OUR TREE

Age group	Primary, Grade 4	
Competency features	Obtaining and receiving information 	Applying information in practice 
Aims	▪ to develop pupil´s ability of observation ▪ to develop pupil´s relationship with nature ▪ to make use of theoretical knowledge in practice ▪ to increase pupil´s knowledge of natural science ▪ to increase pupil´s knowledge of maths - geometry ▪ to develop pupil´s creativity, interaction and empathy	
Timing	2 + 2 lessons (plus a preparatory natural science lesson, eventually also P. E. lesson at school playground)	
Location	outdoors (partly also indoors later)	
Resources & materials	measuring tape, hard boards, loose sheets of paper, writing utensils, rope, tree atlas (or alternative source of information), wax crayons, camera, enough copies of Worksheets for outdoor and indoor activities	

Description

Day 1

1. Teacher splits the pupils into groups of three. During natural science and/or p. E. lesson, the class go out to the school playground (or available free space, garden, etc.). Together, they will observe and note down how many trees and of what kind there are. Each group will choose a tree, and name it with teacher´s assistance. As homework, pupils will find out as much about the plant as possible. They may identify some records pertaining to the tree, be it in books or on the web – the oldest, tallest, greatest circumference, etc.

Day 2

2. The following day the children may ask questions for clarification. Teacher hands out instructions to every threesome (worksheet for outdoor activity), tools and materials, and bids them to get into the tasks as soon as they can.
3. Outdoors, pupils work for one-and-a-half hours at the playground/open space; they

will have about as much time again in the classroom to finish the task). They can use all the tools and materials they have, and query the teacher.

4. All the pupils work in threes, with each team focusing on one tree; classification of trees has been done in natural science lessons. They take pictures, make drawings, take notes, and process data. Individual tasks are attended to within the group by all members. Teacher makes sure every member participates more or less equally.

Helpful suggestions for teachers – Tasks in the Worksheet for outdoor activities:

- Every tree has a particular shape. Capture it!
- Estimate the tree´s height:
  One of the threesome who knows his height, stands next to the tree. At the distance of 25 meters, the other two would mark up his height along the tree trunk – this is the comparative method. Pencils may be used. Then together, count and record the estimated tree height.
- How old is the tree?
  To establish the age of a tree is very difficult. Even those planted at the same time will differ in size just a few years later. A rough estimate could be made from the trunk circumference. About 130 cm from the ground, we should measure up the trunk, and divide the figure by three (this is the approximated growth per annum).
  In what year, roughly, was the tree planted?
- It is claimed that trees spread their roots underground to such a degree as their top spreads out. Think about it and measure up how far the roots of your tree might spread. Estimate the area they take up. What are the roots for?
- Find out when your tree comes into bloom, and what the blossom looks like (make a drawing).
- Find out when your tree bears fruit and what it looks like (berries, nuts, etc. - make a drawing). If possible, get hold of some and take them to school.
- Learn the shape of the leaves of your tree – are they simple or compound? Draw them, and take some to school.
- Inspect the trunk and branches. Take a good look at how they are shaped and positioned, how they grow. If any branches have been cut off, take note of what the cut looks like. Make a number of drawings.
- Take a good look at the shape of the top, and make the best drawing you can.
- Get an imprint of the bark, using wax crayons and paper.
- The trunk is always covered by bark. Find out how tall the trunk of your tree is, whether it is damaged in places and/or there are hollows in it. Draw them.
- Trees provide refuge for a number of animals, esp. birds. Can you find any signs of animal presence or their tracks (e.g., nests)? Draw their position.
- As far as your tree is concerned, where is north, south, east and west? Check whether the tree shows any anomalies in growth depending on the direction it is facing.
- Inspect the trunk, branches and immediate vicinity of the tree. Are there any animals around? If so, name them and take photos.
- Inspect the vicinity – what plants make up the undergrowth? Name them, make drawings and take photos.

- Is your tree memorable and/or protected?

5. Once the task is finished, pupils are taken back to the class to continue further work. Teacher hands out new instructions (worksheet for indoor activity), and while pupils attend to individual tasks, she may help them, observes their performance, and checks that everyone participates more or less equally.

