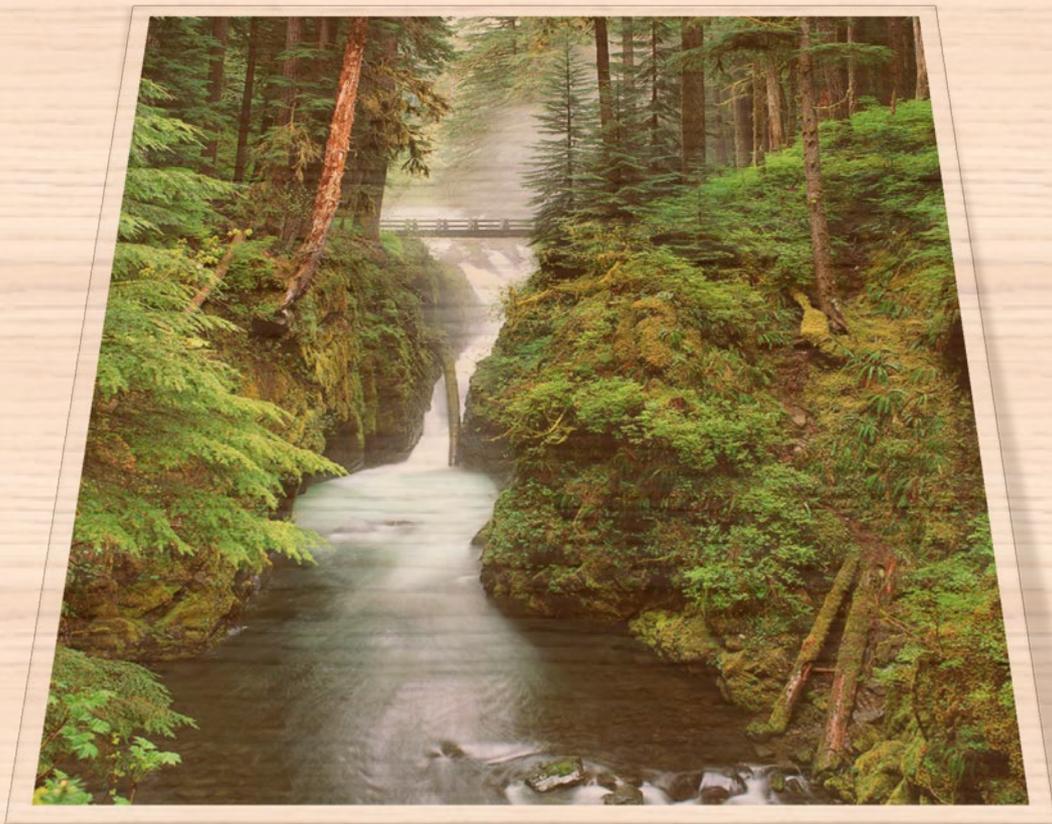

PRODUCTS

BENEFITS AND SERVICES

FROM THE FOREST

ACTIVITIES



Dear friend of forests!

This booklet contains activities about the benefits and services from the forest. You can read about the benefits and services from the forest in the fact booklet.

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1. ECOLOGY - ACTIVITIES ON BIODIVERSITY

Activity

1.1. Land art for children

Introduction

Diversity does not only refer to different species. It also refers to variations within a species and variations in habitats (ecosystems). Different types of soils will cause different types of plants growing there. Biological diversity is important for a number of reasons, and the most obvious reason for us humans, is that all our foods, medicines, clothes and other products have an origin in nature. Hence removing one species may cause the disappearing of a product that we need. Another important reason is that nature and its great diversity provides pleasure and joy.



Photo: Rainer Schall, Germany

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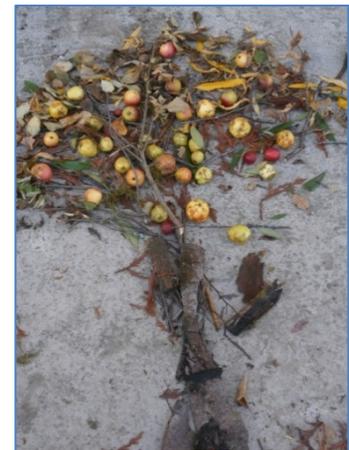
Land art is when you make patterns, sculptures or drawings in the landscape using the elements of nature. Leaves, flowers, pine cones, twigs, pebbles, shells, anything from the nature may be used. The piece could be integrated in the landscape, or stand out. After having finished, it is common to take photographs. Thereafter the creation is left to the elements of nature.

