

ANTibioticS and mobile resistance elements in WastEwater Reuse applications: risks and innovative solutions

**H2020-MSCA-ITN-2015/675530 - ANSWER**



## **Outreach Activity 6: "Open Days at Environmental Institute"**

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**Description**

- Date of the event: 20-21 September 2018
- Place where the event took place: Environmental Institute, Okružná 784/42, Koš, 97241, Slovak Republic
- Audience Details (number of participants, age, sex, etc.): Target audience was children from elementary school (Základná škola in Prievidza and in Koš). In total 30 young kids participated in EI Open Days during 20-21 September 2018. Audience sex was balanced (16 of them male and 14 female). The age of the participants was 12-14 years old.
- Brief description of the topic of your presentation: The dissemination activity took place in two consecutive days and students from elementary schools from the region were invited to participate. We prepared for the students a presentation for antibiotics and an experiment with common materials and simple chemical glassware. The scenario involved 1) a student who was ill, 2) a student who was the physician, 3) a student who was the chemical engineer in a wastewater treatment plant and 4) a student who was the cook. The sick student was examined by the physician student, who found out that sickness was due to bacterial infection and prescription of antibiotic was inevitable (Antibiotic was represented by an alkalic red solution of phenolphthalein; Figure 1). The next step of the experiment involved mixing of the part of the antibiotic excreted by human body unchanged with another solution representing influent wastewater. The student pretending to be the chemical engineer applied cleaning with sand filtering and the resulting solution was transparent and clean. Thus, it was poured in a container with fish, which were represented as sponge cloth cut in fish shape (Figure 2). The fourth student was a cook, who took the fish out of the container and added few droplets of oil (solution of NaOH). When, the cook added few droplets, the fish were colored red, indicating that antibiotic passed to the trophic chain (Figure 3).



## Photos of the event



Figure 1. Student pretending to be a physician, who prescribed antibiotic to a student pretending to be sick. It was explained to the audience that part of the antibiotic was excreted unchanged to a beaker and part was absorbed by the body of the patient. The antibiotic was mixed with dirty water simulating influent wastewater. Due to the pH of the wastewater, the final mixture color was transparent.



Figure 2. Student pretends to be chemical engineer in the wastewater treatment plant and is applying sand filtration. The filtrated sample was transparent and phenomenally clean, and thus was mixed with a container having fish (Fish are sponge cloth pieces cut in fish shape).





Figure 3. Student who pretends to be a cook, adds oil (solution of NaOH) to the fish, which was instantly colored red. This indicated to the students that antibiotic entered the muscles of the fish.

## Participants

Participants	Participants	Date
School of Prievidza	18 (16 of them male and 14 female)	20/09/2018
School of Koš	12 (6 of them male and 6 female)	21/09/2018

## Final Remarks

-Discussion with student was very active throughout the experiment and especially at the end of the experiment, when we asked the student whose fault was that fish were contaminated. We discussed all questions of the students; even their craziest ideas (e.g. to send the contaminated water to the space).

- Overall, children were impressed by the experiment and by the laboratory. Some of them asked us to be employed in the company and help us with the experiments.



- I would like to acknowledge my colleagues for helping me to organize the event for the students and for their patience. Event would not be feasible without the contribution of them. Special thanks go to Dr Peter Oswald, Ing Martina Oswaldova and Michaela Mazanova.

