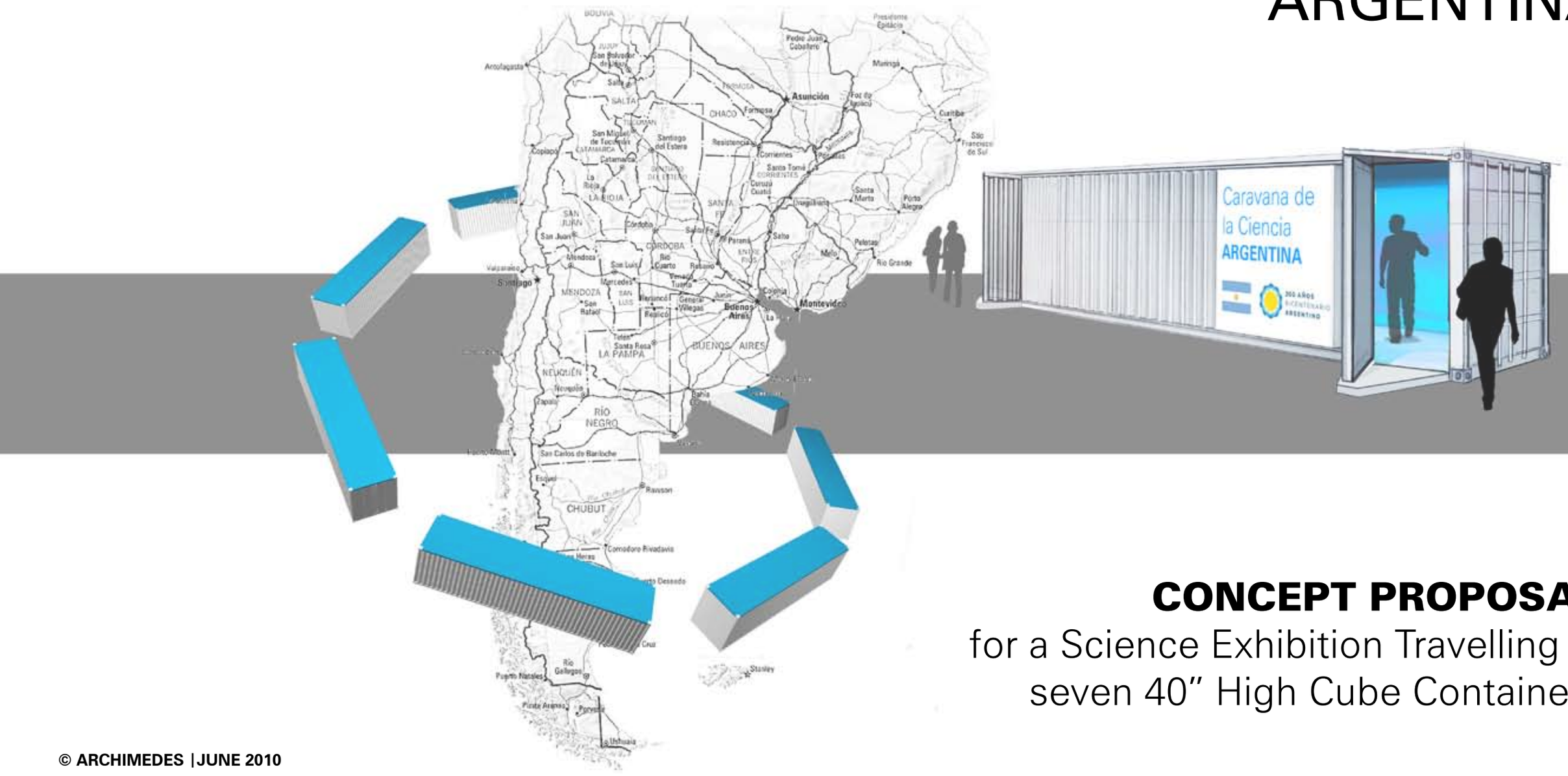
ARCHIMEDES

200 AÑOS
BICENTENARIO
ARGENTINO

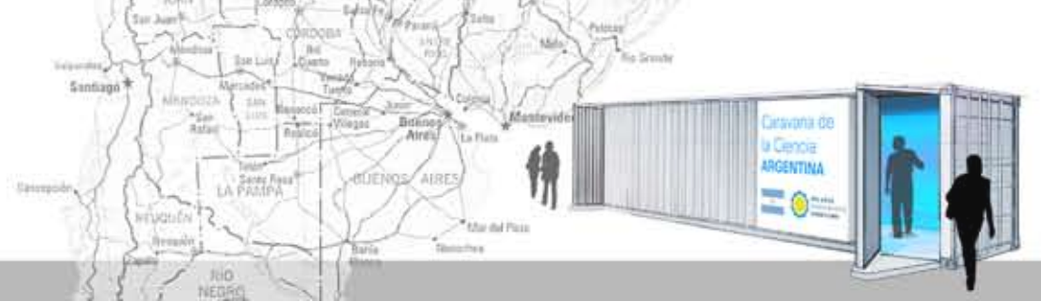
CARAVANA DE LA **CIENCIA**

ARGENTINA



CONCEPT PROPOSAL

for a Science Exhibition Travelling in
seven 40” High Cube Containers



THE CARAVAN

The Caravana de la Ciencia Argentina is an interactive science exhibition showcased in seven 40“ high-cube containers.

The 40“ high-cube containers offer a flexible solution for Argentine transport conditions; they can be transported to the exhibition venues by rail or lorry; the exhibition can be visited on platforms at railway stations; or in squares in the town centres, where the containers can be positioned in a variety of different ways.

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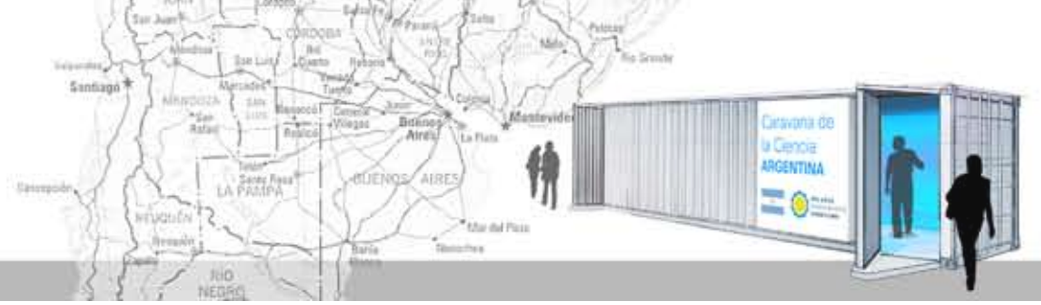
The seven containers provide a total area of 189 m². The dimensions of a standard 40“ high-cube container are approx. 12 m x 2.4 m x 2.9 m, creating 27 m² of exhibition space in all.



