

Energy



Erasmus+:Comenius "IT'S TIME TO HELP"

Project duration: 1 September 2014 – 31 August 2016



Meeting at the LUKAS School, Bassum, Germany, 13 April – 17 April 2015

© LUKAS Schule, Industriestr. 4a, 27211 Bassum
Layout: Thilo Kaesler Texte und Fotos: Elena Lenk

The ITTH project is funded by the European Commission in the framework of the Erasmus+ Comenius Programme, Cooperation and Innovation for Good Practices.

Project website: itth.webnode.cz



Save Energy. Save Money. Save the Planet.

INTRODUCTION

The third meeting of the Erasmus+ project “It’s Time to Help” was held in Bassum, Germany, from the 13th of April to the 18th of April, 2015. The host school was the LUKAS School. Students and teachers from our partner schools in The Czech Republic, Latvia, Finland, Portugal and Malta came to see us and cooperated with us on the ENERGY topic.

There has been a focus on ENERGY in Germany since the German chancellor Angela Merkel promoted the “Energiewende”, the Energy Transition for Germany. Induced by the threatening impression of the nuclear disaster in Fukushima, Japan, in March 2011 the vision of an Energy Transition has become very powerful. Energy Transition means an increasing focus on renewable energy and energy efficiency. Renewable energy sources can be wind farms, biogas plants or photovoltaic solar power. As all of these three energy sources are increasingly used in North Germany the students of LUKAS School are interested in learning all about them. That is why the German school chose this topic for the “It’s Time to Help” erasmus+ project.

For the meeting all partners had prepared evaluations of the use of energy in their schools, the so called **Energy Analyses**. In the ENERGY booklet you can find extracts of these analyses together with good ideas to save energy. Looking at the presentations of each country gave new insights to the students and they wrote them on posters. You can find those in the part **Mutual Inspiration**. It is a good thing to provide each other with information about how to deal effectively with energy in school. But this is only a first step. The aim must be that we put those good ideas into practice which are suitable to the conditions at our school. And we want others to join in, schools, organizations and the public: Save energy. Save money. Save the planet!

The **CD on the cover** provides you with different activities on the ENERGY topic. There are worksheets together with methodologies for the learning process. In the booklet you can find extracts in the part **Worksheets**.

In addition to cooperating with each other on the environmental topics work in the ITTH project also focusses on developing communicative skills in teachers and students. We want to make new friends, we want to practice English as our language of communication, we want to learn

about the other countries' culture and traditions. The part **Evaluation** looks at the students' and teachers' opinions about how this was achieved during the meeting.

The last part **Meeting Day by Day** presents highlights of the cooperation at LUKAS School. You can find information on the visit at the biogas plant, at the eco-centre RUZ Hollen and the presentation fair of students' energy projects. Here you can see the programme of the week:

MEETING IN GERMANY 13 – 18 APRIL 2015

Day/Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8:00 - 9:00		Breakfast teachers	sit-in in lessons: Presentation of schools by guests	Breakfast teachers	Breakfast teachers	
9:00 - 9:30		Lesson pupils			Trip to Hof Martens by bus	In the morning: Online evaluation
9:30 - 10:00		Walk to the town hall				
10:00 - 10:30	Czech and Malta Team:	Reception at the town hall	presentation of eco-projects guests from: 10.00 Finl/Malta 10.20 Cz/Port 10.40 Latvia	Presentation biogas plant - Udo Martens -	Presentation fair of German students on energy papers 10 – 11 meeting Axel Knoerig, MdB (member of German Parliament in Berlin)	Latvian, Portuguese and Finnish Team: Visit of Klimahaus in Bremerhaven
11:00 - 11:30	Visit of Klimahaus in Bremerhaven	Presentation of agenda 21 Bassum				
11:30 - 12:00	others: if possible, Airport pickup	Visit of photo-voltaic system	11.40 presentation of biotope and school garden	Lunch		
12:00 - 12:30		Walk to the school				
12:30 - 13:00		Lunch at school		trip to eco-centre RUZ Hollen by bus	Lunch at school	
13:00 - 13:30			Lunch at school	Workshop at the eco-centre RUZ Hollen		
13:30 - 14:00		Welcome at the LUKAS Schule group photo				
14:00 - 14:30		Travel by train to Bremen	Energy-Questionnaire	coffee		
14:30 - 15:00					Religious service at Stiftskirche Bassum	
15:00 - 15:30		Guided city tour (in English)				
15:30 - 16:00			pupils leave school	trip back to Bassum	Afterwards at school:	
16:00 - 16:30						
16:30 - 17:00						
17:00 - 17:30			project meeting of teachers		Get together fingerfood	
17:30 - 18:00		pupils leave the group				
Evening programme		Dinner at the "Bremer Ratskeller"				





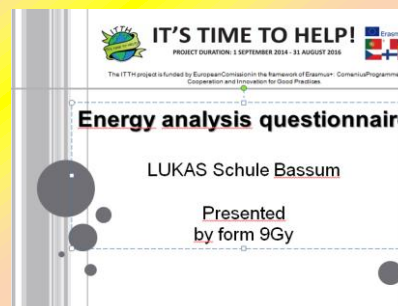
1. ENERGY ANALYSES

Presentations and Analyses

The coordinating Czech team prepared a questionnaire on the ENERGY topic which was based on the materials prepared for schools involved in the international programme Eco-school. Each partner school used the questions to find out about the use of energy in their school building and prepared an analysis for the presentation at the meeting. So at the session of the presentations the other schools had a unique opportunity to become familiar with the different aspects of energy management in the different climate regions.

Each team of the partner schools presented their analysis and noted down the most important aspects on big sheets of paper which had been prepared for a wallpaper presentation. The participants of the other school took notes of interesting aspects and tips from the presentation of the presenting school. Both were later used during the common work on the project output.

The schools will also try to incorporate these ideas into their future school life and thus try to improve their school's energy management.



ENERGY ANALYSIS QUESTIONNAIRE



Question	Answer	It is our strong/weak point ☺ ☹ :-	
Energy consumption/savings in numbers			
What energy resource does your school use for heating, water warming,? (coal, gas, wood, electricity, ...) Does it influence the environment in a less harmful way?			
What is the energy consumption per person/per a year? It is possible to compare with the period before insulation of your school building or before implementation of any kind of eco-friendly measures.			
Who monitors the energy consumption, how often?			
Heating			
What is the heating resource of your school? Does it take advantage of renewable sources of energy (solar energy, biomass,..)?			
The way of heating control – according to your previous experience, temperature, school run, recuperation....?			
Is it possible to influence/affect temperature in your classrooms, how?			
Have you set any thermometers in your school building and where? Do you record the temperature regularly?			
What is the average air temperature during the heating season in your classrooms, on corridors/halls, in a gym?			
Windows, doors			
What type of windows do you have in your school building – advantages/disadvantages?			
Which way do you usually ventilate? Does the school use recuperation?			
Appliances			
What appliances do you keep in standby mode?			
What sources of light do you use at school, how many of them? Are they energy-saving/economical?			
Which way do you affect wasting of energy for light? (notices like: Switch off the light!, switch off the lights when not necessary, in break time,)			

1.1 The Czech Republic



Zakladni skola Prerov, Travnik 27
Travnik 27
75002 Prerov
Czech Republic
www.zstravnik.cz



Erasmus+ Comenius „IT'S TIME TO HELP“
Project duration: 1 September 2014 – 31 August 2016



- Not only in eco-lessons but also in other lessons we pay attention to energy conservation.
- In Eco-Team meetings we play *Take Risk* game. It is translated into English and we have brought it with us.



