

WATER BODIES

Fichtelgebirge Nature Park

TIPS & TRICKS



Material requirements

Depending on group size, adjust numbers to the number of pupils!

Experiment 1:

- Glass jars with lids (e.g. jam jars; preferably wide openings)
- Cling film
- Pebbles, sand and soil
- Empty cover of a tea light / lid of a bottle
- Cress seeds

Transfer Excursion 1

- Atlas oder map of Europe/Germany

Experiment 2:

- 4 plastic bottle necks
- a large jar
- various materials for the filters: gravel, sand, soil -> collect in the surrounding area
- filter paper or absorbent cotton
- a small bucket for the dirty water

Experiment 3:

- 4 plastic bottle necks
- a large glass
- various materials for the filters: gravel, sand, compost or potting soil -> collect in the surrounding area
- filter paper or absorbent cotton
- two small cups for the dirty water
- ink
- oil

Transfer Excursion 2

- Glue
- Scissors
- Identification book
- Tablets/ cell phones (for digital identification)
- Fine sieves
- Small buckets/ beakers
- White tubs / white containers
- Magnifying glasses
- Tweezers

Notes on the procedure

General information

- Goal: learning that is as free and student-centered as possible
- Learning through research and discovery -> students experience their environment, actively engage with it and thus gain Knowledge
- Point out to the students that they can ask questions or ask for help at any time



Course of the research excursion:

- Preparation in class (LK)
- Walk to the meeting point Work on the stations in class (see order below)
- Discussion of the problem question/work assignment
- Conclusion: Farewell Wrap-up in class (LK)

Suitable identification book:

KOSMOS: What lives in streams and ponds?

Children's nature guide ISBN: 978-3-440-14799-3

Identification App:

ID Logics

Android/ Apple

Overview

| Page numbers correspond to pn of the researcher booklets | page | ✓ |
|---|------|---|
| <u>Experiment 1: Water cycle in a glass</u> | 4 | |
| <u>Transfer: The water cycle</u> | 5 | |
| <u>Info: Where does it come from?</u> | 6 | |
| <u>Excursion 1: Where does it come from?</u> | 7 | |
| <u>Transfer: Where is it going?</u> | 8 | |
| <u>Experiment 2: Soil as a water filter</u> | 9 | |
| <u>Evaluation of experiment 2: Soil as a water filter</u> | 10 | |
| <u>Experiment 3: Contaminated water</u> | 11 | |
| <u>Evaluation of experiment 3: Contaminated water</u> | 12 | |
| <u>Excursion 2: Species at a glance</u> | 13 | |
| <u>Evaluation of excursion 2: Species at a glance - animals</u> | 14 | |
| <u>Evaluation of excursion 2: Species at a glance - plants</u> | 15 | |
| <u>What I want to do</u> | 16 | |

Preparations

Hello!

Welcome to your researcher's notebook!

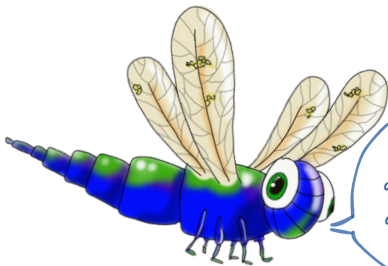
We, **Danny Dragonfly** and **Carl Caddisfly** larva are here to help you today!

Today you will learn a lot during a research trip to a watercourse near your school. We'll help you to collect the important things here so that you can understand today's experiences and findings later on.

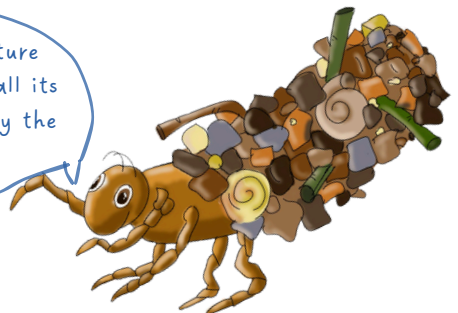
You can also repeat some of the experiments at home.

At some points, we will provide you with hints or ask you questions for further thought.

