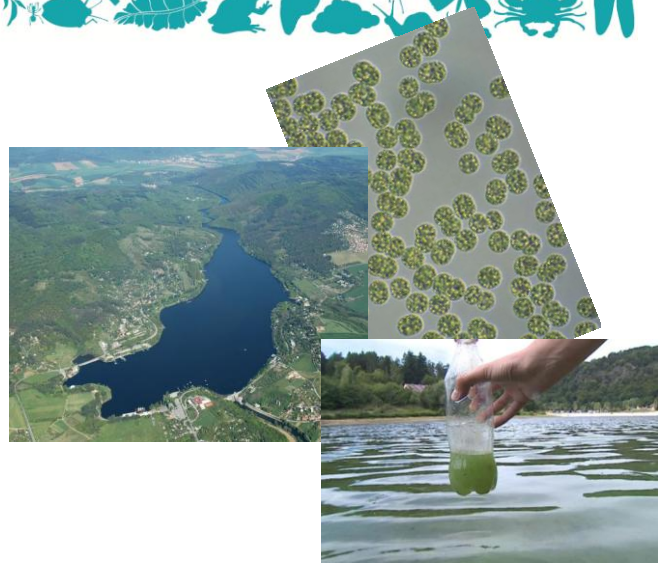
Country: Czech Republic

Name of the programme: KAUZA PRIGL – THE CASE OF WATER RESERVOIR IN BRNO



Age of the children involved: 13 to 18 years old.

Teaser / Short introduction:

- 3,5 hours long outdoor programme, designed for group of 30 students, 2 teachers
- designed according to the specific local problem with a water reservoir suffering from the eutrophication

What is the frame?

The local water reservoir is a great place, where can people enjoy their free time but there are also problems with eutrophication caused by people.

What are the goals of the programme?

The providing organisation called Lipka aims in general to inspire young people to understand, care and value local environment. Each programme developed by Lipka leads to meet these targets.

Specific goals of the programme were as follows:
The programme was developed for school classes, that is why various skills, knowledge and values were supposed to be developed:
Specific goals of the programme were as follows:

- teach the programme outdoors (to get the young people outdoors)
- Inspire young people to spend their free time in a natural locality of water reservoir, which is situated in their home town
- clearly show a general problem of water eutrophication in a specific case of a local water reservoir
- develop social competencies such as cooperation , communication skills etc.

What values are promoted in the programme?

according to the hand model: respect for nature and care for the state of our planet

according to the PIRC: curiosity, protecting the environment, responsibility

according to the Lipka organisation :

- enjoy time spent outdoors in some natural site
- value and enjoy the local natural site
- value the water ecosystem services
- personal responsibility for a local environmental

The programme in general was designed with a strong idea connected with topic of values and frames. It was a clear aim to arrange a programme that would represent the values described by Lipka (see above). A broad discussion whether it is possible to promote some values during 3.5 hours long programme were lead across the teaching team. There was a general agreement within the Lipka teaching team that even though it is not easy to change the values systems of the students, it seems to be necessary to highlight the values point of view, and work with this “values googles”.

In this 3.5 hours the values are mainly shared and promoted by the personality of the teachers running the programme. These teachers are supposed to be stable in their values and their message is supposed to be clear from every sentence or behaviour characteristic that happens during the programme. It is based on the personal characteristics of the teaching team in general as well as clear identification of the values, that are supposed to be promoted during the lesson.

Which competences are promoted that empower learners to shape a sustainable future?

- cooperation and participation: through the group work and feedback on this group work
- being reflective and critical thinking and considering different perspectives: through the role play at the end of the lesson

Which of the specific scientific concepts does the programme relate to?

Mainly is the programme related to the concepts of CYCLES and STABILITY. Since eutrophication is strongly linked to the nitrogen a phosphorus cycles, in an activity focused on the sources of N and P in the freshwater students think together about the sources of N and P, where are these particles flowing from, they are revealing the human source of such nutrients and also the effects caused by the high concentrations of such nutrients in the water. Cycles could be seen form different perspectives, such as nutrients cycles, seasonal cycling of concentrations of such nutrients that are changed according to the light and temperature changes and also according to the positive or negative feedback mechanisms processed in the water during the season. The feedback mechanisms lead students also to the stability concept. Since a big question of how was this problem caused and how could it be solved, is mainly connected with the issue of disruption of previous balanced stability of the nutrients concentration in a freshwater, which is now being changed according to the human behaviour.

Which ecological problems are involved?

The whole programme is focused on a problem of eutrophication, which is mainly connected with 2 Science MindMaps, such as Freshwater use and Biogeochemical loading.
Freshwater use: students reveal the problem of eutrophication from the visitor's point of view and consider how the different human activities could increase or decrease the problem of eutrophication (not from a chemical one).
Biogeochemical loading: water quality measurements help students to understand how the chemical particles affects the quality of water.

