

## The Architecture + School project

The building site for the new school is directly opposite the existing primary school and Pruefening Primary School therefore makes the most of this special situation for both learning and teaching. In the Architecture + School project (A+S project), architect Silke Bausenwein provides guidance on the technical and educational aspects of the building site and brings those aspects into the classroom. Teaching modules for years 3 and 4 developed specifically from the building process are used for education in the built environment in playful form.

Regensburg city council's offer of integrating the pupils in the process of the building of the new primary school is a pilot project. Some 300 children and 14 teachers thereby gain an insight into the world of planning and building. The building of the new school becomes an integral part of the daily teaching programme thanks to the enthusiastic support and help of the teachers.

The contents in the syllabus on the subject of building are interdisciplinary and therefore particularly suitable for lessons at primary school level. Many of the educational objectives of the syllabus from art, German, science and maths become incorporated in the project, such as reading, understanding and interpreting plans and the use of scales for model making.

Communication skills such as listening, rationalization, reasoning and presentation are also tried out and practiced. Teamwork in the workshops encourages a cooperative approach to work in the class and enables children of different aptitudes to be effectively integrated.

Thematically the entire A + S project revolves closely around the planning and construction process spanning a period of five years. The specific focal subject areas are developed from the observations of the children and the questions they raise, giving the primary school pupils insights into areas which are otherwise concealed from them.

The pupils themselves become little experts capable of understanding and presenting even highly complex architectural relationships. They develop decision-making skills and responsibility and become enabled to take an active role in shaping their own environment.

The building site as a subject is openly communicated within the school family as a whole

through the continuity of the A + S project. The pupils share their impressions and observations directly with their parents, brothers and sisters and teachers, enabling them participate in the fascinating process of the construction of the new school.

### Researching Cognition Implementing Architecture – what is it?

Pupils of all the school classes have a keen interest in architecture. But describing what the term architecture means and what an architect actually does is not something they can do very clearly. It is therefore logical to start the project by exploring the origins of the term architecture: Architecture is a composite word, i.e. a word formed out of two separate words. Archi, the first part of the word, is from Greek and means the beginning or origin, and the association with Noah's Ark can quickly be made. The second part, tecture, also has its origins in Greek. This covers meanings such as craftsmanship and technology. The Latin word tectum means roof or house.

Nowadays architecture is only considered to be true architecture if a house or building is not just utilitarian but has been designed with certain artistic aspirations. In other words, the house not only has to be functional, it has to look good too. It is the architect's job to build buildings that are considered to be aesthetically appealing by as many people as possible. And what makes an architect? What are their tasks? An architect must be able to do and be many things.

The ideal dream house for many children is a luxury villa on a large plot of land with an open fire and lots of technical comforts, digital networking and solar panels. How the pupils imagine their dream home comes out in a lively lesson on different types of dwellings. One pupil takes the modern tower house by Blasch Architects in Regensburg for inspiration and makes it his dream house.

### Learning Developing Drawing Dream school

Before the children design their own dream school they learn about architectural design elements. In playful form they also learn technical terms such as saddleback roof and upright window and bring lively technical discussions into the lesson.

In studying the plans of their own school, most of the children get to see an architectural drawing

for the first time ever. They quickly find their orientation and are thrilled to locate their own classroom. The orientation of the school building according to the four points of the compass is no problem either.

Stimulated by the careful reading of the layout plan, only a few of the pupils depict their dream school in the form of a straight fantasy architectural image, most of them drawing a layout based on their own school instead. The drawings contain deliberate changes in scale, e.g. for the presentation of the site plan, the building layout itself or the layout of the classroom, with the occasional elevation drawing too.

One pupil adds a top view to the facade shown in his drawing of his dream school. An exceptional and highly independent achievement requiring considerable three-dimensional perception and abstraction skills. The top view and building elevations match in terms of scale, the modern architectural style is evident.

### Questioning Understanding Assessing Architectural competition

The announcement of the architectural competition by Regensburg city council marks the start of an exciting time for the pupils. They follow the competition in detail and take great pride in the fact that architects from all over Europe take part in the competition for their new school.

The pupils are fascinated that the competition designs are always submitted anonymously and that none of the judges knows which architectural practice has submitted the plans and models received during the competition.

In small work groups the pupils work out the specifications for the invitation for proposals for the architects and learn about the individual stages involved in the competition: What is the purpose of an architectural competition? Who is involved in architectural competitions? ... They find the answers in the official competition documents which are sent to the architects by Regensburg city council as the developer of the new school.

