SCHOOLS GO GREEN

Co-funded by the Erasmus+ Programme of the European Union

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Project number: 2020-1-DE03-KA201-077258

Water Resources Protection and Management

Scoala Primara EuroEd

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LESSON PLANS FOR TEACHERS

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Project Information

PROJECT: Schools Go Green

PROJECT TITLE: DEVELOPING A WHOLE-SCHOOL APPROACH TO PROMOTE SOCIAL CHANGE AND SUSTAINABLE DEVELOPMENT AS A RESPONSE TO ENVIRONMENTAL CHALLENGES

ACRONYM: SCHOOLS GO GREEN

PROJECT WEBSITE: https://schoolsgogreen.eu/

PROJECT NO.: 2020-1-DE03-KA201-077258

PROJECT COORDINATOR: LEIBNIZ UNIVERSITAT HANNOVER, GERMANY

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Module: Water Resources Protection and Management	
Topic 1 Title: Introduction	
Lesson Plan 1 – Introduction into Water Resources	
Duration: 110 Minutes **2 Sessions of 55 min each**	
Short Description of the Lesson	**Introduction to the main topic of the Module** **Water: Read All about It!** This lesson is designed to use our knowledge and the information available online/in newspapers about water to create an article. This activity is important to start with. It serves as a tool to find out the state of knowledge in the classroom. It means you will find out what children already know about water. You can later build on their knowledge in the following activities. Pupils realize different forms of water.
Learning Goals	The important goal is to find out what children already know, what you can use to build further knowledge, what should be repeated and what is completely new for them. Students will recognize water as a frequent subject in the news. Students will utilize different sources to find information on current water issues. Students will use writing skills to create a paper on water issues.
Green Competences Linked	• material use and impact quantification • impact and use minimisation • procurement and selection
Target Group	Primary school students aged 10-12 years old
Educational Approach	Classroom Setting, Presentations and Discussions
Link to School Curricula (if applicable)	Geography/Sciences in the Romanian Curricula, Ministry of Education http://programe.ise.ro/Portals/1/Curriculum/2017-progr/45-Geografie.pdf ; https://www.edu.ro/
Facility/ Equipment	• Classroom • White board • Internet access
Tools/ Materials	• newspapers (local, state, and national) • pencils • markers, crayons, etc. • composition paper • glue

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	• scissors • Annex 1 template for each group • computer • publishing software (optional)
Main Tasks	**SESSION 1 (55 min)** 1. Discuss why water is a "newsworthy" subject. See if they can recall any water-related issues that have been in the news. Students can also clip out articles related to water from different newspapers (local, state, and national). Tell students they are going to develop their own paper focusing on the theme of water. The topics could include such items as water rights issues, recreation, pollution, water uses, conservation, and so forth. 15-20 min. 2. Divide the class into groups (3-4 students). The groups should brainstorm topics of interest for them. And establish the roles in each group, the writer, graphician, etc. Also mention that the article must not exceed 150 words. As in all newspapers establish a deadline of 2 school hours to complete the paper. Give each group the ANNEX 1 template 10 min. 3. Start the research, provide students newspapers, articles (it may be local, state, and national, and no time line needed). Be sure that every group has access to: • pencils • markers, crayons, etc. • composition paper • glue • scissors 25 min. As students are working circulate around the room to see if they are making progress.

SESSION 2 (55 min)

1. Start the class monitoring the current state of the research and article, for each group.
Develop for 10 min the Water subjects they choose.
20 min.

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2. Let the groups finish the article. All work should be proofread and corrected before handing in a final product. The layout could be done one of two ways: either on the computer using a Word Document or a publishing software, or it could all be done by hand. 20 min. 3. Assessment As a class, have the students explain why water is a subject of interest in the news. Students would then evaluate the quality of the paper they produced. Also discuss the rewards and frustrations of producing a newspaper. As students are working circulate around the room to see if they are making progress. To grade their writings on the animal use the PA Writing Rubric. 15 min.	
Extracurricular Activities	ANNEX 1

Module: Water Resources Protection and Management	
Topic 2 Title: Properties of Water	
Lesson Plan 2 – Properties of Water **Water Cycle**	
Duration: 55 Minutes	
Short Description of the Lesson	**Properties of Water - Water Cycle** To find out what water is, where it comes from and where it goes (water cycle). • The stages of the water cycle. • Experiment: Water cycle.
Learning Goals	Students must have mastered the scientific method and basic science principles; the water cycle.
Green Competences Linked	• quantification and monitoring (waste, energy, water) • management systems (waste, energy, water) • procurement and selection.

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	• material use and impact quantification. • impact and use minimisation. • impact assessment. • risk management.
Target Group	Primary school students aged 10-12 years old
Educational Approach	Classroom Setting, Presentations and Discussions
Link to School Curricula (if applicable)	Geography/Sciences in the Romanian Curricula, Ministry of Education http://programe.ise.ro/Portals/1/Curriculum/2017-progr/45-Geografie.pdf ; https://www.edu.ro/
Facility/ Equipment	• Classroom • Internet access • Projector • White board
Tools/ Materials	• Potted plant • Plastic bag (see through) • String/elastic band • Dish • Water Cycle Poster to your class • YouTube access
Main Tasks	1. Start with the Experiment: Water Cycle Materials • Potted plant • Plastic bag (see through) • String/elastic band • Dish Method a. Make sure the potted plant is well watered before the experiment! b. Place the plant in the dish. c. Place the plastic bag over the plant. d. Secure the bag with the elastic band/string, around the pot. e. Leave in a sunny place! After a time (less than an hour) notice the water drops on the inside of the plastic bag! This water has evaporated from the leaves and soil and has condensed on the plastic bag. This shows how water evaporates from the earth and condenses in the clouds! 10 min. 2. Introductory activities (engage) Have the class think about rain and water. Ask: Where does rain come from? Where does the water go after it rains? Are there different types of water (think about where we find water)? What questions do you have about rain and water? 10 min.

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	3. Display the Water Cycle Poster to your class. Source for every language: www.usgs.gov/special-topics/water-science-school/science/water-cycle-schools-and-kids Using simple language, explain each step of the water cycle. Explore or demonstrate the water cycle further by using appropriate video resources such as the one below from YouTube https://www.youtube.com/watch?v=ncORPosDrjI From the following list give each student three key words ANNEX 2: evaporation, condensation, precipitation, collection, cycle, sun, heat, gas, vapour, cools, clouds, water droplets, rain, hail, snow, sleet, form. Ask students to simple describe each of their words. Have students identify words that they still find difficult to understand. 20 min. 3. Assessment Revising Experiment 1. After less than an hour notice the water drops on the inside of the plastic bag! This water has evaporated from the leaves and soil and has condensed on the plastic bag. This shows how water evaporates from the earth and condenses in the clouds! Let each student observe the process. Ask students: What have you learnt? What words or extra information can be added? What would you like to explore further? 15 min.
Extracurricular Activities	**ANNEX 2**

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Module: Water Resources Protection and Management

Topic 3 Title: Water resources on Earth	
Lesson Plan 3 – Water resources on Earth	
Duration: 55 Minutes	
Short Description of the Lesson	**Water resources on Earth** To build students' understanding of water on Earth, its limited availability and that there are different types of water and usable amounts. The suggested lesson plan will: • investigate the distribution and location of water on a range of scales on Earth • explore the difference between water sources – freshwater, saltwater and the useable amounts on Earth • recognise that drinking water can come from a mix of water supply sources • engage and connect students with their local waterways.
Learning Goals	Students will appreciate that all the water on Earth is all that we have. Water is precious. This will build a foundation for understanding the water cycle, water saving behaviours and caring for water.
Green Competences Linked	• quantification and monitoring (waste, energy, water) • management systems (waste, energy, water) • procurement and selection • material use and impact quantification • impact and use minimisation • impact assessment • risk management
Target Group	Primary school students aged 10-12 years old
Educational Approach	Classroom Setting, Presentations and Discussions
Link to School Curricula (if applicable)	Geography/Sciences in the Romanian Curricula, Ministry of Education http://programe.ise.ro/Portals/1/Curriculum/2017-progr/45-Geografie.pdf ; https://www.edu.ro/
Facility/ Equipment	• Classroom • Internet access • Projector • White board

