Techmania Science Center / CATALOGUE OF EXHIBITS

Techmania Science Center

TRAVELING EXHIBITION

Man vs. Animal... One world... A common world!

Every human has a body – a perfect and unique mechanism. Throughout our entire lives, we explore and push the limits of human abilities. What makes humans different from animals? Humans have the power of intellect, but how does it fare against the powers and skills that animals posses? Study animal abilities, learn from them and improve yourselves, and enjoy a first-hand experience of the world around us.

EXHIBITION AIMS

Human versus Animal creates a comprehensive concept of biology that makes it accessible and understandable and invites the visitors to discover their own physical abilities and possibilities.
The exhibition is built around thematic topics that are focused on the senses, the structure and performance of the human body and uses a popular format to show humans at the top of the food chain on Earth. The majority of all exhibits demonstrates to visitors the performance or limits of their own bodies in comparison to certain representatives from the Animal Kingdom: each of them will have the chance to compare the abilities of their own eyes with those of an eagle, to compare their auditory range with dolphins and bats and familiarize themselves with the difference between the orientation skills of a tarsier and themselves, as well as many others.

FACTS AND FIGURES

Area: 800-1,000m2 (8,608-10,760 sq. ft.)
35 interactive exhibits
Graphic design is set up for three language versions (current language versions: Czech, English, German)

Produced in 2014
Designed by Techmania Science Center

TARGET GROUP

The exhibition is intended for the general public, especially for children. Its design and concept should spark interest in physical activity and discovering the visitors' own physical abilities, regardless of their age.

EDUCATIONAL AREA

biology, geography, health education, civics and physical education.

RENTAL CONDITIONS

·The rental fee is 200 000 EUR per year.
·Insurance, transport and install / deinstall will be at the expense of the hirer.
·Techmania will at the hirers cost change all graphics and computer programs into the hirers languages.
·Translation into the hirers language will be at the expense of the hirer.

AVAILABLE FROM: February 2016

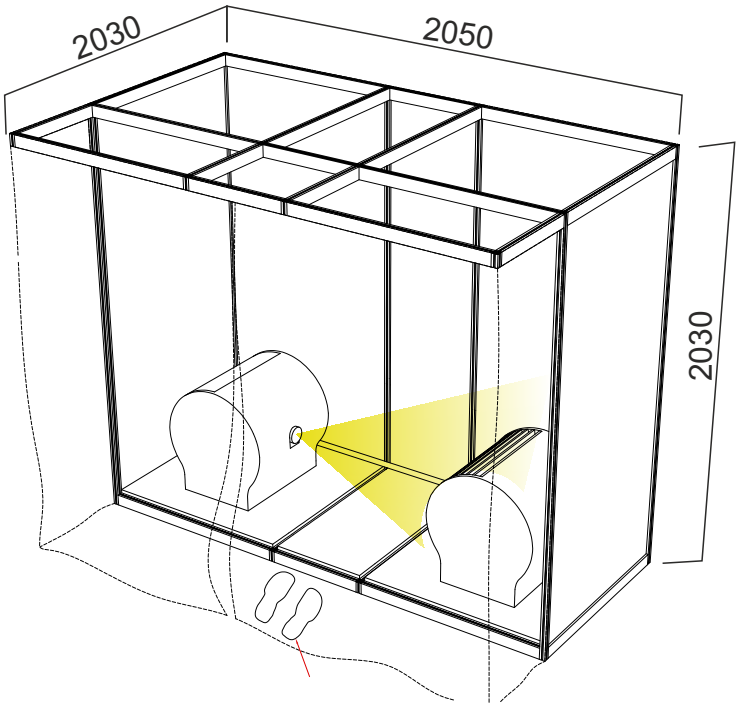
Techmania Science Center

For more information
(terms, prices and availability)
please contact:

Mrs. Katerina Chabova
Techmania Science Center
Czech Republic
mob: +420 737 247 595
email: katerina.chabova@techmania.cz

The memory of the eyes 01

A visitor approaches the exhibit and picks up the white stick. It is attached to the exhibit. By quickly waving the stick between the projector and the screen, the projected image will be displayed on the screen.



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The memory of the eyes 01

The main phenomenon:	The human eye's delay in processing an image.
The main message:	The human eye is capable of processing a certain number of images within a given period of time.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of three parts - a projector, a screen, a white stick. The projector at one end of the exhibit projects an image - a silhouette of a flying eagle. The image from the projector is displayed on the screen at the other end of the exhibit; however, the screen is oriented so that the image does not form there. Visitors must quickly wave the white stick between the two parts of the exhibit where the image will then be displayed shortly afterwards. The exhibit requires a shaded area.
The main idea be retained:	One of the properties of the human eye is the speed that is processes an image and its short-term storage
Questions to be raised:	How does the human eye work?

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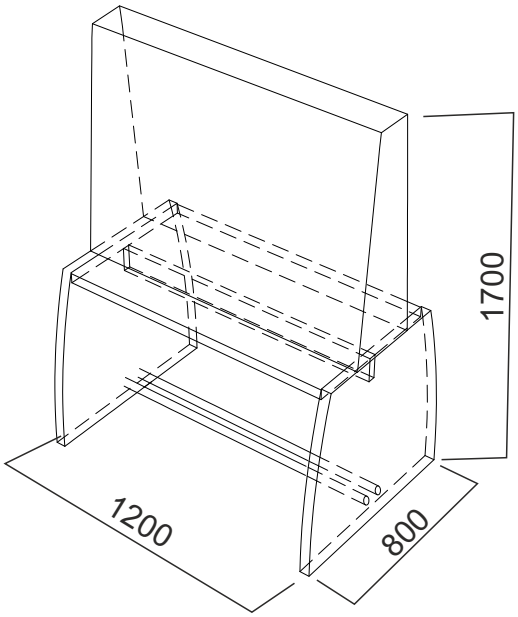
Hearing range

02

A visitor approaches the exhibit, sits down on a stool and puts on earphones (this exhibit is for 1 person). By pressing the START button, he/she starts the exhibit's operation. Using a dial, he/she can control the frequency broadcast in the earphones – everything is well shown on the display in front of him/her as well as on the pillars where he/she can see what other animals can perceive the current frequency. The visitor continues with other frequencies in his/her earphones, and at the same time he/she presses the "slyším" (I CAN HEAR IT) button to mark the frequencies that he/she actually can hear or the "neslyším" (I CANNOT HEAR IT) button to mark the frequencies he/she cannot hear. He/she can then see his/her own hearing range as well as the hearing range of selected animals.



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MAN versus ANIMAL

Hearing range

02

The main phenomenon:	Learning the frequencies that a visitor is capable of hearing.
The main message:	A human can hear frequencies roughly from 20 to 20,000 Hz. Some animals, however, have much better hearing than humans, both from the perspectives of sensitivity and the frequencies that their ears can perceive.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of two parts: display pillars and a control panel. The display pillars are made of plastic milk bottles. Inside are diodes that gradually light up layer after layer and thus they demonstrate the range of frequencies. Next is a control panel with 1 pair of earphones and a display that shows the current frequency. The panel also contains buttons START (START), SLYŠÍM (I CAN HEAR IT), NESLYŠÍM (I CANNOT HEAR IT).
The main idea be retained:	Humans cannot hear everything. We can only hear those sounds that are in our hearing range.
Questions to be raised:	Why can we only hear sounds of certain frequencies? How does the human ear work?

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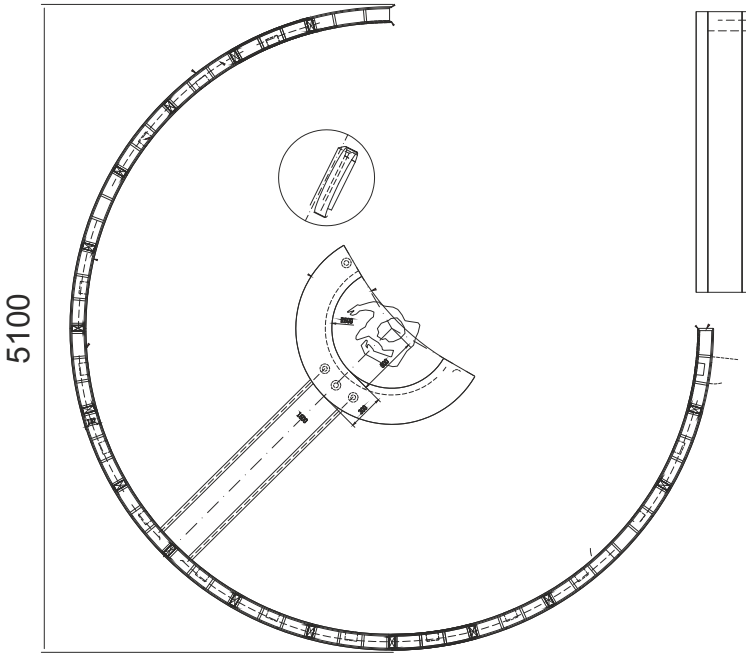
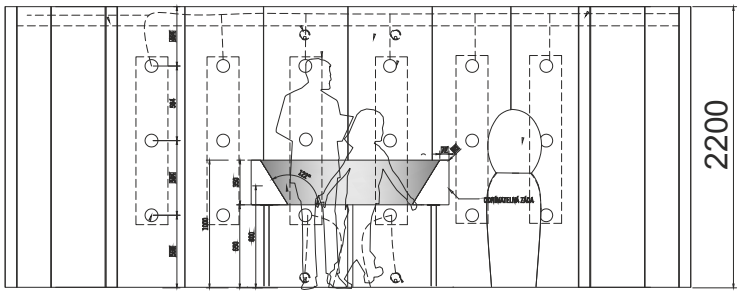
MAN versus ANIMAL

Find a cricket!

03

A visitor approaches the semi-circular area and steps onto the marked spot near the control panel. He/she presses the START button and a sound can be heard from a random loudspeaker on the wall. The visitor then tries to determine where the sound is coming from and presses the corresponding button on the control panel. He/she can immediately see whether or not their choice was correct. Another loudspeaker is then randomly chosen.





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MAN versus ANIMAL

Find a cricket!

03

The main phenomenon:	Determining the source of sound and its direction.
The main message:	Source of sound - sound waves. The human brain identifies the source of a sound according to the difference in time in which the sound reaches each of the ears.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a large semi-circular wall with 50 fixed loudspeakers on the inner side. The whole inner wall is covered with the image of a rain forest. A control panel in the middle of the semi-circular exhibit is equipped with buttons and each button corresponds to one loudspeaker on the wall. The control panel contains a START button on. In addition, there are two lights that signal whether or not the visitor has correctly determined the source of sound from the loudspeakers.
The main idea be retained:	The human brain determines from which direction a sound comes. Humans can accurately determine whether a sound is coming from the right or from the left, but it is very hard for humans to determine whether the source of a sound is in front of them or behind them.
Questions to be raised:	How does a human determine from which direction a sound comes?

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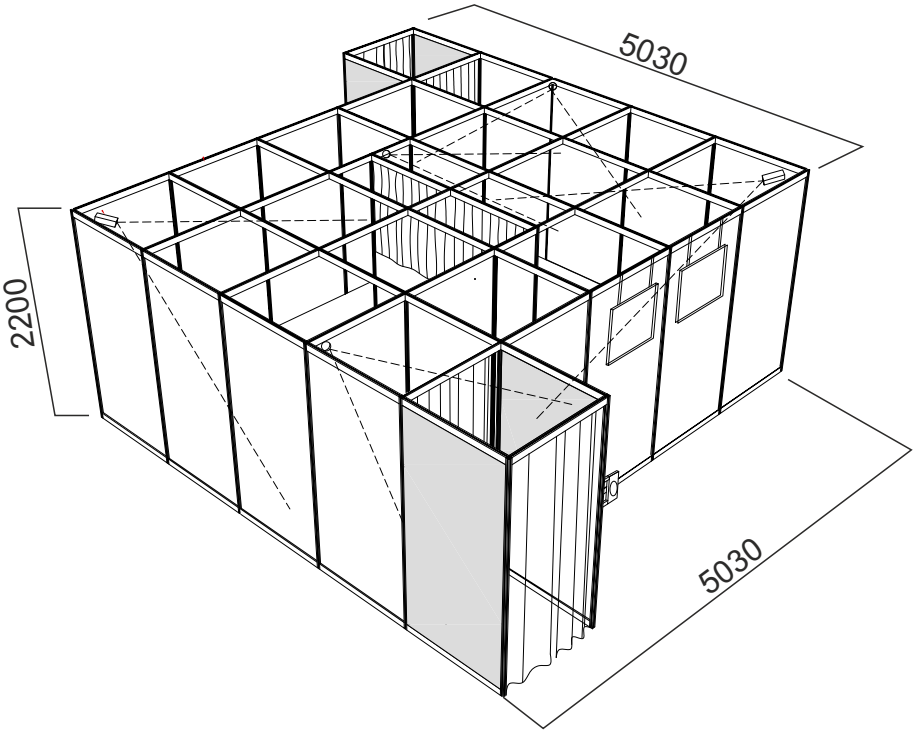
Orientation

A visitor approaches the entrance of the closed exhibit (the dark room). Traffic lights signal whether he/she can enter the dark room. When the visitor enters the room he/she is to walk through it and overcome all obstacles located therein only with the help of his/her touch. Visitors standing outside the room may watch his/her actions in the room on two external TV screens located outside the exhibit. The inner area is monitored by UV cameras.