   Helpful suggestions for teachers – Tasks in the Worksheet for indoor activities:

   - tree leaves:
     Simple vs. compound, lobed vs. unlobed, palmate vs. pinnate, etc.
     Half-leaf imprint, finish off the full contour – is it symmetrical? If so, what kind of symmetry it is?
   - fruit:
     What kind? What geometrical shape? Is it symmetrical?
   - blossoms:
     When does the tree blossom? Axis of symmetry? Draw it.
   - signs and tracks:
     Should pupils find none, they need to copy two examples from the textbook.
   - *On a sunny day, a large deciduous tree will release ca 1.5 kg of oxygen into the air per hour.*
     Calculate:
     How much oxygen will the trees at the place we have been to *(trees were counted the day before)* release on one sunny day, and how much over the year *(it is necessary to guess the number of days the tree has leaves)*.

6. In the end, the group will have a finished project in hand. Another possibility is to gather the drawings of trees and the like, and exhibit them on the school premises.

Risks & recommendations	The outdoor exercise is carried out over two days. It takes off from knowledge already gained in the classroom, and makes pupils use it actively in solving complex theoretical as well as practical problems.  
Application in classes	Geometry – measuring, estimation, geometrical shapes and bodies Basic learning and natural science – enriching information about trees and nature as such Maths - calculations Czech – written records in worksheets, composition Art – graphic rendering of worksheets (drawings)

Notes	

Worksheet for outdoor exercise
OUR TREE

Group members:

Tools:

Tree selected:
1. Every tree has a certain shape. Picture it!
   Photo

2. Estimate the height of your tree:

   Use comparative method. One of you (establish his height) will stand next to the tree. From the distance of 25 meters, watch him and mark up his height along the tree. Calculate and record the tree height.

3. Establish the age of your tree:
   It is possible to find out roughly about the age from trunk circumference. Measure around the trunk at 130 cm from the ground, and divide by 3.
   In what year was the tree planted?

4. What are the parts of a tree?

   Tree silhouette

5. What are tree roots good for?

   It is alleged that the roots spread out as much as the tree top. Estimate how far the roots go, and using a rope, establish what area they may cover.

   Does the area resemble a geometrical shape? What exactly?

6. Look at the tree trunk. What is its shape?
   Notice how branches grow out of the trunk. If any have been cut off, look at the cut and make a drawing.

   Is the trunk is damaged, are there any hollows in it? Draw and describe (photo).

7. Look at the shape of the top, and sketch it as best as you can.
   Photo

8. Take an imprint of the bark, using wax crayons and paper.
   Photo

9. Count all the trees in our current space:

10. Trees provide refuge to animals. Can you see any signs of their presence (e.g., nests)?
    Photo

11. Establish where north, south, east and west are at your tree. Does it grow the same in all directions? Describe how to ascertain cardinal directions:

12. Inspect the vicinity of your tree, and find out what plants there are in the undergrowth. Try and identify them.
    Photo

13. If you find any tracks of animals around your tree, make a cast in French plaster. Do you know what animal it is?

NB: Each group will bring to the class: fruit (as long as the tree has any), and a branch with three leaves!

Worksheet for indoor exercise
OUR TREE

1. Investigating tree leaves

Establish whether the leaves are simple or compound

Establish whether the leaves are palmate or pinnate

Imprint half-the-leaf on paper, and complete it by drawing the remaining half.

Is the leaf symmetrical?

What kind of symmetry is it?

2. Investigating the tree fruit

Establish what kind of fruit it is

What is its geometrical shape?

Is it symmetrical?

3. Finding out what the tree blossoms look like

Find out when the tree blossoms.

Draw the blossoms.

Is there an axis of symmetry? Draw it.

4. Investigating signs of animal presence

Do you see any symmetry in the cast of animal tracks?

If you did not find any traces of animal habitat, copy two examples from your textbook and write down what you know about them.

5. Importance of trees

On a sunny day, a large deciduous tree will release about 1.5 kg of oxygen into the air every hour.

Calculate
how much oxygen will the trees at our select place release

- during one hour
- during a sunny day

Estimate how many days in a year your tree is likely to have leaves

How many kilograms of oxygen would your tree produce in a year?

6. Write down everything you now know about your tree: