







5.1 Natural water cycle

Basic information and collecting ideas 	<p>Do the demonstration on page 2 and have the students guess which amount of water is represented by the individual volumes.</p> <p>Facts:</p> <ul style="list-style-type: none"> Water covers about three-quarters of the Earth's surface. 96% of the world's water is salt water. 3% of the world's water is fresh water, but most of it is frozen or not easily accessible. Less than one percent of the world's fresh water is useable.
Setting up and conducting experiments 	<p>Have the students refill the plastic bag and place it in the sun. If sunlight is not available, you can also pour water heated to about 50 °C into the soil. Small drops of water immediately condense out of the moist air on the cool plastic bag and “rain down” to the soil.</p> <p>The clear water represents solar distillation / natural water purification: contaminants (here blue ink) remain in the soil. When students put a piece of damp paper on the bag, they create an artificial “cloud base”, where the moist air condenses well. In addition to the natural water cycle, this model experiment is also used to explain some weather phenomena. Use the following terms: evaporation, condensation, precipitation, infiltration (into the soil)</p>
Observing and documenting 	<p>Make sure that students understand the value of scarce drinking water on Earth for humans, animals, plants and the environment. Make them aware of how important it is to protect this precious amount of water: No clean water – no healthy life.</p>
Analysing and reflecting 	<ul style="list-style-type: none"> What do you expect, when you put a piece of wet paper on top of the bag? > <i>More water will condense, because ...</i> What natural phenomenon corresponds to the wet paper (hint: Where do clouds form?)? > <i>You create an artificial “cloud base”, where the moist air condenses well.</i> Compare the colour of the “rain drops” with the colour in the soil and explain. > <i>Solar distillation separates the water from the ink (“pollution”), which stays in the soil.</i>
Doing further research 	<ul style="list-style-type: none"> What metal and what colour would you choose to build a solar water heater on your roof? > <i>Copper tubes (good heat conductor), painted black (good light absorber)</i>

Technical and vocational application 	<p>Basic knowledge for those who want to understand and protect the environment.</p> <p>All professions dealing with water use and wastewater.</p>
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Demonstration before the experiment:

1. Fill a plastic cup with 0.5 l of water.
This represents the total amount of water on Earth – both saltwater and freshwater resources.
2. Take a soup spoonful of water from this plastic cup and put it into a smaller cup:
The remaining water in the bigger cup represents the salt water. The water in the smaller cup represents all freshwater resources on Earth.
3. Extract one drop with a small syringe and let it fall on the ground:
The remaining water in the smaller cup represents the fresh water on Earth stored in glaciers and icebergs.
4. The drop represents the fresh water which is available for human use.
Yet, 75 percent of this drop is used for agriculture and industry.
Only 5 percent of this drop is available as drinking water.