The children study this text brochure in detail and translate the results of their research into a language they can understand in rough form. The teachers' initial scepticism about the legalistic and therefore difficult to understand text, for the layperson at least, proves to be unfounded

because of the curiosity of the pupils and discussion with the architect. The class four pupils now understand the complex procedures, can explain them to their fellow pupils and are able to assess the work of the architects. After the presentation to the class, every class four pupil is a real competition expert.

### Studying Reproducing Comprehending Model making with experts

The children are already well versed in reading architectural plans, but they will only gain a truly three dimensional appreciation with a model. At the chosen scale of 1:50, one meter in the real world is the same as two centimetres in the model. Presented at such a scale the individual rooms are big enough to be appreciated in three dimensional form.

This complex and challenging project would not have been possible without the help of experienced architecture students from Regensburg University of Applied Sciences. Primary school pupils and students get to work together in a fascinating collaboration.

The architecture students greatly simplify the plans for the model by modifying the thickness of the walls to that of the sheets. The layouts are subdivided into separate room boxes to allow small groups to work on them. In small work groups they cut out the walls for the room boxes using knives and cutting edges before assembling them. The finished room boxes (the library in the example) are then inserted in the model's base panel box by box. From the basement to the roof, the new school is built up on this basis. Finally, scale figures enable the children to appreciate the real proportions and sizes of the rooms.

It is not just the young model makers who now have a precise three dimensional appreciation of their new school, as the headmistress at the time, Ms. Zangl, is also impressed by the layer model that can be disassembled by stories.

### Mixing Building Moulding Concrete as a building material

Every day the pupils see the big concrete mixer trucks at the building site from their classroom windows. In three concrete workshops they learn about the key building material for their new school, mix their own concrete and try out the diversity of potential uses by moulding, casting and forming.

### Concrete formwork

On a visit to the building site the pupils collect lots of left over material lying about. The architecture students demonstrate and explain the uses of their finds and construct some model wall formwork in the first concrete workshop. So the pupils now have a better grasp and understanding of how they are used on site.

To the delight of the children the students also bring along the right site helmets for the young master builders, so turning the classroom into a real building site.

### Concrete rabbits

The children's wish for a rabbit pen in the new school garden leads to the idea of making rabbits in the form of concrete sculptures for subsequent integration in the grounds. The plan actually comes to nothing because all the pupils later decide they would rather keep the rabbits lovingly created by moulding for themselves.

Applying the concrete to the metal framework requires considerable patience and good touch, as the wet concrete has to be applied layer for layer. The pupils lovingly smooth down the surface of their rabbit with runnier concrete. Almost 100 rabbits are placed in cardboard boxes to dry out and at the end of the project the animal sculptures, each weighing several kilos, are taken home by their proud owners.

### Concrete pebbles

In the third concrete workshop the pupils of class three make large, coloured pebble stones from concrete, to be used later on the rooftop terraces of the new school as stones for playing with or sitting on.

In small groups the pupils pour the liquid concrete into balloons through self-made funnels, which are then carefully embedded and weighed down in fine sand in a mortar tub for drying. The balloons are then cut open and the stones stripped – a great experience for the children. The concrete artists are delighted with their stones, which look like enormous, washed out stream pebbles and feel surprisingly smooth and velvety. Their intensive contact with the stones enables the children to experience a whole new tactile dimension to concrete as a building material. The coloured pebble stones look very stylish and also impress the teaching staff, who make more concrete stones for the terraces in a teachers' workshop.

The conclusion of the various workshops is: concrete is fascinating, not just for architects!

### Thinking Trying Out Understanding School with power

Climate protection is not an unfamiliar topic for the primary school children, but they are still astonished to hear that Germany as an industrial nation used more energy in 2000 than the entire continent of Africa.

Given that almost half the energy requirement is for heating and electricity for the home, climate protection programmes were established with the goal of drastically reducing energy consumption in dwellings. Saving energy and the use of renewable sources of energy therefore play key roles in the planning and conceptual development of new buildings.

Hence the use of solar energy in the new school is highly important as regards energy supply. 351 solar modules generate about half of the new school's energy requirements, including lunch hour care.

How this photovoltaic system actually works is something the children find out at first hand from the young project Julia Tillmann, who visits the class three pupils in their classroom to explain to them the difference between solar thermal energy and photovoltaic systems: the former revolves around heating water in a collector to generate heat, whereas the latter generates electricity.