Orientation

04

The main phenomenon:	Orientation in the dark by touch.
The main message:	The human eye can see only those objects that reflect a sufficient amount of light. If a human finds himself/herself in the dark, he/she can orient himself/herself only by touching and hearing.
Target group:	Families with children
A description of the exhibit:	The exhibit is extra-large, and it consists of "a dark room". There are obstacles in the room (see the drawing) and the whole space is monitored by UV cameras - their image is transmitted to external TV screens. The traffic lights at the entrance to the room inform the visitor whether he/she can enter or not. The traffic lights are connected to lasers located inside the room.
The main idea be retained:	How humans orient themselves without vision.
Questions to be raised:	What animal has the best sense of sight in the dark? Why do cats' eyes shine in the dark?

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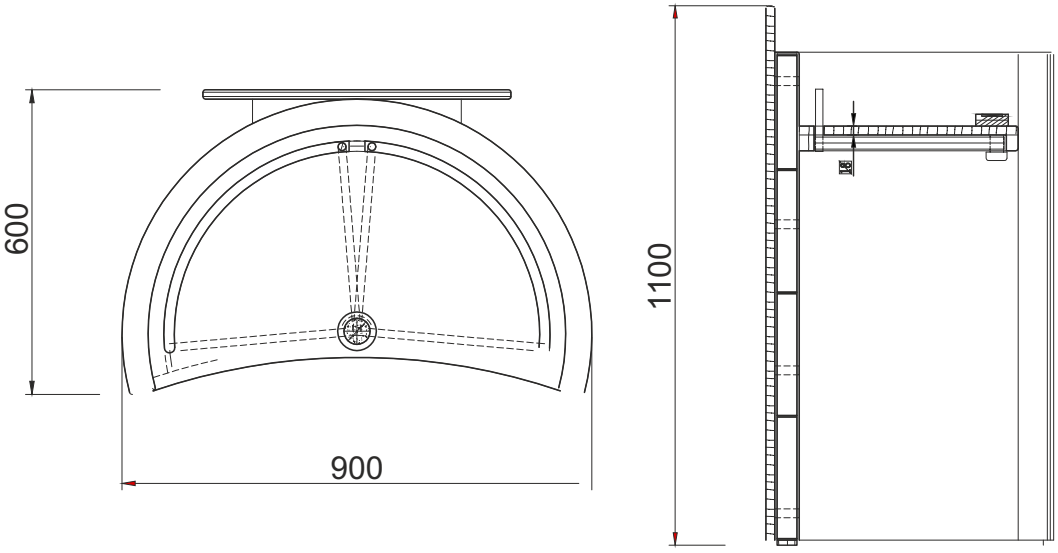
The angle of view

05

The visitor sits down on a stool at the exhibit. He/she rests his/her head on the exhibit so that he/she can see the centre of the exhibit. In front of him/her - i.e. in the centre of the exhibit - is a marked spot and two objects that move sideways. The visitor watches the spot and by controlling the mechanism located under the table at his/her head level, he/she moves the objects along the perimeter of the entire semi-circular table, thus testing his/her angle of vision - what angle he/she is capable of covering. Upon determining the result, he/she can compare his/her angle of vision with the sight of selected animals (herbivores, predators).



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MAN versus ANIMAL

The angle of view

05

The main phenomenon:	Measuring the angle of vision
The main message:	Humans have a certain angle of vision.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a pie-shaped table and stools to sit on. There is a thin shield (board) along the table's circumference that serves as a base for objects moving off to the side. There are two moving objects - they lead from the centre to the right and left sides and they serve for measuring the visitor's angle of vision (the angle that the visitor is capable of covering with his/her sight). The visitor controls the movement of the objects. The control button is located under the table at eye level so that he/she can control it while having his/her head resting on a specified spot. The table's area shows examples of the angles of vision of selected animals.
The main idea be retained:	One of the properties that define sight is the angle of vision.
Questions to be raised:	Why do we have eyes in the front and not on the sides of our head? What angles of vision do have animals? How do they differ from a human's?

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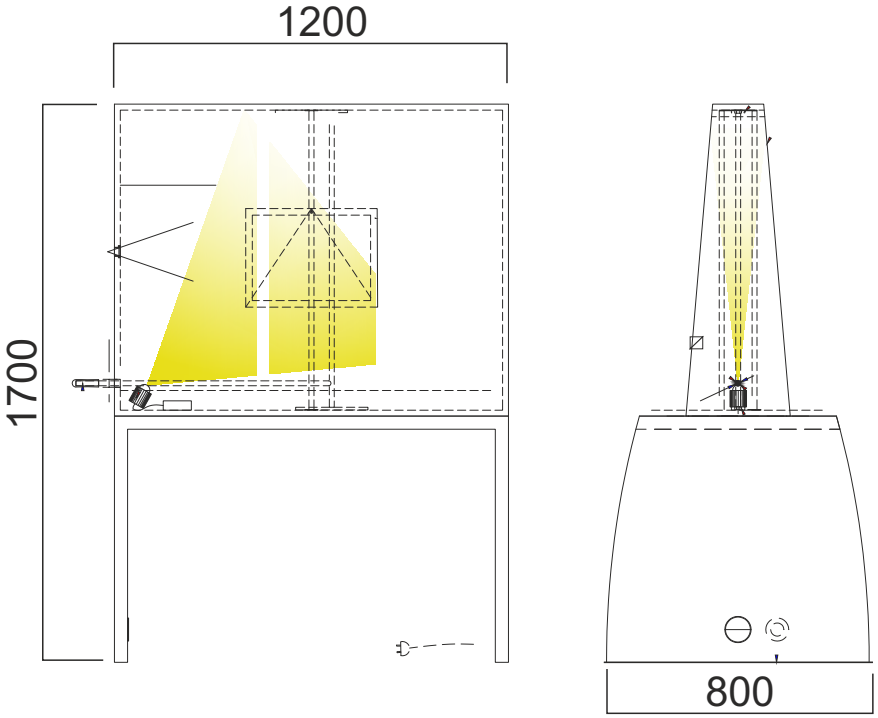
Spatial vision

06

A visitor approaches the exhibit and looks into the marked spot with only one eye. Inside are 3 sticks. His/her task is to align the sticks into one row (beside each other) using a control mechanism. When ready, he/she presses a button that allows him/her look inside the exhibit from the side. The visitor may thus check his/her result and see whether he/she was successful.



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MAN versus ANIMAL

Spatial vision

06

The main phenomenon:	A man has two eyes to in order to gauge depth.
The main message:	Depth perception. Distance estimation.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a cabinet with 3 sticks. The middle stick can be controlled only from the front side of the exhibit using a rod located at the opening through which the visitor looks into the cabinet. There is a button on the exhibit that the visitor presses to see the inside the cabinet from the side, and check his/her result (a one-way mirror).
The main idea be retained:	Humans have two eyes to gauge depth.
Questions to be raised:	How do other animals see?

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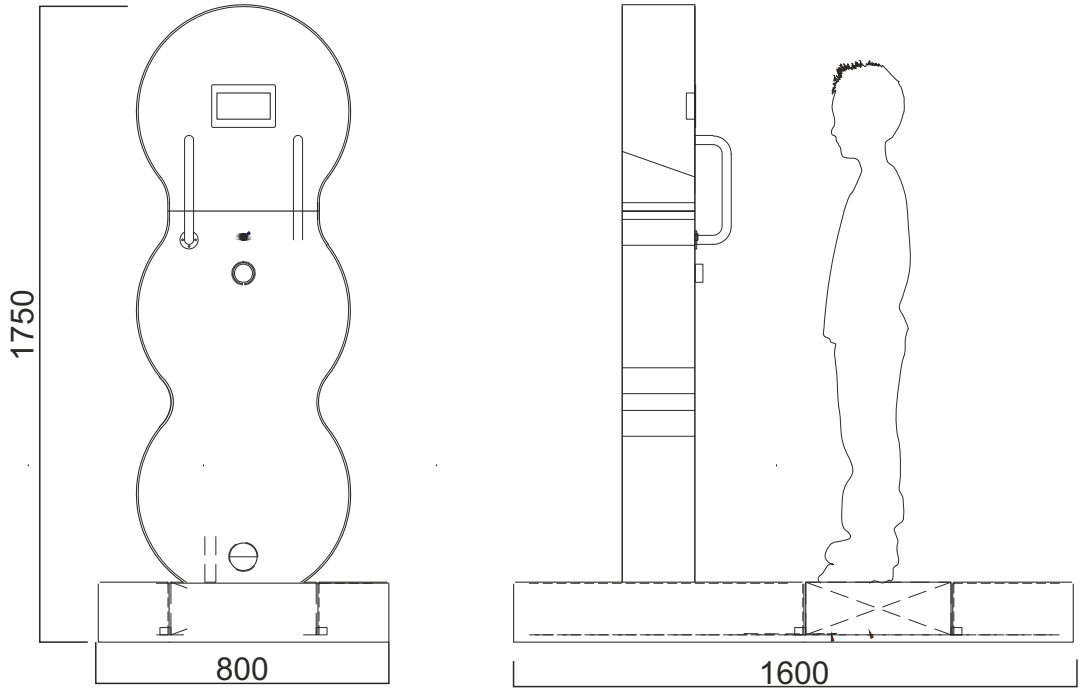
Trembling ground

07

A visitor steps onto the marked spot on the pedestal and presses the "start" button on the information panel, which puts the mechanism into operation. Using the dial, he/she can increase or reduce vibrations of the pad, and at the same time the display shows the current frequency on the display. With such information, the visitor can compare what vibrations he/she can perceive in comparison with certain animals.



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Trembling ground 07

The main phenomenon:	Perception of vibrations.
The main message:	The human body is capable of perceiving vibrations of only certain frequencies.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a pedestal with a built-in mechanism that vibrates the pad and a dial that the visitor turns to change the frequency. There is a control panel in front of the pad with a "start" button and a dial to regulate the vibrations. In addition, there is a display showing the current frequency.
The main idea be retained:	The human body is capable of perceiving vibrations, but some animals even communicate via vibrations.
Questions to be raised:	How does a human body perceive vibrations? How high of a frequency can humans perceive?

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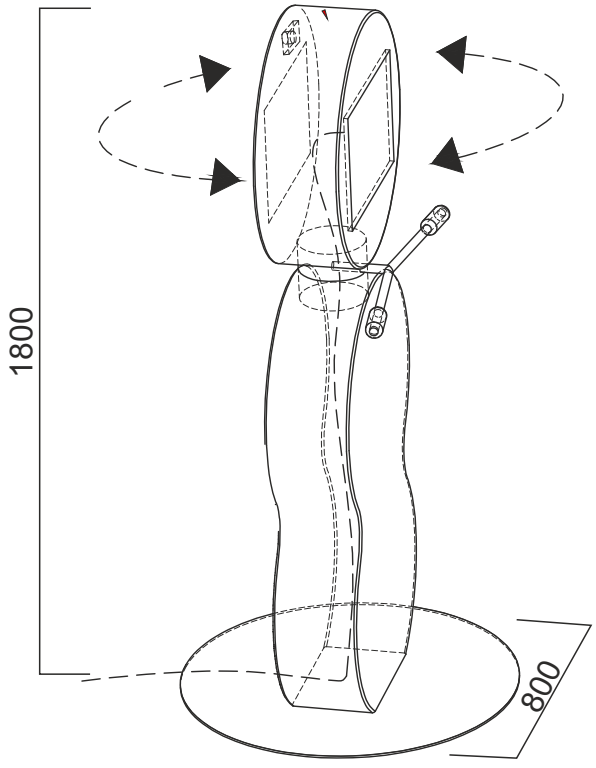
Snake eyes

08

A visitor approaches the exhibit, grasps the handles and starts turning the device horizontally. The monitor then shows the surroundings displayed via thermovision - i.e. infra-red light.



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Snake eyes

08

The main phenomenon:	What would a human see if he/she could perceive electromagnetic waves in IR?
The main message:	Human eyes can perceive only the visible spectrum of light - i.e. an electromagnetic radiation of wavelengths ranging from 400-750 nm. However, there are animals that can see infra-red light.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a pedestal with a revolving part on it. A visitor moves the revolving part using the handles. The monitor located above the handles shows the image from an infra-red camera that shoots the exposition. The revolving angle is 140°.
The main idea be retained:	What would a human see if he/she could perceive electromagnetic waves in IR?
Questions to be raised:	Why don't human eyes perceive infra-red light? Is it possible to perceive UV light?

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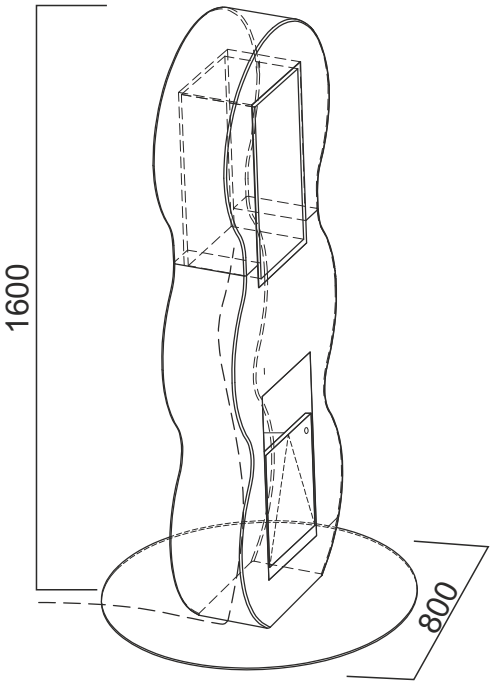
The smell of a taste

09

A visitor approaches the exhibit, which is a candy vending machine. By inserting a coin (1 Czech crown) a piece candy falls out of the machine. The visitor must unwrap the candy and follow the instructions on the exhibit. He/she shall plug his/her nose, put the candy into his/her mouth and try to guess its flavour. With the help of an information board, he/she can then check whether or not he/she was successful with their guess.



