Dwarfs and giants

Required time:	≈ 2 1/2 hours
Material needed:	Ribbons
	May be ask the children to bring a pair of old socks
	15 beans or nuts for each child
	Pins
	Scale
	Small mirrors, half as many as participants

Relevance in context to the curriculum

- Development of plants, observe, describe and documentation
- Name plant parts and describe their function
- Describe adaptation of plants and animals in their habitat

BACKGROUND INFORMATION

From flower to seed

After flowers of plants have been pollinated, fruits develop. The fruits of coniferous trees are the cones. Under their scales develop the seeds. Most deciduous trees have their seeds covered with tissue. This can be soft, as it is the case with fruits, or hard as around nuts.

How seeds spread

Seeds spread manyfold. Most are spread with the help of animals. This is particular true for berries, which are eaten by birds and excreted elsewhere. Jays and squirrels create storages with nuts and oaks for winter, but do not eat them all. Some seeds have a sticky tissue, which helps them to attach to passers by - animals or humans, and are transported this way. Others are carried by wind. And sometimes they are carried by water.

Important food Ressource

Seeds are an important food resource for many animals. Squirrels and mice have nuts, chestnut, acorns and beechnut particular on their winter diet. Crows eat walnut and have developed amazing tricks to get to the seed inside the hard shell. For jays oaks and nuts are an important addition as well. Crossbills are specialist feeders on conifer cones, and the unusual bill shape is an adaptation which enables them to extract seeds from cones. Wild boar enjoy as well nuts, oaks, and beechnut. Most birds and mammals eat seeds while feeding on berries.

Dark and light-dependent germinators

Some seeds prefer darkness for germinating. Which means, they have to be covered by soil. However, they still need light as well. They need long-wave light, which softly enters the soil layer. Light-dependent germinators need the bright short-waved light for sprouting. Both kinds of seeds need warmth, oxygen and humidity for development.

Shade and light

All plants need light for growth. Just, some need more than others. In trees, it is the oak, the ash, the pine, and the larch, for example, which need a lot of light. They grow very fast in the first years and more or less stop growing after 15 to 20 years. Beech, fir and yew on the other side, do not need much light in their first years of growing. They advantage when they age and overgrow the species with juvenile light preferences. In a managed forest the different light preferences are balanced by sivicultural maintenance measures, according to the preferred species combination in a specific forest.

Roots

The root system of trees differs. Some have shallow roots, like spruce, hornbeam, or willow. If soil is to heavy and wet, they do not have enough hold and easily fall victim in storms. Those with taproots reach deep into the ground. Trees with taproots are fir, spruce and oak. Ideally, they are combined in a forest, to support each other during storms. But also to reduce the impact of pests.

PREPARATION

It helps to collect in autumn different kinds of tree seeds and keep them.

AT SCHOOL

Prepare the children for the visit of the forest. Discuss:

- Who has been in a forest before?
- What did you do there?
- How do we behave in a forest?

WHAT TO BRING

Make sure everyone knows how to dress and what to bring!

Everyone should be dressed according to weather. This can be, protection against cold, wind or rain, head cover, sun screen.

It is highly recommended to wear long trousers, as high grasses can be very itchy and spiky plants are very annoying. For the same reason it is preferred to wear closed shoes.

Everyone should bring their own drinking water. Preferable in a reusable bottle. Everyone should have a light snack. It should be made clear, that no trash is left behind!

Have the children bring their notebooks and pencils.

Make sure you have all the materials ready with you, which you may need for your activities.

If it is not anyway mandatory from your school, make sure you have basic first aid with you. At least a small bottle of disinfectant and bandaids.

Have your phone charged and ready with relevant contact numbers.

From dwarfs and giants

SEEDS FROM TREES

Group discussion and activity - 20 minutes

- How small are seeds? Where can you find them?
- How do the different seeds look like, describe their differences.

Let the children look for seeds on the forest floor. Let them describe what they found. Do they know what they are, to which tree they belong? Compare with identification sheets. Take some of the seeds back to school for the follow up activity at school.

MY SEED

Activity - 5 minutes

Have the children chose one of the seeds or tissues from the seeds. Make them close their eyes to increase their awareness in their finger tips. Have them touch the structure, shape. Now stand in a circle and have the seeds and tissues go around from hand to hand in the back of the children. When a child thinks the one it had passed on returned to him or her, it keeps it and only continues the others.

SEEDLINGS

Group discussion and activity - 20 minutes

Have the children look for seedlings in the area and have them mark with a ribbon. If you are in the forest in spring, they may notice, that the first leaves look very different to those of the trees around. Have them carefully remove the soil around the seed. What kind of seed does the seedling have? How and where do the roots grow? How do the seedlings look like? Have them make drawings.

Where do the seedlings grow? Is it rather dark or is there a lot of light? Does the seed match with the trees around? Is it possible, that there would be a seed from different trees? How could it have come here?

SEED DISTRIBUTION

Activity - 5 minutes

Have the children take of their shoes. May be put on old socks. Now have them walk a few meters. - This actually works best, if the forest patch has a well developed herb layer. A meadow might be suitable as well.

How do their socks look like now? What is it, that sticks to them? (Hopefully, a lot of seeds.) Compare the seeds with those they have found from the trees. Explain, that this is an other strategy of plants for distribution.

SQUIRELS GAME

Activity - 20 minutes

Squirrels do not hibernate over winter. They sleep much more, but weak up from time to time to eat.

Depending on the. Amount of participants, chose up to 3 crows. They have to stay next to you and just observe. Do not give them instruction.

The other participants turn into squirrels and get 15 beans or nuts each. They have 3 minutes to hide them in the given area. It is up to them, if they distribute them at different places or all at one place.

Everyone returns.

Imagine! November is coming. It gets really cold. The squirrels hide in their nest, which are called dryes, and fall asleep. They snuggle very close to each other.

Suddenly they wake up, as they are hungry. They run and have to bring 2 beans (nuts) back to the nest.

They sleep again. Now we have December. They wake up again. It is colder already, and they need a bit more food. Have them return with 3 beans (nuts).

Again they fall asleep. In January it is very cold. And when they wake up they need 4 beans (nuts) to survive.

February warms up a bit already. But, they are still weak from January. So, when they wake up, they have to bring once more 4 beans (nuts).

In March, they only need to bring 2 beans.

When the squirrels run for food, they have only 1 minute. And the crows fly out as well for the beans or nuts, the squirrels have hidden. The squirrels do not need to bring those they have stored. They can bring any they find.

If a squirrel does not return with the correct number of beans or nuts, it starves and unfortunately does not survive the winter.

Discussion - 5 minutes

What happens with the nuts the squirrels hide, but do not find?

Nuts are not only an important food resource for animals. Nuts are highly nutritious. They are antioxidant powerhouses. They have many health benefits and are essential for brain functions.

HOW OLD AM I

Activity - 10 minutes

If you have tree stump, have the children count the rings. In spring the wood grows a bit faster and produces a light colored ring. During summer and autumn growth is slowed down. A dark colored ring is produced. Together they form the annual ring. Have the children mark the ring of their own age. Let the chaperones do the same. And how old did the tree got before it was cut?

The age of conifers can be determined very easily. Every year they build a level or whorls of branches. So you simply count the levels.

HOW TALL AM I

Activity - 15 minutes

Have the children look for a stick in the length of their arms. If they hold the stick at one end, the rest of the stick has the length of their arms.

Chose a tree to measure.

Now they hold the stick at one end with their arm stretched. They have to focus on the tree and walk backwards, until the tip is identical with the tip of the tree and the bottom end of the stick is at the level where where the tree is at the ground.

Mark that spot.

Now measure the distance from this spot to the tree. And you have the size of the tree.

WALK IN THE CANOPY

Activity - 15 minutes

Have the children form pairs. Each pair gets a small mirror. One child places the mirror just under the eyes on the nasal root. Now it starts walking slowly. The other child guides the child with the mirror carefully through the trees. It is its responsibility, that the child with mirror stays safe. Switch after some time.

Farewell from the forest

TREE PICTURE

Activity - 15 minutes

As final let them create a picture from elements they find on the soil. They have to lay out a tree with all its elements on the forest floor.

Before you leave the forest,
make sure you collect everything you brought
and take it back with you!

Take all your waste home!
Garbage causes damage to the environment and animals.
By polluting the environment, we harm ourselves.

FOLLOW-UP AT SCHOOL

- Have the children put their seeds in flowerpots with soil. With some patience and care they may be able to observe the development of the seeds into small plants. Have them make a documentation. Oaks and conkers are most suitable.
- Simulate a tree.
- Discuss the use of wood and wood products in our everyday life.

THE PEOPLE TREE

The children embody the different components of a tree: tap root, lateral roots, hardwood, xylem, phloem, cambium and bark.

Heartwood

is the most inner part of the stem. It provides stability for the tree.

The *roots*

Anchor the tree in the soil. They take in water and the nutritions which are dissolved there.

The *xylem*

Transports the water up to the leaves.

The phloem brings the nutritions, which are produced in the leaves, to all the other parts of the tree.

The *cambium*

Is the layer of the tree which grows. It produces ‚water pipes', the xylem inwards, and ‚nutrition pipes', the phloem outwards.

The *bark*

is the ‚skin' of the tree. It protects the tree rom pests and weather (sun).

You need 12 or more people to build a tree using people as the parts.

- Heartwood: 1 person, standing. Big, strong.
- Tap root: 1 person, sitting at the base of the heartwood.
- Lateral roots: 2+ people, preferably with long hair to demonstrate root hairs, lying on the ground, feet against the heartwood. Arms and possibly hair spread out. Roots make a slurping noise.
- Water tubes (xylem): 2+ people standing around the heartwood. Hands held up: hands are. leaves - water tubes make an 'aah' noise.
- Food tubes (phloem): 2+ people standing around the water tubes - food tubes make a 'wheeee' noise.
- Once these participants are in place the 'tree' should go: slurp, aah, wheee. Repeatedly.
- Bark: everybody else. An outward facing ring linking arms and enclosing the tree.
- Bark boring beetle: complete with twigs for antennae, you attack the tree – the bark defends the rest of the tree trying to keep the beetle out.

If you do not have enough children in your group or class, this activity could be an alternative:

YOU ARE A TREE

Discus the different characteristics fo trees, how they grow., and how they could copy those.

Weeping willow: hang down your arms and head, slowly sway

Fir tree: hold your arms down, away from the body

Spruce tree: upwards tilted

Oaks: are stand solid and steady

Aspen: they move in the slightest wind - shake all over

One child takes the command and calls out, „You are a …" The group has to make the movements introduced before. The commands should follow quickly. Who makes a wrong movement changes with the commander