

BIODIVERSITY - INVESTIGATE YOUR LOCAL FOREST

Introduction

One of the world's greatest concerns is to protect and maintain the diversity of biomes, species and genes. To do so, we need knowledge about where we find specific species. It is necessary to map the biodiversity. There are many methods and measures to do this, but one of the basic criteria is to discover and count how many species there are within a certain area.

Purpose

In this experiment, the pupils will investigate the biodiversity in their local forests, and they will learn how to work scientifically. They will learn a method to measure the diversity of species, and to discuss any differences between ecosystems. It will also apply mathematics in practice.

Equipment

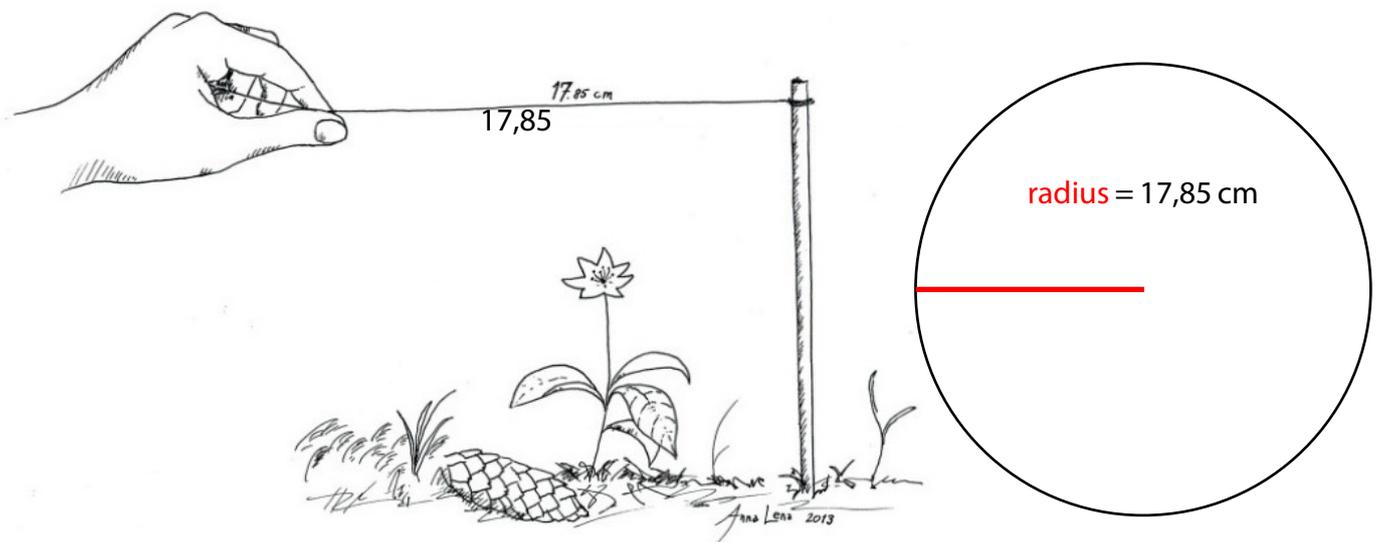
- Stick with 17.85 cm long twine
- Flora and fauna books
- Pencil and paper for taking notes

Implementation

Find two different ecosystems to do the investigations. It can be two different types of forests, or it could be a forest and for example a meadow. Divide the class in two groups, one for each ecosystem. In this way, it is possible to compare two ecosystems afterwards. For each ecosystem, the pupils cooperate in pairs or a group of three. First thing to do, is to toss the stick in an arbitrary direction. Wherever the stick lands, it must be placed in the ground with the twine on top. With the stick in centre, pull the twine around it. This will determine the border of a circle with the radius 17.85 cm. While turning the twine slowly around the stick, register each new species within the radius. After having studied all the plants and animals within this radius, the pupils have mapped the biodiversity of an area of the size:

$$A = \pi r^2 \text{ giving } A = 3.14 \times 17.85^2 \approx 1000 \text{ cm}^2 = 0.1 \text{ m}^2$$

Consequently, ten analyses will add up to a total area of 1 m². In this way, the pupils may easily find the biodiversity of species per square meter.



Name of pupils: _____

Circle	Species	Number of species
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
Average number of species per square meter		

Conclusion for the group:

In this ecosystem, there are _____ different species per square meter.

With the above information, each group can find the average number of species per m² for the specific ecosystem.

	Number of species per m ²					average no. of species/ m ² in ecosystem
	Group 1	Group 2	Group 3	Group 4	Group 5	
Ecosystem 1						
Ecosystem 2						

Which ecosystem has the greatest biodiversity (number of species per m²)? What may be the reasons for the variation in diversity of species?

Supplementary work

- Discuss with the pupils, or let each answer these questions:
- How are the abiotic (non-living) factors in the two different ecosystems?
- Why is it important to maintain a great biodiversity?
- Why is there a greater diversity in the tropical forests than in the boreal forests?