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The smell of a taste

09

The main phenomenon:	The sense of taste is largely related to the sense of smell.
The main message:	A taste is hard to recognize without being able to smell.
Target group:	Families with children
A description of the exhibit:	The exhibit is a candy vending machine. The visitor receives a piece of candy after inserting a coin (1 coin = 1 candy). The vending machine contains candies of the same shape and colour, but with different flavours.
The main idea be retained:	The human sense of taste is greatly related to the sense of smell.
Questions to be raised:	How does a human perceive a taste?

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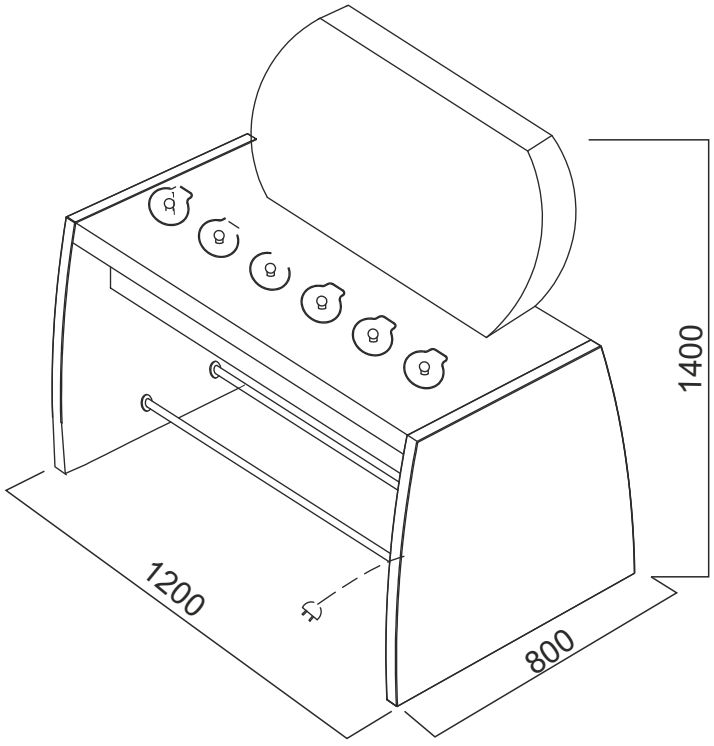
The sixth sense

10

A visitor approaches the exhibit and follows the instructions on how to use their own intuition to discover which flask contains the hidden object.



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MAN versus ANIMAL

The sixth sense

10

The main phenomenon:	The ability of intuition.
The main message:	The ability of intuition.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a table with six flasks built-in side by side, however only one of them contains an object that the visitor attempts to find using his/her intuition.
The main idea be retained:	The sixth sense means intuition - the ability to perceive and subconsciously assess various inconspicuous or hidden facts and connections.
Questions to be raised:	Do animals have a sixth sense?

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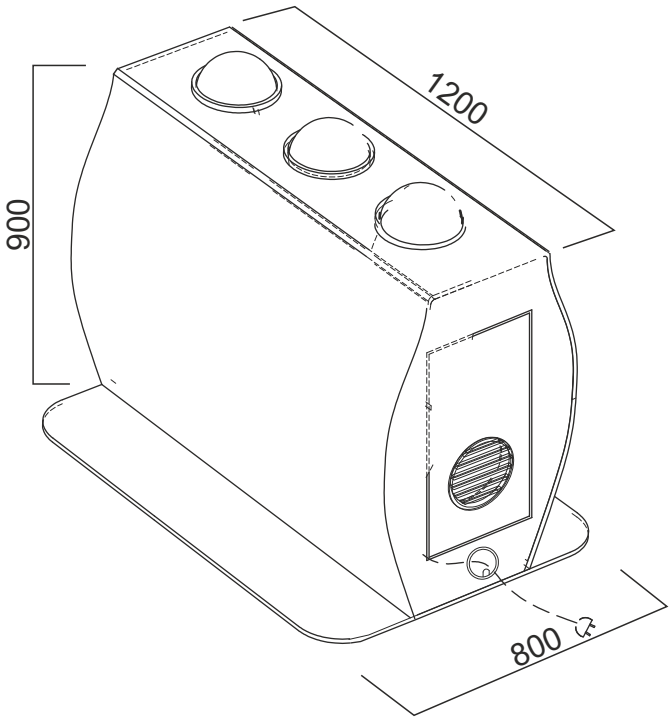
Thermal delusion

11

A visitor stands in front of the exhibit. He/she lays his/her hands on the outer balls, perceiving different temperatures in each hand. A few seconds later he/she touches the middle ball with both hands. Now he/she thinks that each side of the middle ball has a different temperature, however, this is not true. The middle ball has a unified temperature, and the visitor only experiences a tactile illusion.



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Thermal delusion

11

The main phenomenon:	Tactile delusion
The main message:	If human senses keep receiving only one impulse, they get used to it. If the sense touch receives only one impulse, it gets used to it, which may influence other perceptions.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a pedestal with 3 balls of the same size located on it. The surfaces of the balls have different temperatures. One is warmed up (to about 40°C) and the other is cooled down (to about 5°C). The middle ball has the ambient temperature.
The main idea be retained:	Senses may be influenced.
Questions to be raised:	How do we perceive temperature?

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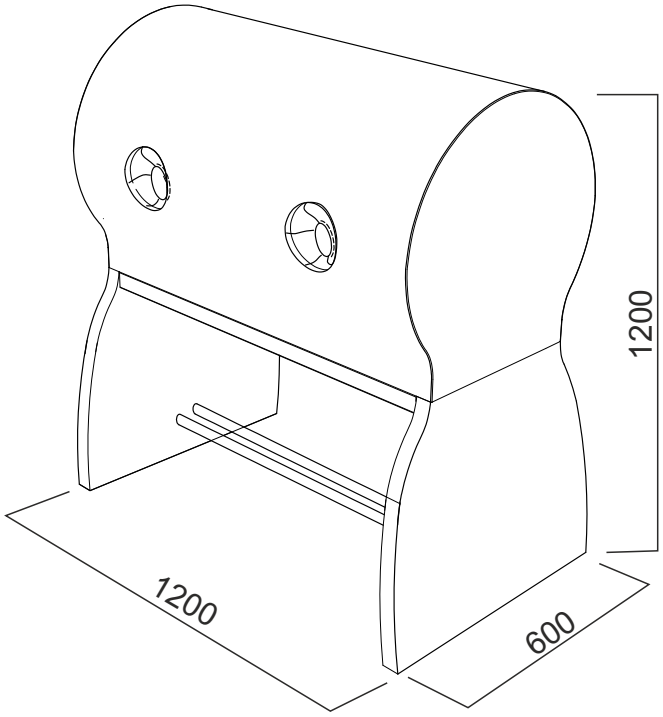
Touch box

12

The exhibit is a closed box with two openings for hands. The openings are covered with textile to prevent light from getting in. Various natural products are located inside the box. The back side of the exhibit is made of a one-way mirror with a button to turn on a light in the box.



Touch box

12

The main phenomenon:	Recognizing objects by touch.
The main message:	Touch is a contact sense.
Target group:	Families with children
A description of the exhibit:	A visitor approaches the exhibit, which is a dark box. He/she puts their hands into the marked openings. Using his/her sense of touch, the visitor tries to recognize what objects are hidden in the box. If the visitor wants to see what is inside the box, he/she can press a button located on the back of the exhibit that makes the back side transparent and discloses the contents of the box.
The main idea be retained:	If we cannot see, our sense of touch can become very effective.
Questions to be raised:	What can we recognize and distinguish by touch?

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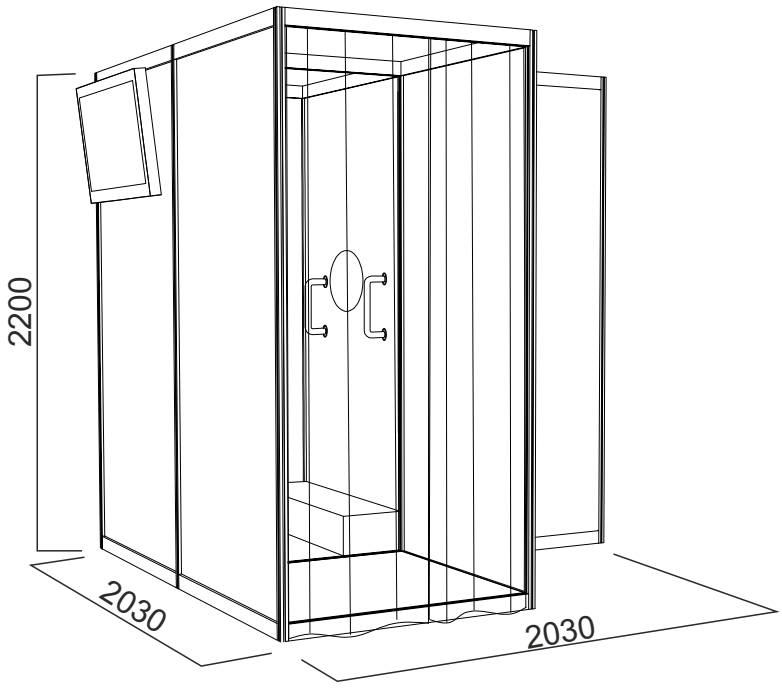
Roar like a lion

13

A visitor approaches the exhibit. He/she stands on a marked spot and leans over inside the exhibit so that the microphone is just in front of his/her head and the camera can see all his/her face. Now the visitor shouts as loudly as he/she can. The display in front of him/her will show the strength of his/her voice in decibels. It is also shown on the outside of the exhibit.



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Roar like a lion

13

The main phenomenon:	The strength of the human voice in decibels.
The main message:	A human can emit sounds thanks to air passing though his/her vocal cords - human speech. But how strong can the human voice be?
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a soundproof box with a microphone and a camera. The microphone records and measures the loudness of the visitor's voice and projects it onto the display on both the outside and inside the exhibit. The camera captures the image inside the box (face) and projects it onto the outer side of the exhibit. Loudness is shown on the outside of the box graphically as well as in numbers. Loudness (the strength of voice) is in decibels.
The main idea be retained:	A human is capable of communicating - speech - thanks to their vocal cords.
Questions to be raised:	How do the human vocal cords work? Which animal has the strongest voice? How many decibels?

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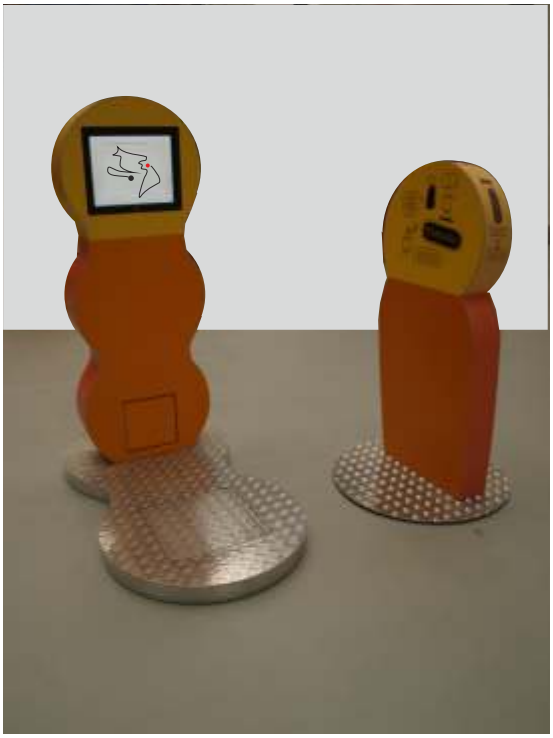
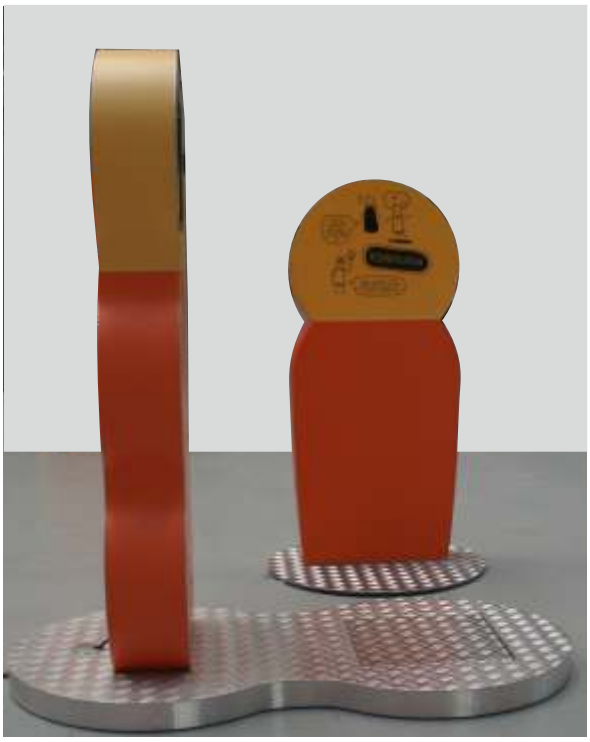
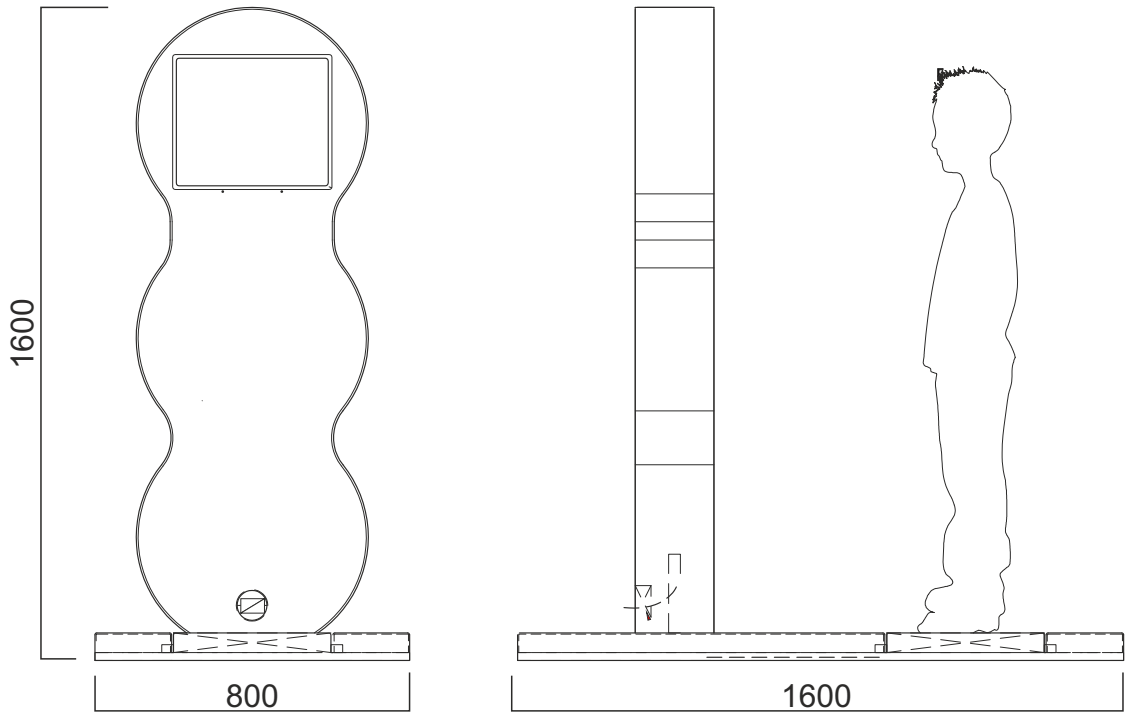
Balance





A visitor approaches the exhibit and steps onto the marked spot on the control board. By stepping on, it he/she puts the mechanism into operation. A game starts on the monitor located in front of the visitor. By shifting his/her weight from one leg to the other, the visitor may push a ball on the monitor towards the finish.



Balance

14

The main phenomenon:	Work with your own balance.
The main message:	A visitor works with his/her own balance.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a control board (a plantograph, a foot impression box) and a monitor. When the visitor steps onto the control board, a game starts on the monitor. There is a five-second countdown before the start of the game. If the visitor steps back off the board, the game will restart. The visitor can control everything only by shifting his/her weight from one leg to the other. For a detailed description of the software, go to the annex: program_rovnováha (program_balance)
The main idea be retained:	Balance is a system condition when the force and effect in all directions are equal.
Questions to be raised:	How does the human body keep its balance?

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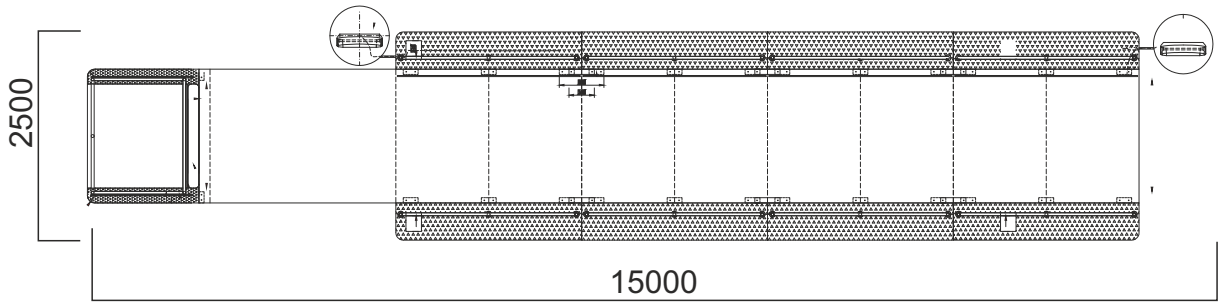
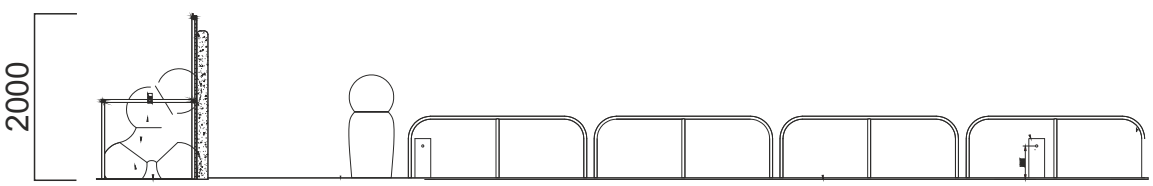
Running speed

15

A visitor stands at the start of the running track. Using the control panel beside the starting point, he/she can choose his/her animal rival with whom he/she wishes to compare his/her running speed. The race starts by crossing the "start" line. During the run, the visitor can see the speed of the animal via a beam of light. There is a mat at the end of the track placed vertically to catch the visitors. After the end of the race, the visitor's running speed is shown on a display together with the speed of the selected animal in km/h.





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Running speed

15

The main phenomenon:	A human can compare his/her speed with an animal's.
The main message:	The objective is to run a certain distance as fast as possible.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a running track, beams of light, a mat, a control panel and a display with a speedometer. There is a control panel (to choose the rival) at the beginning of the track, and a buffer mat at the end of it. Speed is measured using light beams located at the beginning and at the end of the track, and it is shown at the end of the run together with the running speed of the selected animal.
The main idea be retained:	A human can learn what speed he/she is capable of in comparison with various animals.
Questions to be raised:	Which animal is the fastest runner in the world: How can a human increase their speed?

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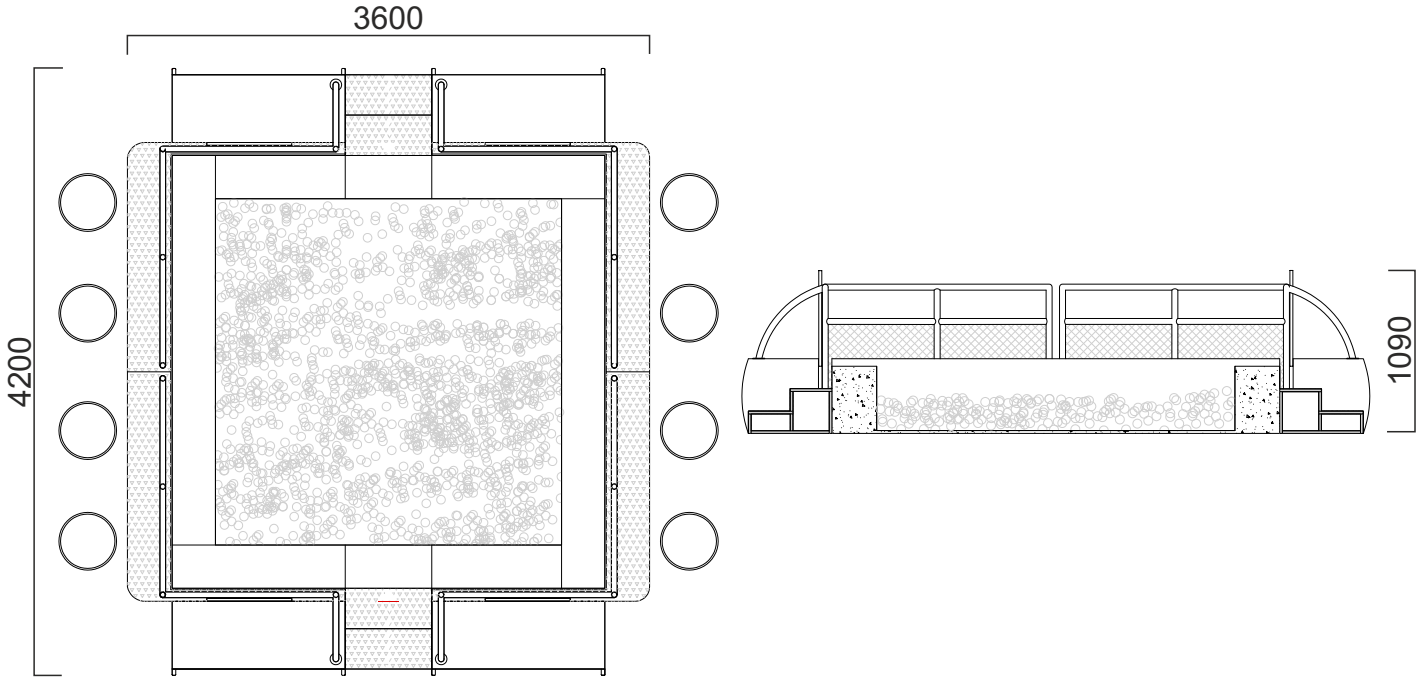
Moving in rough terrain 16

A visitor approaches the exhibit, puts on the shoe covers imitating animal paws and tries to move around the area filled with balls.



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Moving in rough terrain 16

The main phenomenon:	Spreading the weight.
The main message:	From an evolutionary standpoint, some animals are better adapted to moving in a challenging terrain.
Target group:	Families with children
A description of the exhibit:	The exhibit is an oval swimming pool full of plastic balls of the same size and colour. There are shoe cabinets at the entry to the pool with shoe covers imitating animal paws.
The main idea be retained:	The speed of a human's movement is significantly influenced by the surrounding terrain.
Questions to be raised:	

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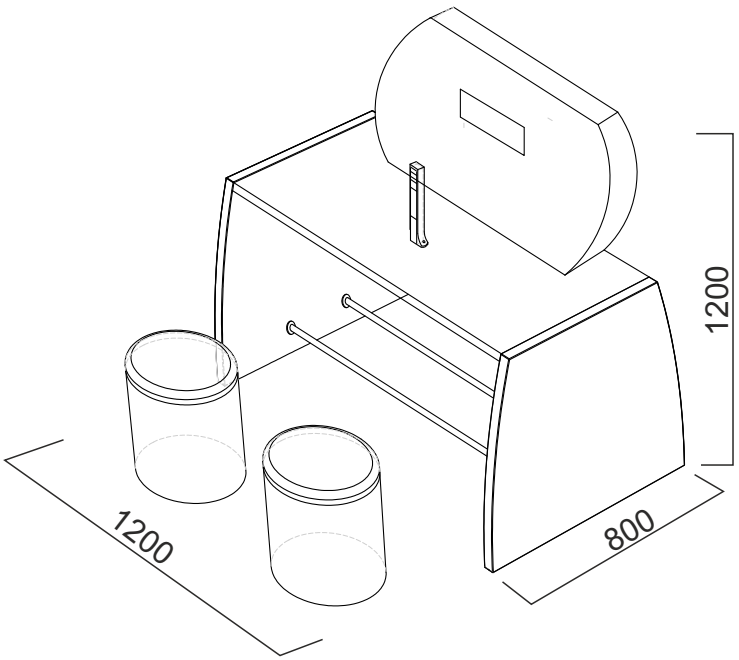
The strength of grip 17

A visitor sits down on a stool facing the exhibit. There are two measuring handles in front of him/her that he/she presses together using only one hand. His/her clench force is then displayed on the display located on the table in front of the handles.



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Science Center

The strength of grip 17

The main phenomenon:	Measuring power
The main message:	A visitor measures the strength of his/her hand.
Target group:	Families with children
A description of the exhibit:	The exhibit is a table with measuring handles that the visitor presses together using only one hand. There is a display on the table that shows the current value of the clench force.
The main idea be retained:	Thanks to our muscles, we are capable of generating a force that is both measurable and comparable.
Questions to be raised:	Which animal has the strongest clench? Does a human have a greater clench force in his hands or teeth?

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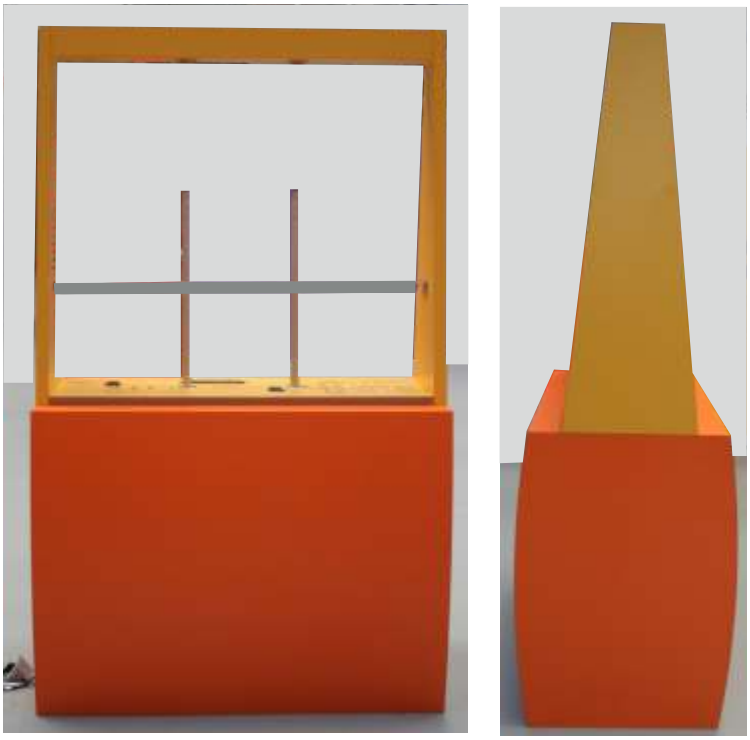
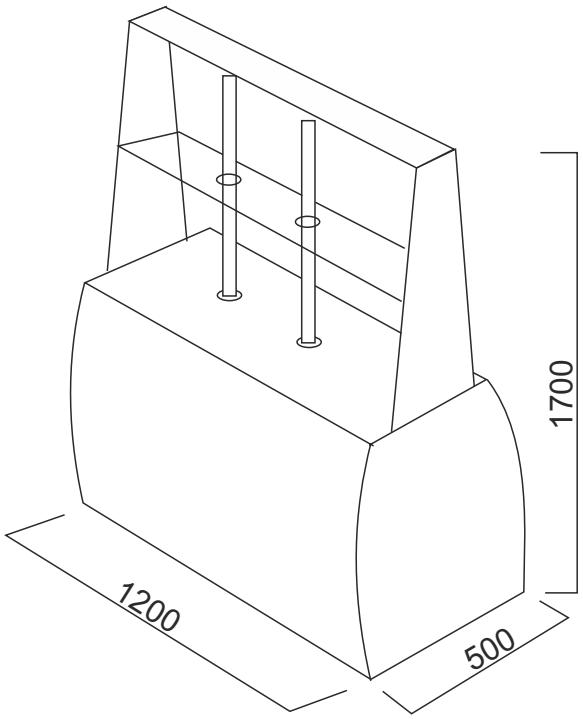
Fast reaction

18



A visitor approaches the exhibit, places the sticks in their initial position (puts them to the upper side of the exhibit following the instructions on the information board), waits for their release and tries to catch them as quickly as possible.