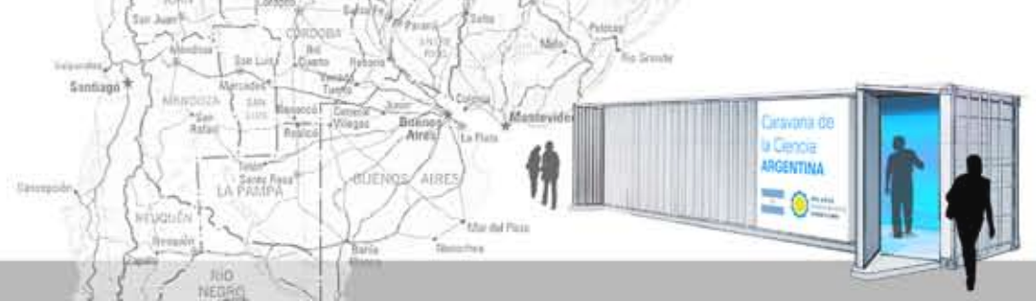
THE CONTAINER CONTENTS

The first container forms the welcome area and information centre, where the visitors are greeted and informed about the exhibition and how to use it. Furthermore, the container also has room for a little office for the travelling team and storage space for consumables and replacement materials to keep the exhibition up and running.

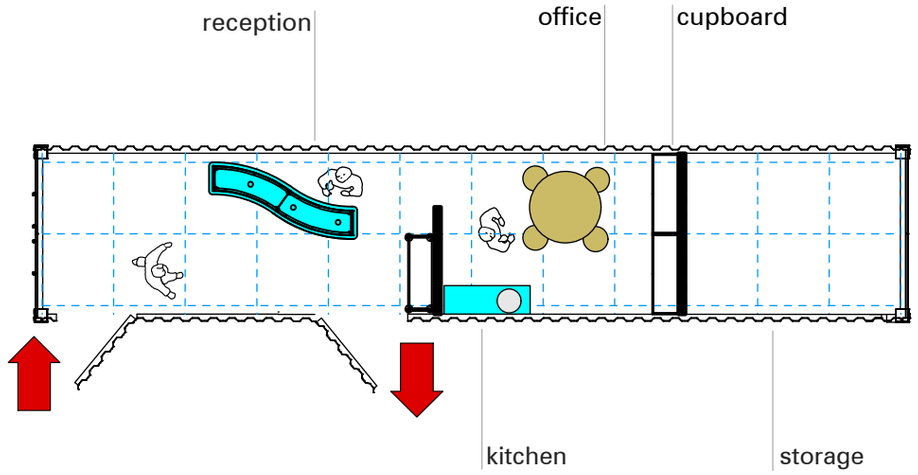
The following three containers showcase themes from the scientific fields of physics, chemistry, biotechnology, communications, and information technology. The interactive exhibition covers both basic knowledge and groundbreaking findings from the research areas. Apart from pictures, films and original exhibits from research facilities, interactive exhibits also communicate basic scientific phenomena, giving the visitors the opportunity to experience topics from the world of science first hand by trying things out for themselves.

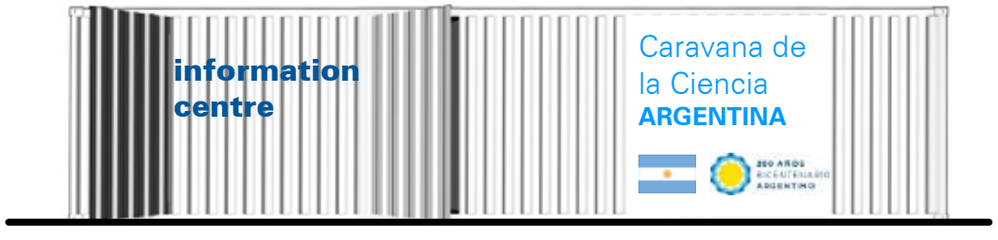
The next container features innovative products and product designs from Argentina. This is where research institutions and companies appearing as exhibition sponsors can participate actively. The section of the exhibition can be used flexibly, i.e. the exhibition and the exhibits are swappable.

In the last two containers, there is a pupils' laboratory and a mobile classroom. The classroom also doubles up as a function and lecture room.



01 WELCOME AREA + INFORMATION CENTRE

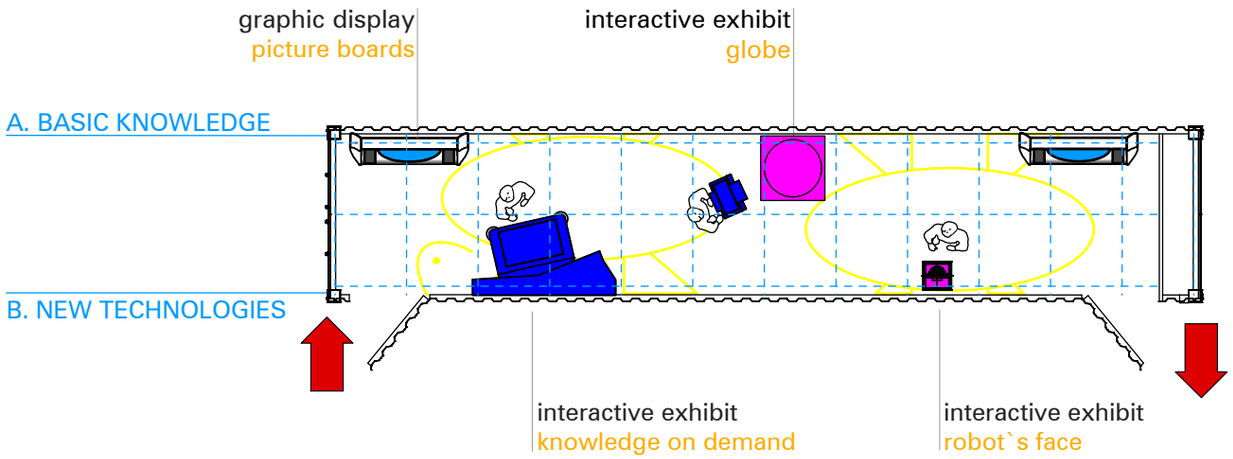




The info cube serves as the entrance to the exhibition where the visitors can find information and get their bearings. Sponsors and organizers showcase themselves with information material and provide information on degree and training opportunities.

A small office area permits the planning and management of the exhibition's administrative side and serves as a staff room; in the rear container, a storehouse provides a storage option for information and consumables.

02 COMMUNICATIONS + INFORMATION TECHNOLOGY



Extensive communication networks span our globe, be they radio networks or cables for telephone or data traffic, and making the exchange of data faster and more global has become a feature of our daily lives. Information technology is closely linked to communication technology.