If you get stuck, please contact one of the rangers, they will be happy to help you!



Discover the nature around you with all its diversity and enjoy the impressions!



You need:

- a glass
- cling film (stretched tightly over the glass opening)
- pebbles, sand and soil
- the empty cover of a tea light or the lid of a bottle
- a seed



How to proceed:

1. Cover the bottom of the jar with a layer of pebbles, a layer of sand and a layer of soil. Moisten the soil a little!
2. Fill the tealight holder/bottle cap with water and place it in the center of the jar. You can plant the seed or seedling next to it.
3. Close the jar with the lid or cling film and place it in the sun.

During the waiting time you can carry out Excursion 1! The evaluation is only possible after approx. 20-30 minutes.

Pupils are welcome to take their experimental set-ups with them and set them up in the classroom (seedling needs time)

Space for your observations:

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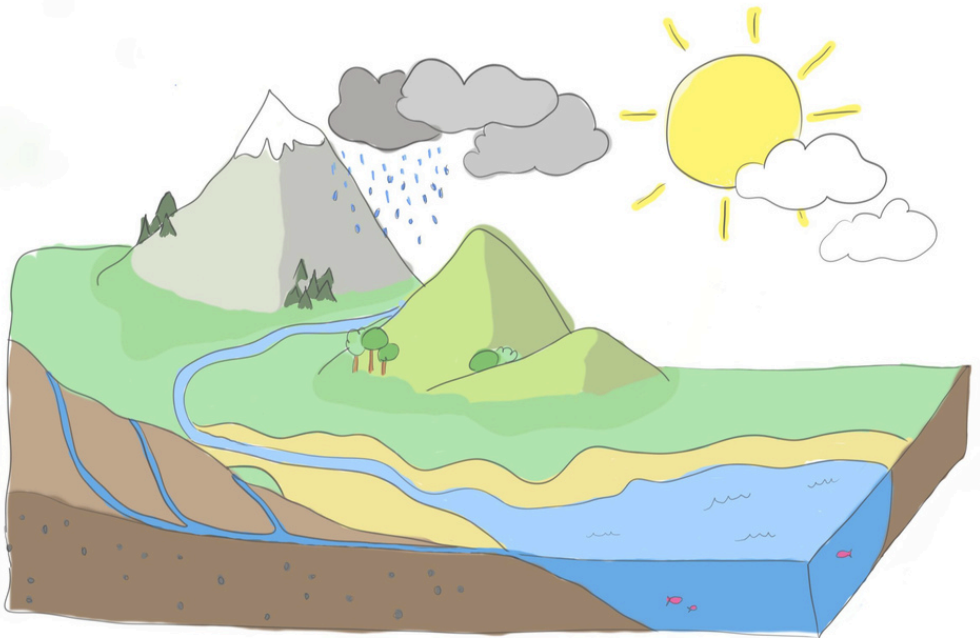
The Water Cycle

Try to transfer the water cycle from the glass to the water cycle on planet Earth.

Which processes take place when?

Enter the terms in the correct places and mark the direction(s) with arrows.

Wind Evaporation Groundwater reflux
Precipitation Condensation Infiltration



To think about



Can planet Earth lose water?
What does water consumption mean?
Why is clean water important?

Where does it come from? – Info

The natural spring

Springs are spatially limited places where groundwater emerges freely, following the force of gravity. Wells, on the other hand, are tapped, obstructed, etc. As a result, the typical habitat of the original spring is greatly altered.

Where do the springs in the Fichtelgebirge originate?

Groundwater always comes to the surface in a spring when a water-conducting layer of soil is cut by a slope. Usually several springs emerge at the same height on the slope. In total, there are over 10,000 springs in the Fichtelgebirge!

Springs - special habitats

The marshy springs typical of the Fichtelgebirge have ground that is constantly seeping with water. Trees cannot cope with these conditions, which is why forest springs are also free of tree growth. Compared to their surroundings, they therefore offer a light habitat from which grasses, herbs, ferns and mosses benefit.