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Fast reaction

18

The main phenomenon:	Fast reaction
The main message:	The swiftness of a human's reaction corresponds to the speed of the transmission and processing of information via the nerves, their subsequent evaluation and issuance of relevant orders from the brain.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a cabinet with a trigger that causes sticks to fall. The visitor puts the sticks in their initial position (the upper side of the exhibit) and then awaits their release. His/her task is to catch them as swiftly as possible as they fall. The exhibit contains two sticks that fall simultaneously. The sticks fall towards the bottom of the exhibit where they are caught. They fall in random intervals from 3 to 8 seconds. They have signs signalling the swiftness of the visitor's reaction.
The main idea be retained:	How swiftly can a human react?
Questions to be raised:	Is it possible to improve one's reactions? Do all animals have the same swiftness of reaction?

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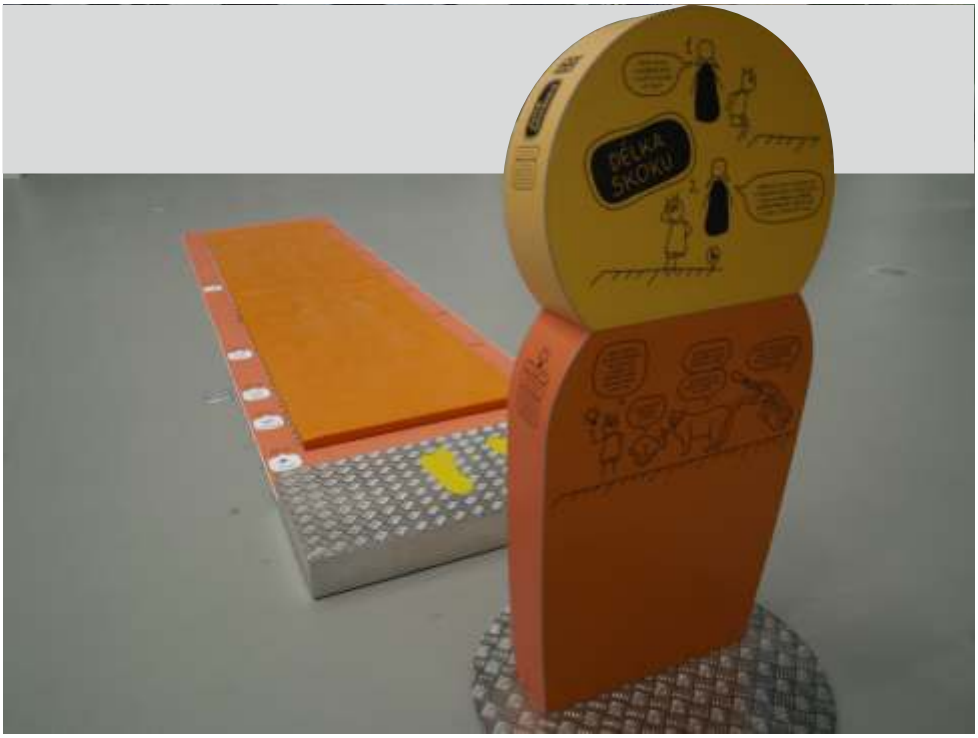
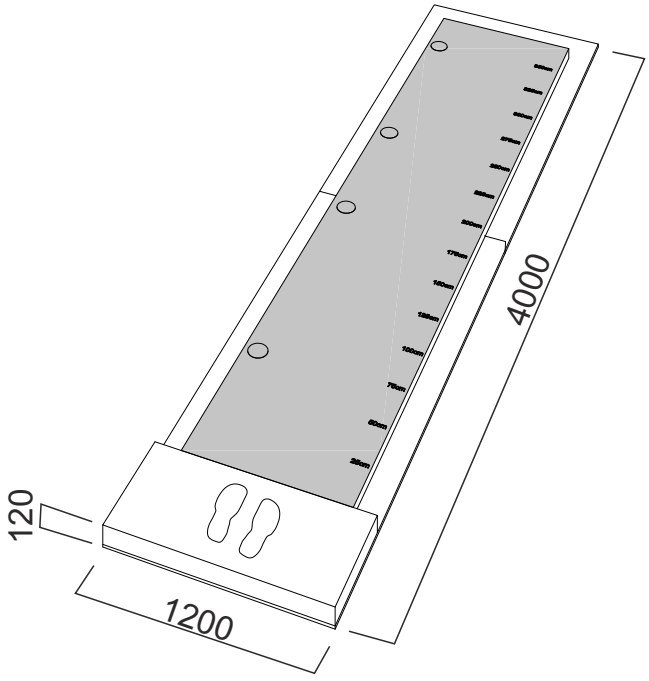
Jump distance

19



A visitor approaches the exhibit, stands on the marked spot on the take-off board and performs a standing jump to the mat in front of him/her. After landing, he/she can measure the jump and compare it with animals whose results are recorded on the mat.



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MAN versus ANIMAL

Jump distance

19

The main phenomenon:	Measuring the length of a standing jump.
The main message:	A visitor can see how far he/she can jump from a standing position.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of two parts - a take-off board and a mat. The starting area includes a marked spot from where the visitor jumps to the mat. The mat measures his/her jump in cm. The mat shows pictures of animals according to their length of jump.
The main idea be retained:	The length that the visitor manages to jump stand from a standing position. Animals that the visitor approximates with his/her jump performance.
Questions to be raised:	How do the muscles work? What animal can jump the farthest? What is the maximum distance that a human can jump? How do other body parts help in the jump?

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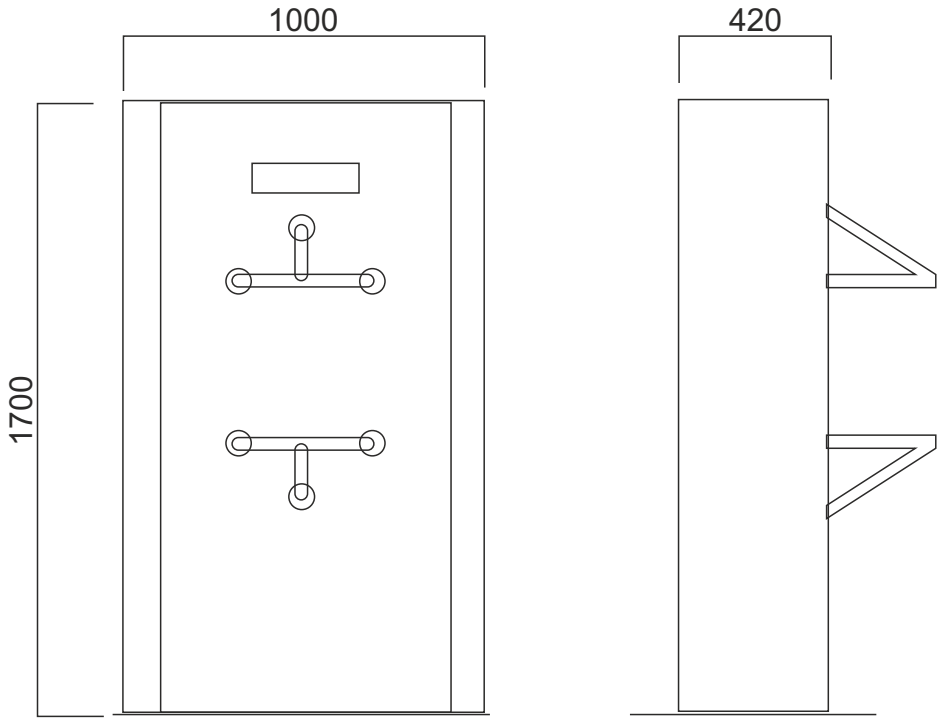
Hand speed

20

A visitor approaches the exhibit and waves his/her hand as fast as possible between the sensors. The display shows the result in m/s.



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MAN versus ANIMAL

Hand speed

20

The main phenomenon:	Immediate hand speed
The main message:	What speed can we produce with our hand?
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a stand with two sensors and a display showing the performance in m/s. There are steps under the exhibit that can be used if necessary.
The main idea be retained:	
Questions to be raised:	

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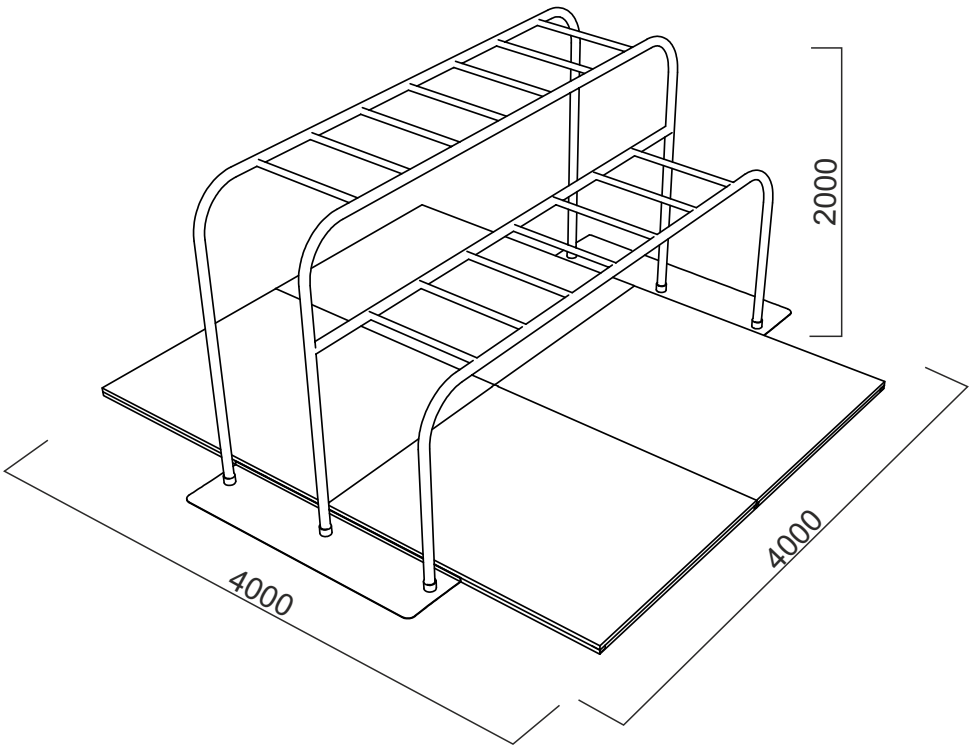
Rope ladder

21

A visitor stands at the start and moves on the ladder hand over hand as quickly as possible to get to the other bank of the river.