The term photovoltaic is comprised of the words photo for light and volt for electrical voltage, since photovoltaic systems convert light, or the energy of the sun, into electrical energy.

### Analysing Assessing Presenting Break time

Another topic of the architectural project concerns the school grounds. The open spaces without predefined uses allocated in the winning design make one stop and think: What do I like doing most in my break time?

This question stimulates lively class participation in every class. In a highly enthusiastic discussion the pupils take turns to describe what they like doing most in the break and together they develop the following proposals using the grounds: natural areas, play and sports areas, resting spots and shady spots, water and a snack kiosk.

The number one wish in every class is always for animals. Another wish is for large sports and play areas for games involving movement or group games. Some of the sports enthusiasts among the pupils express their urge for movement by drawing their favourite sports equipment. The list of sports and equipment is long. One pupil combines a slide, climbing wall, chain bridge and rope ladder all in one in his tree house.

Other children prefer to spend their breaks without any activity at all, dreaming instead of spots in the shade beneath pergolas, of loungers, hammocks or benches beneath trees and of a fountain.

### Sport and games

To give the pupils new ideas for the design of the grounds, school trips are made to theme playgrounds and to the School for Visually Impaired in Pruefening. The children are given the task of trying out the play equipment and checking its suitability for their school.

The classes visit also five playgrounds with provision for a wide range of activities. They especially like a climbing frame that demands a good deal of skill. One boy finds it is so fascinating that he draws it on the spot and describes the way to climb it in detail.

Green shaded spaces, such as the willow labyrinth, are explored and investigated. With a great eye for detail, one girl spontaneously draws a birds-eye view of the mosaic floor of the labyrinth.

In the park of the senses at the School for the Visually Impaired the pupils' perception focuses on listening, smelling and touching. The pupils walk bare foot along the trails laid out in crushed brick, sand or gravel, closing their eyes and enjoying the intensive sensation of the materials' textures. In the botanical garden the children marvel at the variety of fragrances and colours and pick up ideas for their school garden.

### Concepts and ideas

Back in the classroom the sights and experiences have to be put down on paper. In this project the children follow exactly the same approach as the landscape architects contracted later. They study the site plan of the new school building as already conceived by the architects in the competition design. The young designers set to work eagerly in small groups and present their

design proposals in clear sketches, plans and descriptions. Their main focus is on the rooftop terraces and the playground.

One class adds a design element to the concrete proposals for uses. The children would like a lot of space and material in the grounds for the design of natural objects in the sense of "land art". To this end they suggest species of trees which are particularly attractive because of their beautiful leaf shapes and autumn colours.

### Seeing Understanding Reflecting

#### Building site and construction vehicles

From the classroom and the big window of the stairwell the pupils have a perfect view for observing the shell of the building on site. The building site changes daily and the view from the window becomes an integral part of lessons. Maths questions suddenly lose a bit of their importance when a prefabricated staircase floats past the window. In teamwork the class four pupils create posters about the really interesting site vehicles such as cranes and mini-excavators, displaying them on the classroom blackboard. Together they try to work out how a crane works, for example, and why there are so many on site.

#### Construction site - Access allowed

The children can hardly wait for a visit to the building site that they have been observing for months. One hundred ten-year-old school children visiting a building site is anything but an everyday event! After lengthy preparations and approval from the site supervisor, school head and parents, the class four pupils get to visit a secured part of the site in October 2010.

At the gate in the site fence bearing the sign "Warning - Construction site - Keep out", the pupils are picked up by site supervisor Georg Eichinger and the manager of the building contractors, Otto Jaeger, and given an informed tour of the site.

In the foyer area the pupils, drawing on what they have learned, easily identify the facilities for the music and multi-purpose room and the school road. They put many questions to Mr. Jaeger, which he answers clearly and informatively. He explains that concrete is poured into a formwork tube made of specialty boards so that the column surface is as smooth as desired later. The pupils also learn why the concrete wall has holes you can look through.

A wooden bridge provided for the young site visitors leads them safely and cleanly into the basement and to the gym. They are impressed by the size of the hall, as they had not imagined it would be so big!

Given all the new impressions and information, the snack organised by Mr. Jaeger for all the children comes as welcome refreshment.

#### The architect and the new building

March 2012 - crate packing started weeks ago, for the time to move into the new school is fast approaching. Though work on site is flat out to get everything finished on time, the two architekten from Cologne allow a whole morning to give the curious class three pupils a tour of the new building.