A characteristic community of plants and animals has therefore developed under the special site conditions of the springs - relatively much light, fairly cool in summer and relatively warm in winter.

Endangerment and protection

The springs and their flora and fauna are primarily affected by human interests in their use. Springs offer specialized animals and plants a habitat which, once destroyed, cannot be restored. This is why they are protected as particularly valuable biotopes under the Bavarian Nature Conservation Act. Springs must therefore not be destroyed. The purity of the spring water must be maintained. In particular, nutrient and pollutant inputs into the groundwater should be avoided, as well as unnecessary damage caused by trespassing, tapping and construction. However, appreciation is also important, as water is the most important basis of life for humans and nature.

Based on: Quellen im Fichtelgebirge, Begleitheft zur gleichnamigen Ausstellung des NaturparKS Fichtelgebirge, Autoren: W. Wurzel und V. Auddorff)



Mark the parts
that are important
to you!

Excursion I

Where does it come from?



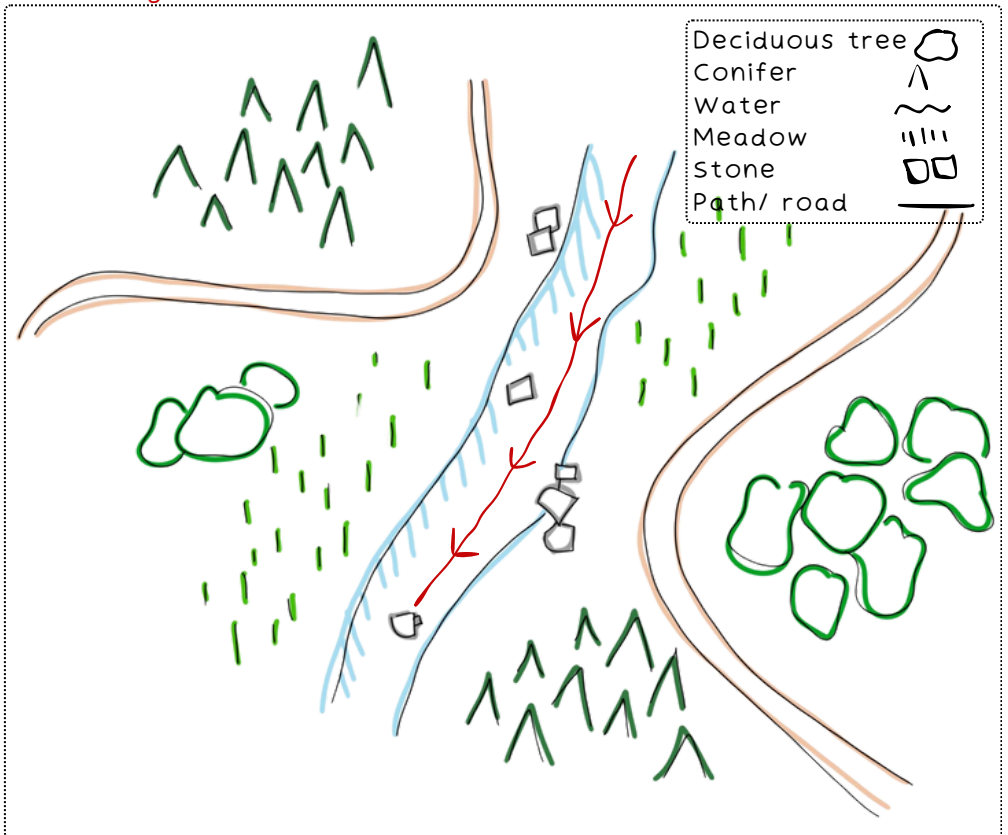
Look around you.
You are by a stream.
Try to depict your surroundings
from above.

The best way to do this is to imagine that you are a bird hovering high above your head.

You can use symbols that make it easier for you to visualize.

Also mark the direction in which the water flows.

drawings could look like this



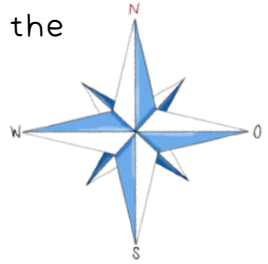
Where is it going?