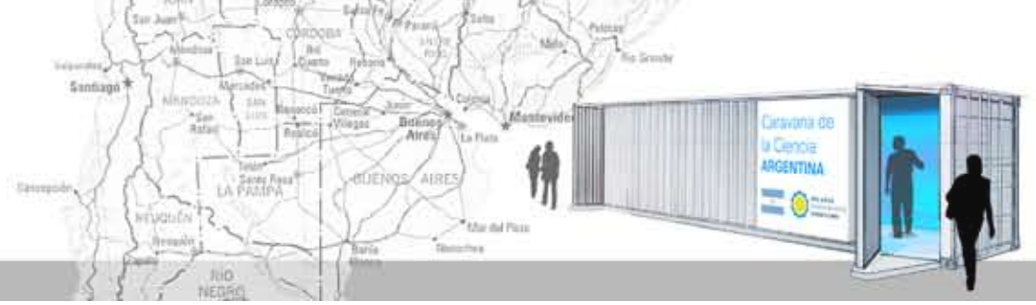
Themes

A_BASIC KNOWLEDGE

- Communication technology: data transfer techniques demonstrated using fibre optics
- Computer technology: transistors and semiconductors

B_NEW TECHNOLOGIES

- The future of the WWW
- Navigation satellite systems
- Computer chips: faster and faster the smaller they get?
- Artificial intelligence: robotics



02 COMMUNICATIONS + INFORMATION TECHNOLOGY

C_EXAMPLE EXHIBITS

- Globe exhibit: global data paths

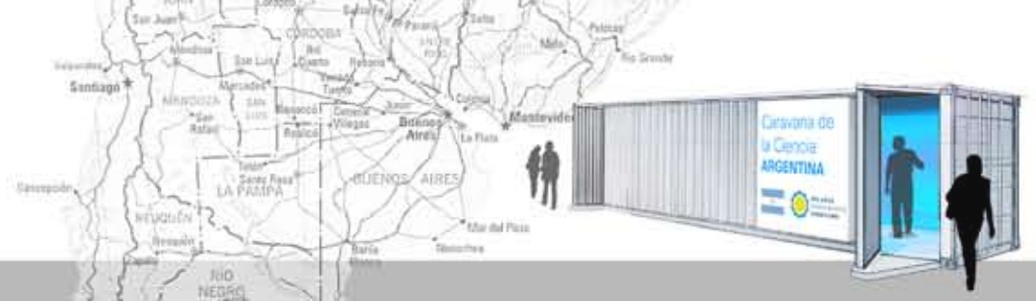
A large rotating globe displays the often complicated data paths all around the world; the visitor selects web-sites on a touchscreen and can follow their transmission paths on the globe.

- Robot face

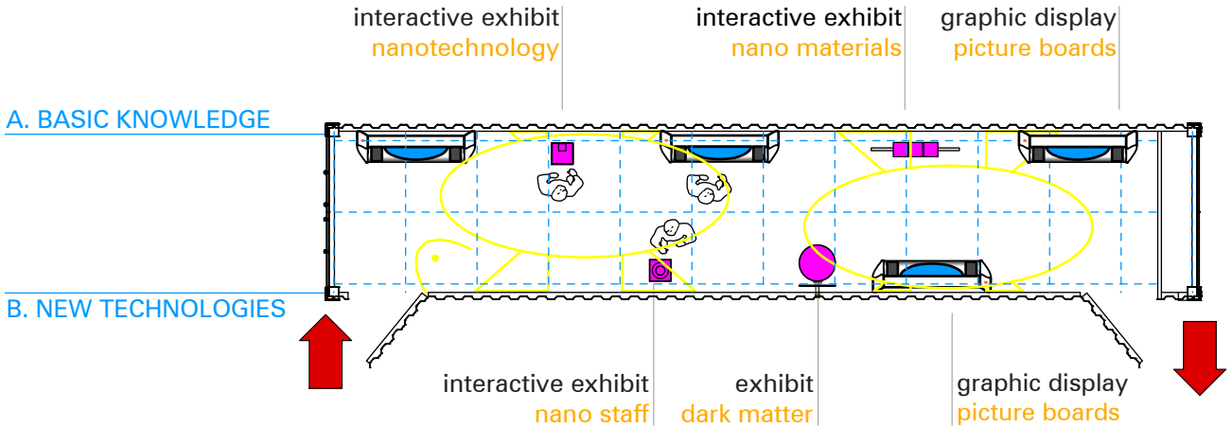
A robot face complete with the main features interacts with the visitor; the robot “recognizes” the different expressions of the visitor with the aid of a camera and is able to mimic them.

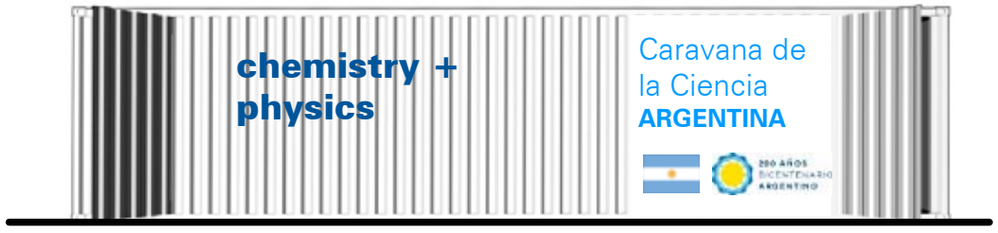
- Knowledge on Demand

The internet of the future will be an “Answer Machine“, a personal assistant. Ever new tools help to unlock manifold sources of knowledge. This development that has already started is demonstrated on an interactive table that is equipped with additional screens. On the touch sensitive surface, visitors can choose pertinent websites via symbols that will then be depicted on the screens. Several users can interact simultaneously; they pilot the application intuitively through gestures. The symbols on the surface can be moved at will, zoomed into or activated in order to bring further levels of information to light.



03 CHEMISTRY + PHYSICS





Modern physics is devoted to the elementary building blocks of matter and their interactions. At the same time, the subject has close ties with astrophysics and harks back to the question as to the origin of our world. Physics and chemistry converge in the field of nanotechnology; innovative tools and procedures make it possible to manipulate matter on a molecular and atomic scale and produce novel materials.

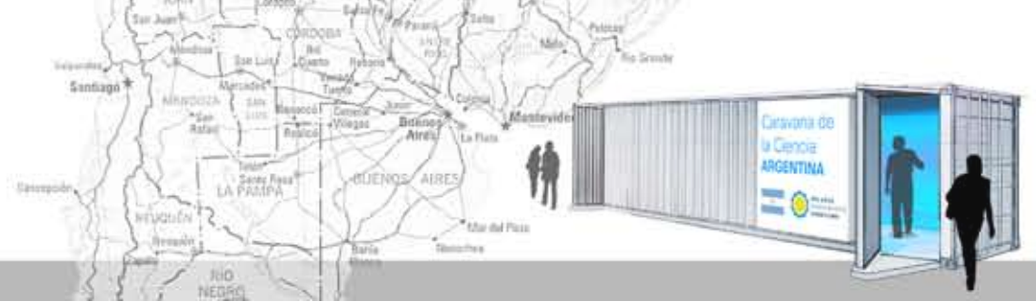
Themes

A. BASIC KNOWLEDGE

- Little and large: space and elementary particles
- How big is an atom? Nanoscale sizes

B. NEW TECHNOLOGIES

- What is the universe made of? Matter and dark matter
- The search for elementary particles: the LHC particle accelerator
- How can atoms be manipulated? (Tools, e.g. the atomic force microscope)
- Nanotechnology: materials with new properties



03 CHEMISTRY + PHYSICS

C. EXAMPLE EXHIBITS

- Children's exhibit: nanotechnology

The children piece together figures using magnetic balls to find out how researchers in nanotechnology build novel materials out of atoms.