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Tools/ Materials	• PPT Presentation, also in printed form • Other Resources: Google Earth and Google Maps • YouTube https://www.youtube.com/watch?v=bW2kFQzlu5o
Main Tasks	1. Using a PowerPoint presentation engage students to answer to the following questions: • Where is water on Earth? • How much water is on Earth? • Is all water the same? • Does ice count as water? • Where is water in your country? Is water near you? 20 min. 2. Students explore the Earth's surface Google Earth and Google Maps. They should identify features such as the seven major continents, five oceans. Find examples of lakes, rivers, snow and glacial ice and consider: What does Google Earth or a world globe show/represent? 15 min. 3. Watch the Water on Earth https://www.youtube.com/watch?v=bW2kFQzlu5o video at reduced playback speed (YouTube settings) then visually demonstrate the concept. 10 min. 4. Using Google Earth explore and identify different types of water. Working in pairs, guide students through the Match the water ANNEX 3. Working in pairs, guide students through the Match the water. Using Google Earth or a map, find locations that match these types of water. White their names in the correct blank. 10 min.
Extracurricular Activities	**ANNEX 3**

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Module: Water Resources Protection and Management

Topic 4 Title: Relationship between Humans and Water	
Lesson Plan 4 – Relationship between Humans and Water	
Duration: 50 Minutes	
Short Description of the Lesson	Relationship between Humans and Water • Topic: What is water pollution? • Methodology: Concept map development, cooperative learning Students will learn about what causes water pollution and how to be environmentally aware. Note: Students should understand the concept of the water cycle before moving onto water pollution.
Learning Goals	The students will develop a definition of water pollution that will be used for this series of lessons. The students will also see pictures of water pollution and begin to develop an idea of the causes and sources of water pollution. Students will develop an understanding of the language associated with pollution and being environmentally aware.
Green Competences Linked	• quantification and monitoring (waste, energy, water) • management systems (waste, energy, water) • procurement and selection • material use and impact quantification • impact and use minimisation • impact assessment • risk management
Target Group	Primary school students aged 10-12 years old
Educational Approach	Classroom Setting, Presentations and Discussions
Link to School Curricula (if applicable)	Geography/Sciences in the Romanian Curricula, Ministry of Education http://programe.ise.ro/Portals/1/Curriculum/2017-progr/45-Geografie.pdf ; https://www.edu.ro/
Facility/ Equipment	• Classroom • Projector • Computer • White board or mind mapping platforms online
Tools/ Materials	• PPT Presentation, also in printed form

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Main Tasks	1. Mind Mapping (eg. https://www.mindomo.com/mindmap/water-pollution-78ca669ac656c87d775d2e3e76c9dfc2) On the board write "Water Pollution". a) Ask each student in turn to give a word or phrase that relates to water pollution and write their responses attached to the central term. (15 min) b) When every student has given one answer, go through the answers and make links between statements and add new statements as they come up. (5 min) c) Ask the students if they have ever seen examples of water pollution. Have them give details like location, type of water body, type of pollution, did they tell someone about it/make an effort to clean it up? (15 min) d) Play the slide show of pictures of water pollution (see ANNEX 4). There are questions to ask the students for every picture. (20 min) 2. For homework ask the students to write down possible causes of water pollution to bring to class the next day.
Extracurricular Activities	**ANNEX 4**

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Module: Water Resources Protection and Management