Purpose

The purpose of this activity is to become more aware of the diversity around you. The idea is to slow down and examine the surroundings. This is an exercise to make you more conscious of the different details, constructions, patterns and colours in nature.

Equipment

You don't really need anything, apart from the materials in nature. But it could come in handy with a basket to collect the items, and scissor (either normal ones or branch scissors). It is also a good idea to bring a camera, so that you can save your work.



Made by pupils at Tighnabruaich Primary School Photo: Tracy Stock

Preparations

Find some examples of land art to give the children a better idea of what they are expected to do, and to give them inspiration. That is easy to find by typing “land art (for children)” into Google Images. Do any of the pictures catch their interest? Ask them what they think they are made of. Would they like to try and make something similar?

What to do

To get the children started, give all of them the same task. Let them work together in groups to collect material; leaves, twigs, seeds, flowers, feathers, pebbles, etc. Thereafter they must cooperate to make a spiral pattern.



Photo: Mandy Tulloch
www.mudpieadventures.co.uk

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Afterwards

Let the pupils choose their own activity. Let them construct something, or make a design, or perhaps even a drawing.

Finally, the pupils should take a photograph of their work.



Photo: Rainer Schall, Germany



Photo: Sebastian Blaschke, Germany



Photo: Forest Management Institute, Czech Republic

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Photo: Union of Forestry pedagogues of Czech Republic



Photo: Douglas Gooday, Scotland



Photo: Forest Management Institute, Czech Republic



Photo: Sebastian Blaschke, Germany

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TIPS!

YouTube offer many videos for learning purpose.
For more inspiration on land art we can recommend the following:

Video about land art

<http://www.youtube.com/watch?v=ulLU1BUJk8Q>



1.2. The food web

Introduction

Diversity is important for a number of reasons. One of the arguments for maintaining the different species is the value they have in themselves. One obvious reason for us humans is that all our foods, medicines, clothes and other products have an origin in nature. Hence removing a species may possibly result in removing a product that we need. Another important thing to be aware of is that by removing one species, the whole food web can be disturbed. We will never be able to foresee all the consequences of removing or introducing a species in an ecosystem, and should therefore be cautious about this.



Photo: Anna Lena Albertsen, Norway

Purpose

The purpose of this activity is to learn about the food web and to become more aware of how the different species are interconnected and interdependent.

Equipment

Each participant needs a picture. The pictures should display different species which belong in the local forest and are part of the same food web. Attach a string so it can be hung around the neck. In addition the group needs a long twine/rope.

Preparations

Apart from the pictures and the twine, no preparations are needed. But it could be a good idea to introduce the pupils to the terms food web, producers, consumers and decomposers before doing the task.

What to do

This is an exercise that may be performed indoors or outdoors. (Being done outdoors, some images may even be substituted by objects from the nature, for example leaves from different trees or bird feathers.) Let the pupils stand in a circle, holding their picture so that everyone can see it. One person will start holding the twine. She must look at the other images, and decide which of the other species interacts with her own species. For example, if the person who starts has a picture of oak nuts, they may be food for a squirrel. She therefore throws the twine to the person with the image of a squirrel. The pupil with the squirrel then passes the twine to a person with the image of a cone (which the squirrel eats) or to a marten (which could eat the squirrel). And so it goes on until all the pupils have been included.

Ask the pupils if they realize what they've just made. Hopefully they will see that they represent the food web, and that the twine represents the connection between the species.

Remove one of the species. What is the effect of removing this species? Is it an advantage or disadvantage to the other species? Discuss with the pupils. If you would like, more species may be removed. Could all species eventually become distinct?

2. ECOLOGY - EXPERIMENT ON BIODIVERSITY

2.1. Investigate your local forest

Introduction

One of the world's greatest concerns is to protect and maintain the diversity of biomes, species and genes. And to do so, we need knowledge about which species that may be found where. It is necessary to map the biodiversity. This may be done with different methods and measure, 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. They will also apply mathematics in practice.

