The inventor mice! A participatory mice adventure for children between the ages of 3 and 7!

Mice are visiting at the Children's Museum - the inventor mice! They invent the whole day and have a lot of fun in the process. Invent something new with them... Dance with the inventor mice and make music for them with a play clock. Set the mouse film in motion with the go-cart and turn the mouse roundabout. With a stroking machine, you help your mouse to fall asleep. You surely have lots of ideas and will find and invent solutions to meet your requirements. Simply try it out; you'll manage it with your favourite mouse!

An exhibition by Graz Children's Museum FRida & freD.

Information goals & thematic focus areas of the exhibition

- To inspire children to "invent and build" through exciting challenges.
- To be inspired by things that have already been built and to think further and extend and change them.
- To get to know and use physical phenomena in an entertaining way.
- To make it possible to understand and experience interrelationships.
- To translate ideas into action.
- To promote solution-oriented working.
- To promote social interaction – younger and older children invent together, younger children support each other, older ones help out when necessary.
- To train the handling of tools when working together.
- To creatively design things that have been built.
- To get to know old inventions.

Concept approach

What does "inventing" mean for children between the ages of three and seven? They invent something new every day when they recognise challenges, solve puzzles and find and invent new paths!

Particularly young children of nursery and pre-school age have an almost insatiable thirst for knowledge and it seems to be their intrinsic motivation to find solutions to problems. They want to be challenged and need the incentive of not thinking in strict dogmas but giving free rein to their thoughts.

For an exhibition on the topic of inventions, this now means confronting them with challenges that they are glad to take up. **Inventions need a reason!** The children fantasise, rack their brains, puzzle away, discover, design and try to imagine in the truest sense of the word how they can succeed in mastering the one or the other challenge. "How do I manage to get the roundabout up there to move?" What do I need to drive the cable car?" How do I manage to set the conveyor belt in motion?" With their inventive spirit, the children find solutions and also invent innovative creations. For there are no boundaries to imaginativeness and the motto is: Everything is possible, everything is allowed!

Children with a vivid imagination need

- a whole lot of different materials,
- the right tools,
- clothing that does not restrict their creative spirit,
- supporting accompanying persons who do not pre-empt anything but are on hand to help
- and a whole lot of inventive spirit!
- **And many children need inspiration! This inspiration is offered by the higher-level story.**

The higher-level story

Like technology in general, the topic of inventions has a "masculine connotation". To reduce the barrier for the female target group, the "activity of the children" is packed into a story. With large-format "picture book illustrations", the small inventions of the children are placed in context and a story is told parallel to the interaction. Why should the children do something? What are they supposed to achieve?

With a cuddly toy mouse, the visitors arrive in an "attic" where the mice live – the inventor mice. However, they are no normal mice – no, they are part of the story and the exhibition. They accompany both the employees and the visitors and stimulate them to invent, build and design something. Particularly children love to come up with solutions to a task and then to implement them. Inventing allowed!

The inventor mice are guiding figures that are likeable, whom children like to follow and who provide impulses for invention. The guiding mice figures developed out of the consideration that children can only build on a small scale and their implemented ideas must therefore fit for a "physically small" guiding figure. They are also sociable, live in a group and with different social ties. This can give group dynamics to the story and children also enjoy being in a group, for many things are easier in a group. Supporting and helping each other and accepting help is also an important information goal for the target group. There are a total of five mice – Kunz, Lenz, Zita, Zora and Strizzi – they all have their own character and most children discover a "favourite mouse" who appeals to them most.

