



The  
**Fibonacci**  
Project

DISSEMINATING INQUIRY-BASED SCIENCE  
AND MATHEMATICS EDUCATION IN EUROPE

FIBONACCI EUROPEAN TRAINING SESSION

# TS<sub>2</sub>: USING THE EXTERNAL ENVIRONMENT OF THE SCHOOL

Monday, October 10<sup>th</sup> to Wednesday, October 12<sup>th</sup>, 2011  
Helsinki, Finland



WITH THE SUPPORT OF



# WHAT IS THE FIBONACCI PROJECT

Funded by the European Union under the 7<sup>th</sup> Framework Programme and supervised by a high level scientific committee, the Fibonacci Project (2010-2013) aims at a large dissemination of Inquiry-Based Science and Mathematics Education (IBSME) throughout the European Union, in a way that fits with national or local specificities. This project defines a dissemination process from 12 Reference Centres to 24 Twin Centres based on quality and a global approach. The Fibonacci Project will lead to the blueprint of a transfer methodology valid for building other Reference Centres in Europe.

The Fibonacci project is based on 3 pillars:

1. **An inquiry-based approach** to science and mathematics teaching and learning in primary and secondary schools;
2. **A local approach**, mobilising a comprehensive and complementary group of local partners.
3. **A twinning strategy** linking 37 centres in 24 countries. From 2010 to 2012, 12 Reference Centres with a high expertise in IBSME are twinned with 12 intermediate centres and 13 beginner centres. In 2012, 24 new partners (not identified yet) will join the Fibonacci project, expanding it to almost all European countries.

See <[www.fibonacci-project.eu](http://www.fibonacci-project.eu)> for details.

# TS<sub>2</sub>: USING THE EXTERNAL ENVIRONMENT OF THE SCHOOL

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## Dates

Monday 10<sup>th</sup> to Wednesday 12<sup>th</sup> of October 2011.

## Aim and special topics

Using the external environment of the school: especially

- How to use science centres to the benefit of classroom learning
- How to use nature to the benefit of classroom learning (outdoor activities)

## Contents

Schools are more and more open to using the external environment to teach science. The main issue in our European training session will be to describe how to bridge the gap between informal and formal education and how to include the IBSME approach.

Program will focus on activities in different environments outside the school and will give to participants an opportunity to get involved in sessions and activities that will take place in three different places.

During the three days, participants will get to know the Finnish system of working with the external environment of the school. Teachers and educators, mainly from the Fibonacci-project, will be invited to present materials and share their experiences and knowledge concerning IBSME activities carried out in informal environments. After the three day seminar all participants will have new thoughts, ideas, an understanding about using the external environment of the school under the IBSME approach.

## Venue

On one of the days activities will be held in Heureka, the Finnish science center <[www.heureka.fi/portal/englanti/](http://www.heureka.fi/portal/englanti/)>. There will be an opportunity to observe how Finnish schools and teacher students are using science centres according the three step model: before pre-activities – during the visit – after post-activities. One of the focus will be on how to use IBSME activities in a laboratory designed for young kids.

Another day will be spent in the Finnish National

Park, Nuuksio <[www.luontoon.fi](http://www.luontoon.fi)>. It will be a special opportunity to work in the nature, have an overview of outdoor activities carried out by schools and to discuss and think how to create IBSME-activities. Of course, we will go to sauna after the hard day!

Another day will take place in the University of Helsinki, Department of Teacher education <[www.helsinki.fi/teachereducation/](http://www.helsinki.fi/teachereducation/)>. The program will include presentations about science education, IBSME activities and ICT tools. And of course lots of practical sessions.

## How to register

Online registration form will be open in September 2011 on:

<<https://elomake.helsinki.fi/lomakkeet/26390/lomake.html>>

## Contact persons

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# Programme

MONDAY, October 10<sup>th</sup>

## USING THE EXTERNAL ENVIRONMENT OF THE SCHOOL

Place: University of Helsinki (map 1)

<[www.helsinki.fi/university/index.html](http://www.helsinki.fi/university/index.html)>

8h00	
9h00	
10h00	<b>REGISTRATION</b> 10.00 – 12.00 Registration
11h00	Siltavuorenpenger 5 A - lobby (map 4) < <a href="http://kartat.enero.fi/m/aZRFG">http://kartat.enero.fi/m/aZRFG</a> >
12h00	<b>LECTURES</b> 12.00 – 13.30 Lectures
13h00	<b>Welcome words</b> Hannu Salmi & Arja Kaasinen <b>The Fibonacci-project</b> Mr. Xavier Person <b>Learning science outside the school</b> Professor Martin Braund <b>Inquiry-based science education: the lesson learned - where is the evidence</b> Dr. Stephen Parker
14h00	13.30 – 14.00 Coffee break
15h00	<b>LECTURES</b> 14.00 – 15.30 Lectures
15h00	<b>PISA as a Tool for comparing Educational Systems</b> Dean Patrick Scheinin <b>Schools and co-operation with parents</b> Professor Hannele Niemi <b>Opportunities for an external environment of the school</b> Professor Toomas Tenno
16h00	<b>WORKSHOPS</b> 16.00 – 17.30 Workshops
17h00	<b>Theme: Inquiry-based science and hands-on activities</b> 1 Handicrafts (Leo van de Bogaert) 2 Chemistry and Physics (Jarkko Lampiselkä) 3 Biology (Merike Kesler) 4 Mathematics (Markku Hannula)
18h00	18.00 Welcome Buffee in restaurant Olivia
19h00	
20h00	

TUESDAY, October 11<sup>th</sup>

## SCIENCE CENTRES AS AN EXTERNAL ENVIRONMENT OF THE SCHOOL

Place: Heureka, The Finnish Science Centre, Vantaa (map 2)