This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Zakladni skola Prerov, Travnik 27
Travnik 27
75002 Prerov
Czech Republic
www.zstravnik.cz



Erasmus+ Comenius „IT'S TIME TO HELP“
Project duration: 1 September 2014 – 31 August 2016



1. WHAT ENERGY RESOURCE DOES YOUR SCHOOL USE FOR HEATING, WATER WARMING...? DOES IT INFLUENCE THE ENVIRONMENT IN A LESS HARMFUL WAY?

- In 2004 the installation of a new central heating control system for Prerov was carried out. It is operated by the Teplo Prerov company. The central heating system controls 32 heat exchangers and 90 transfer stations around the town.
- One of them is near our school.



- The heating plant uses coal as a fuel which is harmful for the environment.



This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Zakladni skola Prerov, Travnik 27
Travnik 27
75002 Prerov
Czech Republic
www.zstravnik.cz



Erasmus+ Comenius „IT'S TIME TO HELP“
Project duration: 1 September 2014 – 31 August 2016



3. WHO MONITORS THE ENERGY CONSUMPTION AND HOW OFTEN?

Our school janitor monitors it once a year. The data are stored with the school accountant and are used by pupils of our eco-team for eco-analysis of our school.



This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1.2 Germany



LUKAS Schule
Industriestraße 44
37111 Beinum
Germany
www.lukaschule.de

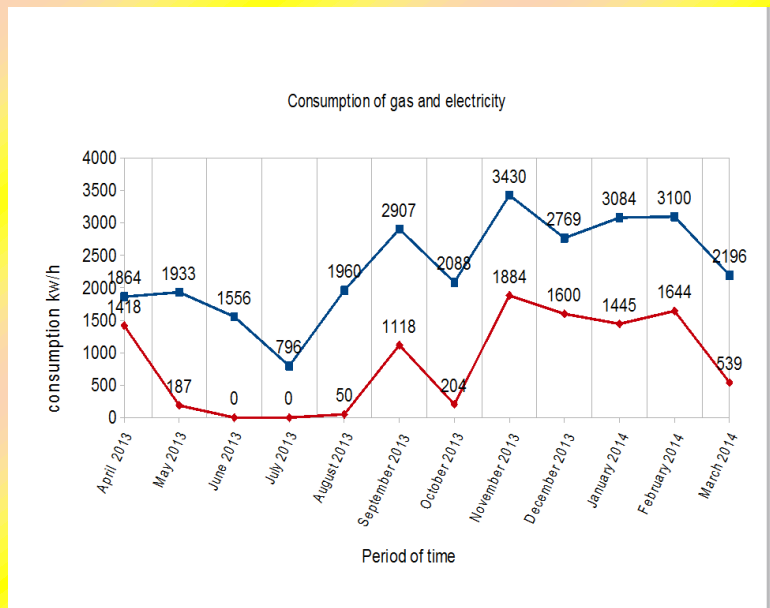
Erasmus+ Comenius „IT'S TIME TO HELP“
Project duration: 15 September 2014 – 31 August 2016

Pictures and facts

General facts:

- Usable in industry and trade markets
- Self-cleaning function
- Conversion of the used energy up to 98 per cent in heat
- Low noise, economical and environmental friendly

This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



LUKAS Schule
Industriestraße 44
37111 Beinum
Germany
www.lukaschule.de

Erasmus+ Comenius „IT'S TIME TO HELP“
Project duration: 15 September 2014 – 31 August 2016

15.03.15




Pivot windows („Schwingflügel Fenster“):

- They have curved inward or outward opened casements.
- The pivot point is located in the side part of the window frame
- They have the advantage, that they can be cleaned easily.
- But the disadvantage is, that they don't have a tilt position.

This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1.3 Latvia






  

2. WHAT IS THE ENERGY CONSUMPTION PER PERSON/PER A YEAR? IT IS POSSIBLE TO COMPARE WITH THE PERIOD BEFORE INSULATION OF YOUR SCHOOL BUILDING OR BEFORE IMPLEMENTATION OF ANY KIND OF ECO-FRIENDLY MEASURES.


The energy consumption after old building insulation in summer 2008:
NOVEMBER 2009: -Old building 59 MW/h
 -New building 48 MW/h

The energy consumption after old building roof insulation in autumn 2014:
FEBRUARY 2015: -Old building 52 MW/h
 - New building of 60 MW/h




This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

2. WHAT IS THE ENERGY CONSUMPTION PER PERSON/PER A YEAR? IT IS POSSIBLE TO COMPARE WITH THE PERIOD BEFORE INSULATION OF YOUR SCHOOL BUILDING OR BEFORE IMPLEMENTATION OF ANY KIND OF ECO-FRIENDLY MEASURES.




This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

8. WHAT IS THE AVERAGE AIR TEMPERATURE DURING THE HEATING SEASON IN YOUR CLASSROOMS, ON CORRIDORS/HALLS, IN A GYM?

The average temperature at school is 20°C - 25°C.

It depends on whether the windows are open and how heater is regulated.



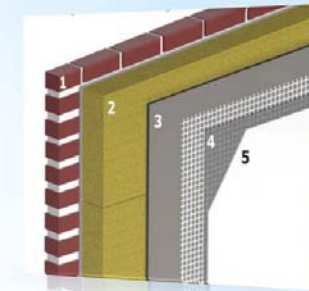
This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1.4 Finland



* Isolation

* Because of the cold winter we need to isolate our houses. We use double windows and isolate the walls with Mineral wool. We also isolate the ceilings and the floors.



* Energy use in Källhagens skola

- We use District heating
- The energy consumption for a month is 63 MW/h (63 000 kW/h)

* Biodegradable & mixed waste

In a year we use 5,160 tons (5 160 kg)



* Water

- * In a month we use:
- * 128 m³ (128 000 l) cold water
- * 37 m³ (37 000 l) warm water
- * This is in the whole school, in the kitchen, by the students and teachers...

- * The average temperature in school is 21°C in the corridors 21,5°C and 21,5°C.
- * It is possible to affect the temperature by opening the windows and air conditioning
- * We save energy by turn off the lights and we have these small notes everywhere "Did you turn of the lights" and etc.

* We also have motion sensors in schools



* Everything else

1.5 Portugal



ENERGY ANALYSIS



Energy consumption/Savings in numbers

1. What energy resource does your school use for heating, water warming,...?
Does it influence the environment in a less harmful way?

- ✓ Our school mainly uses electrical energy in heating appliances.
- ✓ The electrical power we use comes from a hydroelectric power plant because it is considered a clean energy that does not release polluting substances into the environment.



