Xplora for eTwinners

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Introduction

• Xplora is hosted by European Schoolnet and financed by PENCIL, a project funded by the European Commission

• Target group: Science teachers, science communicators, pupils

• Aim: Enable teachers to give up to date fascinating science lessons
  – Teachers are experienced to motivate students, but need support
  – 1 motivated teacher influences up to 4000 pupils in his professional life time

• Pupils: Invited to join Xplora
Xplora online offers

• Basic services
• Advanced services
• Web experiments
• Database projects
• Collaborative projects
Basic services

• Library
  – Search resources, download and read description of software, information about activities

• Megalab
  – Informs about web experiments, database projects, collaborative projects

• Practice
  – Favourites, examples

• Events
  – Online expert talks, calendar

• Community
  – Register, login
Advanced services

• For registered users only
  – Registration completely free

• Library
  – Upload resources

• Megalab
  – Participate in web experiments, database projects, collaborative projects

• Events
  – Participate in online chats

• Community
  – Create own groups, upload/download material in groups
Members area

Welcome to your desktop
Here you can update your profile, communicate with other users, search for and manage your learning resources, create or search for a community to join or conduct your on-line experiments.

Profile  Forum  List Community  My community  Create community
My chats  Resources  Web experiments  Database projects
Chat
Web experiments

• Real experiments in a remote controlled environment (RCL: Remote Controlled Laboratories).

• Excellent solution to enable students to work on expensive, dangerous or time consuming experiments.

• Coupling with a database of results allows scientific reasoning for those experiments, which need a large number of results for interpretation.

• Xplora–Knoppix provides resources.
Semantic structure of a web experiment

- Background information about experiment
- Background information about first experimentalist
- Lesson plan
- Software
- Teacher material
- Students guide

- Web experiment
  - Educational environment
  - RCL
  - Experiment
    - Server
    - Database management
    - Users
  - Time slots
  - Results

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The Millikan experiment

- An oil drop is exposed to an electric field
- The speed of the drop is measured
- From the speed and the electric field strength, the charge on the oil drop can be calculated

[Image from Wikipedia]
Reasoning from database

Millikan experiment

Database results (simulation)

# of experiment

\[ q \]

1e-19
2e-19
3e-19
4e-19
5e-19
6e-19
7e-19

6.408e-19
4.806e-19
3.204e-19
1.602e-19
Reasoning from database

Millikan experiment
Database results (simulation)

$q [C]$

This is my value!

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Database projects

• Pupils visit a location to note observations and/or run experiments

• Observations and experimental results are given into a web database

• Geographical information is available together with experimental results (GIS functionality)

• Some projects
  – Sunset, AquaData, AeroData, TerraData, RadioData, GraviData .....
Sunset project

- Pupils visit a location and note the time and direction of a sunset
- Observations of date, time, direction and location are given into a web database
Collaborative projects

- Projects that require collaboration of different classes with different topics
- Example: 4seasons

- Pupils cooperate in the sunset project
- Pupils report about traditions at these times
- Cooperation across subjects
Xplora offline offers

- Xplora-Knoppix
- eCourses
Xplora-Knoppix

- Adapated Knoppix version for science teaching
- Self booting DVD with its own Open Source operating system
- Educational material from the Internet and from project partners
- Software to cover all aspects and all levels of science teaching
  - from gcompris for Kindergarten kids to ghemical for quantum chemistry calculations...
- Give copies to teachers, students, friends...
- Download for free
- Order a burned copy
Screenshots Xplora-Knoppix
eCourses

• MOODLE as Learning Management System (LMS)

• Implementation of courses on bootable USB stick (MOUSE: Moodle On Usb Stick Environment)
  – Teacher boots a computer in the LAN from USB stick
  – Teachers work on the USB stick
  – Analysis of pupils work at teachers home

• Adaptable standard courses downloadable
  – Under development: Analysis
MOUSE

Knoppix on USB

Apache Webserver
Offers he Moodle web pages to the LAN environement.

MySQL Database
Saves the Moodle courses.

PHP
Programming language used by Moodle.

Moodle
Learning Management System (LMS) to host the course.
Client

Client computer

Operating System
Network access to Moodle Server.

wxMaxima
CAS for course exercises.

GeoGebra/GEONExT
Dynamic geometry software for course exercises.

Office software
Software with mathematical typesetting facilities for reports and presentations.
Integrated support environment

- **Online presentation**
  - Provides Resources, Information, Projects Cooperation
  - Delivers Moodle courses either to integrate into the schools Moodle server or independent on a USB stick
  - Download resources, participate in collaborative projects, web experiments, database projects, submit examples of good practice, cooperate in communities

- **Download from Xplora & partners**
  - Xplora develops courses for Moodle Open Source LMS
  - Xplora's courses are based on Moodle. The teacher can install his own Moodle server in school

- **MOUSE**
  - Moodle On Usb Stick Environment supports teachers to use Moodle courses from Xplora without installation and configuration
  - MOUSE contains its own configured Moodle server
  - MOUSE allows teachers to use Moodle without support of system administrator
  - A teacher can use the self booting DVD in his classroom environment without installation and configuration

- **Offline**
  - Xplora-Knoppix DVD contains software and educational material
  - Students use at home Open Source software they also use in school without installation and configuration

- **Home**
  - A teacher can be sure that pupils have the needed software and he can be sure that they can use it

**European Schoolnet**
eTwinning activity proposals

• Twin in a web experiment
  – Let your pupils work on the same experiment and exchange results.

• Twin in a database project
  – Eratosthenes, Sunset, Water quality,....

• Twin in a collaborative project
  – 4seasons is excellent for this purpose

• Contribute the results of your work to the Xplora-DVD

• Twin in developing an eCourse and share it with the world
Eratosthenes

- Two schools (ideally on the same longitude) measure the length of the shadow of a stick during the same day.
- The time of the shortest shadow marks noon.
- The length of the shadow sticks and the shortest shadow are exchanged.
- From both data the radius of the earth is calculated:

\[ \frac{b}{2\pi r} = \frac{\alpha}{360^\circ} \Rightarrow r = \frac{360^\circ \cdot b}{\alpha \cdot 2\pi} \]
Eratosthenes result

Distance between the partners on earth surface, corrected to the same meridian

\[ r = \frac{360° \times p}{\delta \times 2 \times \pi} \]

Difference angle between the two shadow angles
Eratosthenes support

• Support is given in Xplora's community Eratosthenes.
  – Login to Xplora (Register if you have not done before)
  – List communities
  – Join Eratosthenes
  – Download/Upload material
  – Communicate in the forum
  – Send emails to partners
Thanks...

... for listening.