Exhibition design

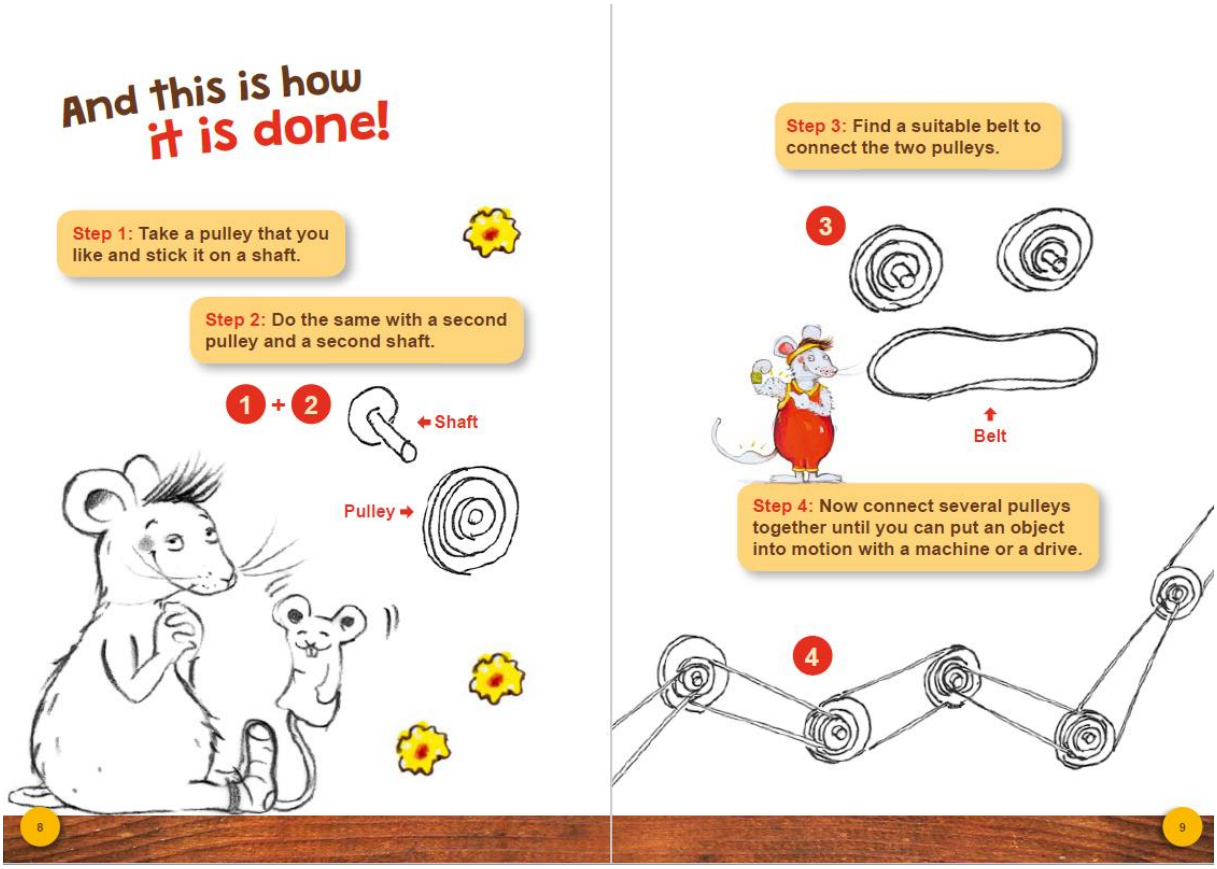
The exhibition is designed as an attic that is inhabited and enlivened by the inventor mice. At this place, the children are invited by the inventor mice to discover, invent, build and construct together. The atmosphere in the attic is warm, cheerful and informal. The place is mysterious and exciting; there is lots to discover here. Wood as a natural building material invites the children to work with it and on it. Funny and colourfully illustrated scenes with the five inventor mice in large format very specifically invite the children to participate. Those who want to and listen carefully can also have the wishes and ideas of the mice whispered directly in their ear.