You've probably wondered where the water flows to, right?

Let's find out together.

Using the map, try to trace the path of the following watercourses with your finger.

Where do you lose sight of them?



Write like this:

Der weiße Main > Rhein > Nordsee

Der/ Die je nach Standort

Die Eger > Elbe > Nordsee

Die Naab > Donau > Schwarzes Meer

Die Saale > Elbe > Nordsee



There are numerous streams and rivers in the Fichtelgebirge. The four main rivers flow in the four cardinal directions: The Naab flows to Süden via the Donau into the Schwarze Meer.

The White Main flows to Westen via the Rhein, the Saale to Norden via the Elbe and the Eger to Osten via the Elbe to the Nordsee.

Experiment 2

the soil as a water filter

When water seeps into the ground, it flows through different layers of soil and is filtered as a result. Groundwater is therefore very clean and can be used as drinking water.

You can build a model of the ground here and test the filtering effect.

You need:

- 4 clay pots with a hole/ plastic bottle necks
- a large glass jar various materials for the filters: gravel, sand, compost or potting soil,
- filter paper or absorbent cotton
- a small bucket for the dirty water

How to proceed:

Collect soil, leaves, twigs and other things. Put these things in the small bucket and fill it up with water. Then mix everything well and you have the dirty water.

Fill the clay pots with one filter substance each and place them on top of each other on the large glass. It's best to put the gravel at the top, then the sand, the soil underneath and the filter paper or absorbent cotton at the bottom.

Then pour the dirty water into the filter system and observe the result. Observe what happens and explain the filter function of the soil



Notes



I noticed that:

- Self-directed reflection on the experimental procedure Pupils
- Exchange among themselves desired
- Feel free to take notes while listening to the students

that was easy / difficult for me

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Why is the filter function of the soil important?

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Experiment 3

polluted water

When water seeps into the ground, it flows through different layers of soil and is filtered as a result. Groundwater is therefore very clean and can be used as drinking water.

But can all pollution really be removed from the water by filtering the soil?



You need:

- 4 clay pots with a hole/ plastic bottle necks
- a large glass jar
- various materials for the filters: gravel, sand, compost or potting soil, filter paper or absorbent cotton
- two small cups for the dirty water
- ink
- oil

How to proceed

Mix a cup of water with ink and a cup of oil. Fill the clay pots with one filter substance each and place them on top of each other on the large glass. (Gravel on top, then sand, then soil, filter paper or absorbent cotton at the bottom) Then pour the dirty water into the filter system and observe the result. Observe what happens and explain the filter function of the soil

Make absolutely sure to collect the contaminated water & do not pour it out into nature.

Notes

I noticed that:

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Is the filter function of the soil sufficient for any pollution?

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What does this mean for my own behavior when dealing with water?

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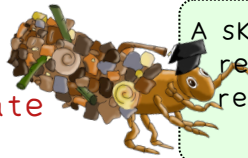
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Look around you. There are lots of different animals and plants around you.

With the help of your own sketchbook, you are now going on a journey of discovery.