- Nanomaterials

Two different cubes display images of nanostructures and the products they are used to produce; visitors have to match each nanostructure to the correct product.

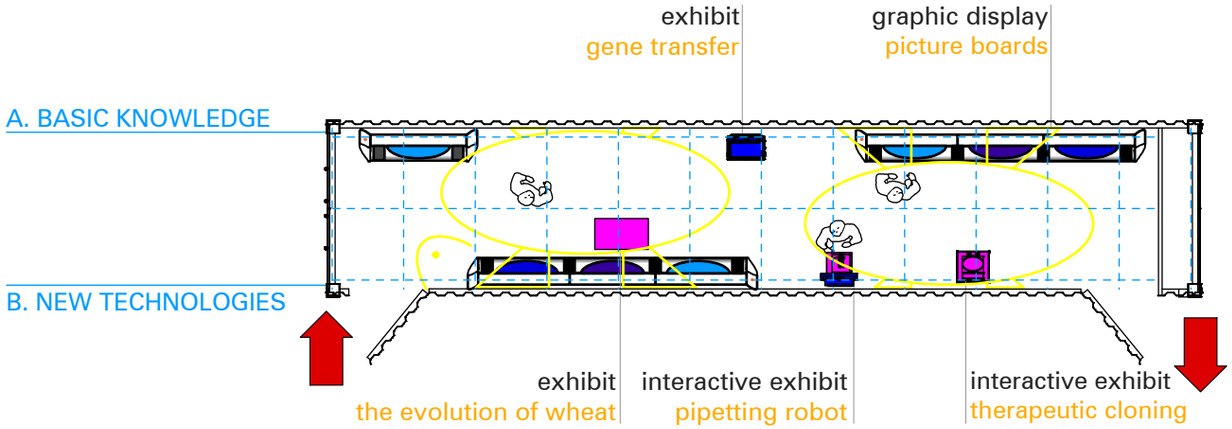
- Nano-ruler

A nano-ruler measures height in nanometres, thus explaining the proportions in relation to the human body.

- Dark Matter

Even if we cannot see it, we know that dark matter exists. In what proportion it stands to normal matter is visualised by this exhibit that shows balls in two colours in appropriate amounts in a container.

04 BIOTECHNOLOGY + MEDICINE



Scientists understand how life is structured and which complex processes are involved better and better. Once the genome had been decoded, the next step was to research how living systems work on a molecular level; the findings are deployed in medicine, such as in biotechnology, for instance, which develops novel procedures to render organisms usable.

Themes

A. BASIC KNOWLEDGE

- What are genes and why do we need them?
- Processes inside the cell (basics of systems biology)

B. NEW TECHNOLOGIES

- New analysis and diagnosis methods: high throughput screening and DNA chips
- Gene therapy
- Individualised medicine: custom-made medication
- Genetic engineering in agriculture

04 BIOTECHNOLOGY + MEDICINE

C. EXAMPLE EXHIBITS

- Animated film about gene transfer

A gene transfer method reveals how plants can be modified genetically.

- Therapeutic cloning

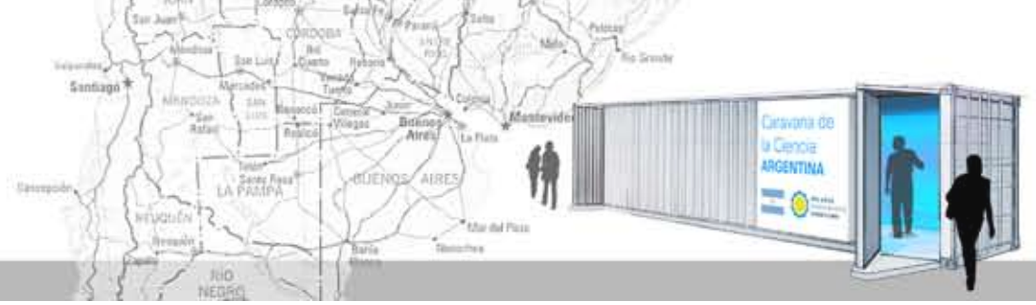
An animated film shows how stem cells could be produced using cloning techniques and how they might be used to help cure diseases in the future.

- Pipetting robot

The exhibit demonstrates how large test series are conducted in labs with the aid of pipetting robots these days; visitors can take on the robots, which fill microwell plates with test substances at high speed, and have a go with a pipette themselves to see how fast they are compared to the machines; a computer calculates the results and displays them on a screen.

- The Evolution of Wheat

How can inconspicuous grains and grain ears be presented in an exhibition? To make the evolution of wheat from the primordial type to its modern form comprehensible, grains are shown in a custom made display case. In it, plant parts are shown in a kind of genealogical tree which illustrates their grade of relation and lines of descent.



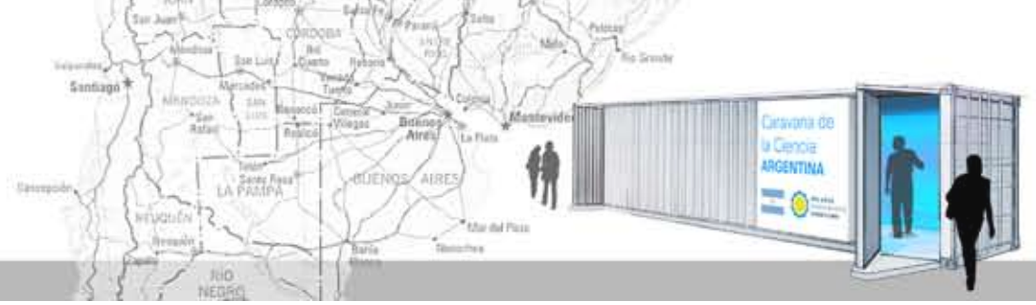
05 MULTI-FUNCTIONAL CONTAINER / EXHIBITION

