

Europeana Learning Scenario

Title

STEAM in the Water Cycle

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Abstract

Water is vital for every living organism. Where does water come from? Rain is one of the most important sources of water on our planet. What makes it rain? And what can we do to save water? Through this learning scenario the students will learn about the water cycle and how to make the best use of water on a day-to-day basis.

Keywords

STEAM, Early years, Primary, rain, water cycle, reducing water consumption

Table of summary

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Subject	Science, English, Art, Mathematics
Topic	Science: learning about the water cycle. English: discussing pictures and a video; oral comprehension. Art: the students use their creativity to draw a rainy scene. Maths: the students will become more familiar with the vocabulary associated with capacity through hands-on experience with non-standard units.
Age of students	6 - 8
Preparation time	3 hours
Teaching time	4 sessions of 45 minutes each.
Online teaching material	The Water Cycle Song The Water Cycle Memory Game Natural Water Cycle Game
Offline teaching material	Science: use of interactive whiteboard to project a presentation about the water cycle, Water Cycle Worksheet. Experiment 1: glass jar, water, shaving foam, blue food colouring. Experiment 2: glass jar, ceramic plate, hot water and ice cubes.

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	<p>English: The Water Cycle Song lyrics, flashcards with key vocabulary. Art: coloured pencils, paint, blank paper. Maths: jars, bottles, smaller non-standard measures (yoghurt cups, eggcups, spoons, etc.), water, capacity labels</p>
Europeana resources used	<p>Sound recording: Rainy hillhead street Video: The rain came Artwork: Rain Clouds over a Lake Landscape</p>

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Integration into the curriculum

This learning scenario takes a cross-curricular approach and is linked to the current learning outcomes/syllabi in primary schools as follows:

- **Science:**
 - Our Planet and its neighbours.
 - The Weather – the students will be able to describe changes in weather.
- **English:**
 - The students will participate in shared reading experiences.
 - With support, the students will demonstrate ability to answer questions on text.
 - The students begin to develop an extensive repertoire of vocabulary in context.
- **Art:**
 - Observing and reflecting.
 - Creating and designing.
 - Using media.
- **Maths:**
 - The students will understand and use the vocabulary related to capacity.
 - The students estimate, measure and compare the capacity of a set of containers using non-standard units.

Aim of the lesson

The students will understand evaporation, condensation and precipitation, as well as ways to save water through interactive and hands-on learning activities.

They will also understand and learn the vocabulary related to capacity.

Outcome of the lesson

The students will identify and explain the different stages of the water cycle and how they relate to each other. They will learn how they can reduce water consumption and conserve water. They will also learn about capacity and the vocabulary related to capacity.

Trends

STEAM Learning: through an interdisciplinary and applied approach, the students can make connections between the classroom and the world around them.

Discovery Learning: through hands-on experiences, the students construct their own knowledge and understanding of the world.

Peer learning: the students acquire knowledge and skill through active helping and supporting each other.

Edutainment: the students learn while having fun.

21st century skills

Critical thinking: the students discover facts for themselves.

Creativity and Collaboration: the students learn how to be creative to solve a problem, working constructively together to achieve a common goal.

Communication: the students need to discuss and express their thoughts in a way that others can understand.

Curiosity, wonder and questioning: the hands-on activities in this Learning Scenario give students a reason to wonder, think critically, ask questions, observe, assess information and work constructively with each other.

Activities

Name of activity	Procedure	Time
Lesson 1: Presentation of the topic	The teacher presents the Europeana sound recording Rainy hillhead street and asks the students to guess what it is. A brief discussion about the rain follows to determine the students' prior knowledge about the subject.	5 mins
Group discussion	The students watch the Europeana video The rain came . In groups, they discuss what happened in the video as a result of the rain/shortage of rain. Allow the students to watch the video again during the discussion so that they have the opportunity to check and hypothesize about their	

	<p>understanding. At the end, the leaders of each group share the conclusions with the rest of the class. The teacher writes the key phrases on a chart.</p>	15 min
Creating a rainy day scene	<p>The students draw a rainy day scene with paint and/or coloured pencils.</p>	25 mins (Total 45 mins)
Lesson 2: Learning about the water cycle	<p><i>Where does the rain come from?</i> Brief discussion to check for students' prior knowledge of the water cycle.</p> <p>Present the interactive presentation to explain the water cycle: Water on earth is constantly moving. It is recycled over and over again. This recycling process is called the Water Cycle.</p> <ol style="list-style-type: none"> 1. Evaporation: the sun heats up water on land, in oceans, seas and streams, and turns it into water vapour. The water vapour rises into the air. 2. Condensation: water vapour in the air cools down and changes back into tiny drops of liquid water, forming clouds. 3. Precipitation: the clouds get heavy and water falls back to the ground in the form of rain or snow. 4. Water returns to the sea: rain water runs over the land and collects in lakes or rivers, which take it back to the sea. The cycle starts all over again. <p>Open-ended questions will follow to check for comprehension. The students fill in the Water Cycle Worksheet, and take turns with the interactive games on the classroom computers to consolidate the learning. Finish the activity with The Water Cycle Song.</p>	45 mins
Lesson 3: Hands-on experiments:	<p>Present the Europeana artwork Rain Clouds over a Lake Landscape. Discuss the picture.</p> <p>In groups the students conduct the Rain Cloud in a Jar Experiment. Provide jars with cool water, shaving foam and blue food colouring. Instruct the students to create a cloud on top of the water with shaving foam. Using a pipette, they squirt food colouring on top of the water. What happens? Let the children observe, hypothesize and discuss.</p> <p>Elicit from the students that as the cloud fills and gets heavier the rain falls down. Explain that this is the same way that rain is created. As the cloud fills and gets heavier the rain falls down.</p> <p>Making Rain in a Jar Experiment: (For safety reasons, the teacher will do this experiment while the students observe).</p>	

Pour hot water in a jar and cover with a plate. After 3 minutes put some ice cubes on the plate. Ask the students to predict what they think might happen.

The hot water inside the jar is evaporating into the air inside the jar as water vapour. When we put the ice on top of the plate, it cools down the water vapour. As a result, the water vapour turns into water droplets. Water is too heavy to float in the air and falls back to the bottom of the jar. This is exactly how the water cycle works!

45 mins

**Lesson 4:
Learning the
vocabulary
related to
capacity**

Teaching the meaning of empty, full, half full, nearly empty and nearly full: Show the children different containers holding different amounts of water. Allow some thinking time, then elicit from the children the capacity word for each bottle.

Group work:

Give the children different containers and capacity labels, and ask them to fill the containers to match each label.

Estimating, measuring and comparing – ask the children to estimate how many yoghurt pots are needed to fill in a larger container. Then they actually fill up the containers, and record their findings. Which container holds most/least?

Collecting rain water in jars over a week:

Every day the students will put an empty jar in a suitable place in the yard. Each day at the same time, the students will take the jar to class and replace it with an empty one. Each jar will be labelled with the name of the day and the correct capacity label (empty, nearly empty, half full, nearly full or full). At the end of the week the students will discuss, compare and order the jars according to the amount of water inside them.

45 mins

On a particular day that week, place an extra bottle under the rain gutter downspout so that the students can compare the 2 bottles. Explain how we can collect rainwater and conserve it for household use, thus reducing tap water consumption.

Assessment

The students' contribution during group discussions will reveal their level of participation and understanding. Moreover, drawing is used in this lesson scenario to encourage students who might have difficulty in expressing themselves verbally to put forward their ideas through drawing and show what they have learned.

Open-ended questions are to be used to engage the students in higher-order thinking, and to help the teacher in assessing their understanding.

Before the experiments, the students are encouraged to predict what they think might happen. Comparing these predictions with the actual results helps the students to assess their own level of learning and understanding.

During the Maths session, the students should be able to identify full, nearly full, half full, nearly empty, empty and use these words correctly during the activity.

***** AFTER IMPLEMENTATION *****

Student feedback

N/A

Teacher's remarks

N/A

About the Europeana DSI-4 project

[Europeana](#) is Europe's digital platform for cultural heritage, providing free online access to over 53 million digitised items drawn from Europe's museums, archives, libraries and galleries. The Europeana DSI-4 project continues the work of the previous three Europeana Digital Service Infrastructures (DSIs). It is the fourth iteration with a proven record of accomplishment in creating access, interoperability, visibility and use of European cultural heritage in the five target markets outlined: European Citizens, Education, Research, Creative Industries and Cultural Heritage Institutions.

[European Schoolnet](#) (EUN) is the network of 34 European Ministries of Education, based in Brussels. As a not-for-profit organisation, EUN aims to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners. European Schoolnet's task in the Europeana DSI-4 project is to continue and expand the Europeana Education Community.

Annex

Name: _____

Date: _____

The Water Cycle

Colour the picture. Talk about the water cycle.

