inTruST Learning Scenario

Title: Where does Water go







Link to YouTube video: https://www.youtube.com/watch?v=M9ONag_Krgk



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Research Questions/Tasks

Where does water go after it disappears?
How does the water cycle work?
What are evaporation and condensation?
Students observe changes in water, carry out simple experiments, and explain the stages of the water cycle.

Short Description

This Learning scenario introduces students to the water cycle through hands-on experiments, collaborative activities, and guided scientific inquiry. Students investigate what happens to water when it evaporates and how condensation forms through direct observation and experimentation.

Throughout the unit, students participate in interactive activities designed to help them understand the stages of the water cycle, including evaporation, condensation, precipitation, and collection. They record observations, discuss results, and connect scientific concepts with real-life situations related to weather and water in everyday life.

The unit promotes curiosity, teamwork, scientific communication, and active participation. Visual experiences and practical investigations support younger learners in understanding abstract scientific concepts in a meaningful and engaging way. The activities encourage students to reflect on the importance of water and environmental awareness while developing basic inquiry and observation skills.

Information about the Implementation

Students' age: 8-9 years old Students' language: Catalan/English

Number of lessons: 4 Duration of one lesson: 45 minutes

For which subject(s) is the activity usable?

Physics ☒ Chemistry ☒ Biology ☐ Science ☒ Maths ☐

Art ☐ Technology & Design ☐ Other:

Level of Inquiry (see information in the Appendix):
0- Confirmatory ☐ 1- Structured ☒ 2- Guided ☐ 3- Open ☐

Select the Science and Engineering Practices that are the focus of the designed unit:
(Detailed information on the practices can be found here (Next Generation Science Standards).)

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1		Asking questions and defining problems	☒
2		Developing and using models	☒
3		Planning and carrying out investigations	☒
4		Analysing and interpreting data	☐
5		Using mathematics and computational thinking	☐
6		Constructing explanations and designing solutions	☒
7		Engaging in argument from evidence	☐
8		Obtaining, evaluating and communicating information	☐

Information about the Learning Scenario

- **The water cycle:** Evaporation, condensation, precipitation and collection.
- **States of water:** Solid, liquid and gas, and changes between them.
- **Evaporation and condensation:** Understanding these processes through simple experiments.
- **Weather and natural phenomena:** Connecting the water cycle to clouds, rain and temperature.
- **Scientific inquiry:** Making predictions, conducting experiments, observing and recording results.
- **Environmental awareness:** Understanding the importance of water and its conservation.

Students will be able to:

- Understand and explain the main stages of the water cycle.
- Identify the different states of water and how they change.
- Explore evaporation and condensation through hands-on experiments.
- Formulate hypotheses and compare predictions with experimental results.
- Observe and interpret changes during scientific investigations.
- Use appropriate scientific vocabulary to explain their findings.
- Work collaboratively, share ideas and draw conclusions based on evidence.
- Connect scientific concepts with everyday situations.
- Recognise the importance of water and responsible water use.

Materials and other resources

- Projector
- Water containers
- Transparent cups or jars
- Plastic wrap
- Ice cubes
- Markers and pencils
- Worksheets of lesson 1,2,3 and 4
- Videos and animations about the water cycle: https://www.youtube.com/watch?v=TD3XSIE4ymo

Previous knowledge of the students

Students should:
Understand that water exists in everyday life in different forms.
Be able to make simple observations.

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Have basic collaborative working skills.
Recognise common weather phenomena such as rain or clouds.

Description of the lesson plan (simplified version for teachers)

Lesson 1 – Introduction to Water in Everyday Life (45 min)

The teacher introduces the question: "Where does water go when it disappears?" Students share their ideas and discuss everyday examples, such as puddles drying after rain or wet clothes becoming dry.

The teacher asks:

- What happens to water when it gets hot?
- Does water really disappear?
- Where do you think the water goes?

Students express their initial hypotheses, which can be recorded on the board.

The teacher prepares an electric kettle containing water. Students gather at a safe distance to observe what happens when the water is heated.

1. The teacher switches on the kettle.
2. Students observe the visible mist appearing near the spout.
3. The teacher asks students to describe what they notice.
4. Students discuss where the water might be going.
5. The teacher introduces the concept of evaporation and explains that water vapour itself is invisible; the visible mist consists of tiny condensed water droplets.

Students record their predictions and observations in their science worksheets

Students compare their initial ideas with what they observed. The teacher guides a discussion about how heating can cause liquid water to change into water vapour.

