

Prof. Dr. Albrecht Beutelispacher**Director, Mathematikum, and Professor for Discrete Mathematics and Geometry, Justus-Liebig-Universität Giessen****What inspired you to create the Mathematikum, the world's first mathematics science center, in 2002?**

The first beginning was a seminar with students. In this seminar, the students constructed models and described the mathematics that was used to create these models. The models became so beautiful that I decided to make an exhibition out of them, and the exhibition eventually became a traveling exhibition. And then it was quasi automatic: people liked the exhibits so much it became immediately clear that we were moving in the right direction.

What kinds of interactive activities do you have at the Mathematikum to engage young children and stimulate their interest in mathematics?

The permanent collection contains more than 150 interactive exhibits which are designed to stimulate the visitor's interest in a particular mathematical phenomenon. All of the exhibits look very "simple," yet such simplicity is often achieved only after a significant amount of reasoning and experimentation. The aim of making an exhibit "simple" means to focus on the "heart" of the underlying mathematical phenomenon. This focusing on the essential part stimulates the brains of our visitors in an amazing way: They begin to comprehend concepts, ideas, solutions – and sometimes the "Aha-moment" occurs, in which everything becomes clear.

In addition to the experiments, we offer small science shows, "number stories" (for four- to eight-year-old children); children's lectures (for eight to twelve year olds), and a math academy for youngsters between fourteen and eighteen.

If you were addressing a group of parents, what kinds of games or activities would you recommend they engage in at home to stimulate their children's interest in mathematics?

Stimulate their curiosity. Show them interesting things. This can, for instance, be done by showing them a calculating trick, or a strange property of numbers, such as $11 \times 11 = 121$, $111 \times 111 = 12321$, $1111 \times 1111 = 1234321$, and so on. This can be done by showing them

your enthusiasm, your questions, and your attempts to understand phenomena. Be open for the children's observations, questions, and explanations.

If you were advising a group of mathematicians interested in establishing a similar type of mathematics science center, based on your experiences since 2002, what would you recommend?

(a) Take the visitors seriously. In particular, define your audience. We, for instance, state clearly that our target audience is the leisure market (then also school classes will come). This has enormous consequences for the exhibits. Our visitors do not want to do mathematics in a formal way. So, we provide exhibits which allow the visitors to take their "first steps into mathematics." For instance, when visitors assemble a puzzle, such as the "Soma-cube," they have to combine small pieces to form a larger cube. In doing this, they gain geometric insight and learn combinatorial properties.

(b) Take your subject seriously. This has two aspects.

- Select "interesting" ("good," "important") mathematical phenomena. Try to establish a fair balance between the different parts of mathematics. In other words, the exhibits cover geometry (i.e. forms and patterns), algebra (i.e. numbers and their properties), calculus (in particular functions), and statistics and probability (the theory of randomness).

- Show that mathematics is interesting in itself. In the Mathematikum we deliberately avoid light effects, strange colors, noise, fog, etc. On the contrary, we are convinced that at least some important parts of mathematics are attractive and of themselves interesting for many visitors.

Do you think that our current reliance on computers and other digital devices will have a negative impact on science museums and related institutions?

No. For two reasons. 1. Today, science museums are very popular, because they provide a real experience, in contrast to an "indirect" experience provided by TV and computers. Therefore, as long as science museums provide hands-on exhibits and show authentic originals, they will attract a lot of visitors. 2. There are many ways the computer can be used intelligently in science museums. I am convinced that we just took the first few steps.