Topic 5 Title: Water resource management (WRM)	
Lesson Plan 5 – Water resource management (WRM)	
Duration: 110 Minutes **2 Sessions of 55 min each**	
Short Description of the Lesson	**Water resource management (WRM)** **Water security and crisis** Students analyse how much of Earth's water is available for humans to use for life-sustaining purposes, and they explore the concept of water scarcity in both physical and economic terms. Students explore how water footprints are an invaluable tool for identifying patterns of water use so that individuals, businesses, and even nations can more effectively manage their use of one of the most precious resources on Earth: water. Critical to this exploration is a visit to watercalculator.org, where students calculate their personal water usage, analyse the results, and set a base point for tracking and conserving their water use.
Learning Goals	Students will be able to: Describe the availability of water on Earth. Describe several ways that people use water. Explain how a water footprint can help contribute to the better management of our water resources. Evaluate their water footprint using Water Footprint Calculator watercalculator.org.
Green Competences Linked	• quantification and monitoring (waste, energy, water) • management systems (waste, energy, water) • procurement and selection. • material use and impact quantification. • impact and use minimisation. • impact assessment. • risk management.
Target Group	Primary school students aged 10-12 years old
Educational Approach	Classroom Setting, Presentations and Discussions
Link to School Curricula (if applicable)	Geography/Sciences in the Romanian Curricula, Ministry of Education http://programe.ise.ro/Portals/1/Curriculum/2017-progr/45-Geografie.pdf ; https://www.edu.ro/
Facility/ Equipment	• Classroom • Internet access • Computers, smart phones, and/or tablets • Projector • White board

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Tools/ Materials	• PPT Presentation, also in printed form • White paper • Access to Water Footprint Calculator https://www.watercalculator.org/wfc2/q/household/
Main Tasks	**SESSION 1 (55 min)** HOW DO WE USE WATER? 1. Instruct students to take out a blank sheet of paper and respond in writing to the following prompt: • What do you think the phrase "eat water" means? • In what ways do you think you "eat" water every day? Allow students 5 minutes to record their thoughts and then share with peers. 15 min 2. Show students a short video, Fresh water scarcity: https://ed.ted.com/lessons/fresh-water-scarcity-an-introduction-to-the-problem-christiana-z-peppard An introduction to the problem, as a quick introduction and to jump-start their thinking. Open discussion on the video. 15 min. 3. Discuss on How much water do we waste in our daily lives? In Kitchen, Bathroom and other activities https://www.youtube.com/watch?v=38aYXZou4uc 10-15 min. 4. Homework – allow time to explain the homework tot the students. Suggest that students use the Water Footprint Calculator at watercalculator.org to assess their personal water footprint at home before working through it in class. Access the tool in class. Explain that the calculator will prompt them to answer questions for everyone who lives in their household, so reflecting with members of their households on some of the questions can help them arrive at more precise estimates. 10 min. **SESSION 2 (55 min)** HOW DO I USE WATER? 1. Working in small groups, students brainstorm a list of habits they have, products they buy, or foods they eat that they think may require a lot of water and then rank those items according to which likely require the most water. 20 min.

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	2. Working independently, students use the Water Footprint Calculator at watercalculator.org to estimate their personal water footprint. Access to: Computers, smart phones, and/or tablets Then they take the data gathered from the calculator to complete the My Water Footprint Stats Worksheet https://www.watercalculator.org/wp-content/uploads/2019/05/WF_MS_L1-My-WF-Stats-Student-Worksheet_2020-02-25.pdf Students participate in a final discussion and question/answer session. 30 min. 3. Homework – allow time to explain the homework tot the students. Create a Water Diary Annex 5 5 min.
Extracurricular Activities	**ANNEX 5**

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ANNEX 1

The Weekend News

NAME: _____ MONTH: _____ DAY: ____ YEAR: ____

HEADING: _____

Caption:

Caption:

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ANNEX 2

From the following list give each student three key words

Ask students to simple describe each of their words

Have students identify words that they still find difficult to understand.

evaporation	gas	rain
condensation	vapour	hail
precipitation	cools	snow
collection	clouds	sleet
cycle	water	form
heat	droplets	sun

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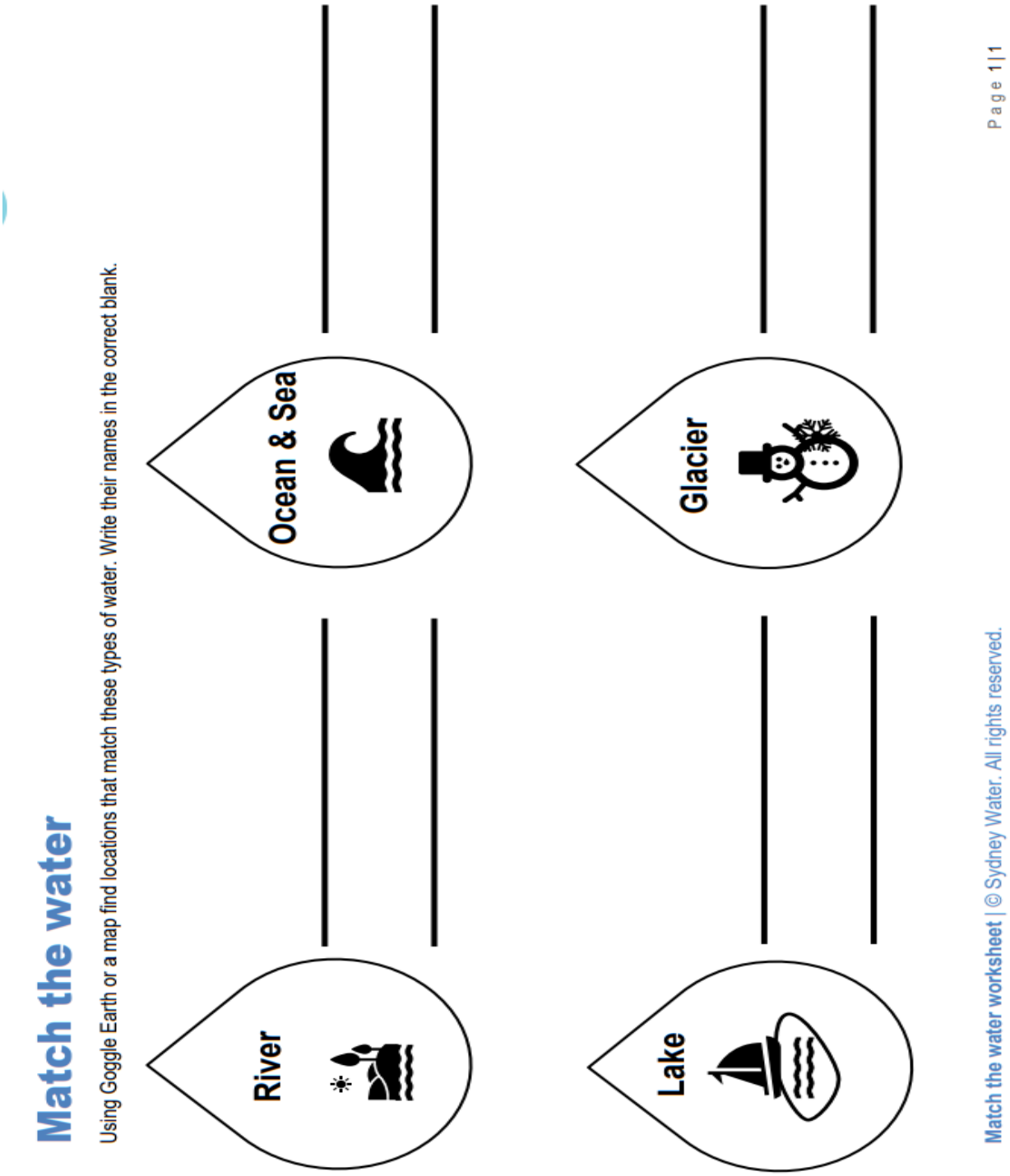
ANNEX 3

Working in pairs, guide students through the Match the water.

