MODULE III

Lesson Plan 2

Summary

Title	
The Water Cycle	
Duration	90 min.
The age range of students	10 - 12

Summary of the theme

In this lesson, students will learn about the water cycle by creating a 3D model. Concepts such as evaporation, condensation, precipitation, and infiltration will be explored. The hands-on activity will help students visualise and understand these natural processes in an interactive and fun way. At the end, each group will present their model explaining the different stages of the water cycle.

Learning outcomes

Aim/Learning Objectives.

- Students will understand and be able to explain the different stages of the water cycle: evaporation, condensation, precipitation, and infiltration.
- Students will develop teamwork skills and creativity by building a 3D model.
- Students will be able to identify the importance of the water cycle for the environment.

Cross-cutting objectives

- It encourages collaboration and teamwork.
- Develops project planning and execution skills.
- Explains environmental processes and natural systems.

Connecting Sustainable Development Goals

This lesson relates to:

- SDG 6: "Clean water and sanitation"- Target 6. b. Support and strengthen the participation of local communities in improving water and sanitation management.

- SDG 13: "Climate Action"- Target 13.3. Improve education, awareness, and human and institutional capacity for climate change mitigation, adaptation, impact reduction, and early warning.

Implementation

Facilitation

- Make sure all materials are ready before starting the lesson.
- Divide students into small groups to encourage teamwork.
- Supervise and guide students during the construction of the model.
- Use recyclable or recycled materials whenever possible.
- Provide visual examples and diagrams of the water cycle for reference.
- Protect the tables with plastic to facilitate subsequent cleaning and to avoid excessive staining.
- Double the total material needed to avoid stock-outs.

Resources / Materials needed

- Paper, plasticine, glue, scissors, paints, and brushes.
- Small containers (to represent bodies of water).
- Markers and labels.
- Recycled materials for decoration.
- Colored cardboard.
- Newsprint or recycled paper.
- Silicone and silicone gun.
- Polystyrene boxes, cardboard boxes, or wooden planks are used as the base of the model.
- Sierra.

Ideas to continue

- Make a group presentation of the models, explaining each stage of the water cycle to classmates from other classes.
- Create an observation diary where students draw and describe the water cycle in their local environment.
- Organise a visit to a nearby water body to observe the water cycle in nature.

Source / Classroom materials and preparation

- Introduction to the water cycle with a brief explanation based on these sources: Source 1 and Source 2.
- Educational videos to facilitate students' understanding: Video 1 and Video 2.
- Examples of water cycle models are attached in the Annexes section for printing or displaying on a screen.
- Videos of the construction of the model to guide students: Video 1, Video 2 and Video 3.

Topic outline

Time	Step-by-step instructions
10 min.	Introduction to the water cycle with a brief explanation (Source 1 / Source 2) and educational video (Video 1 / Video 2).
10 min.	Divide the students into groups and explain the 3D model activity (Annexes section).
25 min.	Construction of the water cycle model (Video 1 / Video 2 / Video 3). First part: 1. Land preparation: a. Model Base: Use cardboard, polystyrene, or a wooden box as a base for the model. b. Create Relief: Crumple newspaper to form mountains and other land elevations. Use masking tape to attach the paper shapes to the base. Make sure the mountains are firm and won't fall over. c. Coating: Cover the paper shapes with more recycled paper or play dough to give them a more uniform and solid texture. 2. Definition of the stages of the Water Cycle: a. Representation of Water Bodies: Place the small containers on the ground to represent rivers, lakes, and oceans. b. Evaporation: With light blue play dough, create small waves and arrows to represent water evaporating from the water bodies into the sky. Attach these shapes to the containers with glue. c. Condensation: Use white or grey plasticine to create clouds on top of the relief. These clouds will represent the condensation of water vapour in the atmosphere.
25 min.	Construction of the water cycle model (Video 1 / Video 2 / Video 3). Second part: 1. Precipitation and Infiltration: a. Precipitation: With blue paint, draw lines falling from the clouds to the ground to represent rain. These lines can also be made with thin plasticine and glued with silicone. b. Rivers and Streams: Paint or place strips of blue play dough connecting the water containers to represent rivers and streams. Use glue or silicone to attach them. c. Infiltration: At the base of mountains and terrains, paint small lines or use brown plasticine to show how water infiltrates into the ground. 2. Decoration and finishing touches:

	a. Decoration: Add small decorative elements such as branches, stones, and other recycled materials to give the model a more realistic look. b. Labels: Cut out small cardboard labels and use markers to name each stage of the water cycle in the model (evaporation, condensation, precipitation, infiltration). Attach these labels with glue.
10 min.	Group presentations: Each group explains its model and the different stages of the water cycle. The pupils in the same group take turns explaining, in turn (all group members must participate), the stages they have shown in the model, as well as a brief commentary on the materials they have used and the reason why.
10 min.	Final reflection and evaluation of what has been learned (Annexes section).

Formative evaluation

- Classroom observations and oral questions during the making of the model to check if the cycle phases are clear.
- Evaluation of the models and group presentations, in which a brief discussion is held among the other groups to highlight the strong points of the model of the presenting colleagues.
- Use of the reinforcement activities attached in the Annexes section: crossword puzzle and outline to complete.

Feedback

Net Promoter Score (NPS) is a widely used tool to measure the loyalty and satisfaction of customers or, in an educational context, students. It measures the likelihood that students will recommend the subject or course to others.
How to analyse and apply NPS is explained below:

Development of the NPS question:

- Main question: "On a scale of 0 to 10, how likely are you to recommend this topic to other students?
- Follow-up questions: "Why did you select this score" and "How can we improve this issue?

Collection of responses:

- Digital surveys: Use online tools such as Google Forms, SurveyMonkey, or Typeform to collect student responses.
- Paper surveys: Paper questionnaires are distributed at the end of the lesson for students to complete. A template for collecting responses with paper surveys is shown in the Annex.
- Interactive applications: Interactive applications such as Quizziz, Mentimeter, or Kahoot! are used to collect answers in real-time.

Classification of responses:

- Promoters (Score 9-10): Students are very satisfied and likely to recommend the subject.
- Passive (score 7-8): Satisfied, but not enthusiastic students; they could easily change their minds.
- Detractors (Score 0-6): Dissatisfied students who are unlikely to recommend the subject; they could provide constructive criticism.

Calculation of NPS:

- Formula: NPS = % of promoters - % of detractors.
- Score interpretation: NPS ranges from -100 to +100. A positive score (above 0) is generally good, and a score above 50 is excellent.

Analysing and using comments:

- Review the comments to understand the reasons behind the scores.
- Identifies patterns and specific areas for improvement among detractors and passives.
- Use the promoters' positive comments to reinforce the positive aspects of the issue.

Annexes

Images of examples of 3D models of the Water Cycle to print or display on a screen:

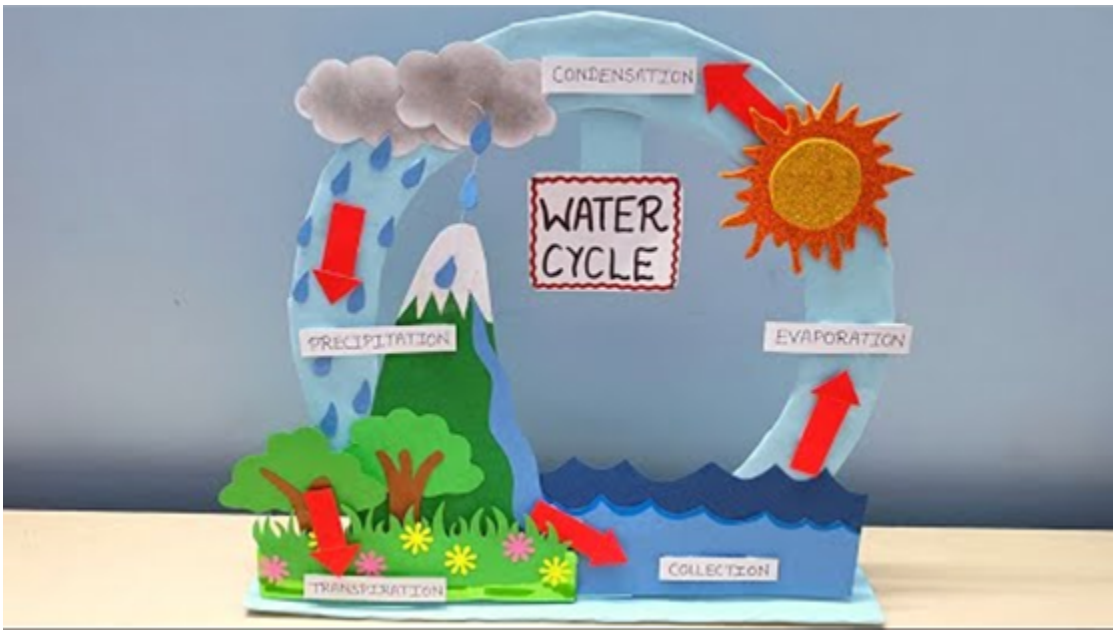


Figure 3.2.1: Support figure. Source: YouTube's channel of aspration crafts. Link: https://m.youtube.com/watch?v=-hMbfLV7En4#dialog