INNOVATIVE PRODUCTS MADE IN ARGENTINA

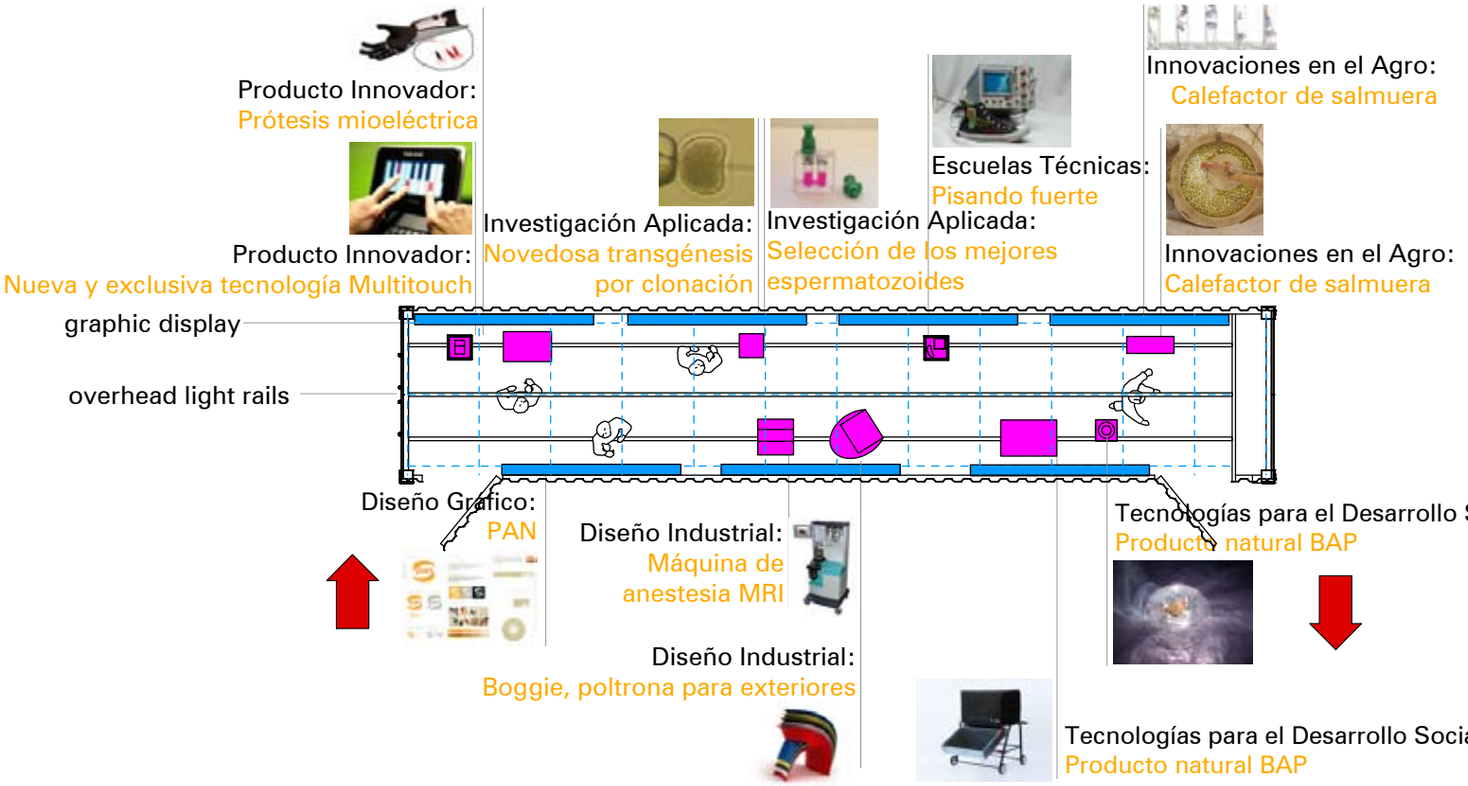
The results from basic research are relevant for everyday life, playing a crucial role in the development of specific products. A range of innovative Argentine products and application technologies are to be showcased in this carriage; for instance, exhibits from the annual event **INNOVAR** and products from sponsors can be integrated here.

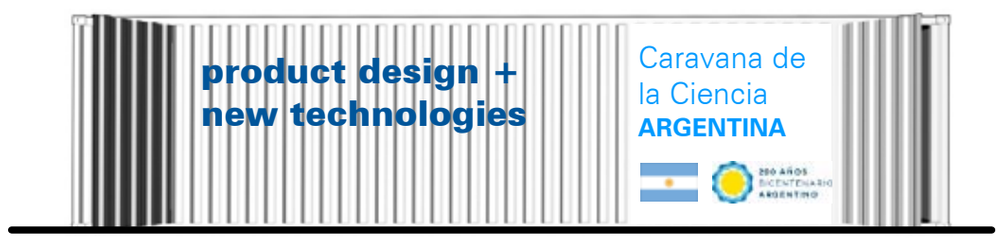
Sponsors and partners can be both Argentine and international companies such as:

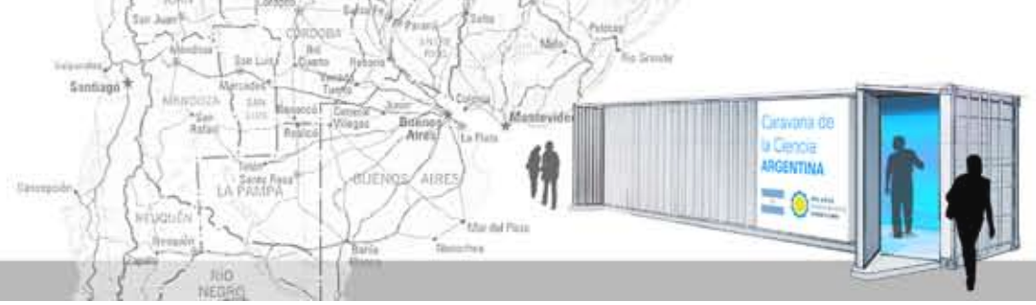
- German companies that have branches in Argentina: Bayer, BASF, Siemens, VW, Robert Bosch, Deutsche Telekom (T-Systems Argentina S.A.), Osram
- German research institutions: Max Planck Society
- Argentine companies
- Argentine educational and research institutions



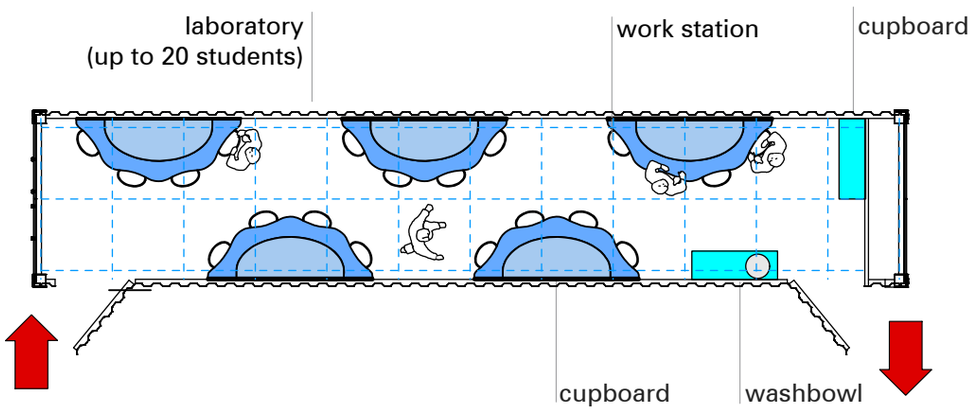
05 MULTI-FUNCTIONAL CONTAINER
E.G. EXHIBITION INNOVAR