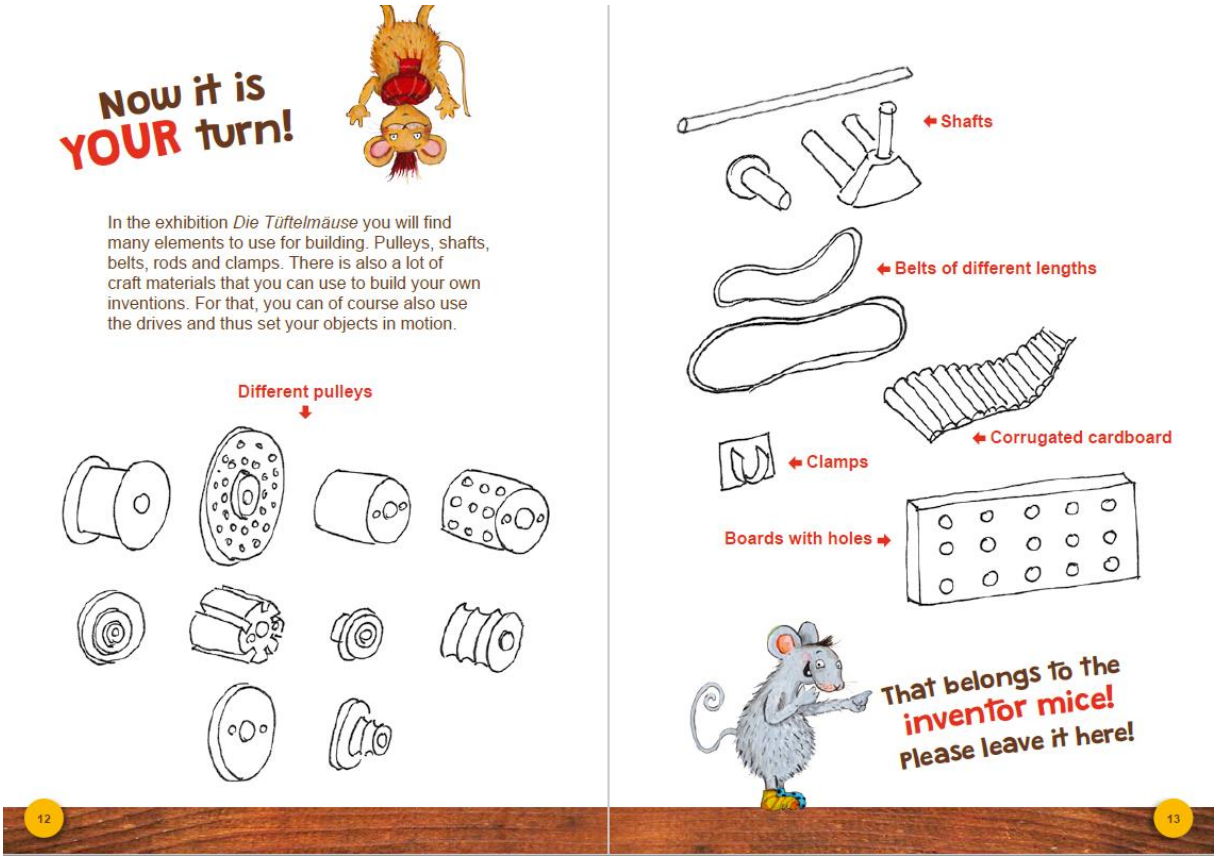
There are diverse items and materials that are not in use and can therefore be used or used differently. Lots of building material is thus very naturally available to the children so that they are inspired to solve tasks and implement their own ideas.

With its supports, beams and spaces, the attic offers different spatial situations. It does not only support the drives and attractions of the machine to be built. It gives structure; it is the living and playing area for the inventor mice; it forms niches as places of retreat for the children. It enables children to conquer the third dimension, both when building upwards and when climbing and exploring the crawling tunnel high above the heads of the adults. This creates a differentiated and inspiring room that can meet the different requirements of the children: the attic of the inventor mice is a studio and a workshop, a room for movement and for withdrawal, a room for dreaming, thinking and inventing, and to be amazed.

Exhibition areas

There are different areas in the *"The inventor mice"* exhibition. Firstly, offers and possibilities for free play, secondly specific problems that can be solved with various drives and mechanisms. The inventor mice have various machines and drives that can set something in motion. And there are exciting and funny items that can be set in motion. In order to be able to start the objects from the machines and drives, the children establish connections with rollers and belts. Not every one of these connections will work well; the children therefore find out which rollers are well-suited for this or that connection, and which are not. The children are also free to change rollers and belts that they find there!





There are even more impulses in the accompanying book to the exhibition!

BALL TRACK SMALL: The ball track offers the youngest visitors the possibility of getting to know phenomena of physics in an entertaining way and to obtain ideas and stimuli for their own building projects. At the end, the effect of the ball can be tried out on everyday items.

WATER WHEELS: Children can build water wheels with the aid of a plug system. They thus train planning, anticipatory thinking and train their motor skills when putting the small parts together.

SHADOW THEATRE: The children cut out outlines from paper and place them on a turning plate. The turning plate is lit by a lamp and casts shadows onto a picture frame on the wall. The children can think up their own imaginative shadow stories and set them in motion.

SEWING MACHINE & CLOCK: Many children are no longer familiar with old sewing machines that were still turned by foot using a pedal. At the home of the inventor mice, visitors can set the foot pedal of a sewing machine into motion. The hands of the clock are moved by this movement.

DRAWER & TURNING WHEEL: How can a drawer be opened with a drive? How do the mice reach what is hidden in the drawer? The children will find that out here!

BALL LIFT & FREE BALL TRACK: The ball lift consists of turning mechanics via which the children can transport wooden balls in a transparent tube upwards. At the top, the balls roll into a basket from which they can be removed by the children and can be stuck onto a fixed ball track via a funnel. The children reach the top via a crawling tunnel. Hook-and-loop fastenings are attached to the beam on which the children can build a free ball track using diverse tubes.