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Rope ladder

21

The main phenomenon:	Proportionate to their weight, humans do not have strong arms.
The main message:	The flexibility of the human body.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a ladder to be climbed hand over hand. One is for adults, the other for children. Under the exhibit is a picture of a river depicted as realistically as possible. The imaginary banks of the river are painted at each end of the ladder so that it looks like that the visitor has to cross the river by moving hand over hand on the ladder.
The main idea be retained:	Through evolution, humans have lost the ability to move in trees.
Questions to be raised:	

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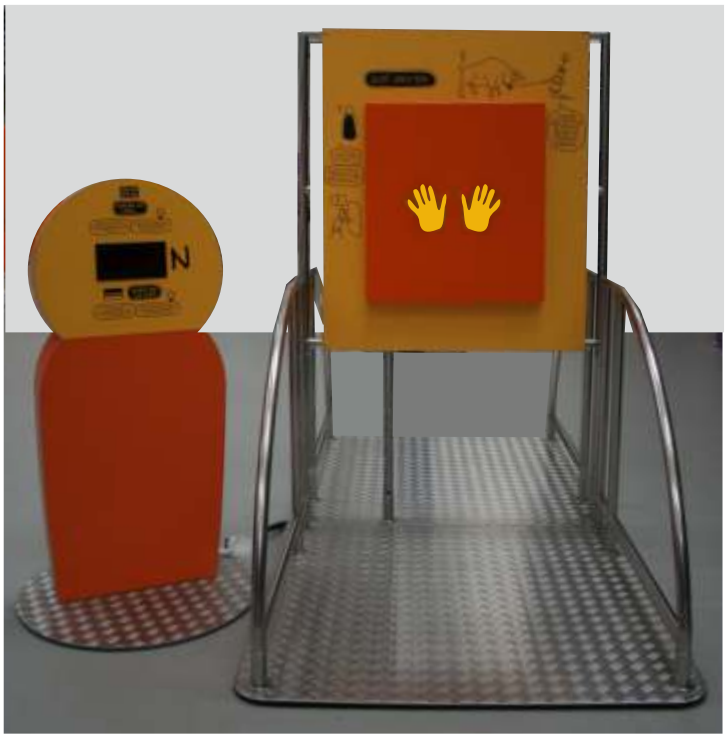
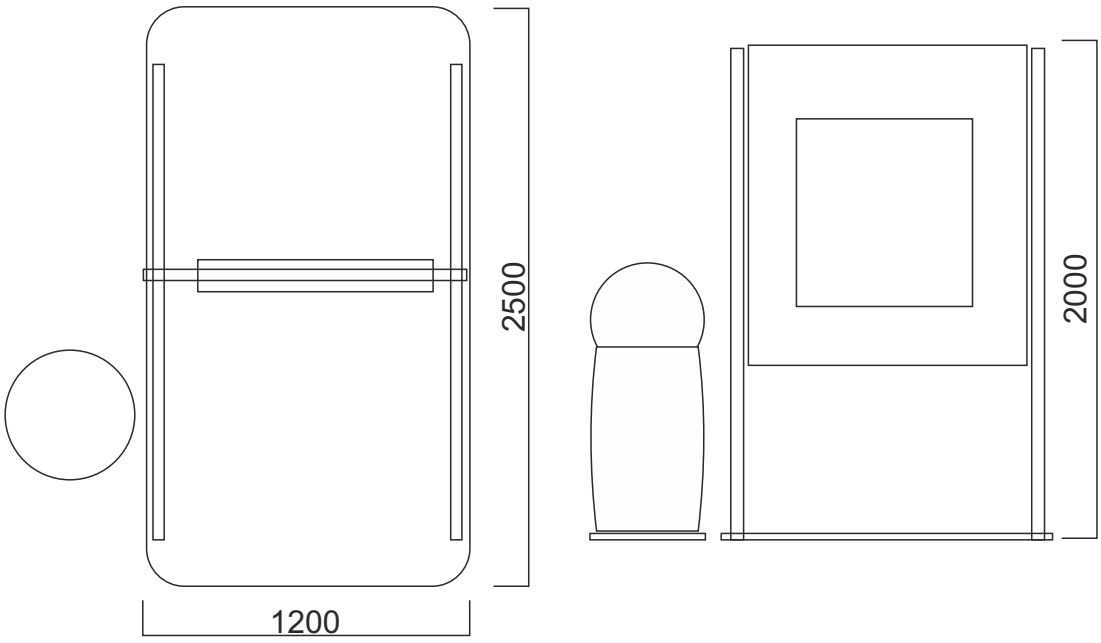
Strong as a bull



A visitor approaches the exhibit (a board) and pushes it as powerfully as possible. The force he/she generates is shown on the display next to the board.



MAN versus ANIMAL

Strong as a bull

22

The main phenomenon:	How powerfully can a human push
The main message:	Measuring power
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a board and a display unit. The board includes a measuring mechanism. There is a display next to the board that shows the amount of force that the visitor produces through his/her pushing on the board. The board that the visitor pushes is located on the front and it is high enough so that it cannot be kicked, only pushed. The exhibit is put into operation by a pushing force.
The main idea be retained:	How powerfully I am able to push.
Questions to be raised:	How do the muscles in the human body work? What animals are stronger than humans?

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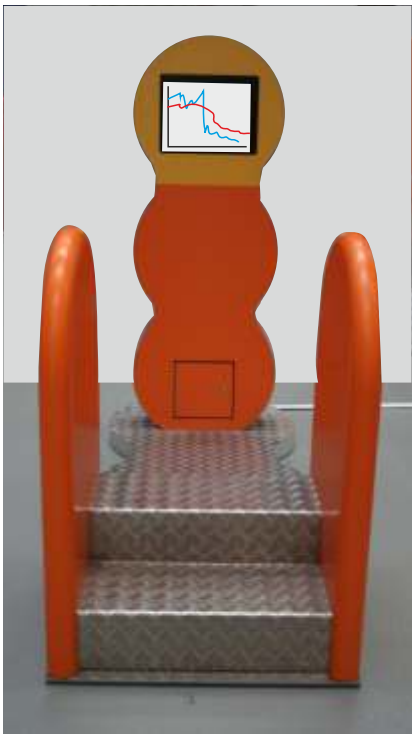
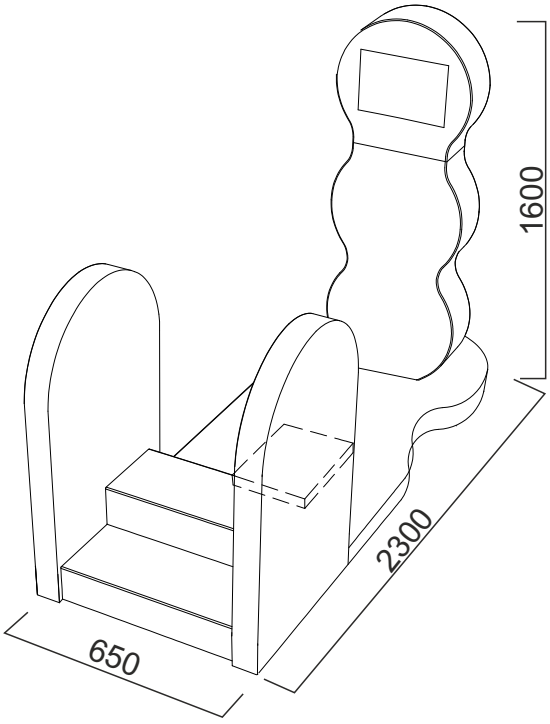
Science Center

Cat jump

23



A visitor approaches the exhibit and climbs the steps on the take-off board. After landing on the measuring board, the display shows the graph of the landing and a coefficient describing the absorption of landing forces. A visitor may jump repeatedly and attempt to find the smoothest possible landing.



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Science Center

Cat jump

23

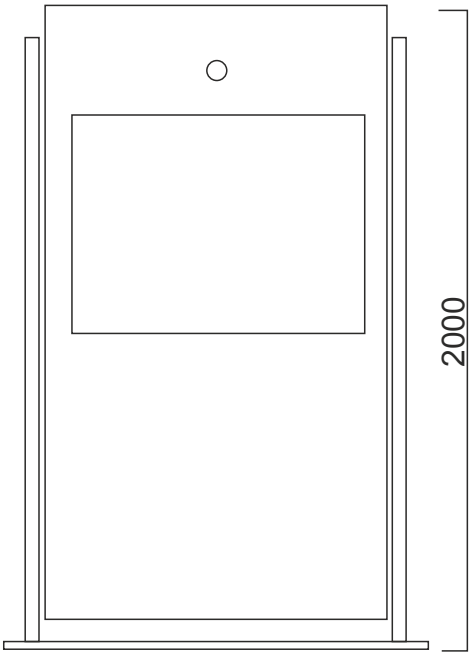
The main phenomenon:	Absorbing the shock of a landing.
The main message:	With of their muscles, humans are capable of not only generating a force, but also absorbing it.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a take-off board, a measuring board and a monitor that shows results. The take-off board is a block with two steps leading to the top – a solid banister is placed along the sides of the steps. There is a measuring board under the take-off board that serves as the landing area for the visitors. A display showing a graph of the landing and the absorbing of the shock is part of the exhibit. Software: a graph is shown on the display. The X axis shows the time (about 1-2 seconds after the landing). The Y axis shows the landing force in Newtons. A visitor tries to land so that the curve of the graph is smooth and the force is evenly distributed. If the visitor lands heavily, he/she will notice a deflection at the beginning of the curve. The monitor also shows the maximum deviation as a numerical value. Measuring starts immediately after landing. Values on the display remain static for about 5 seconds so that the visitor can leave the landing board and still view the result. The next jumper is given notification on the display when it is time for them to jump.
The main idea be retained:	Through absorbing the landing force, some animals are capable of jumping outstanding heights.
Questions to be raised:	How can we improve the absorption of our landing forces? What animal has the smoothest landing?

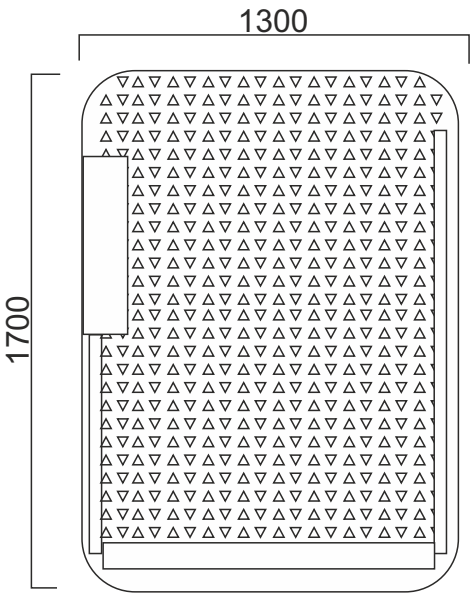
Techmania
Science Center

Thermal camera

24

A visitor stands on a marked spot and can see his/her thermal image shot by the thermal imaging camera located above the TV screen. He/she can see what parts of the body radiate the most or least heat. He/she can then see how heat radiation works with selected animals whose thermal images are placed next to the screen.





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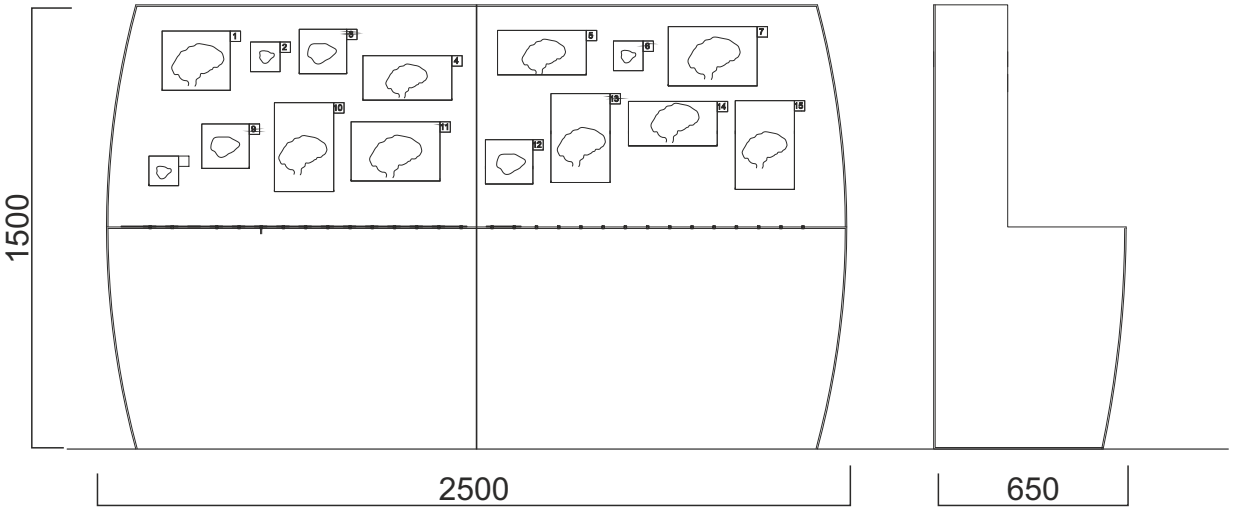
Thermal camera 24+31

The main phenomenon:	Heat radiation
The main message:	Due to the metabolic processes in our body, we radiate heat.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a TV screen and a thermal imaging camera. The camera is located above the TV screen and it shoots an image that is subsequently projected on the screen. The visitor can see what heat he/she radiates or what objects reflect or absorb heat. There are thermal images of selected animals placed next to the TV screen.
The main idea be retained:	Every warm-blooded animal radiates heat.
Questions to be raised:	What provides the best thermal insulation? Which animal has the lowest protection against heat loss and which one has the best?

Techmania
Science Center

Brain models

A visitor approaches the exhibit, which contains a control panel and full-sized models of the brains of various animals. The control panel is divided into two parts. The visitor takes the left cable with his/her left hand and the right cable with his/her right hand. His/her task is to use the cables to match the picture of an animal with its corresponding brain image by putting the left cable next to the picture of the animal and the right cable next to the selected brain image. If the visitor is correct, the panel turns green and if he/she fails, the panel turns red and the visitor has to try to find another combination.



Brain models

25

The main phenomenon:	The human eye's delay in processing an image.
The main message:	The human eye is capable of processing a certain number of images within a given period of time.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a panel where a visitor attempts to match pictures of animals with images of their brains. Behind the panel are full-sized models of brains that serve as examples. The panel is divided into two parts where both (the left and right) are connected by cables. The left side contains pictures of animals and the right contains images of their brains. By connecting the cables (one to the animal and the other to the corresponding picture of the brain) visitors can try to find the correct combinations. If successful, the panel perimeter turns green, otherwise it turns red.
The main idea be retained:	The ratio between the size of an animal's body and the size of its brain varies for different species.
Questions to be raised:	Which animal has the biggest and the smallest brain? Is there a rule that the bigger brain the better the brainpower?