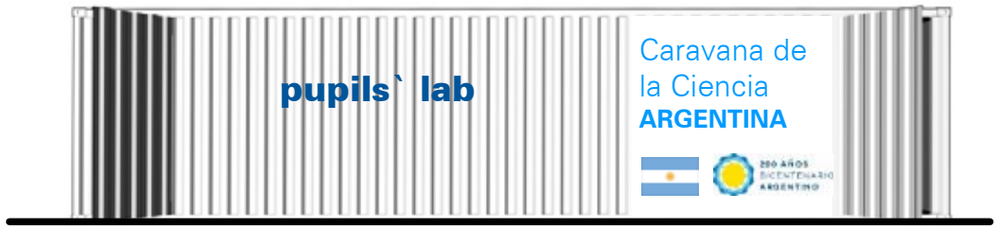




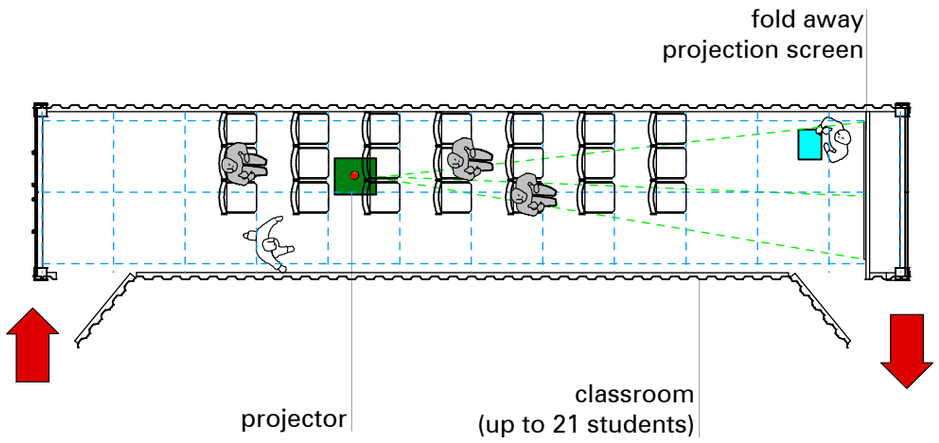
06 PUPILS' LAB



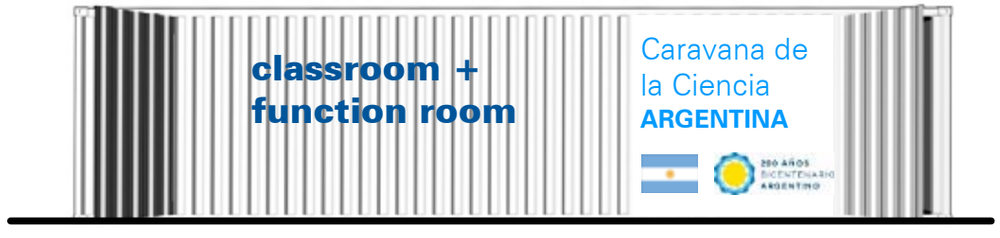
The pupils' lab offers school children an opportunity to conduct experiments on a variety of different topics under the watchful eye of trained staff. Themes taken from the exhibition are demonstrated here in small groups.

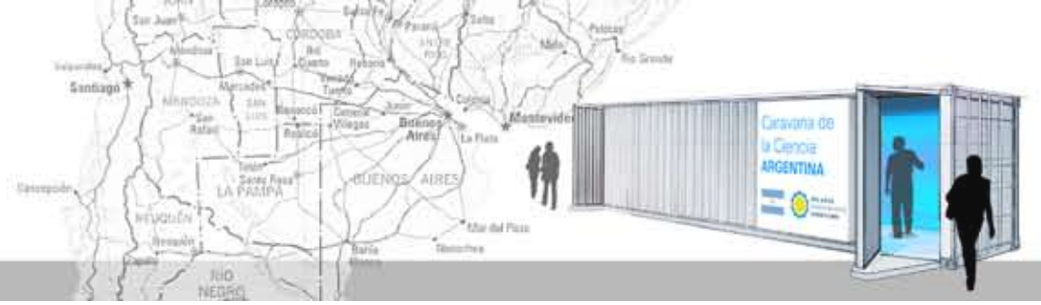


07 CLASSROOM AND FUNCTION ROOM



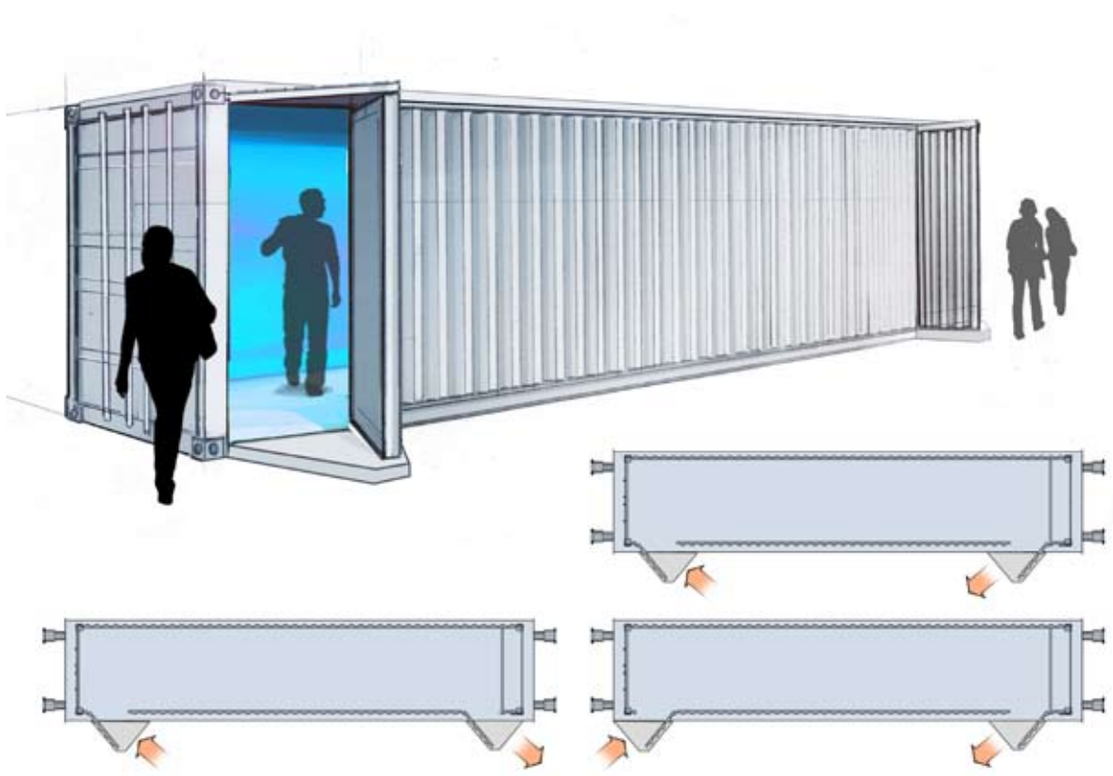
This container is designed as a classroom where pupils and visitors can congregate. Thanks to modern presentation technology, however, it can also host lectures.