ENERGY ANALYSIS



Windows / Doors

9. What type of windows do you have in your school building – advantages/disadvantages?

- ✓ The school has got double glass windows, with the advantage of these being effective in thermic isolation, opposing to the ones with simple glass, that are much more frequent in our country.



ENERGY ANALYSIS



Windows/Doors

13. Which way do you affect wasting of energy for light?

- ✓ We use the sun light that comes through the windows.
- ✓ We also turn off the lights, electrical and electronic appliances when not needed, for example, during breaks and at the end of the school day.




1.6 Malta



De La Salle College Malta
St. Edmund Street
Sliema
Malta
www.dlscollegemalta.org


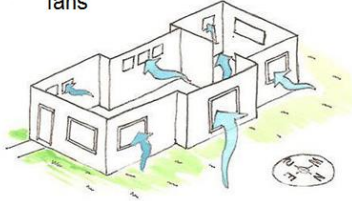
Erasmus+Comenius „IT'S TIME TO HELP“
Project duration: 1 September 2014 – 31 August 2016

Erasmus+



6. Is it possible to influence temperature in your classroom, how?


- We control the temperature using two methods.
- 1: Natural Ventilation
- 2: Artificial Ventilation using fans



De La Salle College Malta
St. Edmund Street
Sliema
Malta
www.dlscollegemalta.org


Erasmus+Comenius „IT'S TIME TO HELP“
Project duration: 1 September 2014 – 31 August 2016

Erasmus+



8. What is the average temperature during the heating season in your classroom?

- Typical room temperature: 15 degrees Celsius



De La Salle College Malta
St. Edmund Street
Sliema
Malta
www.dlscollegemalta.org

Erasmus+Comenius „IT'S TIME TO HELP“
Project duration: 1 September 2014 – 31 August 2016

Erasmus+



13. Which way do you affect wasting of energy for light?

- Swiccerinu Initiative.



1.7 Wallpapers

It's time to help – ERASMUS+ Lukas Schule, Bassum (Germany)

Answers	
This is our strength ☺	
This is our weak spot ☹	
Energy consumption (1)	
What sources of energy are used at your school? (coal, gas, wood, electricity, ...)	How is the environment protected by that?
Czech Republic	COAL – HEATING ☹
Finland	A combination of coal and gas, but only for heating (district heating). ☺
Germany	Oil gas; modern high efficiency burning unit, efficiency 2 x 97% and higher, CO ₂ emission less than 50 kg per year. ☺
Latvia	gas HEATING ☺
Malta	HEAVY FUEL OILS → Being currently converted to LNG ☺
Portugal	Electricity. The electric energy mostly considered a clean energy because it does not release pollution into the environment. ☺

It's time to help – ERASMUS+ Lukas Schule, Bassum (Germany)







Answers	
This is our strength ☺	
This is our weak spot ☹	
Energy consumption (2)	
How high is the energy consumption per person per year? Have there been improvements (such as isolation the building, etc.) that changed consumption?	
Czech Republic	heating 2010 (2,681 GJ) → 2014 (1,323 GJ) ☺
Finland	Very difficult to approximate/calculate, but about 63 MWh/month TOTAL. The cold winters demand high energy consumption. ☺
Germany	The building was built in 2013 on an actual technological isolation level. Energy cons. per year: 2100 kWh electricity Total energy cons. per student: 1150 kWh per student and year ☺
Latvia	?
Malta	There has been a marked improvements (less consumption) since we changed all light bulbs to energy saving ☺
Portugal	Our energy consumption is 10455 kWh in average which gives an average around 1 per person of 199 kWh. ☺







Answers	
This is our strength ☺	
This is our weak spot ☹	
Energy consumption (3)	
Who monitors energy consumption and how often is this done?	
Czech Republic	school janitor - 1x a year
Finland	School janitor, as needed. Has access to the information on a daily basis. ☺
Germany	Energy consumption and cost is monitored monthly by caretaker and administration. ☺
Latvia	A headmaster's assistant in economic issues. ☹
Malta	School Accounts Department ☹
Portugal	The eco-schools team, every three months ☹

Answers	
This is our strength ☺	
This is our weak spot ☹	
Heating (1)	
How is the school heated? Are renewable sources of energy used, such as solar power?	
Czech Republic	HEATING PLANT - NO RENEWABLE SOURCES ☹
Finland	District heating (coal gas). ☹
Germany	Solar gas burning unit, no renewable sources yet, solar panels possible on flat roof ☹
Latvia	GIA "0laina water and heat" ☹
Malta	NO HEATING IS NEEDED
Portugal	Electricity, we don't have any other source of alternative energy. ☹

Answers	
This is our strength 😊	
This is our weak spot ☹️	
Heating (2)	
From your own experience - how is heating managed - room temperature during school time and after lessons?	
Czech Republic	CLASSROOMS 23°C GYM 22°C CORRIDORS 21°C Classrooms 21°C, usually no need to adjust. Temperature is not lowered during the night. Corridors 21°C Gym 20.5°C
Finland	😊
Germany	😊 On a appropriate technological level; comfortable temps are reached automatically.
Latvia	😊 20°C - 25°C
Malta	😊 N/A
Portugal	😊 Heating is only turned on in the winter months, if needed

Answers	
This is our strength 😊	
This is our weak spot ☹️	
Heating (3)	
Is it possible to regulate room temperature in and from the classroom? If so, how is it done?	
Czech Republic	😊 opening the windows, thermostatic valves on radiators
Finland	😊 Thermostatic controls on the water radiators, opening of windows (not during windows)
Germany	😊 - Individual Temp. sensors can be adjusted to required room temp. - windows
Latvia	😊 The new building - yes! Thermostatic valves on radiators In the old building - open the windows
Malta	😊 In summer (hot months, we use fans to control the temp.
Portugal	😊 we don't have any control over the heating temperature in our classroom.

Answers This is our strength ☺ This is our weak spot ☹	
Heating (4)	
Does the school have thermometers in the school building? If so, where are they? Is room temperature checked on a regular basis?	
Czech Republic	- 5 - Bio0064, ICT and English labs, 601 garden - 1x a year 
Finland	Temperature sensors outside of the building, Temperature can be checked on a daily basis. 
- Germany	- 0- to protect Temp. sensors in each room, connected to the heating system which automatically controls Temp. 
Latvia	In the school Conference hall. Yes! 
Malta	Yes they are placed in the main office 
Portugal	No, we haven't. 

