



May 2015

Teaching the TEMI way

*How using
mysteries supports
science learning*

Dear Partners,

Teaching the TEMI Way booklet summarises the project concept and innovations for using mysteries in the classroom. It is now available in English on the project website. To accompany it, TEMI partners are also producing a *TEMI Book of Mysteries*, a selection of mysteries with guidance notes for teachers and student worksheets. The book will introduce, explain and provide examples for the four TEMI teaching innovations with practical suggestions for use in the classroom. The aim of the book is to inspire teachers with examples they can use and also inspire them to develop more mysteries using the TEMI methodology.

A draft book is well under way and has already received feedback from the Scientix ambassadors, a community of European science teachers very much involved in communicating about education projects. TEMI partners are now on finalising and testing the book with teachers and a final version is planned to be made available to public in November 2015 in English, followed by translations in several European languages by March 2016!

Thanks to all partners for their contribution to both books.

Peter McOwan and Dorothee Loziak

WHAT'S COOKING?



TEMI and the SCIENTIX community

TEMI has developed close links with the SCIENTIX community since participating in the SCIENTIX conference in Brussels last Autumn. TEMI coordinator Queen Mary University of London hosted a SCIENTIX meeting in April 2015 and presented the project over 4 hours to their community of Ambassadors. TEMI partner Sterrenlab was invited to present the project to a SCIENTIX meeting held in Barcelona in April 2015



2nd teacher training cohort in Leiden

In the end of May our second teacher training cohort had a very successful kickoff with 20 teachers from all over the Netherlands and Belgium. For this second teacher training cohort we have a very active group of 20 teachers, working in primary schools, secondary schools, teacher training colleges and planetariums. We got help for the showmanship part of the training from RINO, a foundation of Leiden physics students that



Vienna finished cohort 4

The UNIVIE team finished cohort 4. It took place in Vienna on four afternoons with about eight teachers. Especially successful was the continued cooperation with the magician Tilman Andris. This time he invented a magic trick with one of the mysteries – the density bottle. The video of the trick can be watched on the TEMI homepage: <http://teachingmysteries.eu/at/zauberer-tilman-andris-war-in-wien/>

and partner Sheffield Hallam University presented the TEMI methodology to science teachers at another SCIENTIX event in Brussels in May 2015.

visit schools across the country to present their Freezing Physics show to classes. The magician Tilman Andris will be performing a few of his magic tricks and discuss showmanship skills with the teachers during the second day of the workshop. In the beginning of June our third cohort will start with again 20 teachers from both the Netherlands and Belgium.

The teachers were amazed and wished for a continuation of the workshops. The UNIVIE team plans a follow-up to start in February 2016 with all interested TEMI teachers. The follow up strives to deepen teachers' competences to implement inquiry-based teaching using the 5E-model, and to develop further mysteries together with the participants.



Positive Feedback on TEMI Events

March 04, 2015, was an official in-service STEM teachers' study-day at UniHB (in Bremen: MINT-Fachtag). Several lectures on current topics from



The magic touch in Norway

During the April, the TEMI team in Norway has arranged day 1 of cohort 4 and day 2 of cohort 3. This month day 2 of our 4th cohort is planned.



The Mystery of the Missing Mass

A new collaboration between the Milan and CERN is under construction and a new challenging TEMI-like activity about the Higgs boson is being

different domains of science were combined with teachers visiting the non-formal student laboratories at UniHB or participating in workshops on new and innovative pedagogies in science education. One of the workshops was about TEMI. 20 teachers attended a three hours session organized by Dörte Ostersehl and Johanna Dittmar. After a short introduction into the TEMI philosophy teachers got the chance to experience 15 different mysteries in the laboratory mainly focusing biology and chemistry related topics. Examples concerned the magic sand mystery, misleading the senses, the chemical garden or the love meter activity. The practical work took about two hours. Teachers recognized the TEMI style of approaching science with enthusiasm. Intense discussions were initiated among the teachers and between teachers and science educators from UniHB. Discussions were about how to integrate the different activities into lower secondary science classrooms and to whether the TEMI style of science teaching can be a solution for a lack of motivation and interest among the students for science education.

During day 2 of cohort 3, we worked with the magician Kristine Hjulstad, who also happens to be a medic. We are very grateful that Kristine will teach our TEMI teachers about the essence of mysteries, and give some ideas about how you can turn yourself into a good entertainer. Furthermore we are currently working on ways to become more in touch with our teachers through different networks. We have also started to plan a TEMI conference at the university college next year, for the teachers participating in the program. During the last month, the TEMI team in Norway finished the contribution to the TEMI app and the Mystery of the Month. We made a mystery about why hail in Norway forms in summertime and not in wintertime.

projected.

The suggested activity is addressed to the teachers attending the Italian Teacher Programme scheduled in September 2015 and will be developed in eight hours of very intense structured inquiry. It will be based on the following four workshops: Electromagnetic induction; Eddy currents induced mass; Superconducting currents, massive photons and massive particles; Higgs boson detection.

The fundamental mystery underlying all the project can be reassumed by two questions: "What is the mass? Why the things around us have a mass?" These questions are so profound that they are almost unnatural for students; very difficult to be understood. Therefore, the first thing to do is to create a context that can give sense to the previous questions and, only afterwards, tackle the answer given by the standard model, that of a spontaneous symmetry breaking leading to the idea of the Higgs field and the detection of the Higgs boson.