RECORD PLAYER: With a record player, the children examine the connection between speed and music. How does the translation between the rollers of different lengths have to be selected using belts so that the music and singing sound correct? What does the music sound like when the record turns too quickly or too slowly? A piece of music has been especially composed for this exhibition area: Inventor mice, inventor mice!

OPTICAL ILLUSIONS & TURNING WHEELS: Discs with different optical illusions are set in motion by pedal wheels; the optical illusions become visible when they are turned.

PULLEY: Visitors pull themselves upwards sitting on a "chair". This is possible with the aid of a pulley; as a result of the translation, a child can easily pull his or her own weight upwards.

CONVEYOR BELT: The conveyor belt offers the younger children the opportunity of putting together rockets in a team, and then also dismantling them again. There are different rocket components in the white boxes. By turning the crank, the children transport the components from one area to the next and with each step, other components are added until the rocket is finished. Following the steps of the building instructions depicted together in a team leads to the goal.

BALANCE: Balance is challenged and trained in this area. The visitors stand alone or with somebody else on the balance disks and move a ball by shifting their weight. Here, balance, coordination, concentration and patience are required. In addition, there are ropes on which visitors can swing and climb or hold tight when they are balancing.

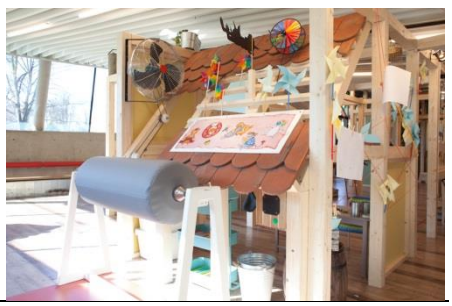
STROKING MACHINE: The mice want a stroking machine so that they can fall asleep easily. A "stroking machine" is operated at some distance, in the mice's realm, by rocking backwards and forwards. A mechanism thus moves a feather over a mouse as if it was stroking him or her. This area is special through the enjoyment of comfortable movement and the link with an unusual usage of the rocking chair.

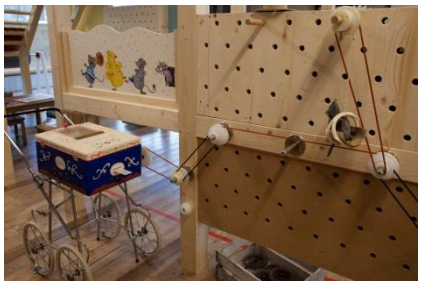
TOP: In this area, everything revolves around the top. Humming tops for the youngest children on the carpet generate optical and acoustic effects. The children will find paper, toothpicks and modelling clay on two worktables of different heights. Tops can be built and also painted from these materials. Tops with cartridges leave spiral tracks on the paper as they spin. They can be experimented with on low platforms with white paper.

CLOCK WITH COGWHEELS: This clock is slightly crazy, it turns how it wants – or better: how the children want it to turn.
A clock with a large movement can be set in motion with the aid of cranks; the children can thus examine cogwheels, their design and their function in an entertaining way.

HAND PISTONS & PRAXINOSCOPE: In a plexiglass tube, there is a piston that has to be regularly and rhythmically pressed in to obtain an ongoing rotation on the flywheel and the following elements. In this way, disc cinemas can be set in motion. The image sequences thus become a small film.

HUGE ROLLER & VENTILATOR: The children find a large roller that can be turned by hand alone or with another person. The turning movement drives a ventilator some distance away. This ventilator generates the wind for the wind turbines that the children build themselves and stick on the roof.



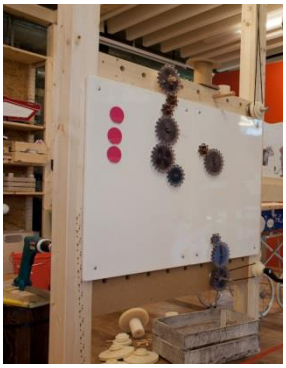


BARREL ORGAN: The dancing mouse wants to dance! The visitors help her. They "compose" music by punching holes in strips of paper. The length of the strip defines the playing time and the individual notes are spread across the width. The strip of paper is placed in the barrel organ; the crank of the barrel organ is then turned via a drive. What melody rings out?

DRILL & LIFT: A drill turns slowly. With this motor, the children can now dry the machines that they have built themselves.