Answers This is our strength ☺ This is our weak spot ☹	
Heating (5)	
What is the average room temperature in the classroom when heating is needed – in the corridors, in the gymnasium/sports hall?	
Czech Republic	Classrooms - 23°C gym - 22°C corridors - 21°C 
Finland	Classrooms 21°C Corridors 21,5°C Gym 20,5°C 
- Germany	Classrooms 20.5°C (average); >22° in summer due to sun and big glass surface Corridors 18-19°C (") 
Latvia	20-25°C 
Malta	15°C 
Portugal	In the classroom the average temperature is of 20°C 

Answers	
This is our strength ☺	
This is our weak spot ☹	
Doors and windows (1)	
What type of windows does the school have? What advantages/disadvantages (pros and cons) do these windows have?	
Czech Republic	new plastic windows with double glass ☺☺
Finland	Double or triple glass windows for better isolation. Wood/aluminium combination. Very good for keeping the warmth inside. ☺
Germany	- Combined tilt/turn windows, double glass, wooden frame P: the varieties of air ventilation possible, easy to use C: wooden frames change form due to temp. and humidity, must be protected by colour ☺☺
Latvia	New plastic OR aluminium with double glass ☺
Malta	Standard aluminium windows ☺☺
Portugal	Double glass windows that have got the advantage of being more effective in thermal isolation. ☺

Answers	
This is our strength ☺	
This is our weak spot ☹	
Doors and windows (2)	
How are the rooms ventilated? Are there any rules?	
Czech Republic	opening the windows, shortly and for 5 minutes ☺
Finland	No rules per se, ventilated as needed by opening the windows. School has a mechanical ventilation system. ☺
Germany	by opening windows for a short period at least once per lesson ☺☺
Latvia	In the new building – a recuperation system. In the old building – opening the windows ☺☺
Malta	Natural Ventilation: windows and door are opened. ☺☺
Portugal	We open the windows and doors. We do not do any heating recuperation ☺☺

Answers	
This is our strength ☺	
This is our weak spot ☹	
Technical Appliances (1)	
What appliances are run on standby-mode?	
Czech Republic	Data projectors and computers in classrooms ☹☹
Finland	Computers, data projectors and existing appliances (in Home Economics class) ☺
Germany	- Internet Server - Lift - Copier - Telephone system - Integrated Heating System ☹☹
Latvia	Computers; Interactive boards, ☺☹
Malta	Computers and projectors. ☺☹
Portugal	Only some projectors and computer screens. ☺☹

Answers	
This is our strength ☺	
This is our weak spot ☹	
Technical appliances (2)	
What artificial sources of light are used at school and how many of them are there? Are these light sources ecological and energy-efficient (i.e. do they help saving energy)?	
Czech Republic	- new energy-saving tubes that on the ground and 1. floor (0.79 kW) - tubes in schoolrooms - original → big consumption ☹☹☹
Finland	- light tubes (low energy consumption) in corridor and classroom. LED-lights would be more efficient. ☺
Germany	- all light bulbs are "energy saving" and consume 9 to 16 W each; (6m) - motion sensors in corridors and rest rooms (50) ☹☹
Latvia	Tubes, electric ceiling bulbs - hard to put ☺☹
Malta	We use energy savers ☺☹
Portugal	Mainly sun energy, when needed electrical energy using low power light bulbs. ☺☹

2. MUTUAL INSPIRATION



Getting Inspiration

In the audio-visual presentations of the ENERGY Analyses the students from the different countries had presented strong and weak points of their schools at home. But in every presentation the students also pointed out good practice of their schools. And they mentioned good solutions which had been found to save energy. So during the afternoon of presentations quite a number of good or even innovative ideas emerged about how energy can be saved. Of course students and teachers were busily taking notes. The participants even came across some surprising and unexpected facts.

So after the session of presentations the teams of the ITTH Project worked on their “Rainbow of Good Ideas”.

The students and teachers went through their notes and asked questions about any unclear points. They also discussed different aspects of energy management in the respective schools. Finally they noted down inspirations that they had got from other partners and wrote them on big posters.

These will be the ideas which can be disseminated around in the partners’ towns, regions and countries by the project participants.



ITTH’s “Rainbow of Good Ideas” for ENERGY management!





CZECH REPUBLIC



Erasmus+: Comenius „IT'S TIME TO HELP“

Project duration: 1 September 2014 - 31 August 2016

- Inform young people about state eco-politics (scientists, politicians, eco-specialists)

shorter time + more windows
 → more intensive ventilation in classrooms in winter
 - decrease temperature in classrooms from 23°C (→ 21°C)

- look for eco-standby appliances
- use visual funny symbols for evaluating eco-friendly behaviour
- more renewable energy sources (different)
- experiments with energy-consumption of household appliances

The ITTH project is funded by the European Commission in the framework of Erasmus+ Comenius Programme, Cooperation and Innovation for Good Practices.
 Project website: itth.webnode.cz



GERMANY

- to wear a pullover at a lower temp. status less 15 degrees
- use of thermal energy
- turn off the stand by - mode
- a certain time for ventilating the room

Erasmus+: Comenius „IT'S TIME TO HELP“

Project duration: 1 September 2014 - 31 August 2016

- possible use of air aircondition
- use solar energy

- saving energy in general
- recycling
- reduce the waste of energy

The ITTH project is funded by the European Commission in the framework of Erasmus+ Comenius Programme, Cooperation and Innovation for Good Practices.
 Project website: itth.webnode.cz



LATVIA



Erasmus+: Comenius „IT'S TIME TO HELP“

Project duration: 1 September 2014 – 31 August 2016

- * DO NOT USE gadgets in stand-by mode
- * Replace low energy lamps
- * Put thermometers into the classrooms
- * Switch off the computers when finish working
- * Start to replace old lamps with LED

The ITTH project is funded by the European Commission in the framework of Erasmus+: Comenius Programme, Cooperation and Innovation for Good Practices. Project website: itth.webnode.cz



FINLAND



Erasmus+: Comenius „IT'S TIME TO HELP“

Project duration: 1 September 2014 – 31 August 2016

- Replace lamps with low-energy variants.
- Keep room temperatures at acceptable levels (20-21°C)
- Turn off lights and electric appliances when not needed.
- Plan ahead ~~to~~ in order to minimize waste (e.g. photocopying)
- Replace old, inefficient appliances with more energy-efficient ones.

The ITTH project is funded by European Commission in the framework of Erasmus+: Comenius Programme, Cooperation and Innovation for Good Practices. Project website: itth.webnode.cz



PORTUGAL



Erasmus+: Comenius „IT'S TIME TO HELP“

Project duration: 1 September 2014 – 31 August 2016

- Do not keep appliances in standby-mode
- Use low energy light bulbs
- Find effective Ventilation Ways
- Find effective ways to recycle cork
- USE Solar panel energy more efficiently

The ITH project is funded by the European Commission in the framework of Erasmus+ Comenius Programme, Cooperation and Innovation for Good Practices. Project website: ith.webnode.cz



MALTA



Erasmus+: Comenius „IT'S TIME TO HELP“

Project duration: 1 September 2014 – 31 August 2016

- INT. STAND-BY MODE ... IS IT TRULY EFFECTIVE?
- WE NEED TO SWITCH OFF LIGHTS!! WORK ON THAT!!
- BETTER WINDOWS : BETTER SEALING
- " - VENTILATION
- IMPORTANCE OF SOLAR ENERGY IN OUR SCHOOL
- COULD WE AS A SCHOOL INVEST IN LEDs?! BETTER CONSUMPTION

The ITH project is funded by the European Commission in the framework of Erasmus+ Comenius Programme, Cooperation and Innovation for Good Practices. Project website: ith.webnode.cz



3. WORKSHEETS

The partner schools of the ITTH erasmus+ project want to give support to environmental education in schools. We believe that teaching children how to use energy, water etc. responsibly is one step in making people aware of the consequences of everybody's behavior. The ITTH project's partners have collected a few worksheets that contribute to developing key competences in students.