The activities, that will be structured following the 5E (Engage, Explore, Explain, Extend, Evaluate) cycle that are at the core of the TEMI project, will make plenty use of lab-works and games and will develop teachers' observing / verifying skills in the contexts of electromagnetism, superconductivity and high energy physics.



TEMI App - work in progress

Cnotinfor had set up several meetings and an opening discussion forum to clarify questions for the TEMI App. Currently it is foreseen to have only one App running at the same time on the web and as a smartphone and tablet App both for iOS and Android.



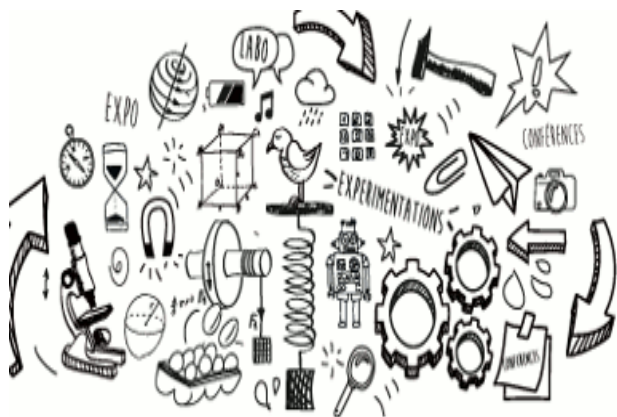
Lab sessions at UL

The UL team have recently completed their teacher training workshops with their third cohort of teachers. Ten in-service Irish science teachers attended their second and final TEMI workshop on Saturday 9th May. It proved an enjoyable day, particularly the lab session in the morning where four teachers presented their developed TEMI mysteries to the group. All participants commented on their evaluation forms about how useful and interesting this session of the workshop was.



Training providers TEMI meeting

Team Weizmann had a great meeting in London with 19 representatives of almost all partners. The participants were asked about their expectations from the meeting, and they matched our goals. They mentioned, experiencing new experiments, sharing and learning best practices, how to motivate students to investigate, learning more about how to involve the 4 innovations, especially showmanship. Each partner presented a mystery and the others experienced it. All partners put a great effort in presenting their activities. We interacted a lot and nourished each other with the mysteries and great ideas.



TEMI landed in France

TEMI landed successfully in France for a full week dedicated to mysteries, illusions and science at Espace des Sciences Pierre-Gilles de Gennes in Paris. The programme included science shows by Traces' science explainer for primary school students and families, a two-fold workshop on showmanship shortly presenting other innovations for teachers, a round table and some appetizing science experiments fooling your senses. The teacher discussions spread on a wide range of topics from the motivation of students, the nature of mysteries, gender issues and the differences of approaches outside and inside of the classroom, to the links between TEMI and other IBSE projects in



Workshop for teachers in CZ

Our TEMI Workshop for teachers was the last workshop of the third cohort, which took place on 24th - 25th April. After that, we began preparing the second workshop of the fourth cohort, which consists of pre-service teachers - chemists, who study pedagogy to qualify themselves for teaching. This workshop took place on 15th to 16th May and it followed up on the first workshop (February & March 2015) as a part of their studies. Each of these workshops lasted 16 hours in total. Mid May, we began preparations of the first workshop of the fifth cohort, which is planned to take place in the beginning of June. The last event was our participation on the annual



Science on Stage Festival 2015

TEMI will participate to Science on Stage, the most important European teaching festival that will take place from the 17th to the 20th of June at Queen Mary University. TEMI will have a dedicated stall where the TEMI methodology will be presented with short mysterious demonstrations, the TEMI mascot and promotional material. We will also animate a lunch with the teachers to engage them in a discussion about the concept of mystery in the didactics of science. Sterrenlab and Queen Mary will coordinate and organise our participation to the festival and we will be supported by 4 TEMI teachers coming from Germany, Ireland, UK and Italy. We believe the teachers will be the best

France. Other topics included the entrance of the teacher in the classroom, the importance of the setting and climate to create, the use of familiar objects, of what you have and what fits your personality and own history with your students, the GRR, the costumes and characters that were created or could be created by teachers to try new things while not giving up on their authority, what could IBSE and TEMI do for students who tend to be “labelled” or have different ways of learning, counter intuitive experiments, and many other.

meeting of the ECTN in Ljubljana, where we disseminated information about TEMI during the sessions about the education of pre-service and in-service science teachers using a poster and personal discussion.

We also continued with the preparation of the TEMI Meeting, which is taking place from 10th to 12th June in Prague. We prepared the agenda with Peter and Dorothee along with some organization issues.

We revised our publication "Exploring the world around us by inquiry and examination" at the end of the month to prepare it for printing. We also revised new materials to upload them to the TEMI website.

ambassadors of our project as they will be able to share their point of view and impressions with colleagues across Europe. Hopefully we will have time to visit the fair too and be inspired by projects and presentation by over innovative 350 teachers!

More outreach events this summer!

TEMI partners SHU, UMIL and Leiden University will be presenting the project through various mysteries and activities at the CERN and European Space Agency summer schools for science teachers! These are great extra opportunities for TEMI to reach out to teachers and collect feedback on our pilot project.