Equipment

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

What to do

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Find two different ecosystems to do the investigations. It could be two different types of forests, or it could a forest and for example a meadow. Divide the class in two, so that each half can study a different ecosystem. In that way the two ecosystems may be compared afterwards. In each ecosystem the pupils cooperate two or three together. When they reach the area which is to be studied, toss the stick in an arbitrary direction. Wherever the stick lands, place it standing in the ground with the twine on top. With the stick in centre, pull the twine around, in this way deciding the borders 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 $A = \pi r^2$, 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 m^2 . Thus the pupils may easily find the biodiversity of species per square meter.

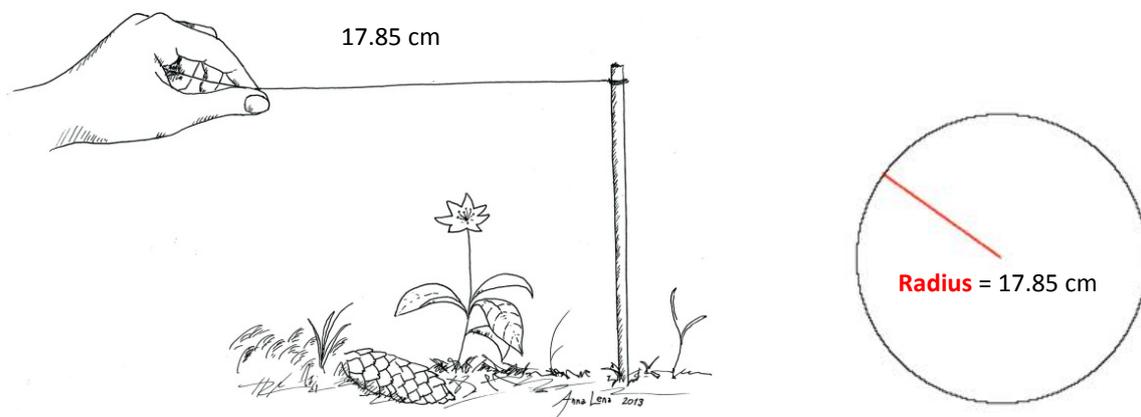


Illustration: Anna Lena Albertsen, Norway

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BENEFITS AND SERVICES FROM THE FOREST

Name of pupils: _____

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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.



PRODUCTS, BENEFITS AND SERVICES FROM THE FOREST

BENEFITS AND SERVICES

Now all the groups in the same ecosystem need to find out the average number of species per m² for that 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? Discuss with the pupils. How are the abiotic (non-living) factors in the two different ecosystems?

TOPICS FOR CLASS DISCUSSION

- Why is it important to maintain a great biodiversity?
- Why is there a greater diversity in the tropical forests than in the boreal forests?

3. ECOLOGY - EXPERIMENT ON WATER

3.1. Forest floors and water quality

Introduction

One of the many benefits of the forest is that it works like a giant sponge, retaining water and thus preventing floods and erosion. Slow running water also means that there will be less sediment in lakes and rivers. In addition the forest floor acts like a filter. Water in the forest will percolate into the ground. Healthy forest soils filter and trap pollutants, in this way helping to clean water as it reaches the ground water system. The result is clean drinking water.

Purpose

In this experiment pupils will learn about the forest floor, what it is made of and the effect it has on water quality. They will observe and learn that forest floors clean and filter running water.

Equipment

- Forest floor material (soil, sand, gravel, humus, mosses, leaves, needles, twigs, branches, bark)
- 3 screen boxes (cylinders such as 1.5 l plastic bottles can be used when two are attached)
- Drainage catch basin for each box
- Water jug with muddy water

Preparations

The three screen boxes (photo next page) should be installed before class begins.

1. Fill one box with stones and pebbles.
2. Fill one box with layers of sand, soil and organic matter on top. Predominantly with organic matter. This may include living organic matter (residues of dead organic matter such as leaves, needles, pine cones, twigs, branches, plants, mosses and lichens) and decomposed organic matter (humus).
3. Fill one box mostly with sand and less organic matter.



Photo: MS Clip art

To be able to observe the filtration effect, the water used must be muddy.

What to do

Begin with a discussion of what a forest floor is and what its components are. Before pouring the water into the boxes, ask the pupils what they expect will happen. In which box will the filtration process be most efficient?

Pour the same amount of water on to each box. Allow time for water to filter through materials. This will take some time, so the pupils could do a different task while waiting. Return to boxes to observe and discuss the water quality in the catch basin for each system.