The Czech Republic

The worksheet presents the game "Take a Risk". It is a game for teams of 3 to 6 students. Some questions are based on knowledge, some on estimation while the others are based on ability to decode the anagrams. There are 30 coloured cards with 5 categories. Each category has 5 different point levels from 1000 to 5000. The questions are about lighting, energy sources, anagrams, energy efficient housing and heating.



Germany

The material presents topics of interest in the realm of energy. Students can work out presentations on one of these and present them in a presentation fair. A score sheet for the feedback of the audience is given. Marks for the presentations can take these scores into account.



Latvia

The set of worksheets inform students about the damage of acid rain. Acid rain is produced when people use too much fossil energy. A quiz on the topic is provided and also an experiment. Students can investigate about the influence of acidic liquids on plants.



Finland



Portugal



Malta

Lesson plans for a series of lessons on electricity are provided. They deal with a power station and alternative sources of energy, include practice sessions on the electrical circuit and deal with the light bulb. The material provides a number of relevant video clips on the internet.

Take a Risk

Aim: The competition is not the only goal of this game. There are new pieces of information included and the teacher can explain them, if necessary. Some questions are based on knowledge, some on estimation while the others are based on ability to decode the anagrams.

Object: to get the most points.

Content: 30 coloured cards with 5 categories. Each category has 5 different point levels from 1000 to 5000.)

Instructions

1. Split pupils into a few teams of 3 – 6 pupils.
2. The teacher is a leader of the game. The leader puts the cards face down with the numbers up according to the category.

Lighting	Energy sources	Anagrams	Energy efficient housing	Heating
1000	1000	1000	1000	1000
2000	2000	2000	2000	2000
3000	3000	3000	3000	3000
4000	4000	4000	4000	4000
5000	5000	5000	5000	5000

3. A team is randomly chosen to go first. Or rock-paper-scissors hand game can be used.
4. Allow the first team to choose a category/topic and a point value for a question, e.g. Lighting for 100 points.
5. The teacher reads the question and the team has to answer.
6. If the team's answer is right, the team gets the appropriate card. If the answer is wrong, the card stays by the teacher.
7. If there are no more cards left, each team counts their points.
8. The team, that earned the most points, wins the game.

Variation:

The game can be played in smaller groups. Each group gets its own set of cards and picks out its leader who will organize the game.

This project has been funded with support from the European Commission. The opinions expressed in this publication do not necessarily reflect the views of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Project website: itth.webnode.cz



The Czech Republic

 Energy-efficient housing	 What is the best energy-saving house? a) active b) passive c) low-energy
 Energy-efficient housing	 How much energy escapes through the masonry in the common non-isolated building? a) 25% b) 40% c) 10%
 Energy-efficient housing	 What material with best insulation properties is used for house insulation? a) wood b) polystyrene foam (Styrofoam) c) hollow brick Porotherm / tubular brick
 Energy-efficient housing	 What's the name of the special energy source using simultaneously waste warm, heating and ventilation in low-energy houses? a) Compressor b) Recuperator c) Condenser



Germany

Suggested topics for Presentations on ENERGY

1. The fuel cell
2. Renewable resources
3. Energy through light – carbon as an environmental factor
4. Energy through light
5. Temperature as an environmental factor
6. Testing of the Allen's rule in biology
7. Testing of the Bergmann's rule
8. Photosynthesis – Engelmann's experiment
9. Sports expenditure in endurance sports
10. Sports in a biological perspective
11. "New" sports
12. The future of semi-conductors
13. Electrically powered cars in individual transport
14. The future of nuclear energy in Germany and Europe
15. LED lamps versus low energy light bulbs
16. E-Cars in a critical perspective
17. Fracking – Is it the solution to all energy problems?
18. Give us today our daily bread - Hunger grows
19. Energy transition in Germany
20. Permanent repository sites for nuclear waste
21. Tidal power plants
22. Offshore wind farms

LUKAS Schule –Industriest. 4a – 27211 Buzum


Score sheet for the Energy-Presentations by class 10

20%	Poster
	<ul style="list-style-type: none"> • Visualization: Is the poster well-structured and can be read well? • Content: Is the outline agreed, and the result be easily understood? • Design: Did the poster help to understand the presentation?
20%	Presentation table
	<ul style="list-style-type: none"> • Does the arrangement attract people's attention? • Effort: How much work and material was invested into the arrangement? • Effect: Did the presenter use the material on the table to support his/her presentation?
60%	Presentation
	<ul style="list-style-type: none"> • Did the presenter keep eye contact? • Did the presenter support his presentation by gestures and facial play? • Did he speak slowly and clearly? • Did the presentation have a clear outline? • Did there are a good specific knowledge expertise? • Did you learn something new from the presentation? • Did you learn something new from the presentation? • Was it possible to understand the English summary?


Number of the group:

Poster	: - /	☺
Presentation table		
Presentation		


Acid Rain



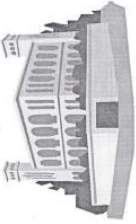
Pollution produced by fossil fuel power stations, factories and cars contains sulphur and nitrogen gases.



When acid rain falls, it can cause damage to trees and plants. It can also kill fish living in ponds and rivers.



When they are released into the air, these gases mix with the rain inside the clouds to make acid rain.



Some buildings made out of a chalky stone called limestone can start to crumble because of years of acid rain falling on them.

Although acid rain can cause a huge amount of damage to buildings, it does not do us any harm if it falls on us!

Scientists use special paper to test the acidity of liquids. This paper is called pH paper. It changes colour depending on how acidic the liquid is. We can use pH paper to test rainwater, to find out whether or not it is acid rain.

Acid Rain Investigation

Choose three plants the same size and type for this experiment. Make sure that they are in the same size pots and are given equal amounts of sunshine and liquid. Over two weeks give plant A water, plant B water and lemon juice and plant C vinegar. Vinegar and lemon juice are both acidic. Record how the plants look each day.

Day	Plant A	Plant B	Plant C
1	Healthy	Healthy	Healthy
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

At the end of the investigation...