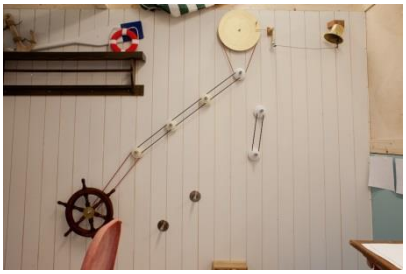
For the construction of their very own machines, pre-drilled "free boards" are available to them here (as they are at some other places) in which they can insert shafts according to their own ideas and build their own mouse attractions. A lift or a cable car are very popular here.

CONFETTI RAIN: The mice want to dance and preferably in confetti rain. A particularly difficult task for the visitors: a very wide connection between a crank and the connection point has to be established and for that self-constructed interim steps on "free boards" are also required. Those who have managed to do that have really earned the confetti rain as a reward and will give great pleasure to the inventor mice.



COGWHEELS: A combination of "free boards" and magnet panels brings the transmission of power through cogwheels into play. They are connected on magnets or with sheaves so that they can be set on magnet panels or shafts. What effect do the direction and speed of turning have?

SHIP WHEEL & BELL: Lazy mice on the mice pirate ship! The children are challenged to wake them up with the sound of a bell. Turning a ship's wheel can sound the bell. There are different routes via which the children can establish the connection via rubber ropes and shafts. And then perseverance is required: the drive wheel only turns very slowly but at the end it hits the bell!



GO-CART & CAMERA: The children take their seat in a go-cart and drive a mechanism by pedalling. An old film projector is set in motion in this way. The mice are already sitting in their cinema seats and are waiting for the film to finally start! The stop trick film is shown directly on the screen of the illustrated mouse scene.

EMBOSSING ROLLER & CRANK: The inventor mice are setting up home and need wallpaper, preferably with a mouse motif.
The children help: they push a sheet of paper between two embossing rollers and turn a crank. There are mouse shapes on the rollers and these are embossed on the paper. By shading with a colour pencil, the contours of the mice can be made even more visible. Wallpapering can then really continue with the self-made wallpaper.

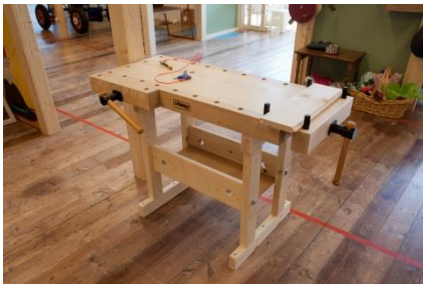
ROUNDABOUT & CRANK: The children can make their inventor mice fly in the aeroplane roundabout. If they turn the crank more quickly or if they change the transmission, the mice fly faster.

WASHING LINE: Diverse things can be affixed with pegs to a washing line and transported upwards to the crawling tunnel. The end of the washing line is located in the crawling tunnel; the children put their hands through holes in the illustration and take the items from the washing line - or affix items to the washing line.

CRAWL TUNNEL: The children climb up into higher levels via two towers, enjoy the view there and make it comfortable for themselves with cushions and blankets. In the tunnel, they find various sources of light that create a special atmosphere. There are also some surprises such as speaking and listening tubes.

SKETCH PANEL: With rulers, a pair of compasses and chalk, the children can outline their ideas for invention on a large panel. Here, the children can give free rein to their creativity; drawing with the large school instruments also promotes their fine motor skills. They reach the very top with stepladders.

FREE BOARDS: In many places in the attic, there are wooden boards with a pattern of holes. The children can realise very free, constructive ideas on these "free boards". There are wooden sticks that act as shafts; in turn, a variety of things can be stuck on these.
For that, there are e.g. rollers and belts, rolls of cardboard and corrugated cardboard as a cogged wheel and belt, rolls of plastic with pins... The children will find other materials to realise their ideas in the freely accessible stock of material. Children have maximum freedom here. It promotes their creativity and anticipatory action.



WORKBENCHES, STOCK OF MATERIAL & SUPPORT FROM STAFF: Diverse consumables are available for inventing. At workbenches, the children work with scissors, hole punch, adhesive tape and much more and implement their mice ideas.

If they need something that is not available on the exhibition space, e.g. hot adhesive, sawing etc. they contact the employees. They will help them or take over tasks that are too dangerous for the children.

READING AREA: Soft mats invite visitors to make themselves comfortable with different books: books about mice or stories of inventions – reading material for the whole family.

MOUSE STICKER: When they leave the exhibition, the children take mouse stickers home with them.