- CO_2 Effect of this gas
- Infrared radiation passing or not passing
- Equilibrium state of earth
- Albedo effect
- Temperature graph

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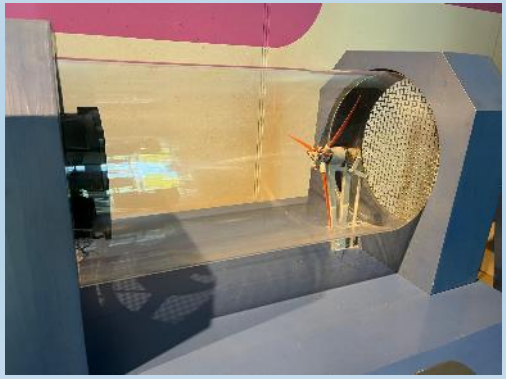
But: How can we use the exhibits in the museum?

- Photovoltaics
- Wind energy
- Memory game about the CO_2-footprint of food



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But: How can we use the exhibits in the museum?

- Let pupils play and explore!
- Let them ask questions!
- Let them do research work!

  (Technologies, social effects, …)

- Explain what we can do!

Be positive!

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Welios: Offers for schools

Worksheets

- Independent engagement with selected exhibits using the knowledge paths for different school levels
- Opportunity for teacher preparation through free admission and the provision of these materials

Workshops

- Focus on mathematical, experimental and programming workshops
- Special exhibition workshop
- Age-appropriate

Science Shows

- Light, Rockets, Nitrogen, Acoustics

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Welios: Extracurricular offers

Talent promotion

- in cooperation with Talente Upper Austria

Scientific talks

- TeaTime

Birthday parties

School vacation programs

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Advantages for talented learners?

Advantages for talented learners?

- Work at their own pace
- Combine things: text from school with exhibit/workshop

- Teachers can foster them
  - Research work: background information
  - Work sheets
  - Give explanationsto exhibit/technology

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Now you!

- Short introduction to the exhibition.
- Working in small groups of three-four people with work sheets „Milestones in the history of science“
- Develop new work sheet.

Hint: You will not find all explanations in English. If you do not understand an exhibit, please ask or use another one.

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Now you!

- Extra task:

- Find 2-4 exhibits, combine and title them with a question that fits your teaching subjects and/or is relevant to everyday life.
- More challenging: Exhibits are not allowed to be in the same group (like mathematics, flying, informatics, …)!

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WELIOS® - Questions???

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