Lesson 2 – Experimenting with Evaporation (45 min)

The teacher reviews the experiment with the kettle and asks students to recall what happened when water was heated.

Students answer questions such as:

- What did we observe?
- Why did the water produce vapour?
- What happens to water when it is heated?

Students work individually or in small groups to complete an observation worksheet about the experiment.

The worksheet includes:

1. What did we use?
2. What did we think would happen?
3. What did we observe?

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4. What have we learned?

Students describe their observations using drawings and short sentences. The teacher supports them in distinguishing between their predictions and the evidence collected.

The teacher presents familiar examples of evaporation, such as drying clothes and puddles disappearing. Students explain how these examples relate to the experiment and share their conclusions with classmates.

Lesson 3 – Condensation and Water Cycle Stages (45 min)

The teacher introduces a new question: "What happens when water vapour cools down?" Students discuss their ideas and make predictions before beginning the experiment.

Now it's time to condensation experiment, you will need: one transparent bowl, warm water, transparent plastic wrap, ice cubes and observation worksheet.

Procedure:

1. The teacher places warm water inside the transparent bowl.
2. The bowl is covered tightly with transparent plastic wrap.
3. Ice cubes are placed on top of the plastic wrap.
4. Students predict what will happen underneath the plastic wrap.
5. Students observe the experiment and look for small water droplets forming on the inner surface.
6. The teacher asks students to describe and explain their observations.

The teacher introduces condensation as the process in which water vapour cools and changes into liquid water. Students record their observations through drawings or short written explanations.

Step 3 – Connecting the experiment to the water cycle

The teacher uses a visual diagram to explain the relationship between evaporation, condensation, precipitation and collection.

Students identify which processes they have observed during the experiments and discuss how these changes occur in nature.

Safety: The teacher handles warm water and supervises the experiment. The water should not be hot enough to cause burns.

Lesson 4 – Conclusions and Reflection (45 min)

The teacher shows an educational animation explaining the water cycle, as illustrated in the classroom video: https://www.youtube.com/watch?v=TD3XSIE4ymo

Students watch carefully and identify the four main stages: evaporation, condensation, precipitation and collection.

After watching, the teacher asks:

- How does water reach the clouds?
- What happens when water vapour cools?

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- Why does rain fall?
- Where does rainwater go?

Students complete a water cycle worksheet, identifying the different stages and connecting them with the experiments.

They are encouraged to explain the processes using their own words and appropriate scientific vocabulary.

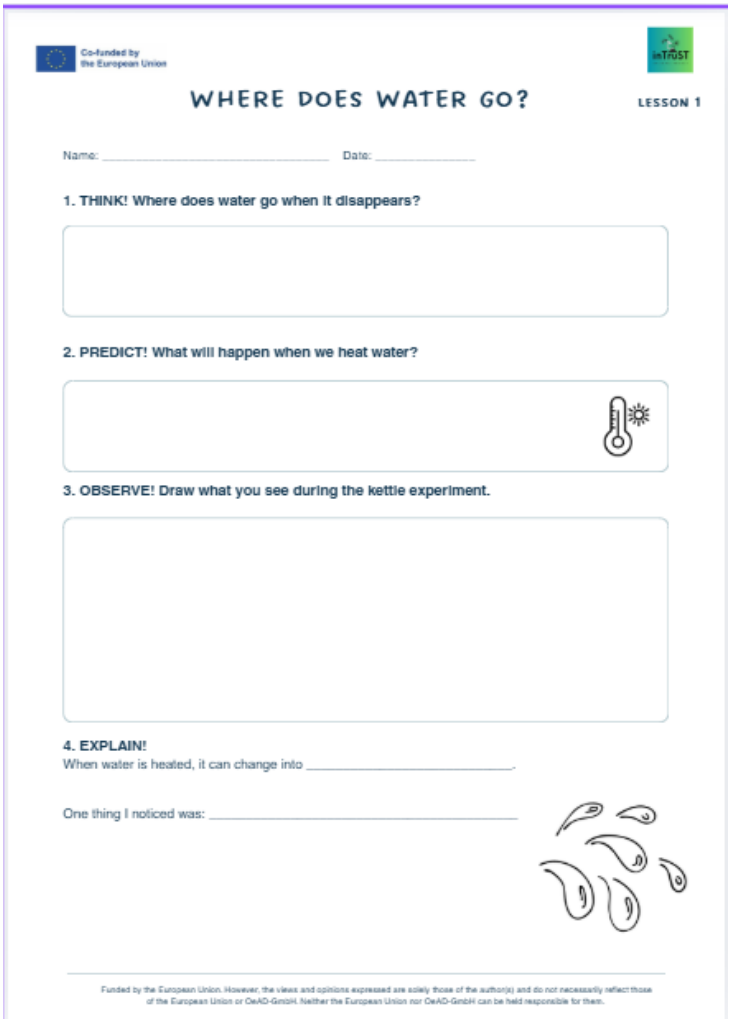
The class revisits the original research question: "Where does water go when it disappears?"

Students compare their initial predictions with their current understanding and share what they have learned.

The teacher concludes by discussing the importance of water in nature and asking students to suggest ways of conserving water in everyday life.

Assessment: The teacher evaluates students understanding through their predictions, experimental observations, completed worksheets and oral explanations

Worksheets: https://canva.link/tdx2v7t0jwxojfx



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WHERE DOES WATER GO?

LESSON 1

Name: _____ Date: _____

1. THINK! Where does water go when it disappears?

2. PREDICT! What will happen when we heat water?

3. OBSERVE! Draw what you see during the kettle experiment.

4. EXPLAIN!

When water is heated, it can change into _____.

One thing I noticed was: _____

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EVAPORATION

LESSON 2

Name: _____ Date: _____



1. REMEMBER! Tick the materials used in the kettle experiment.

☐ Water ☐ Electric kettle ☐ Ice cubes ☐ Plastic wrap

2. COMPLETE THE SENTENCES

When water gets warmer, it can _____.

Water changes from a liquid into a _____.

3. EVERYDAY LIFE

Think about wet clothes drying or a puddle on a sunny day.

What happens to the water? Draw or explain.



4. MY CONCLUSION

Evaporation happens when...

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LESSON 3

THE CONDENSATION EXPERIMENT

Name: _____ Date: _____

1. MATERIALS: bowl, warm water, plastic wrap and ice cubes.

2. PREDICT! What will happen underneath the plastic wrap?

3. OBSERVE! Draw what happens after a few minutes.

4. COMPLETE THE SENTENCES

When water vapour cools, it forms tiny water _____.

This process is called _____.



5. THINK LIKE A SCIENTIST

Was your prediction correct? What evidence did you observe?

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THE WATER CYCLE

LESSON 4

Name: _____ Date: _____

1. LABEL THE WATER CYCLE

Use: evaporation, condensation, precipitation, collection.



2. COMPLETE

Water rises into the air through _____.

Water vapour cools through _____.

Water falls from clouds as _____.

3. BEFORE AND AFTER

Before the experiments, I thought...

Now I know...

I can explain the water cycle: ☐ Alone ☐ With help ☐ Not yet

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Appendix

Level of Inquiry

Refer to the table below for information about the level of inquiry according to Orosz et al. (2023). Select the relevant level of inquiry for your unit in your template above. Please note that, as discussed during LTT2, you can adjust the responsibilities assigned to students and teachers at Levels 1 and 2 if you wish.

Level of Inquiry	Problem/ Question	Procedures	Interpretation of Results	Purpose & Requirements
Level 0 – Confirmatory Inquiry	Teacher	Teacher	Teacher	Students reproduce the results
Level 1 – Structured Inquiry	Teacher	Teacher	Students	Practising simple inquiry skills (e.g., observation, measurement, data interpretation, discussion of results, documentation) or introducing students to IBL
Level 2 – Guided Inquiry	Teacher	Students	Students	Opportunity for cooperative learning, room for creativity, development of skills and abilities (above + formulation of hypotheses, designing the experiment)
Level 3 – Open Inquiry	Students	Students	Students	Greatest level of freedom; demands advanced inquiry skills, reasoning ability and creativity, and high level of responsibility

Science and Engineering Practices

As a framework for designing the learning units, this project used the science and engineering practices according to the Next Generation Science Standards (NGSS). Detailed descriptions of each practice can be found in the Appendix F of the NGSS:
https://www.nextgenscience.org/sites/default/files/Appendix%20F%20%20Science%20and%20Engineering%20Practices%20in%20the%20NGSS%20-%20FINAL%20060513.pdf

Literature

NGSS Lead States. (2013). *Next Generation Science Standards: For states, by states. Appendix F: Science and engineering practices in the NGSS.* National Academies Press. https://www.nextgenscience.org/

Orosz, G., Németh, V., Kovács, L., Somogyi, Z., & Korom, E. (2023). Guided inquiry-based learning in secondary-school chemistry classes: A case study. *Chemistry Education Research and Practice*, *24*(1), 50–70. https://doi.org/10.1039/D2RP00110A

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