THE EXHIBITION CONTAINER

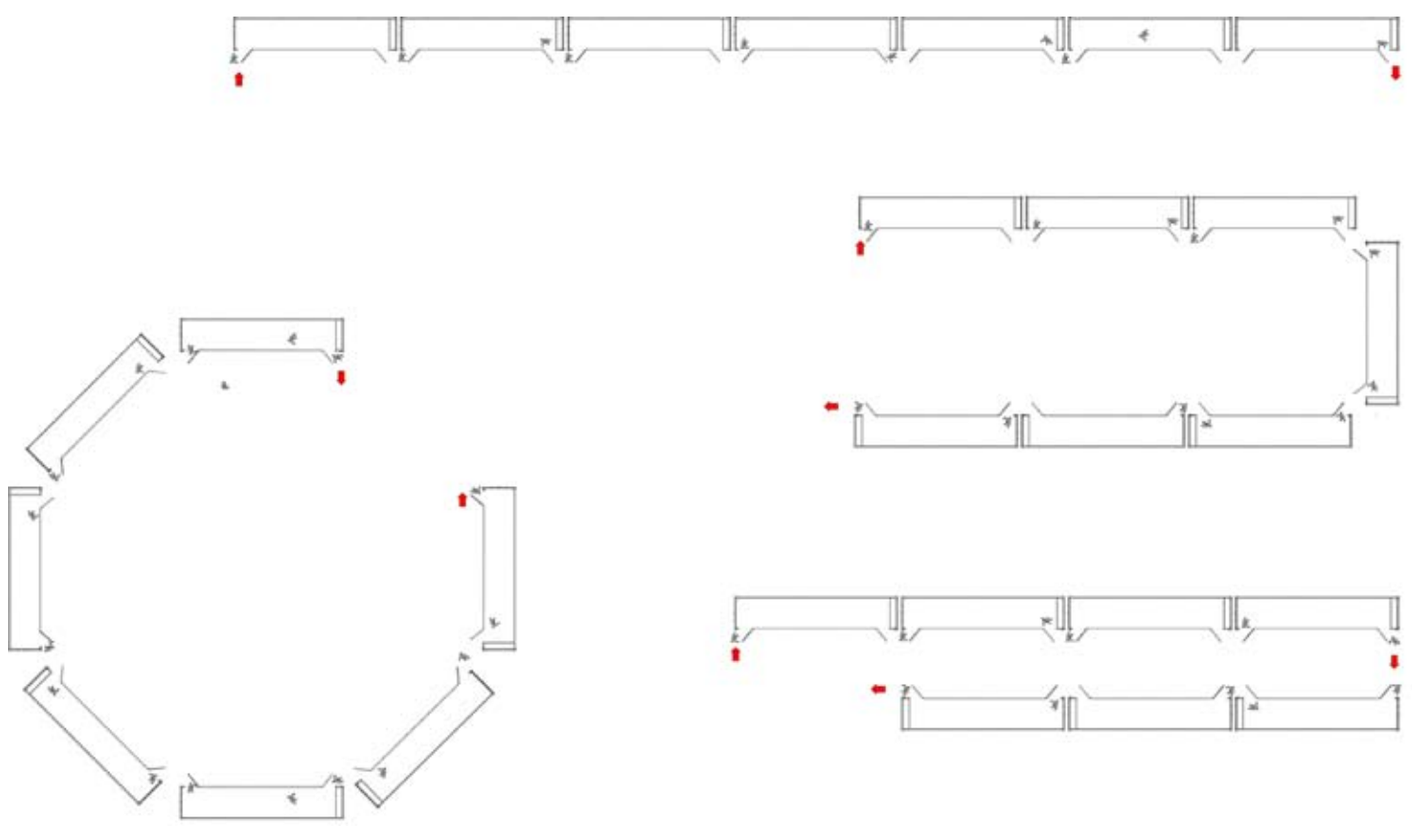
The entrance and exit is designed in such a way that it actively guides the visitor; doors are fitted at the rear and front of one side of the container; the visitors are drawn into the exhibition room through a covered, porch-like entrance that opens out towards them; the doors can open to the left or the right as required to accommodate different spatial requirements or react to wind conditions; the section's text and the title of the container are mounted on the inside of the doors; and flexible staircases that can be adapted to suit the individual site conditions provide for a safe entry.

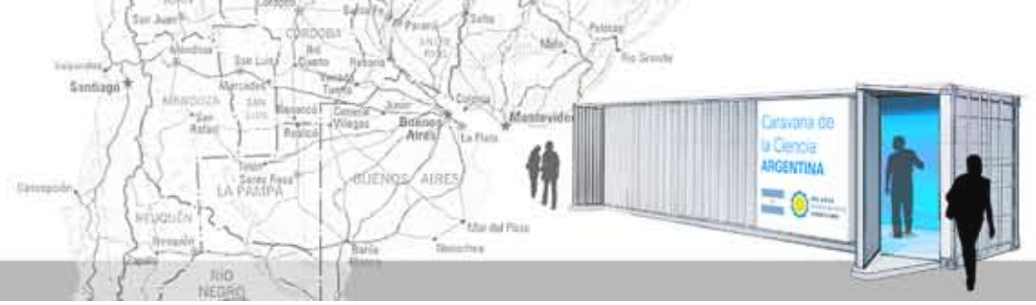


THE CONTAINERS' ASSEMBLY OPTIONS

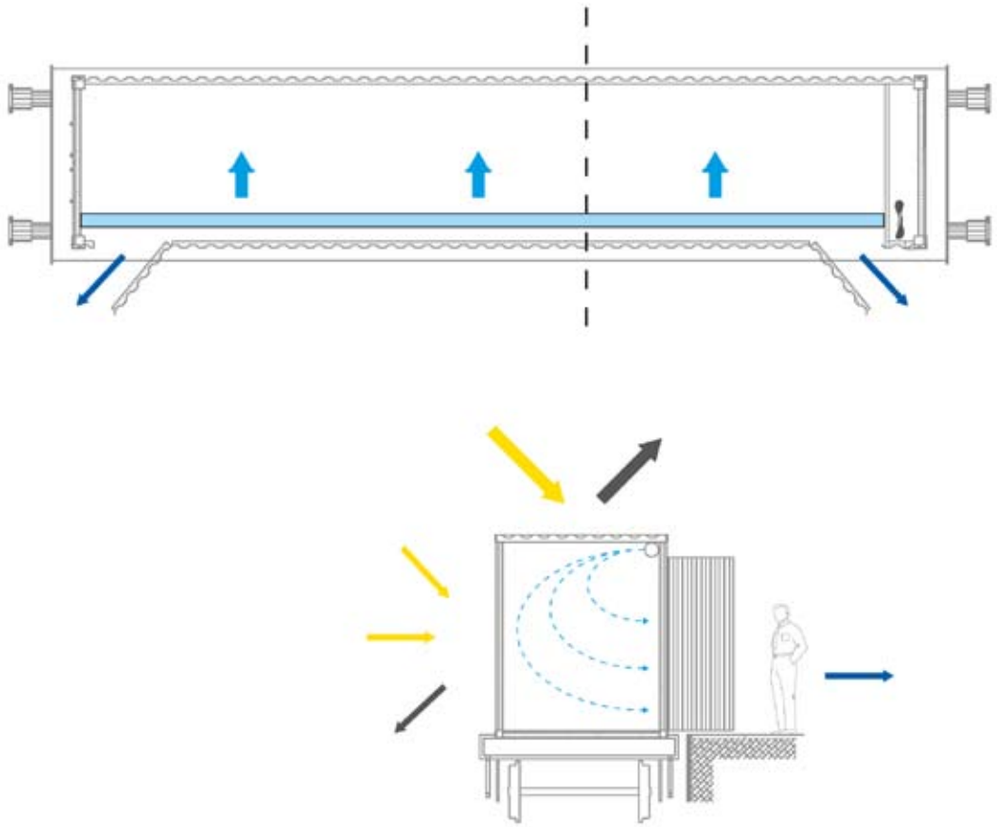
Apart from lining up the containers on a platform, the exhibition rooms can also be assembled variably at ground level depending on the given spatial situation.

