The Mathematikum and mathematical experiments – an ideal first step into mathematics

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Mathematikum in Giessen, Germany



Mathematikum: mathematics for everybody!

- The first mathematics science center in the world
- Opened November 19, 2002
 by the president of the republic,
 Johannes Rau
 - "Mathematics can be fun. This I learned here."
- A success story: So far 1.8 million visitors



Mathematikum: the idea



Interactive exhibits + visitors = experience, understanding, pleasure



Mathematikum: facts

♦ 180 interactive exhibits on 1200 square meters Open every day (except december 24, 25, 31) Between 120.000 and 160.000 visitors each year young and old, groups (40%) and private visitors, families Quality of visits Iong visits visitors come back with their friends ♦ Entrance fee: 7,50 €, reduced 6 €, family 15 € Running costs are in balance About 80 people are working in the Mathematikum











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Mathematikum: Exhibits

Interactive exhibits from all parts of mathematics: Geometry, numbers, probability, functions, history, ... Technically "easy" No hidden mechanisms (electronic, ...) Visitors don't destroy the exhibits Visitors don't steal objects For all ages and each educational background Each exhibit represents an important aspect of mathematics

Is this at all mathematics?



Are these at all experiments?

- An experiment in physics or chemistry verifies a rule of nature or falsifies a hypothesis
 - A mathematical experiment does not replace a proof
- A mathematical experiment is an eye opener
 - it stimulates thinking; ideally, you ask the right questions
 - it stimulates imagination; ideally, it gives you the right idea
 - it makes the Aha-effect
 - it gives you the feeling of success

It is a first step into mathematics

- A mathematical experiment is really a step into mathematics
 - You solve the experiment by thinking
 - You have success (and the success is yours!)
- It is only a first step into mathematics
 - Many more could follow...
 - In school, in workshops, by reading, ...
- Challenge for making experiments: where to stop
 - Find the right amount of impulse so that people can go on for themselves

Difference to mathematics in school

Many experiments fit into the school curriculum
 Forms, patterns, numbers, Pythagoras, ...

Many experiments never occur in school

- Traveling salesman, perspectivity, brachistochrone, soap bubbles (= minimal surfaces), ...
- Mathematikum gives a richer (broader) view of mathematics
 - while mathematics in school is "deeper"

What we do

We take visitors seriously The visitor may choose the experiments she/he is doing, the time she/he is spending, the level of understanding We take science (mathematics) seriously The scientific phenomena are most attractive in themselves We provide a "nice" environment The building is clean and "new" All experiments work Explainers are ready to assist

What we don't do

Motivation

 smoke, light effects, sound, fancy colors, computer games, IMAX cinema, ...

#Education

- Texts, forms to be filled, multimedia stations, rallyes, guided tours, school programs
- No hidden curriculum and control ("what you should know after a visit")

Mathematics makes you happy!

Visitors leave the Mathematikum happier than they entered it!