Using Google Earth or a map, find locations that match these types of water. White their names in the correct blank.



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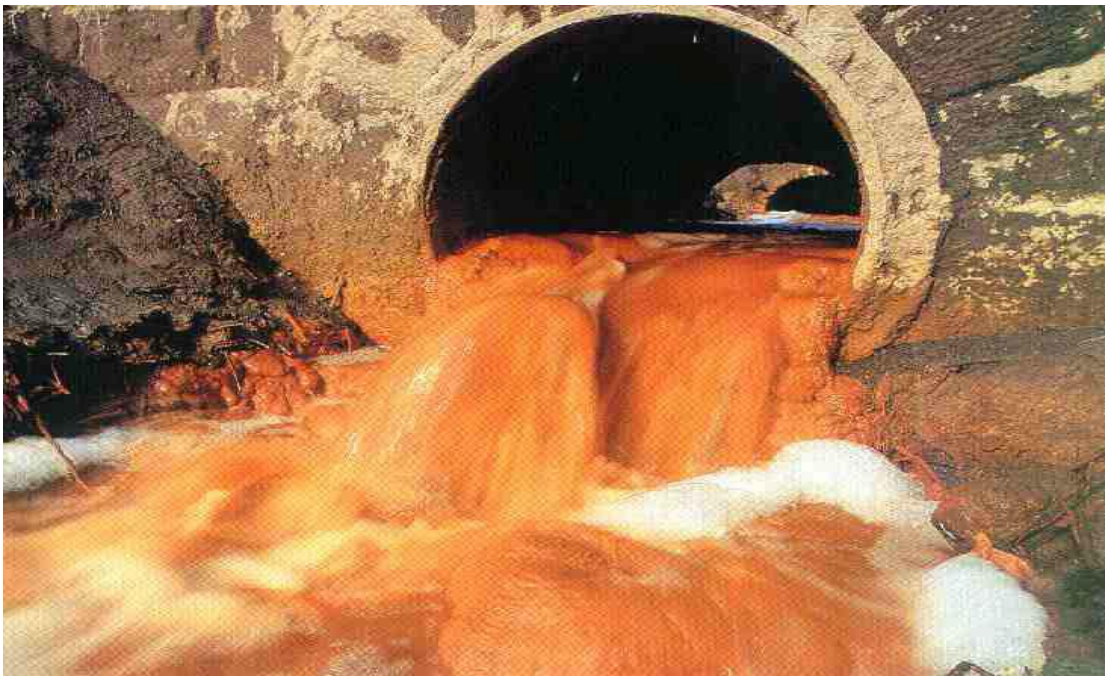
ANNEX 4

Have you ever seen water pollution?

- Where did you see it?
- What type of water body was it in?
- What was the pollution (type)?
- Did you tell someone about it?
- Did you try to clean it up?

What is wrong with the water in this picture?



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An old mine… what can pollute the water here?

What are the two types of pollution in this picture? What might you find in this water?

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This is rain water… why is it not clear?

Water in the sink is clean drinking water? Would you drink this?

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Is the water in this photo clean? Would you drink it directly from the source? Is it possible that the water is polluted?

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ANNEX 5

Create a Water Diary –

Write down all the water or fluids you consume during the day.

_____
_____
_____

Do you leave the tap on whilst brushing their teeth?

_____
_____
_____

How long do you spend in the shower?

_____
_____
_____

How many glasses of water do you drink?

_____
_____
_____

How many times do you flush the toilet?

_____
_____
_____

Name other activities that you do and include water and how much/many times?

_____
_____
_____

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