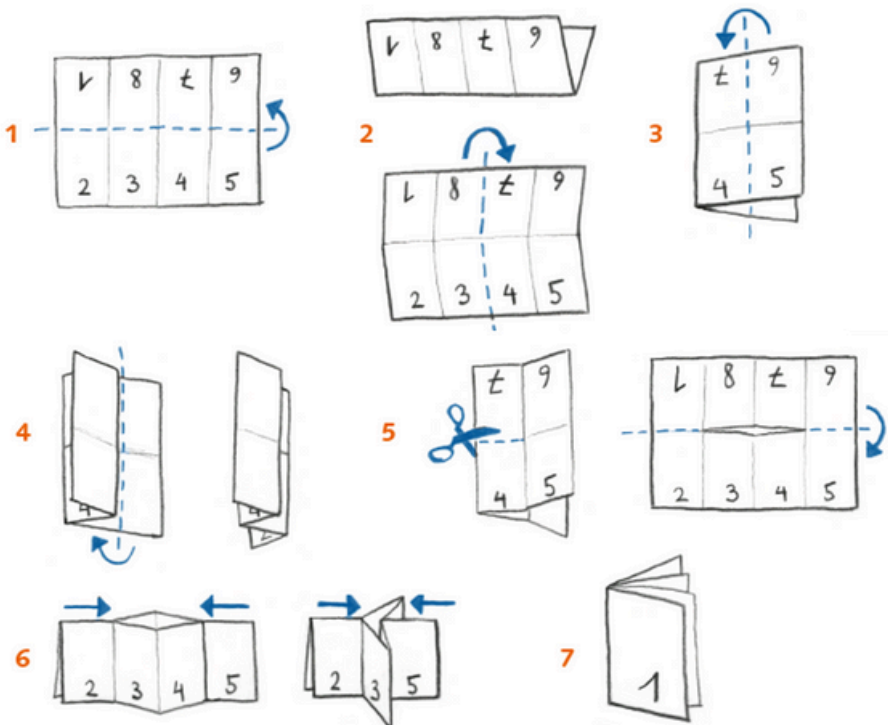
Choose a creature and a plant to sketch in your little book.

If necessary, assistance with folding; you are welcome to participate as an example!



A sketch is a rough or brief representation of a representation of a thing or a state of affairs.

Instructions: Folding a mini book



You can stick your sketches here.

Label your illustrations with the areas of the animal you have looked at (e.g. head, legs, surface, ...)

Try to identify the animal species. Use the IDLogics app or an identification book to do this.

If you get stuck, you can ask the rangers for advice.

Students can also opt for animals directly from the water

-> removal of the animals using a sieve & small bucket (see material requirements)

-> Examination in white tubs with magnifying glasses

Be sure to observe: Appropriate behavior when handling living creatures!

Educate pupils!

-> return to water after examination

Explain briefly.

How did you proceed with the determination? What were the decisive characteristics?

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Exkursion 2

Species at a glance- plants

You can stick your sketches here.

Label your illustrations with the areas of the plant that you have looked at (e.g. stem, leaf, flower, ...)

Try to identify the plant. Use the IDLogics app or an identification book to do this.

If you get stuck, you can ask the rangers for advice.



Explain briefly.

How did you proceed with the determination? What were the decisive characteristics?

After the Excursion 2 - Species in view unit, develop a reflective class discussion.

Let the pupils exchange ideas. Possible stimulus questions:

Which species did you find?

Did we discover some species more than once?

Why did you choose each species?

Was it easy for you to choose?

Aim of the discussion:

- To discover and become aware of the biodiversity of the aquatic habitat (flora + fauna)
- Next:
- To become aware of the need to protect this habitat

A discussion round is planned at the end of the unit at the extracurricular learning location of watercourses.

Pupils should reflect on what they have learned and briefly summarize it for themselves.

These reflections should result in concrete action plans that are based on the sustainable, conscious and protective use of water and bodies of water.

Pupils should formulate both individual and collective (as a class) action plans that can be implemented in order to contribute to water protection.

This final step is a rather open, less guided discussion, with no concrete outcome to be predicted.

Let the pupils' creativity run free and leave the transfer to the pupils themselves as far as possible.

They should independently recognize how important environmental protection is to them and what opportunities, but of course also limits, they themselves have.

What I want to do



Now the question remains, what can you personally do for (clean) water and the aquatic habitat?
What concerns you?
What is important to you?



Think about some concrete actions that you can take in your everyday life to contribute to water protection.

You are also welcome to think together with your class about what you can do as a group.

There is room for your own ideas here!
Develop the specific instructions for action individually from the discussion
Possibly provide assistance with formulations
Degree of support at your own discretion

Some possible instructions:

I do not dispose of waste in bodies of water

I do not trample plants

I do not pull out flowers/plants

Living creatures should be released immediately after observation (preferably where I picked them up)

I do not dump any liquids into streams or rivers

- I do not use more water than necessary