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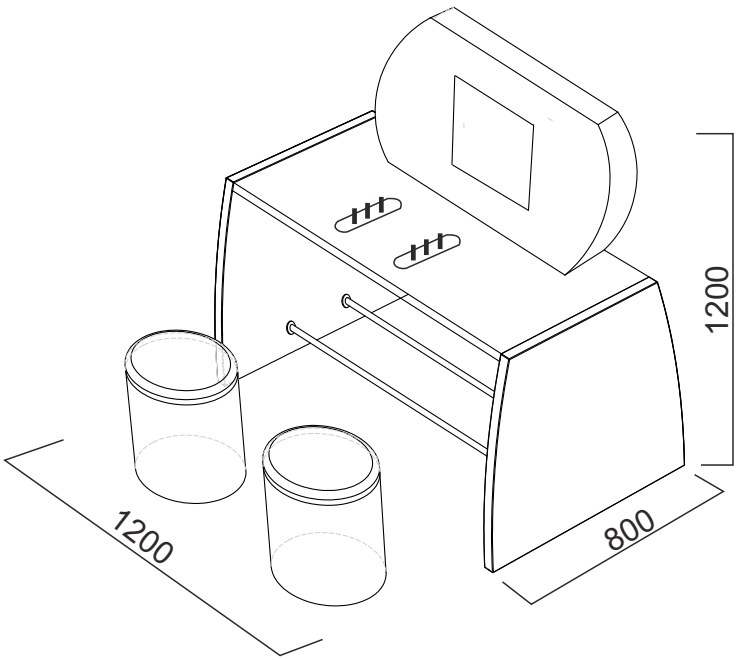
Science Center

Muscle activity

26

A visitor sits down on a stool in front of the exhibit. He/she places his/her forearms on the sensors located in front of him/her. Then he/she starts to flex their arm muscles (for instance by clenching their fist or moving their fingers). The monitor located in front of him/her will show the electrical activity of their forearm's muscles (on a graph).



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Science Center

Muscle activity

26

The main phenomenon:	Measuring the electrical activity of muscles
The main message:	Muscles flex and relax due to electrical impulses received from the brain.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a table with two sensors and a monitor. The sensors are located horizontally so that a visitor can easily place his/her forearm on top of them. There is a monitor behind the sensors that shows the visitor's muscle as a graph.
The main idea be retained:	Our muscles are governed by electrical impulses sent from the brain.
Questions to be raised:	How does the brain generate electrical signals? What is their value?

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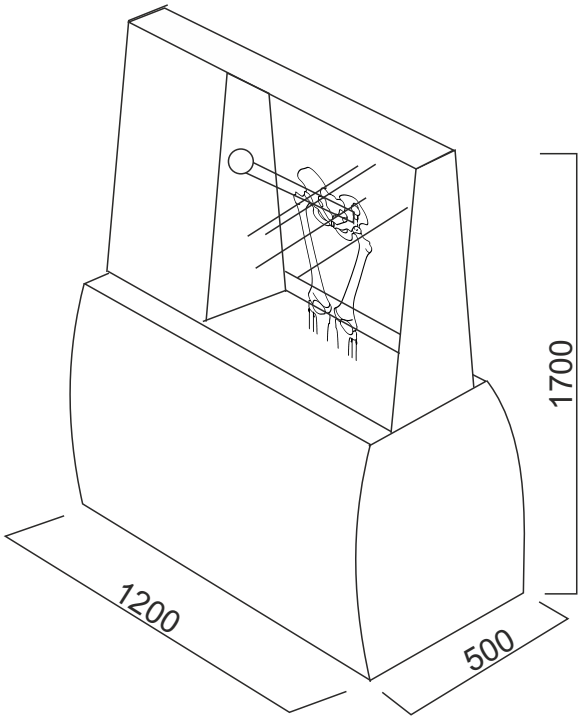
Science Center

Bone load

27

A visitor approaches the exhibit, which is a plastic model of a bone placed behind a polarizing filter. Using a lever, the visitor can exert pressure on the bone and watch where the greatest loads occur.



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Science Center

MAN versus ANIMAL

Bone load

27

The main phenomenon:	The load limits of a human thighbone.
The main message:	Thanks to the structure of human bones, they can withstand huge loads.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a box with a model of a thighbone. There is a light source on the back of the box that illuminates the exhibit. The model of the bone is placed in front of the light source. There is a lever in the upper part of the bone with which a visitor may repeatedly exert different pressures on the bone. A polarizing filter placed in front of the bone model enables the visitor to visualize the parts that have the greatest load (they are demonstrated by denser colour lines in the given spot).
The main idea be retained:	The firmness of bones is also dependent on their shape.
Questions to be raised:	Where do fractures most often occur?

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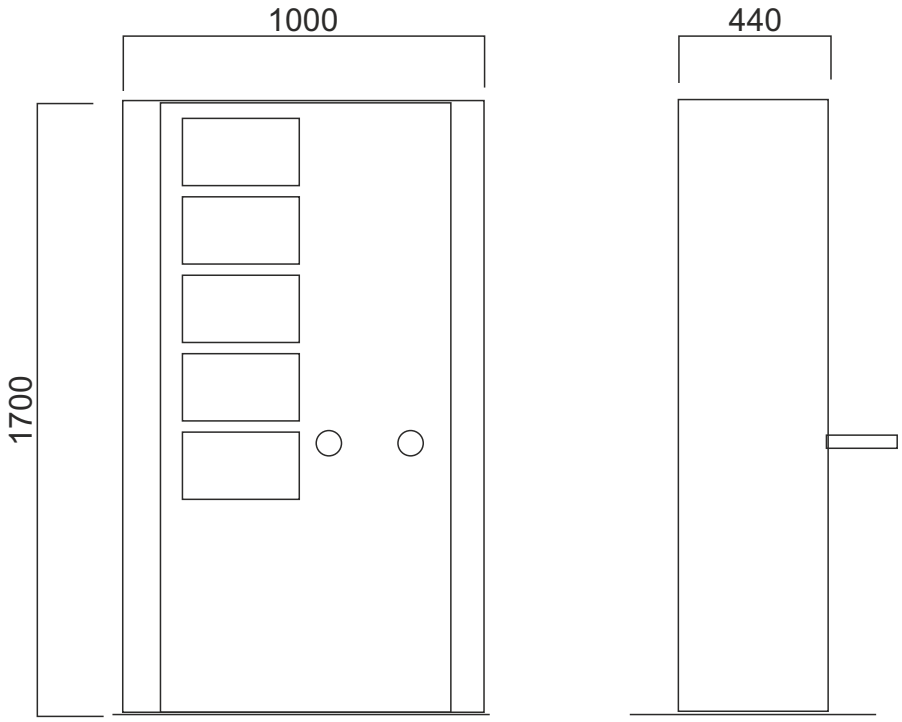
Science Center

Matters of the heart

A visitor approaches the exhibit and grips the handles. The current activity of his/her heart is shown on the middle screen. He/she can then watch the ECG curves of other animals on the other screens.



Matters of the heart 28

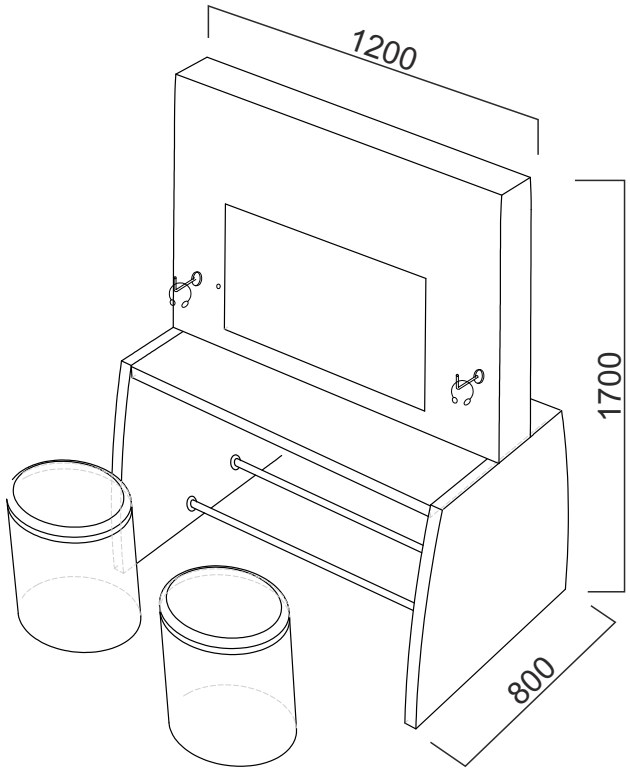
The main phenomenon:	Functioning of the heart
The main message:	Electrocardiograms (ECG) record the heart's activity.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of 5 screens located above one another in a single line, and of handles that the visitor needs to hold to put the exhibit into operation and let their pulse be measured. The middle screen shows the visitor's ECG. Other screens constantly show the ECG of other animals. The ECG curves follow this order: an elephant, a cow, a human, a dog, a mouse.
The main idea be retained:	The larger the animal, the slower the heart's activity.
Questions to be raised:	Can we affect the activity of our heart? What does an ECG curve show?

Techmania
Science Center

Musical memory

29

A visitor sits down on a stool at the exhibit, puts on the earphones and then follows the instructions on the touch screen. His/her task is to repeat the melody.



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Science Center

Musical memory

29

The main phenomenon:	Remembering tones
The main message:	A human can remember a certain sequence of tones for a short period of time.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a pair of earphones and a touch screen. There is a program on the touch screen - software, see the annex.
The main idea be retained:	A visitor tests his/her musical memory.
Questions to be raised:	Is it possible to train musical memory?

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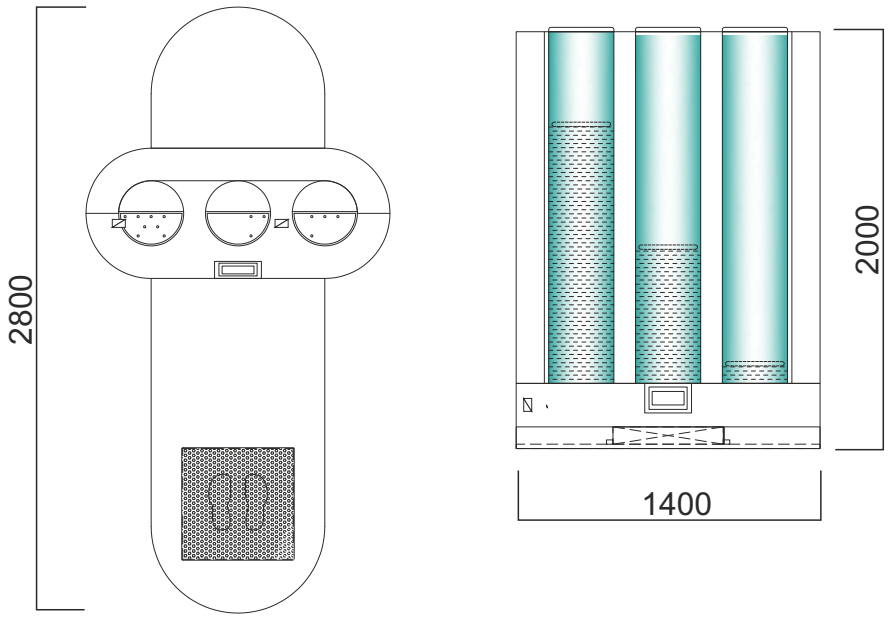
Science Center

Water content in the body

30

A visitor approaches the exhibit and steps onto a marked platform. The exhibit is put into operation when the platform begins to sense a load. There are three empty cylinders in front of the visitor. Water poured into the middle cylinder represents the proportion of water in the visitor's body. The outer cylinders are gradually filled with water until the water level represents what the amount of water in the bodies of the two depicted animals would be if they were the same weight as the visitor.



Techmania Science Center

Water content in the body

30

The main phenomenon:	The proportional amount of water in the human body.
The main message:	Water makes up about 65% of the human body.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of three cylinders and a measuring device. The cylinders are made of a transparent material and they are gradually filled with the proportionate amount of water corresponding with selected animals and the human body. The outer cylinders represent the amounts of water contained in the bodies of selected animals, and the middle cylinder represents the amount of water contained in the visitor's body. The measuring device is located in front of the cylinders - it is a pair of scales with a display showing the value in kg. By loading the scales, the exhibit is put into operation.
The main idea be retained:	Most of the human body is made of water.
Questions to be raised:	Why does the human body contain so much water? Which animal has the least amount and which has the most water in its body?

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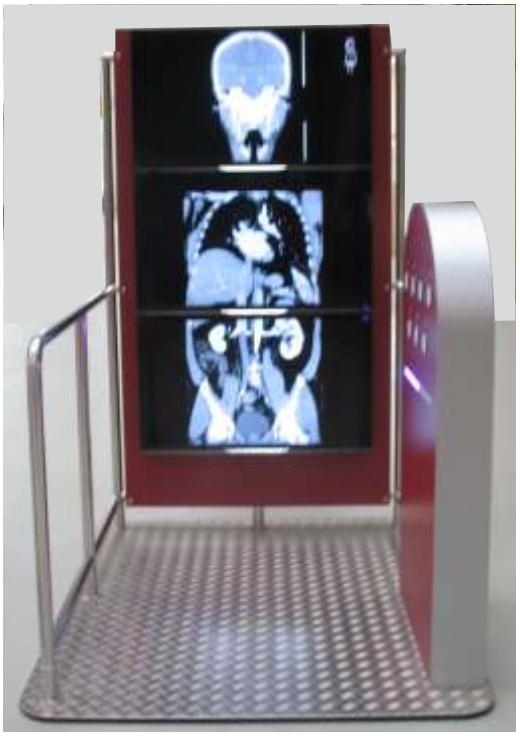
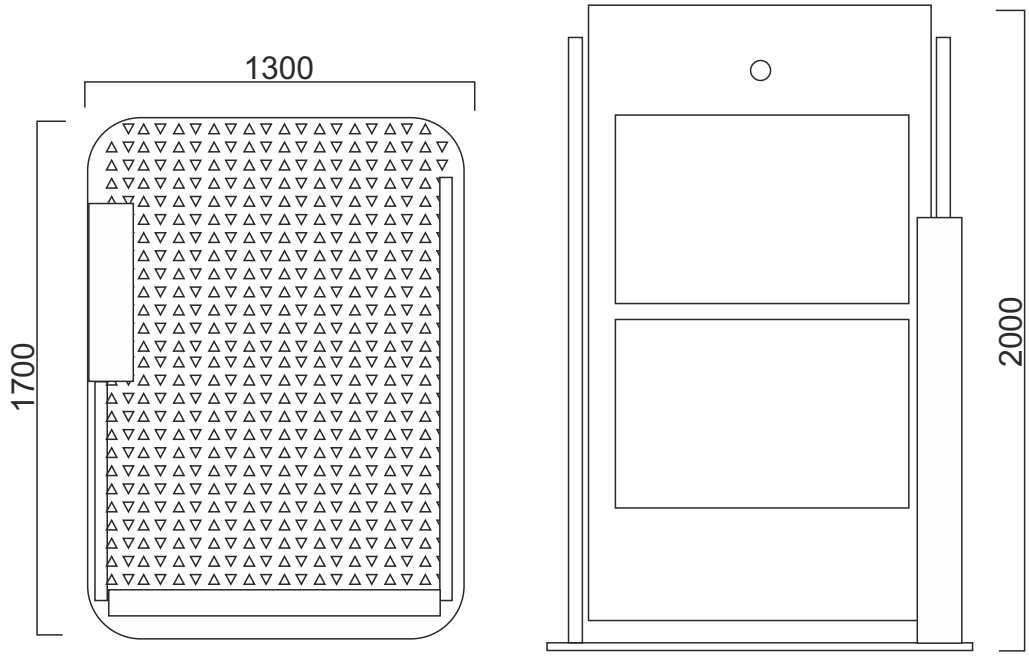
Science Center

Cross-sections of the body

31



A visitor walks through the frame and their movements start to be recorded. The TV screen located in front of the exhibit shows individual body sections and the sections of selected animals. By his/her movement in the frame, the visitor changes the X-ray images that he/she can subsequently see on the screens.



