

Experiment 2

Instructions: How much water can soil absorb?



Materials:

Get various soil samples such as plant soil, sand, clay or clayey soil and loam or loamy soil (6 tablespoons of each sample).

For each soil sample you need:

- 1 paper cup
- 1 tablespoon
- 50ml measuring cup for water
- 1 clear glass / clear cup *

You will also need:

- 2 toothpicks or wooden skewer to perforate cups
- 1 piece of paper towel
- 1 pen for labeling paper cup
- 1 pair of scissors
- 1 measuring cup with 250 ml water
- 1 worksheet "How much water can soil absorb?"

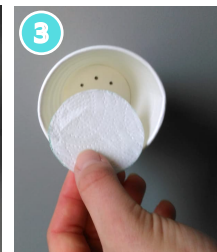
* The glass should be chosen so that you can hang the paper cup in it like shown in the picture on the left. There should be enough space between the bottom of the cup and the bottom of the glass to catch the water running through.



Experiment setup and execution:

(Before you start, read this page and both pages of the worksheet!)

- Carefully poke nine holes into the bottoms of the paper cups with the wooden skewer as follows: make a circle of eight holes and a hole in the middle.
- Place the paper cups on the paper towel and trace the edge of the bottom of the cup.
- Cut out the marked circles, place them in the paper cups and moisten them with 1-3 drops of water. **Make sure that the paper towel sticks tightly to the bottom of the paper cup and that all the holes are covered.**
- Place the paper cups into the glasses. Fill each paper cup with 6 tablespoons of a soil sample. **Make sure that you distribute the soil evenly in the cups.**
- Label your samples (e.g. loam or loamy soil, sand, ...).
- Pour 50 ml of water into each of the paper cups at the same time and compare *:
 - How quickly does the water start to drip from the samples?
 - How quickly does drop follow drop?
 - How quickly does it stop dripping from the samples?
- Note your observations on the worksheet.



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Worksheet: How much water can soils absorb?

1. Write which sample is which type of soil or soil component into the boxes under the glasses.

Sample 1: _____ Sample 2: _____ Sample 3: _____ Sample 4: _____

OBSERVATIONS:

2. Answer the questions by setting the samples according to their dripping behavior. Always sort from "fast" to "slow".

Questions:	fast place	2nd place	3rd place	4th place	slowest place
Which sample drops first, second, third, last?					
Which sample drips fastest, which slowest?					
Through which sample did the most water pass?					

3. How much water has flowed out of the samples? Draw the water levels into the glasses below.

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4. Split the samples according to their water retention capability. Always sort from "best" to "worst".

Questions:	best place	2nd place	3rd place	4th place	worst place
How well does the sample retain water?					
Through which sample did the most water pass?					

EVALUATION:

5. What do you think which soil properties influence how quickly the water passes through the samples? _____

From left to right water flow, different plants require different growing conditions.

6. Which of your soils is best suited for plants that need little water? _____

7. Which of your soils is best suited for plants that like constant water? _____

ADDITIONAL TASKS:

8. Do you have any questions about the experiment? Do you have any ideas what else you could investigate about soils? _____

If you want, post your ideas and pictures at the end of "Mission 2" of the work book topic on www.kniffelix.de in the community area. You can see your upload once we have checked if you have considered all Kniffelix rules like that there are no people or plants or results to harm.

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