The children discover the two big windows which provide views into the gym. They take an instant liking to the light green floor. "In sports lessons you should have the feeling of being on grass," explains the architect. "That's a good idea," the pupils say.

Full of expectation the children enter their new classroom. With the large window front and adjoining rooftop terrace it looks like the living room of a modern bungalow. "In summer we can have lessons outside as well," says one delighted pupil. The large, pale green cupboard wall unit stretching the full length of the room not only adds colour, it is also ingeniously divided up. The children discover the integrated cloakroom and are fascinated by the revolving coat hooks.

At the tour's end everyone is very proud that the new building, with which they have been intensely occupied for so long, has turned out so well. Though they are already very familiar with the school from the Architecture + School project, it is still a very special moment for them to actually stand in it as built. They are delighted to be able find their way around so well already and can hardly wait to move into their new school.

#### Remembering Rearranging Transforming Objects of memory

Before the move into the new school building the pupils and their teachers have to part with many things that have been with them for years. Some class four pupils want to keep personal souvenirs and, together with their teacher, go looking for individual items with special meaning in the old school building.

Along with old photos, including one of the current headmaster, Mr. Thieme, and other teachers, they collect keys, wooden triangles, sponges, loudspeakers, slides, taps, clinker bricks from the school facade, and much more besides. The finds are to be displayed in different display boxes. Fruit boxes are used, which the pupils paint Siena red, the colour of the striking clinker cladding of the old school building. Afterwards the children arrange the objects they have rescued in thematic groups and set about arranging the insides of the display boxes. Five such display boxes are created and they can be grouped in different ways to form a sculpture. These get a special place in the new school.

#### Furniture sculptures

One of the class four classes has the idea of rescuing the surplus chairs from their old classroom, transforming them artistically and assembling them into a bench for the new rooftop terrace. On the principle of "making new from old", brightly coloured new seating creations are the result. For the artistic design of the old wooden chairs the class take a vote to decide four colours which in their eyes go perfectly with the colour scheme of the new school. The chairs are first coated with white primer and then painted with patterns devised in advance or with text such as: "I love my school". At the end the children proudly sign with the name of their class on the chairs which have been screwed together to form a bench.

Another class take the stools from the old craft room and assemble them to make new sculptures. After a few creative attempts at combinations the groups agree on their favourites. The skilful slotting together of the stools results in amazing formations such as a wheelchair or a cube. With great care and fun the seating surfaces are painted with colours. Once dry the stools are joined together with cable ties to be transformed into five colourful sculptures.

#### Learning Presenting Communicating Young experts

One of the key aims of the architectural project is to enable the pupils to communicate what they learn to the rest of the school. A special challenge for the primary school pupils is the official press conference in January 2010, to be held at the school at the invitation of Regensburg city council.

Numerous important guests of honour come on that day, for example the mayor, Gerhard Weber,

as the official representative of Regensburg city council and Michael Hermann, director of the Department of Building and Facility Management. The guests are impressed by the large model that the primary school pupils made with the architecture students. The layer model enables each floor to be viewed separately and also brings out the particular spatial concept behind the new school.

In numerous articles the press provides continuous coverage of the A + S project over three years, thereby bringing it to a wide audience and broadening the communication platform which has developed in the school as well.

#### Architektur vor Ort

##### Architektin Silke Bausenwein

Since 2004 architect and architecture mediator Silke Bausenwein has carried out a wide range of architectural projects in schools in the Regensburg area.

For the one year project entitled "Me as architect" in a primary school she was awarded the "Children to Olympus" award in 2006 in a competition organised by the Educational Initiative of the Cultural Foundation of German States. In the 2010/11 winter semester she lectured on architecture mediation at the Faculty of Architecture at Regensburg University of Applied Sciences on the basis of the "Architecture + School" school project at Pruefening primary school.

"Architektur vor Ort" (or "Local Architecture") - an agency for the mediation of architecture and the built environment - was established as a collaboration between three partners from the fields of architecture, interior architecture, stage design and art education in Regensburg.

She was the initiator of "Treffpunkt Schule" ("School Forum") in "Treffpunkt Architektur Niederbayern/Oberpfalz" ("Niederbayern/Oberpfalz Architecture Forum"), deputy architectural adviser in the Bund deutscher Baumeister (BDB) [German Association of Master Builders] and member of "Architekturkreis Regensburg" ("Regensburg Architectural Forum"). At the 2012 Architecture Biennale in Venice, Silke Bausenwein represents the Bavarian Chamber of Architects at the international symposium "get involved - discover and create common ground".