Note

As the pupils should be involved when learning what a forest floor consists of, they should participate in filling the boxes. If possible let the pupils be involved in collecting the material needed from the forest.

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Screen boxes for filtering water
Photo: Anna Lena Albertsen, Norway



4. SOCIO CULTURAL SERVICES

4.1. Who wants what from the forest?

Draw lines to connect the forest user to what they want or need. There may be more than one possible alternative, but one fits better when you do them all correctly.

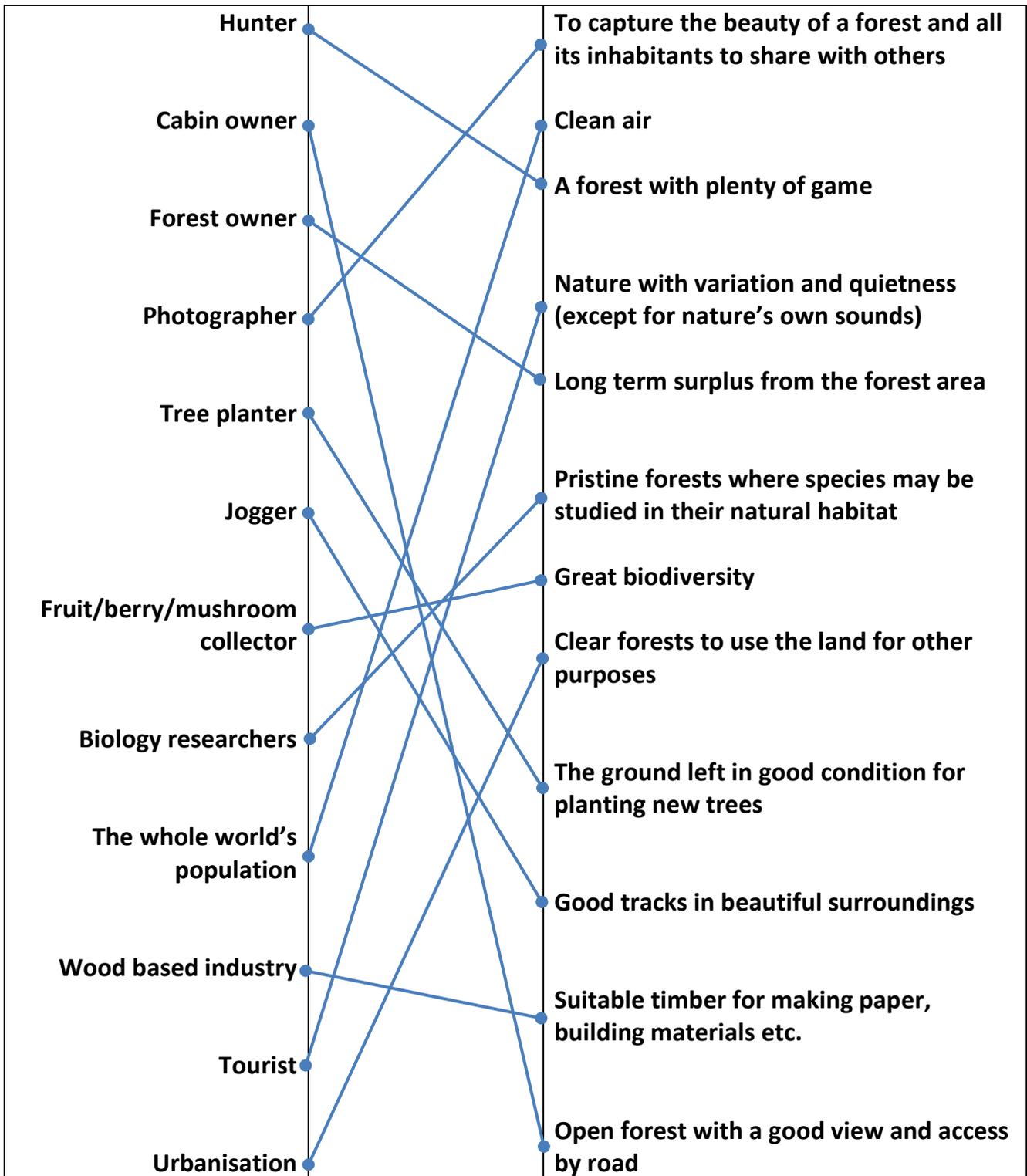
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Hunter	To capture the beauty of a forest and all its inhabitants to share with others
Cabin owner	Clean air
Forest owner	A forest with plenty of game
Photographer	Nature with variation and quietness (except for nature's own sounds)
Tree planter	Long term surplus from the forest area
Jogger	Pristine forests where species may be studied in their natural habitat
Fruit/berry/mushroom collector	Great biodiversity
Biology researchers	Clear forests to use the land for other purposes
The whole world's population	The ground left in good condition for planting new trees
Wood based industry	Good tracks in beautiful surroundings
Tourist	Suitable timber for making paper, building materials etc.
Urbanisation	Open forest with a good view and access by road