The option of having the doors open to the left or right plays a key role in guiding the visitor as it indicates where they should resume their tour of the exhibition.



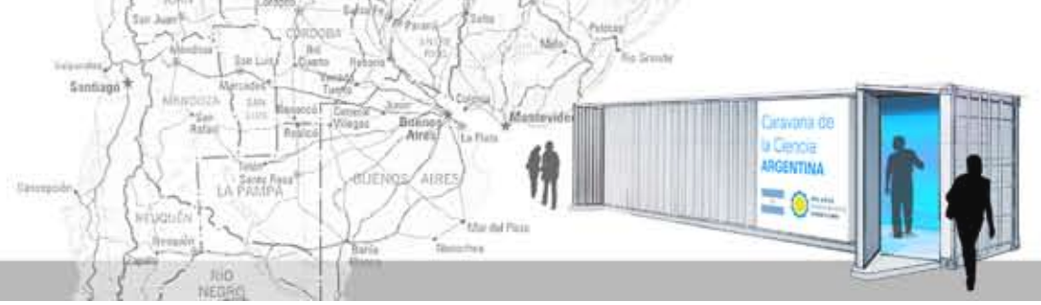


VENTILATION AND AIR CONDITIONING

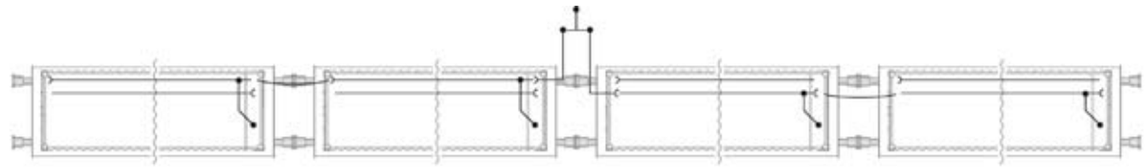


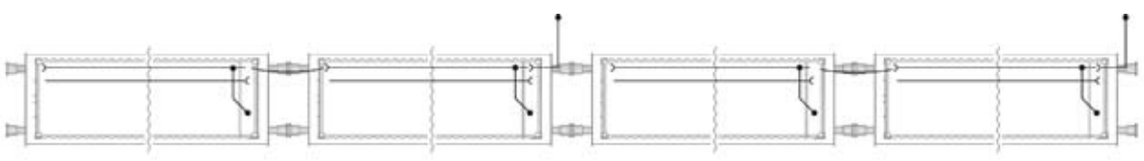
The point of the air conditioning is to ensure that the temperature inside the container does not exceed that outdoors; priority measures for a passive climate concept are high-quality insulation and an active ventilation of the container; the exterior walls are painted in light colours to prevent heating; the container is actively aerated by low-speed ventilators installed at the end of the container that cannot be seen from inside; and the vents blow in fresh air above head-height on the side of the entrance and exit doors (see diagram) that can escape above the two doors after circulating through the exhibition area; moreover, the ventilation system can be used on extremely hot days for night-time cooling.

At extremely high temperatures, high humidity or cold weather; a cooling and heating unit provides just the right balance.



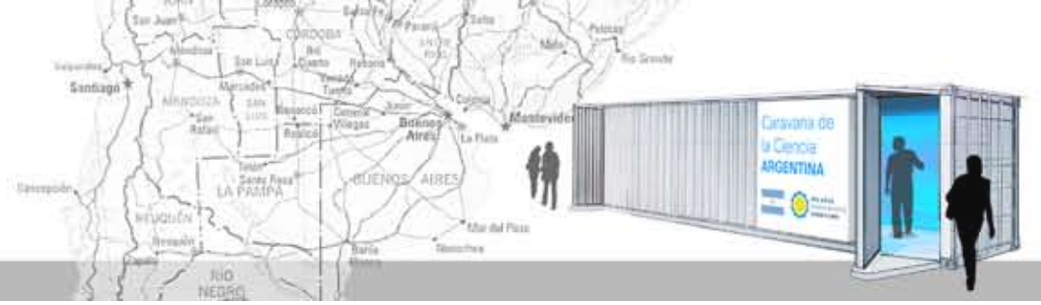
POWER SUPPLY





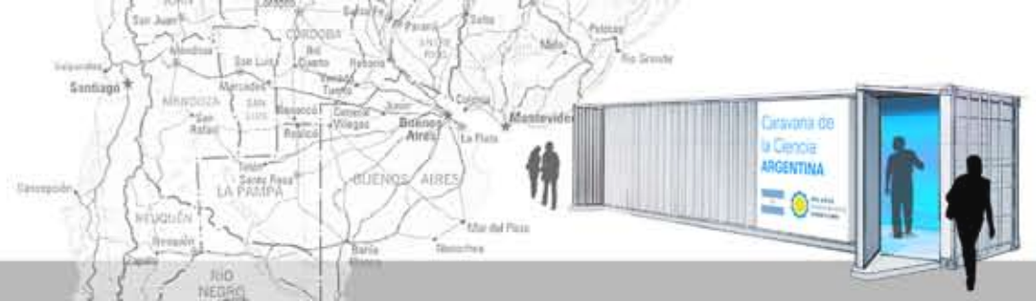
The containers are powered by a local network based on the 400V three-phase power supply available; this makes the containers easier to use in public places. Connections for a total of 87kW are therefore required at each venue (2 x 63A-CEE, 4 x 32A-CEE).

Whilst the electricity can be generated individually for every container in public places, within a train it is possible to “only” connect the containers at the ends as the infrastructure of the individual containers enables them to be interlinked. Each front comes equipped with a connector and socket in order to be independent of which “side” is used for the input.



SAFETY

The point of the safety concept is to render the exhibition as safe as possible for the visitors and operators. This includes using flame-retardant and fire-resistant materials, installing suitable fire detection devices, and a basic evacuation and rescue concept; a multi-level fire-alarm system comprising a combination of smoke alarms and thermostats is provided; the service personnel also has the option of disconnecting individual containers from the power supply; emergency lighting in the floor would then guide the visitors towards the emergency exits. Self-illuminating pictograms and exit-area lighting aid a smooth and rapid evacuation.



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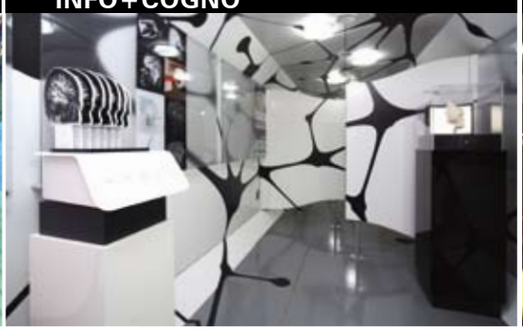
NATURAL.ARTIFICIAL

EFFECTIVE+INDIVIDUAL

INFO+COGNO



SUSTAINABLE+EFFICIENT

EXPEDITION ZUKUNFT

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