Which plant looked the healthiest? _____

Which looked the least healthy? _____

Which liquid was the most acidic? _____

Which liquid was the least acidic? _____

What can you say about the effect of acid on plants? _____

Name: Claudia Suleman	School: De La Salle College	
Week: 16		
Lesson Title: Electricity (Part 1)	60 minutes (10 minutes are deducted from the lesson time due to the fact that students have to be collected and taken back to their main class).	
Grade Level/Subject Area: Year 6 Science.	After completion of the lesson, students are expected to be able to:	
Desired Learning Outcomes:	<ol style="list-style-type: none"> 1. Label the components of a power station. 2. State what happens in each section of the power station. 3. Give examples of alternative forms of electricity production like wind turbines, solar panels and hydro-electric power station. 4. State the unit of electrical power – volts. 	
Surrounding Connections:	Connected to Topics of Light and Electricity in the Syllabus for Primary Schools. Connected to Principle 4 of NMIC: Education relevant for life. Objective 7 of NMIC: Preparing educated consumers.	
Technology Connections:	Using electrical energy in everyday life.	
Materials needed:	<ol style="list-style-type: none"> 1. power point presentation to be projected on smart board. 2. Video clips 	
Introduction: (5 mins.)	The teacher introduces the topic by mentioning that electricity is a form of energy. Students are asked if they know where it is produced and how it reaches their home and school - Power station and power lines. Video clip Energy 101 – Electricity generation (Whole Class Teaching)	
Step 1: (20 mins.)	Booklet page 7 - Students are asked to observe the picture of a power station. With the aid of an enlarged copy of the same picture on the white board, the teacher explains the various sections of the power station and what happens at each stage. This is done through questioning and prompting to test observational skills through discovery and interaction. (No answers are written on the board). (Whole Class Teaching)	

Malta Worksheets on Energy 2015

If you just copy the title of the video clip, paste it into the browser of you tube and then you'll find the video.

Energy101_ Electricity Generation.mp4

How a CFL is Made.mp4

How a coal power station works.mp4

How hydroelectricity works.mp4

How it's made - Incandescent Light Bulb.mp4

How Photovoltaic Solar Cells Work.mp4

Wind turbine_ how does it work_.mp4

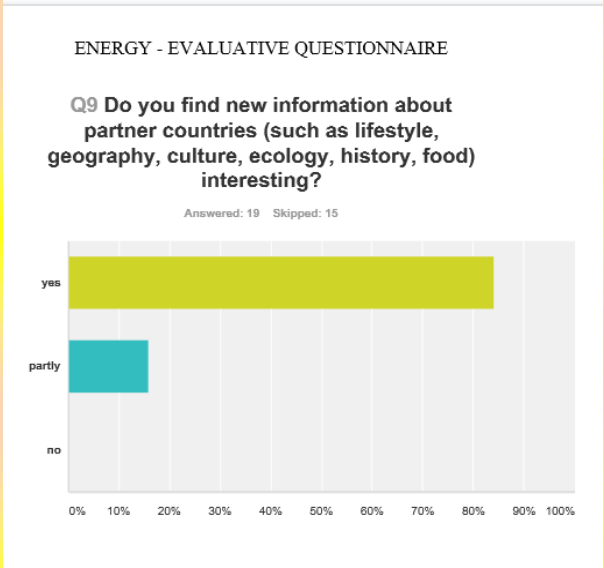
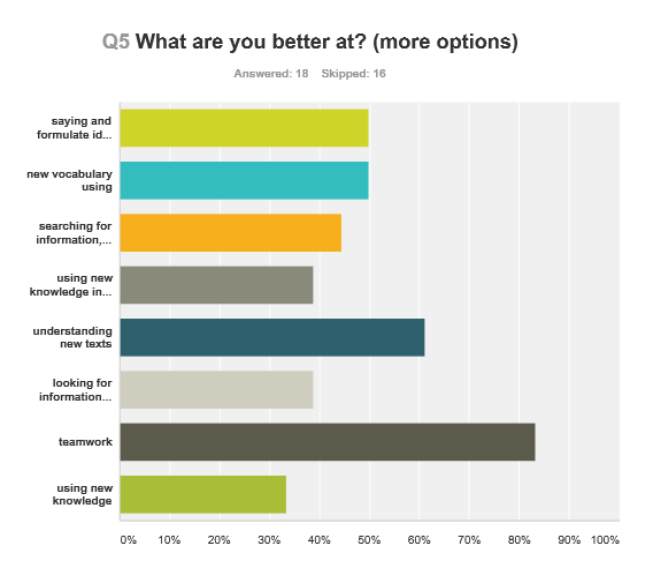
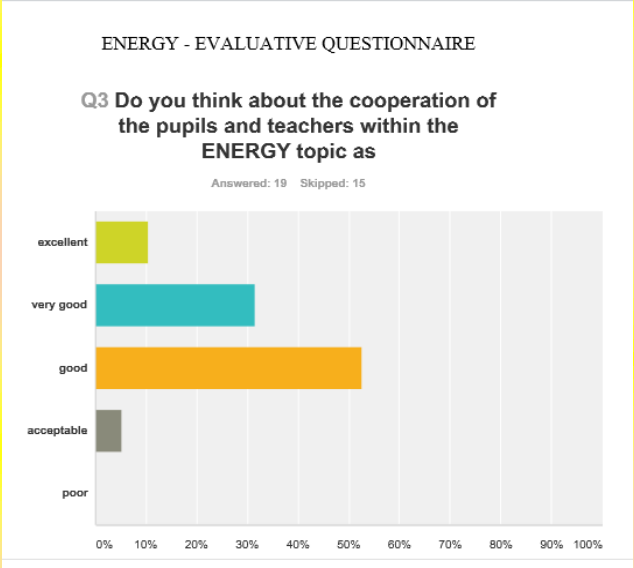
Working of Solar Water Heater .mp4



4. EVALUATION

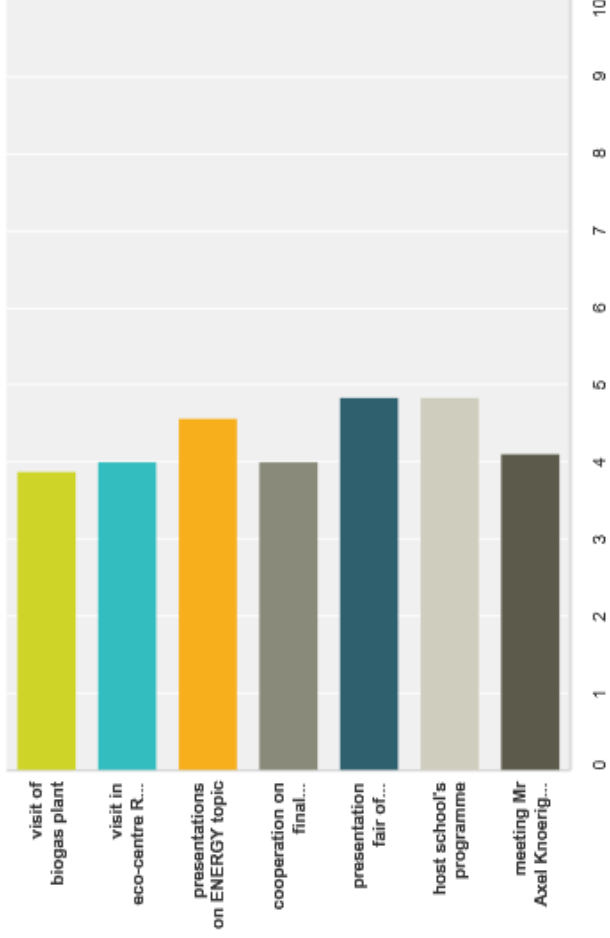
In the ITTH Erasmus+ Project the partners do not only work together on the different topics which are important for the environment, but they also want to get to know the other cultures, customs and traditions. Furthermore they want to improve their skills in the English language and in team work. The Czech team has put up an online evaluation and this was done during the last day of the German meeting also. So the students and teachers reviewed their up-to-now work on the ENERGY topic and also evaluated their improvement in using the English language, ICT, cooperation with mates and teachers and the programme prepared by the host school.

The questionnaire is divided into two sections; one for the pupils (questions from 3 to 11) and the other one for the teachers (from question 12) as the teachers can see their students' improvement even if the students themselves can't see any. The complete results can be found on the project website.



Q11 Use marking 0 – 5 for rankings of activities within the meeting:

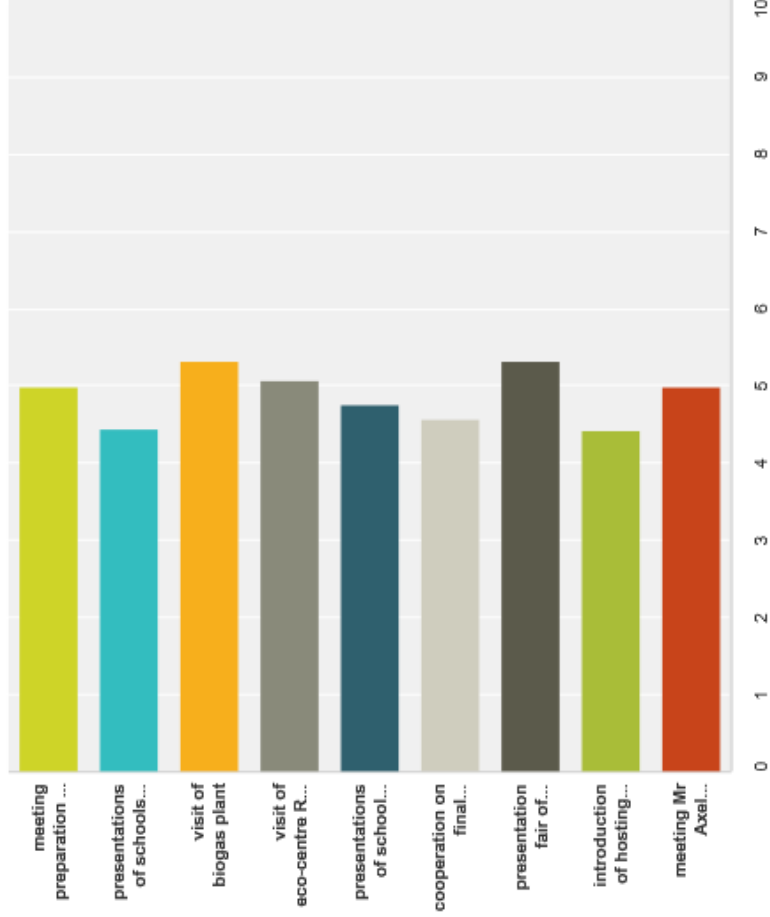
Answered: 19 Skipped: 15



	0 = the worst	1	2	3	4	5 = the best	Total	Weighted Average
visit of biogas plant	5.26%	10.53%	21.05%	26.32%	26.32%	10.53%	19	3.89
visit in eco-centre RUZ Hollen	11.11%	5.56%	33.33%	11.11%	0.00%	38.89%	18	4.00
presentations on ENERGY topic	0.00%	0.00%	10.53%	42.11%	26.32%	21.05%	19	4.68
cooperation on final outputs/products	0.00%	15.79%	21.05%	21.05%	31.58%	10.53%	19	4.00
presentation fair of students' papers on ENERGY projects	0.00%	0.00%	5.26%	36.84%	26.32%	31.58%	19	4.84
host school's programme	0.00%	0.00%	15.79%	15.79%	36.84%	31.58%	19	4.84
meeting Mr Axel Knoerig, MdB (Member of German Parliament)	0.00%	5.26%	26.32%	26.32%	36.84%	5.26%	19	4.11

Q24 Use marking 0 – 5 for rankings of activities within the meeting: (5 is the highest score)

Answered: 12 Skipped: 22



	0 = the worst	1	2	3	4	5 = the best	Total	Weighted Average
meeting preparation and its publicity	0.00%	0.00%	16.67%	0.00%	50.00%	33.33%	12	5.00
presentations of schools involved in the project	0.00%	0.00%	27.27%	18.18%	36.36%	18.18%	11	4.45
visit of biogas plant	0.00%	0.00%	0.00%	16.67%	33.33%	50.00%	12	5.33
visit of eco-centre RUZ Hollen	0.00%	0.00%	16.67%	8.33%	25.00%	50.00%	12	5.08
presentations of school analyses on ENERGY topic	0.00%	0.00%	16.67%	0.00%	75.00%	8.33%	12	4.75
cooperation on final comparative analysis	0.00%	0.00%	16.67%	16.67%	58.33%	8.33%	12	4.58
presentation fair of students' papers on energy projects	0.00%	0.00%	8.33%	8.33%	25.00%	58.33%	12	5.33



5. MEETING DAY BY DAY

Monday 13th April and Saturday 18th April, 2015

The first and the last day of the meeting in Germany offered an excursion to the Climate House in Bremerhaven by train which all partners had asked for. It is a special kind of museum with an exhibition focused on climate and weather. Visitors can travel around the world along the 8th degree of longitude. So there are areas which introduce different climate zones. The exhibition also shows the world's perspectives and chances for the future. On Monday the German hosts took the teams of the Czech Republic and Malta to Bremerhaven and on Saturday the teams of Latvia, Finland and Portugal. A highlight of the trip was so see an old windjammer sailing ship in the harbor near the Climate House – a very special and traditional example of use of wind energy (some photos by Lara Jane Wepner).



Tuesday 14th April, 2015



This was the day of the meeting when all teams met for the first time in Bassum. In the morning there was a reception with mayor Christian Porsch in the townhall of Bassum. Mayor Porsch welcomed the delegations and pointed out that making friends in Europe was very important and he wished the partners a good cooperation on environmental topics. Later Ms Reinhild Olma talked about the local eco-organization “agenda-21”. Mr Erich Feldermann, a town official, explained how the town had changed street lights to LEDs. Then Mr Claus Marx of the local energy cooperative took the ITTH participants on a little walk to look at a photovoltaic system installed by the cooperative on a school roof nearby. This reception in the townhall was an important event for introducing the ITTH Erasmus+ project to the town officials, the local eco-organizations and to the public. The newspapers published long articles about the project on the following day.

At lunch time the guests were warmly welcomed at the LUKAS School by headmistress Gabriele Wilk-Batram. Everyone had lunch and year 10 of the Secondary School baked wafers for the guests. Later everyone enjoyed the get-together when presents were given to hosts and guests.

In the afternoon the whole party went to the city of Bremen for a city tour. They learnt a lot about the local history of the region and enjoyed little stories and anecdotes about the past and the local traditions. On the way students and teachers of the partner schools became friends. In the late afternoon, after the students had met their host families, the teachers went to the Bremer Ratskeller, a traditional restaurant famous for its vine cellar. There the teachers discussed about the cooperation, talked about their schools and how they include environmental education into their curriculum and shared thoughts and ideas.



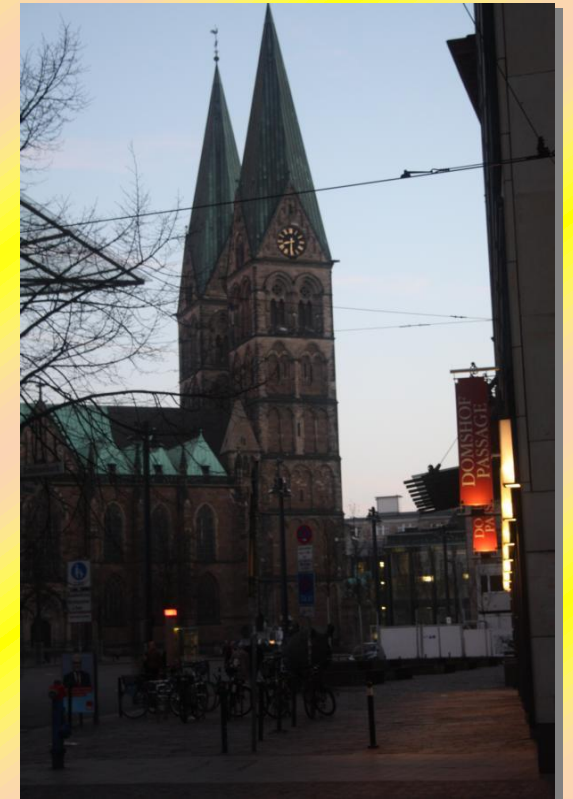


Reception at LUKAS School



Everyone is happy about their presents.

City tour in the historical centre of Bremen



Wednesday 15th April, 2015



The day was spent at school. In the morning the guests went to look at presentations of the different eco-projects which students of LUKAS School had worked on in their lessons. Class 7 of the Secondary School presented their project on mouse trap cars and on models of low-energy houses. There also was a presentation of the bee project which they would start soon. At the same time some teams of the ITTH Erasmus+ project introduced their schools in presentations.

Class 8 of the LUKAS Secondary School presented the biotope and the school garden. As there was really nice weather for the occasion everyone enjoyed being outside. The students presented their work, the guests asked many questions and showed a lot of interest.

In the afternoon the teams presented the ENERGY Analyses and noted down the most important aspects on the ENERGY wallpaper. They also discussed interesting aspects and asked questions. After the students had left the teachers had a team meeting for the cooperation in the ITTH project. The Czech team proudly presented the WATER booklet.



Class 7 presents their previous work on eco-topics: mouse trap cars, low-energy houses and the bee project.



Class 8 presents the biotope and the school garden, the guests introduce their schools and the Czech team presents the WATER booklet.

Thursday 16th April, 2015



The fourth day of the meeting in Bassum was a day of excursions. In the morning the guests visited a biogas plant on the farm of the Martens' family in Borwede near Twistringen. Mr Martens explained the plant to teachers and students of the partner schools. Then the guests were invited for lunch which could be enjoyed in the garden because of the friendly weather.

By bus the group went to the eco-centre RUZ Hollen (Regionales Umweltzentrum Hollen). There the students had a workshop on energy and the teachers visited the garden.



ITTH visited the biogas plant of the family Martens in Borwede.



The students had a workshop in the eco-centre RUZ Hollen (Regional Eco-Centre Hollen)

Umweltzentrum Hollen

Gefördert durch die
Europäische Union
im Rahmen der
Cooperation-Interregionalen
LEADER



Friday 17th April, 2015



The highlight of the final day of the ITTH meeting in Bassum definitely was the presentation fair of the energy presentations that students of class 10 had worked out. They had invited Mr Axel Knoerig, MdB, a member of the German Parliament in Berlin and representative of the region. In his speech to the ITTH delegations he pointed out that friendships among young people from different countries of Europe were very important and that it was crucial for a peaceful future in Europe to come to terms with the topic ENERGY in European politics. He said he was very happy about the invaluable cooperation of the ITTH delegations from the Czech Republic, Latvia, Finland, Portugal, Malta and Germany on environmental topics.

Later teacher Ms Gudula Balkenhol of the LUKAS Gymnasium opened the fair. The students presented findings of their research in such different field as chemistry, biology, sport, physics, religious education, politics and geography. The guests and the whole school visited the stands of the students and discussed with them. The visitors gave their feedback on the presentations using a score sheet which would later be the basis for the students' marks.

Later during the day the members of the ITTH delegations from the different countries did the online evaluation of the meeting in Bassum. In the afternoon most of the participants went to the Stiftskirche, the old local church in Bassum to celebrate a religious service which was also based on the topic of ENERGY. Everyone enjoyed a moment of peaceful silence and of thankfulness that everything worked out fine during the common meeting hosted by the LUKAS School.

Finally the delegations went back to school for the final Goodbye-Party which had been prepared by parents of the school. They had put up a rich and delicious buffet and sponsored drinks. So everyone had a good time. Headmistress Ms Gabriele Wilk-Batram thanked the partners for the good cooperation and their presents. A lot of laughter and chatting was heard although it was hard to say goodbye to the new friends.







List of participants

Czech Republic

teachers:

Eva Vincenová
Pavčina Stančíková
Jana Mikešová

students:

Pavčina (Pavla) Barboříková
Andrea Juhászová

Finland

teachers:

Viveca Mattsson
Mathias Lundqvist

students:

Johanna Lehto
Alexandra Lindroos

Germany

teachers:

Gudula Balkenhol
Monika Breyer
Sonja Fahlenkamp
Tanja Friedemann

Anja Greilich
Thilo Kaesler
Kathrin Kühn
Dr. Elena Lenk
Ruth Litzen
Christine Niebuhr
Anke O'Reilly
Thomas Pentermann
Klaus Rumpel
Martina Selle
Caroline van den Bongardt
Gabriele Wilk-Batram

students:

Lena Marie Cloos
Maurice Conrad
Michelle Conrad
Anne Hunold
Jannick Lupp
Marc Reetz
Antonia Rieck
Thehina Vogelsang
Lara Jane Wepner
Lea Westermann

Latvia

teachers:

Lilija Zujeva
Brigita Zute
Līga Gulbe

students:

Zane Stūre
Gita Auzāne
Una Auzāne
Elza Balode

Malta

teachers:

Nicholai Mifsud
Roberta Azzopardi

students:

Kian Vella
Kurt Axisa
Julian Zarb
Jacob Gafa Kraws

Portugal

teachers:

Maria Jacinta Leão Galó
Maria Joaquina Lucas Borges Felix

students:

Marco José Sardinha Imaginário
Ricardo Fernandes Cardoso
Rodrigo Alexandre Engrácio Coelho

IT'S TIME TO HELP!

PROJECT DURATION: 1 SEPTEMBER 2014 - 31 AUGUST 2016

The ITTH project is funded by the European Commission in the framework of the Erasmus+: Comenius Programme, Cooperation and Innovation for Good Practices.



This project has been funded with support from the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



itth.webnode.cz

ecoproject@zstravnik.cz

graphic design: Dagmar Vaculikova 2015 © ZS Prerov, Travník 27