<[www.heureka.fi/portal/englanti/](http://www.heureka.fi/portal/englanti/)>

09.00 – 10.00 Lectures	<b>Toward the Evidence of Inquiry Based Science Education: Bridging the gap between formal education and informal learning by teacher training</b> Research director Hannu Salmi
<b>WORKSHOPS</b> 10.00 – 12.00 Workshop with students	<b>Theme: Practical overview how to use science centre as an external environment of the school</b> <b>Groups and workshops</b> A Laboratory 1 B Laboratory 2 C Science Theatre Minerva D Planetarium E Augmented Reality F Exhibition
12.00 – 13.00 Lunch at Heureka	
<b>LECTURES</b> 13.00 – 14.30 Lectures	<b>The Role of Informal Science Laboratories:</b> Petra Skieve-Corrette <b>The National Space Centre as an external environment of the school:</b> Tina Jarvis <b>IBSME at schools in Finland: best practices:</b> Kari Töyrylä and Matti Jokela
14.30 – 15.00 Coffee break	
<b>DISCUSSION</b> 15.00 – 16.00 Group Discussion	<b>How to use science centre and its laboratories, demonstrations, planetarium, science theatre etc. as an external environment of the school? Conclusions.</b>
16.00 – 17.00 Planetarium	< <a href="http://www.heureka.fi/portal/englanti/planetarium/">http://www.heureka.fi/portal/englanti/planetarium/</a> >
17.00 – 17.30 Showtime	Senior Inspirer Harri Montonen
18.00	Buffee in restaurant Einstein



## WEDNESDAY, October 12<sup>th</sup>

### NATURE & FORESTS AS AN EXTERNAL ENVIRONMENT OF THE SCHOOL

**Place: Schools and Nature**

(Remember to take good hiking shoes and clothes with you!)

08.30 Hotel Arthur: transportation by bus

09.00 – 12.00 Workshops

A Primary school  
(ages 6/7-12)

B High school  
(ages 13-16)

Workshops with school classes

Workshops with school classes

12.00 – 13.00 Lunch at school

13.00 Transportation by bus to Solvalla, Nuukio  
<[www.solvalla.fi/info](http://www.solvalla.fi/info)>

14.00 – 16.00 Workshops in the forest

**Forests and biodiversity**

*Sirpa Kärkkäinen, Suomen metsäyhdistys*

**Rocks, minerals and Ice Age**

Coffee break during the workshop

16.00 – 17.00 Group discussion and conclusions

17.00 – 20.00 Sauna (opportunity) and dinner



20.00 Transportation back to Helsinki



### Accommodation

We have reserved an accommodation from the Hotel Arthur. <[www.hotelarthur.fi/eng/](http://www.hotelarthur.fi/eng/)> Hotel Arthur is located in the center of Helsinki.

### Hotel Arthur

Vuorikatu 19

00100 Helsinki

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E-mail: <[myyntipalvelu@hotelarthur.fi](mailto:myyntipalvelu@hotelarthur.fi)> / <[vastaanotto@hotelarthur.fi](mailto:vastaanotto@hotelarthur.fi)>



## PARTNERS

### EUROPEAN COORDINATION

**France** - *La main à la pâte* (French Academy of Sciences, *École normale supérieure Lyon*, *École normale supérieure Paris*). For the purpose of Fibonacci, the *École normale supérieure* is the legal entity coordinating the project.

### SCIENTIFIC COORDINATION

Science: **France** – *La main à la pâte*      Mathematics: **Germany** – University of Bayreuth

### REFERENCE CENTRES

**Austria** – University of Klagenfurt    **Denmark** – University College South Denmark    **France** – ARMINES/ Graduate School of Engineering of St Etienne    **France** – Graduate School of Engineering of Nantes  
**Germany** – Free University of Berlin    **Germany** – University of Augsburg    **Germany** – University of Bayreuth  
**Netherlands** – University of Amsterdam    **Slovakia** – University of Trnava    **Slovenia** – University of Ljubljana  
**Sweden** – Royal Swedish Academy of Sciences    **United Kingdom** – University of Leicester

### TWIN CENTRES 1

**Belgium** – Free University of Brussels    **Bulgaria** – Institute of mathematics and informatics of the Bulgarian Academy of Sciences    **Estonia** – University of Tartu    **Finland** – University of Helsinki  
**Greece** – University of Patras    **Ireland** – St Patrick's College    **Portugal** – Ciencia Viva, National Agency for Scientific and Technological Culture    **Luxemburg** – University of Luxemburg    **Romania** – National Institute for Lasers, Plasma and Radiation    **Serbia** – Vinca Institute for Nuclear Sciences    **Spain** – University of Cantabria  
**Switzerland** – University of Zürich.

### ASSOCIATED PARTNER FOR THE GREENWAVE PROJECT

**Ireland** – Discover Science and Engineering - Discover Primary Science.

### TWIN CENTRES 2

**Austria** – Pädagogische Hochschule Wien    **Belgium** – Dienst Katholiek Onderwijs    **Denmark** – NAVIMAT, Danish National Centre for Mathematics Education    **Denmark** – VIA University College  
**France** – PRES de l'Université de Lorraine    **Germany** – Cologne & Bonn Chambers of Commerce and Industry  
**Germany** – Thüringer Institut für Lehrerfortbildung    **Italy** – National Association of Science Teachers  
**Poland** – Jagiellonian University    **Spain** – University of Alicante    **Turkey** – Academy of Sciences/TUBA  
**UK/ Scotland** – University of Glasgow    **UK / Northern Ireland** – Queen's University Belfast.

## CONTACT DETAILS

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