Transferability: Which different areas of learning are included and how?

- Relation to the learners´ communities - programme is focused on the specific problem in a local water reservoir. This site is well known by the community of local people. The role play at the end of the lesson illustrates also well the processes and problems that are usually being solved in local communities in general.
- Relation to the living nature – programme takes place in a natural part of the water reservoir and there is also pond dipping activity revealing the living creatures in the reservoir.
- Relation to man-made environment – the role of human in the problem of eutophication is searched, discussed and illustrated during the programme. The role is strongly connected with people's behaviour and also with technologies applied by human

What educational strategies (learning models, methods, etc.) are used in the programme?

No certain models have been used. In the part of the lesson focused on the water quality measurement we can see an inquiry based learning approach. Working in groups is also quite often used here to improve cooperation and communication skills. As a summary of the whole problem a role play is arranged.

How is the programme evaluated? How do you know the programme achieved its educational goals?

Unfortunately, the programme has not been evaluated according to any certain methods. Only feedbacks by teachers were received. Teacher appreciated mainly the practical part (water quality measurements). Pupils manly enjoyed the measurements part and team activities. There s also a feedback of the programme providers, who reflected it achieving the educational goals quite well.

Describe the programme:

Structure: 2 programme parts (each teacher works with a half of the classroom)

Part 1 Cyanobacteria

1) Observing the pond-dipping trays (10 minutes)
Watching water animals and water plants, watching also cyanobacteria, which are not plants and are not also animals.

2) Difference between plant cell and cyanobacteria cell (30 minutes)
Teams try to create a model of 2 cells (plant and cyanobacteria) from a play dough, strings etc – according to the pictures, which are situated in a certain distance, that is why the information are needed to be carried to the modelling site(students, who are bringing information to the modelling team). The activity is closed up with a summary about the cynobacteria cell adaptations and feedback on a team work.

3) How could cyanobacteria float on the water surface? – cyanobacteria adaptation (15 minutes)
Cyanobacteria has got special structures, which enables them to float in the water, since this structures are filled with a gas which helps them to float. The team activity with air balloons (representing this special structures), which are transported without hands through a special trail. Summary about this special structires and feedback on a team work.

4) How does the pond fertilization work? (15 minutes)
Work with a cycles schemes – human can also benefit from cynobacteria in ponds (sseing things from different perspectives)

5) Quiz game (10 minutes)
Reflecting the knowledge gained through the lesson

6) Last view to the cyanobacteria and water reservoir (10 minutes)
Puzzle pieces that could be arranged in to the right order with a knowledge from a lesson. The whole puzzle is shaped as a water reservoir.

Part2 Water quality and eutrophication

1) Water reservoirs stories (10 minutes)
Matching the stories and pictures connected with the local reservoir site. The eutrophication is mentioned in the last story.

2) Phosphorus in the water promotes eutrophication. How does the phosphorus get in the water? (15 minutes)
Team activity, searching for phosphorus sources (detergents, washing powders, agriculture fertilizes, missing sewage treatment etc.)

3) Water quality inquiry (35 minutes)
Small teams determine whether the water is suitable for swimming according to their water quality measurement (temperature, water colour, water transparency, pH, phosphorus concentration in water). Worksheets are used.

4) City council meeting role play (30 minutes)
During the role play are discussed the possible solution of the eutrophication problem. The role play is arranged as a city council meeting with various characters, such as individual companies offering their technological way of cleaning the dam, local citizens, environmental activists etc.).

Included resources / materials / tools:

www.lipka.cz
http://www.recetox.muni.cz/index-en.php?pg=research-and-development--facilities
http://www.ceskatelevize.cz/zpravodajstvi-brno/zpravy/239099-vranovskou-prehradu-uz-letos-ceka-cisteni/
http://www.pmo.cz/cz/media/tiskove-zpravy/rybari-odlovili-z-brnenske-prehrady-uz-popate-hejno-nezadoucich-bilych-ryb/

Photos, videos, logos:

About LIPKA: As an educational institution for environmental training, Lipka is one of the oldest and largest organizations in the Czech Republic to focus on public environmental education. Under its wide range of activities Lipka offers one-day or longer environmental educational programmes in schools and pre schools whose student attendance is over 20 000 students every year. In the afternoons, Lipka's five training facilities buzz with children fully engaged in science and art courses as well as adults enjoying their handicrafts courses.

Lipka also safeguards teaching of environmental-based subjects at several universities and promotes the systematic training of pedagogues in the field of environmental education. In addition to this, a number of public events for families with children are organized by our employees yearly. All the Lipka team is doing their best to be a refuge for perceptive children and adults who are interested in the future development of the environment and who are willing to play an active role in making the world a better place