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Cross-sections of the body

31

The main phenomenon:	The difference in structures between the human body and selected animal bodies.
The main message:	Every animal has a different body structure, but the basis of bodily organs is the same.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a frame containing TV screens. The banisters on both sides of the frame are equipped with sensors that record the movement of the visitor. By moving forward and backward, the visitor can change the individual planes of the body sections. The front of the banister contains a button that is used to select different animals - section planes change with each different animal. The exhibit is put into operation when the visitor approaches the frame.
The main idea be retained:	How the inner body structure looks in humans and in selected animals.
Questions to be raised:	What are the differences between humans and animals?

Techmania
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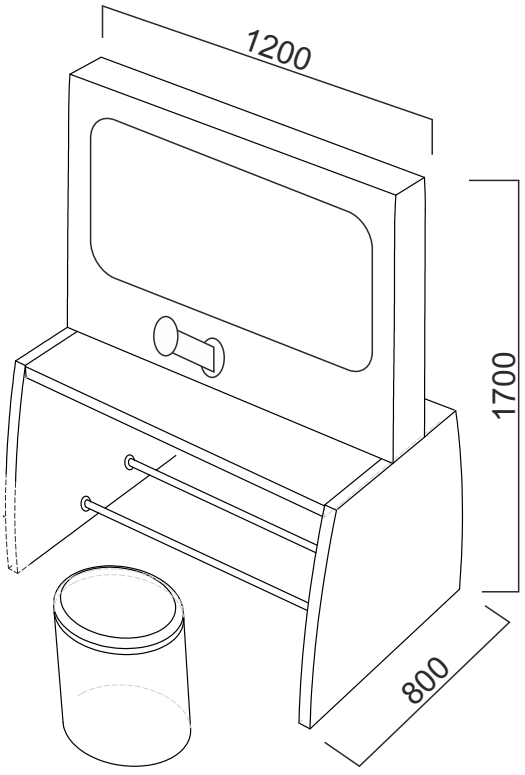
Find the rhino

32

The exhibit consists of an eyehole with a white wall above it. After pressing the button for about 3-8 seconds, an intensive light flashes. The light contains a silhouette of a rhinoceros.



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Science Center

MAN versus ANIMAL

Find the rhino

32

The main phenomenon:	The human eye is equipped with photosensitive cells that can be momentarily "paralyzed" by a strong light.
The main message:	The human eye is equipped with photosensitive cells that can be momentarily "paralyzed" by a strong light.
Target group:	Families with children
A description of the exhibit:	A visitor sits down on a stool and looks at the marked spot on the exhibit. He/she then presses the green button that causes a light to flash.
The main idea be retained:	The human senses can become tired.
Questions to be raised:	When does it disappear?

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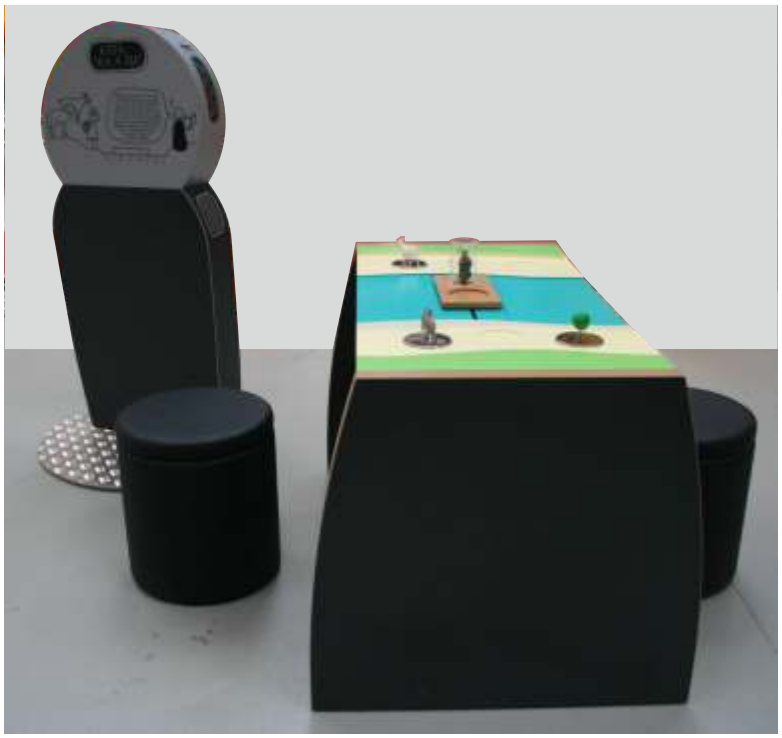
Science Center

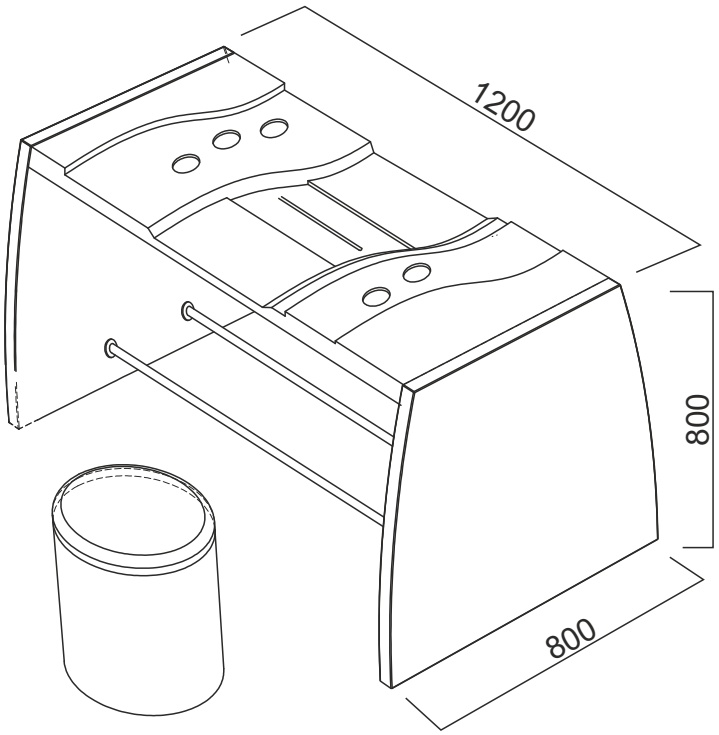
MAN versus ANIMAL

A goat, a wolf and cabbage

33



Logical thinking is a man's prerogative.



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MAN versus ANIMAL

A goat, a wolf and cabbage

33

The main phenomenon:	IQ test
The main message:	Humans can think ahead and do not need to proceed only by the trial and error method.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a table where the upper board represents a natural valley with a river running through it. Both sides of the bank are reserved for a wolf, a goat and cabbage. There is a ferry with a ferryman crossing the river here and back.
The main idea be retained:	Do animals think logically? Can we improve our logical thinking?
Questions to be raised:	

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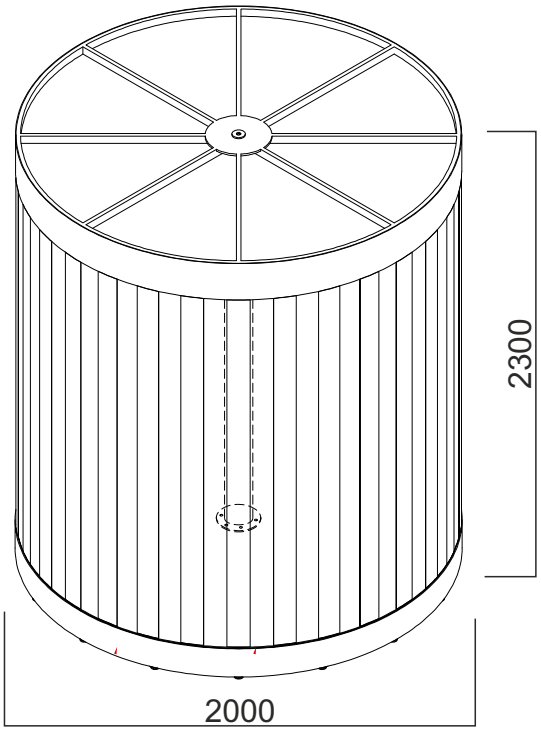
Vertigo

34

A visitor enters a rotating tent and stands in its middle. While standing, he/she watches the rotating wall that might cause a feeling of light vertigo.



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Vertigo

34

The main phenomenon:	Raising a feeling of light nausea.
The main message:	Inducing vertigo.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a tent made up of individual textile strips. The strips have only two colours (alternating). The whole tent slowly rotates. To access the tent, the visitor has to walk through the strips.
The main idea be retained:	A visual perception might induce vertigo
Questions to be raised:	

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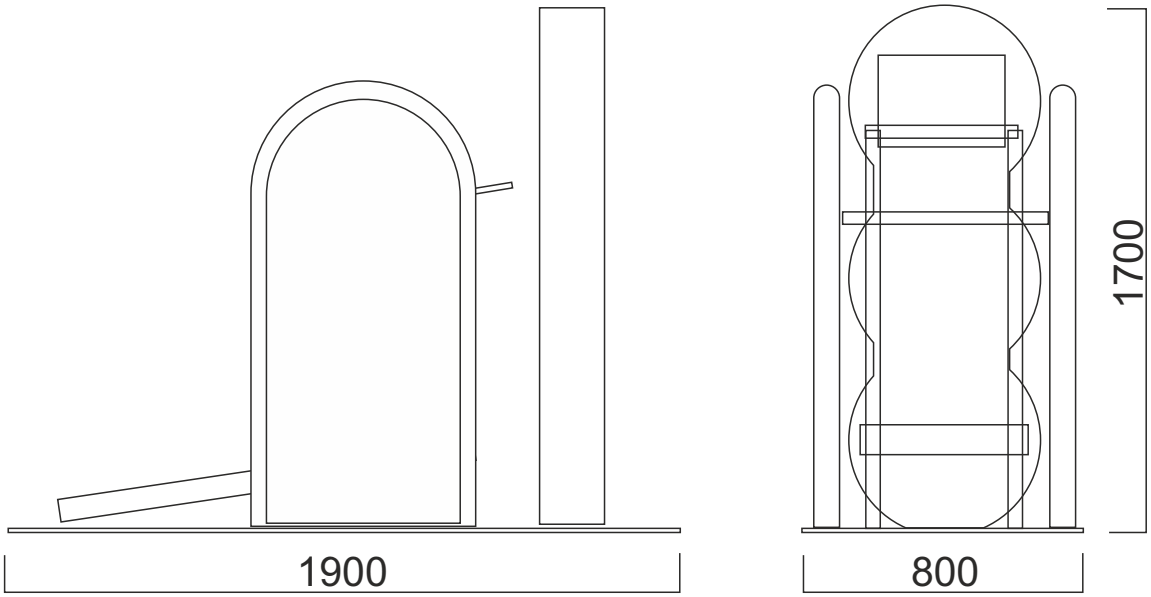
Persistence

35

A visitor steps onto the treadmill and starts running. He/she can see the values of his current run on the screen in front of him - the speed, body temperature and distance he/she has completed. It also records various statistical data. The visitor can then save his/her "performance" and have it recorded in the TSC statistics.



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MAN versus ANIMAL

Persistence

35

The main phenomenon:	A human can run very long distances.
The main message:	Humans are the greatest long-distance runners on the planet.
Target group:	Families with children
A description of the exhibit:	The exhibit consists of a treadmill and an informational touch screen. The treadmill is not powered. There are banisters on the sides of the treadmill to hold onto. The screen is located at the front of the exhibit so that the runner faces it. A visitor can save his/her data and record them in the TSC statistics.
The main idea be retained:	One of the properties of the human eye is the speed that is processes an image and its short-term storage
Questions to be raised:	How does the human eye work?

Techmania
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Financed by Grant program: Operational Programme Research and Development for Innovation (RDI)

MINISTRY OF EDUCATION, YOUTH AND SPORTS

EUROPEAN UNION
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2007-13
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