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BENEFITS AND SERVICES FROM THE FOREST

Solution

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4.2. Conflicts of interest

Forests serve many purposes for people. Some have **economic** interests, some care about forests for its **social and cultural** values, yet others are concerned about the **biological** values of forests. All perspectives are equally important and are represented by stakeholders caring specifically for each perspective. With more than one stakeholder conflicts of interest can occur.

Conflicts of interest trigger democratic processes. It is important to give young people experience in participating in these processes and to see a case from different perspectives.

The activity “**who wants what from the forest**” can be used as a basis and introduction when working on conflicts of interest.

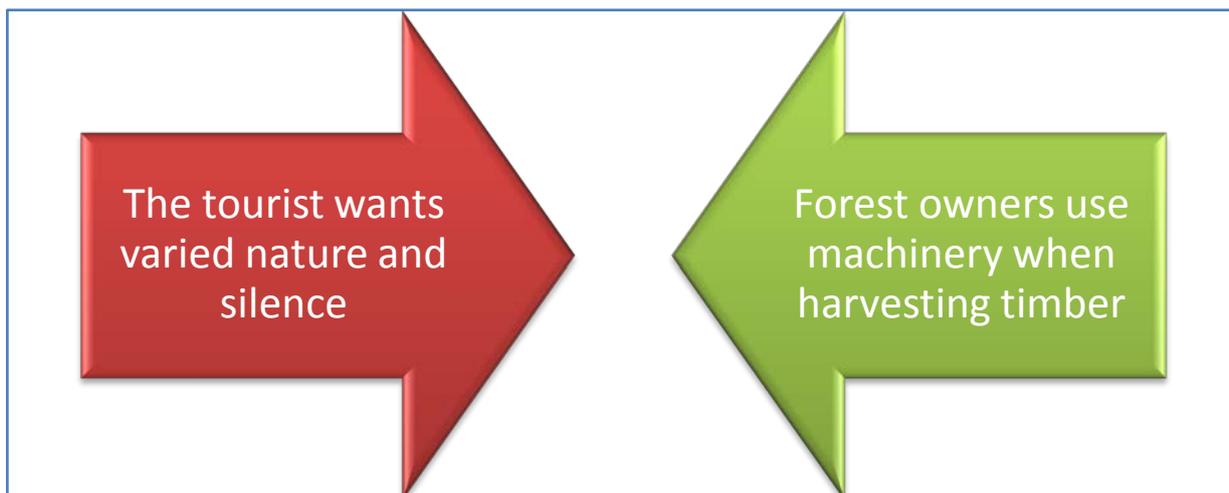
Conflicts of interests raise many questions

- Which of the stakeholder’s interests can possibly trigger a conflict?
- Are any of the various interests more valuable than others?
- How do we measure what is valuable?
- Is it possible to find a solution that all parties agree with?

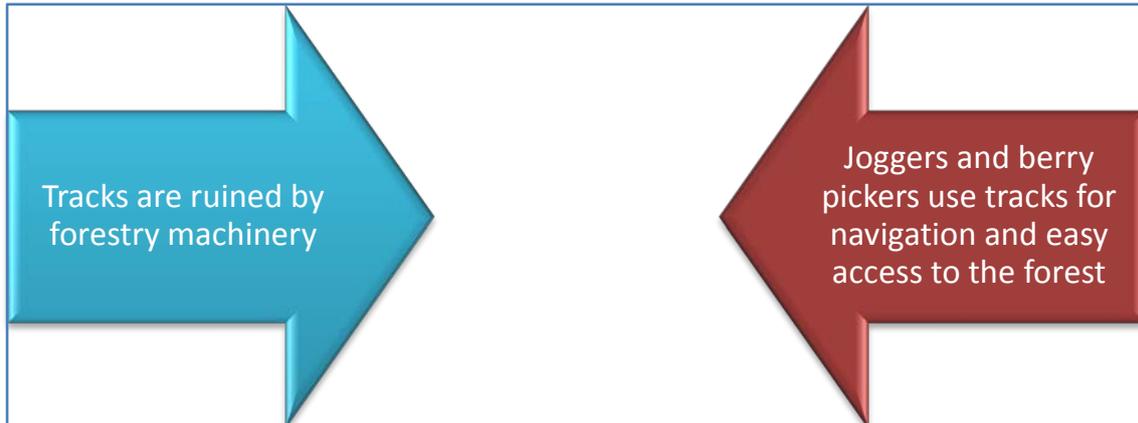
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Conflicts of interests is a very suitable theme for project work