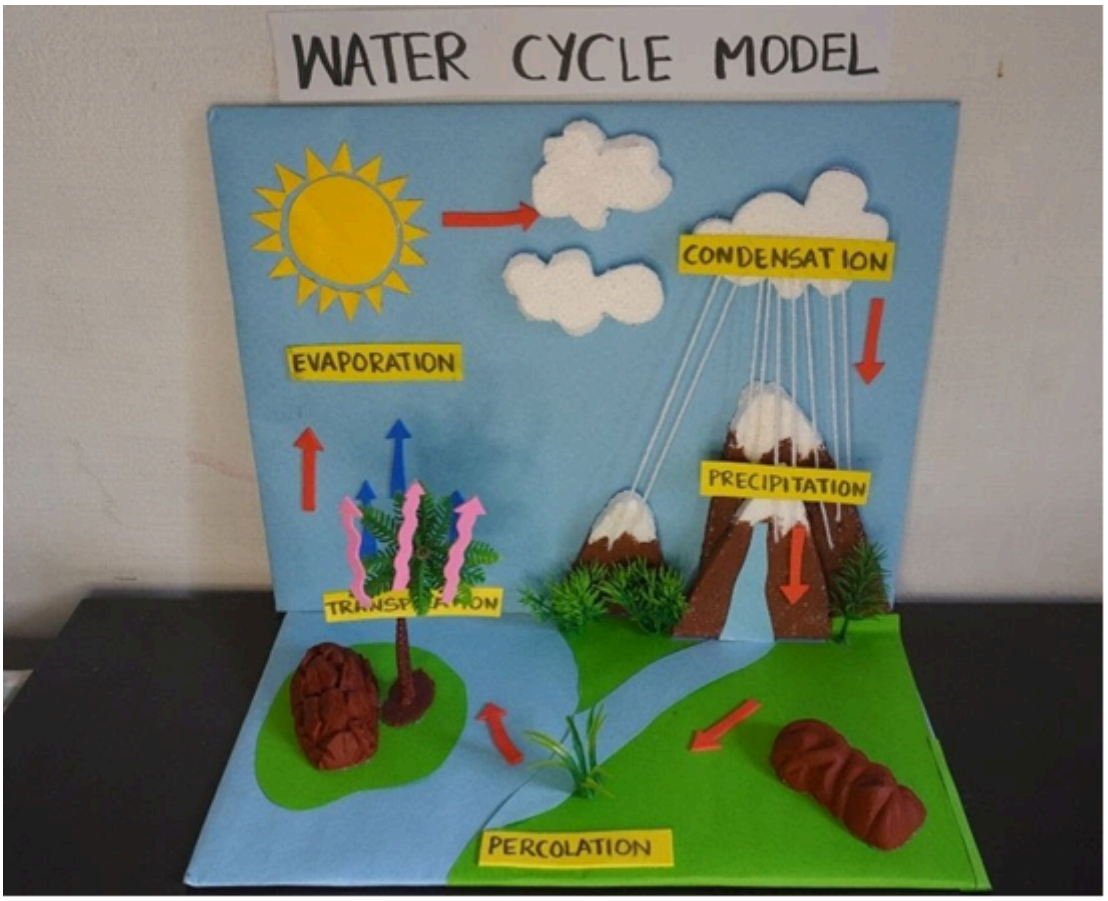


Figure 3.2.2: Support figure. Source: Youtube's channel of The4Pillars. Link: https://www.youtube.com/watch?app=desktop&v=ChaG_Wr9sss



Figure 3.2.3: Support figure. Source: Youtube channel of Sri Cre8ve Corner. Link: https://www.youtube.com/watch?v=4q4hFpATRCM

Reinforcement activities to assess whether students have learned what was explained:

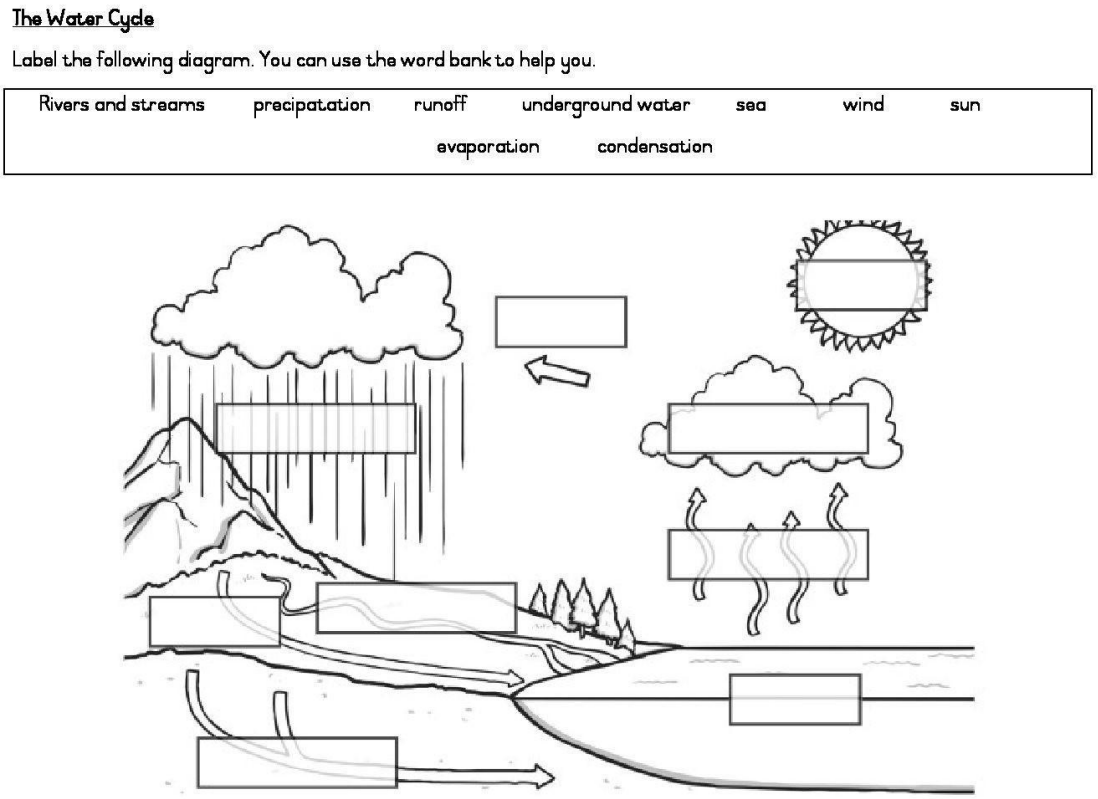
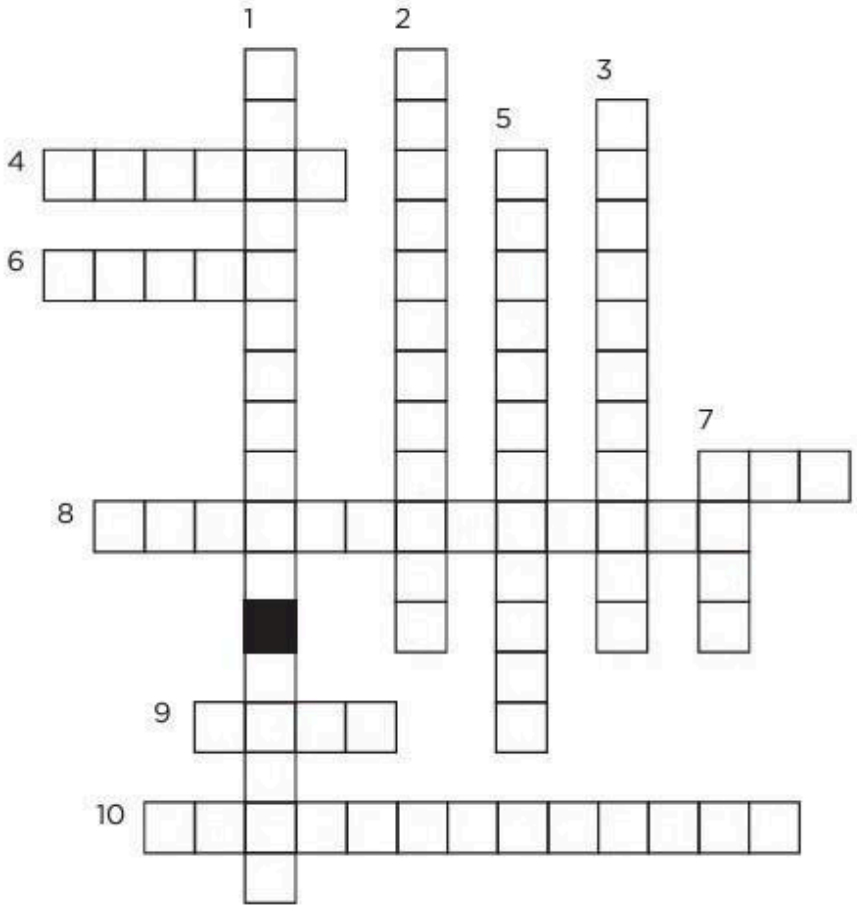


Figure 3.2.4: Support figure. Source: LIVEWORKSHEETS. Link: https://www.liveworksheets.com/es/node/2676084

Water Cycle Crossword



Down

1. Water that is below the surface
2. When water gathers in lakes, seas or oceans we call that:
3. When water vapors rise from water into the air we call that:
5. When gas changes to liquid we call that:
7. Frozen flakes that fall from the sky during winter

Across

4. A visible (sometimes fluffy looking) mass in the sky made from water or ice droplets
6. A large stream of water
7. Center of the solar system
8. When water vapors rise from plants into the air we call that:
9. A body of water surrounded by land
10. When rain or snow falls down we call that:

Figure 3.2.5: Support figure. Source: Own creation.

QUESTIONNAIRE TO COLLECT FEEDBACK ON THE TOPIC

On a scale of 0 to 10, how likely would you recommend this subject to other students?

0	1	2	3	4	5	6	7	8	9	10

Not likely at all Extremely likely

Why did you choose that score?

How could this issue be improved?