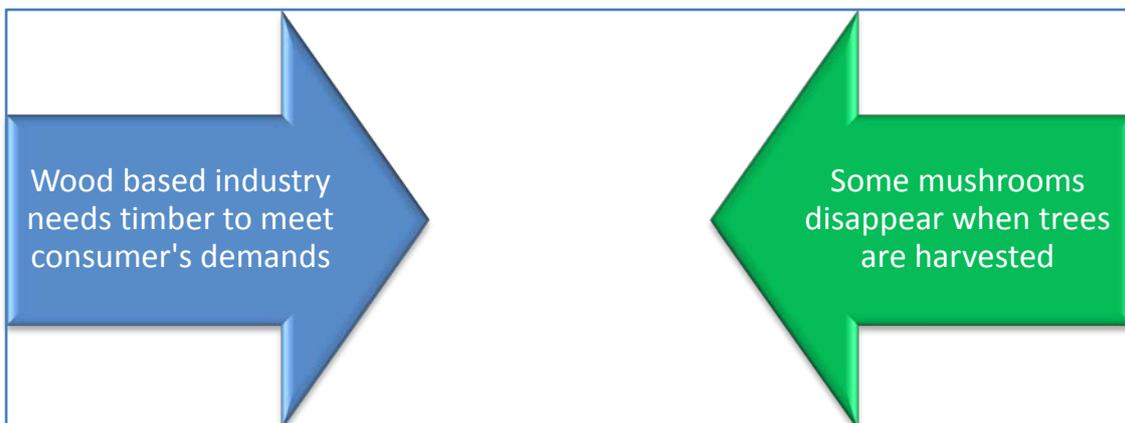
- Making news reports by interviewing different stakeholders
- Make a role play where pupils play out the conflicts
- Arrange a class debate with two or more teams arguing different points of view



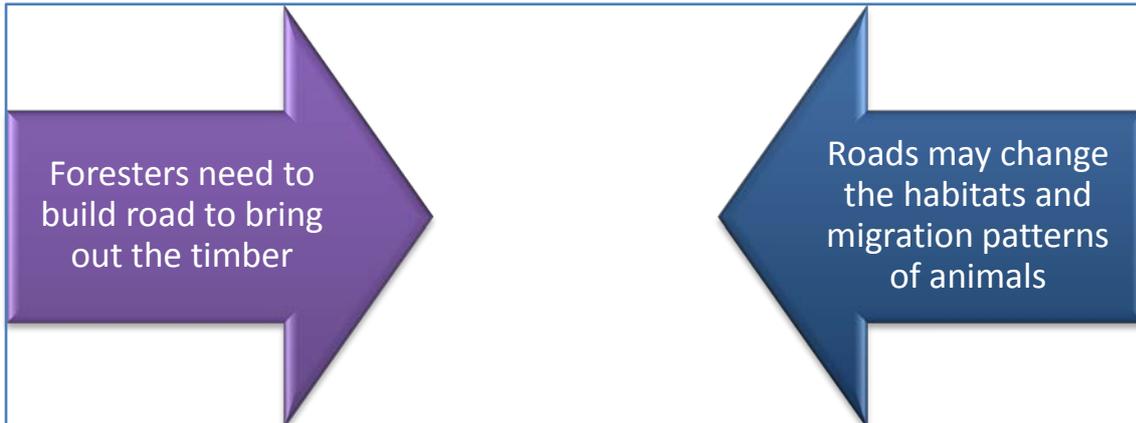
Examples of possible conflicts:



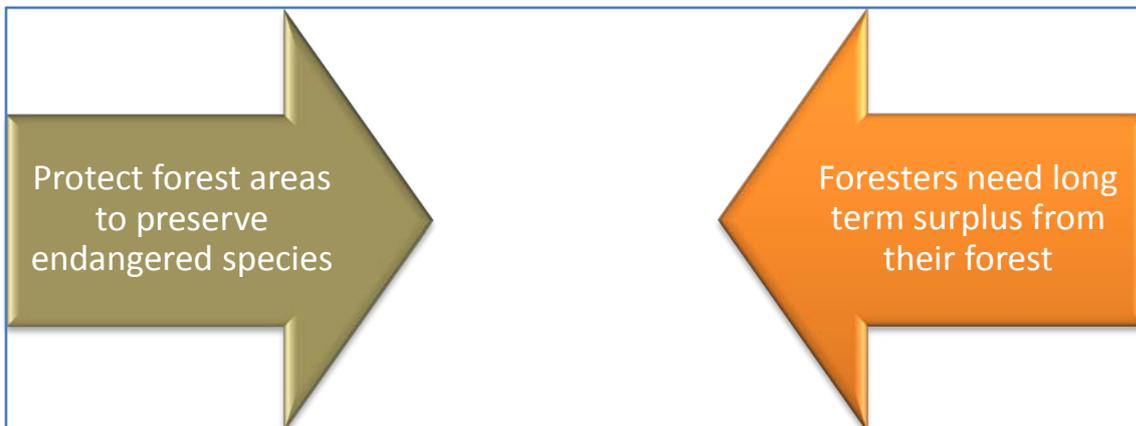
14



Examples of possible conflicts:



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4.3. What can you do in the forest?

Find the missing words in the maze. They appear horizontally, vertically and diagonally.

For help you can use the table below which contains all the words you are looking for.

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Q	F	Y	K	W	S	T	G	H	A	R	V	E	S	T
R	W	D	H	O	Q	G	P	W	I	Y	X	E	H	I
C	O	R	I	E	N	T	E	E	R	I	N	G	M	W
W	R	H	A	T	H	R	G	S	E	H	T	S	E	R
O	K	Y	P	C	E	P	G	T	Q	G	U	F	X	A
F	T	B	K	Y	F	U	L	O	G	W	N	Y	E	X
C	E	U	M	C	Q	G	A	A	J	T	X	E	R	Q
A	Q	R	B	L	E	U	P	D	Y	E	D	I	C	Y
M	R	E	S	E	A	R	C	H	I	B	W	Y	I	R
P	L	N	Y	U	V	Q	H	F	S	H	T	K	S	P
Z	O	W	P	E	F	H	O	J	A	U	P	H	E	W
G	K	D	J	A	W	E	Y	M	I	N	K	G	Q	X
B	H	Q	R	S	F	A	U	Z	O	T	R	Y	D	O
R	E	L	A	X	P	F	L	E	Q	P	U	J	T	W
W	I	T	Y	E	L	W	F	K	S	L	E	A	R	N

WALK	PLAY	WORK	CAMP
HUNT	RESEARCH	HARVEST	ORIENTEERING
RELAX	EXERCISE	LEARN	CYCLE

BENEFITS AND SERVICES

FROM THE FOREST

Solution

Q	F	Y	K	W	S	T	G	H	A	R	V	E	S	T
R	W	D	H	O	Q	G	P	W	I	Y	X	E	H	I
C	O	R	I	E	N	T	E	E	R	I	N	G	M	W
W	R	H	A	T	H	R	G	S	E	H	T	S	E	R
O	K	Y	P	C	E	P	G	T	Q	G	U	F	X	A
F	T	B	K	Y	F	U	L	O	G	W	N	Y	E	X
C	E	U	M	C	Q	G	A	A	J	T	X	E	R	Q
A	Q	R	B	L	E	U	P	D	Y	E	D	I	C	Y
M	R	E	S	E	A	R	C	H	I	B	W	Y	I	R
P	L	N	Y	U	V	Q	H	F	S	H	T	K	S	P
Z	O	W	P	E	F	H	O	J	A	U	P	H	E	W
G	K	D	J	A	W	E	Y	M	I	N	K	G	Q	X
B	H	Q	R	S	F	A	U	Z	O	T	R	Y	D	O
R	E	L	A	X	P	F	L	E	Q	P	U	J	T	W
W	I	T	Y	E	L	W	F	K	S	L	E	A	R	N

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