

Teaching and learning materials on Forest use vs. forest protection (Umeå University)

SUMMARY

The theme Forest use vs. Forest protection is developed for use in upper secondary school. It contains three activities that focus on authentic experiences and local media, as well as argumentation, continuous reflection and connection to students' everyday lives.

INTRODUCTION TO THE TOPIC

Forest use vs Forest protection is focusing on the trade-off between forest management of production forests and forest protection for ecosystem services, biodiversity, climate change mitigation. This is a complex issue – for the public but also for scientists – in Sweden as well as in other countries. For example, Andersson, Bostedt and Sandström (2022) highlight conflicting interests of the role of Swedish forests in climate change mitigation, and a recent discussion in Nature (Högberg et al. 2022; Searchinger et al. 2022) show different views of how to balance forest management in relation to climate change mitigation. A broader approach is taken by Hallberg-Sramek and co-workers (2023) when modelling long-term effects in a forest-scenario analysis that also includes aspects of reindeer husbandry, local livelihoods and recreation, and let different stakeholders evaluate the modeled scenarios. They argue for the value of combining scientific and local knowledge when developing and evaluating future forest scenarios.

In a similar way, our theme Forest use vs Forest protection starts from stakeholders' different interests in forests and the potential conflicts of interest on different levels in society (<https://foresteurope.org/state-of-europes-forests/>). The theme also has personal relevance for most people. For Swedish students, forests are relevant for example for recreation like skiing or hunting, or through family-owned forests. In a broader context, forest management is important for all of us in reaching the Sustainable Development Goals (UN, 2015) related to sustainable forest management, continued provision of ecosystem services and maintained biodiversity. This requires us to make trade-offs based on the best available data and scientific knowledge (<https://www.slu.se/en/ew-news/2023/2/flexible-choices-for-sustainable-forestry/>) as well as personal, cultural, societal and historical values.

Through authenticity and connection to students' everyday lives the forest theme is suitable to promote interest in science and self-efficacy for learning science. Further, it has great potential to provide a context for engagement in activities aimed at development of analytical and critical thinking competencies by inquiry learning, argumentation, collaboration, communication, and decision making. The continued need of recruiting people to forest research and forestry further emphasizes the importance of the topic for future generations and for stakeholders currently involved in the forest.

PRESENTATION OF THE MATERIALS

Overview

The presented materials are designed for secondary school students (age 15-17). The Teaching and Learning Sequence (TLS) reported in the present Toolkit includes three selected and tested activities. The first is an interview students do with persons from three generations, the second is a forest debate, and the third is an investigation of how the forest debate is portrayed by the media. These three activities can be used separately or together. However, they benefit from being included together in a larger theme focused on Forest use vs. Forest protection. A core aspect of the TLS is constituted by authentic cases and media used in the implementation of the theme. Through insights into different economic, ecological, cultural, and social perspectives on forests, students are enabled to make compromises, develop different pathways for action and increase their ability to make decisions about forest-related issues. Another core aspect consists of the continuous reflections that link the activities to each other, to society, and to the students' everyday lives.

The second activity, the forest debate, and additional resources are described in detail on the online teaching platform *The Forest Lab* (<https://skogslabbet.se>), which is developed and hosted by the Swedish University of Agricultural Sciences (SLU). The teaching platform resources consist of research-based articles and videos concerning forests and forest use and include issues closely related to UN's global goals presented in "The 2030 Agenda for Sustainable Development" (UN, 2015). The material is produced in collaboration between researchers and teachers, and it is directed towards teachers and students. The material consists of videos of interviews with different types of researchers, videos of students' discussions of how they value the forest; revisable PP-presentations; activities to uncover different type of dilemmas or conflicts of interest (e.g., 4 corners and concept cartoons).



Scan the QR-code to get to
The Forest Lab
(Skogslabbet)

Information

Age	15-17 years	
Topic	Forest use vs Forest protection	
Country	Sweden	
Duration (select those which apply):		Less than 1 hour
		Between 1-2 hours
		Between 2-5 hours
		Between 5-10 hours
	X	More than 10 hours
Stakeholders involved in the implementation (select those which apply)	X	Teachers
	X	Families
	X	Researchers
		Experts form industry
		Informal and non-formal education professionals
	X	Professionals from the Media
		Policy Makers
Open Schooling Scaffoldings (select those which apply):	X	Other (civil society)
	X	Reflection activities
	X	Jigsaw groups / debates
	X	Meet with the experts
		Learn in the lab
		Going outside
	Other (add all Open Schooling Keywords you consider relevant for your activity/TLS):	
Other Tags		Modelling
	X	Inquiry
	X	Argumentation
	X	Social Justice
		Gender
		CLIL (Content and Language Integrated Learning)
		Problem-based learning
		Project-based learning
		Formative Evaluation
		Flipped Classroom
	X	Contextualization
		Design Thinking
		Case study
		Gamification
		Making
		STEAM perspective
		Technological process
		ICT
		Tinkering
		Evaluation Rubric
	X	Cooperative work
	X	Democratic participation
	Add all keywords that you consider relevant to describe your activity/TLS	
Technical Resources	Add those technical resources needed for the activity or TLS	
Webpage materials	- Swedish version (original) https://skogslabbet.se/ A summary in English is presented in this document	

VISUAL ABSTRACT



Figure 1. The three separate activities can be included in a larger theme which promotes students' abilities to retrieve, reflect and evaluate information.

ACTIVITIES

The TLS includes three activities that can be used separately, together, or included as part of a larger theme focusing on Forest use vs. Forest protection. Each activity has a connection to society through involvement of experts and/or authentic media and engages students in reflective practices. The activities are linked to each other and form a solid basis for students to develop both an understanding of the science linked to Forest use vs. Forest protection, and skills such as inquiry, argumentation, evaluation of information, decision-making and taking action in complex issues.

Activity 1: Interviews with three generations

The aim of this activity is to place the forest-theme in an authentic, local and historic context, and to highlight the relevancy in students' everyday life. Working on the activity contributes by highlighting different perspectives on the theme Forest use vs. Forest protection. In the activity, students interview parents, grandparents or other people from three different generations about their relationship with and use of the forest, as well as how general forest use has changed throughout their lifetime. The students' written reflections from the interviews are submitted to the teacher.

Key concepts of the activity: Contextualization, Reflection activities

Students' resources – Template for writing interview guide

The activity is meant to familiarize students with the theme Forest use vs Forest protection and to promote student agency and sense of ownership. This is the task given to the students:

What do three different generations know about forests?

The forest has a great significance for people and their way of life. During the last century, human relationship with and use of the forest have changed.

Your task is to select people from three generations and find out about their use of and relationship with the forest. In addition you should ask how they think that forest use has changed during their lifetime. Formulate three questions to ask the people. You can also ask if it is okay to record the interview on your private mobile phone or with the school's computer.

Interview

I choose these three people (select relevant background information, such as age):

My three questions are:

-
-
-

The answers:

Person A
Person B
Person C

Summarize your thoughts after the three interviews:

Teachers' resources

The activity is meant to familiarize students with the theme Forest use vs Forest protection and to promote student agency and sense of ownership. No teacher resources are available, but it is good for the teacher to have an overview of the current forest debate in local society and media.

Additional resources – Questions to evaluate activity

The teacher can use the following questions to allow the students to reflect upon how the activity or the complete TLS (activity 1-3) have influenced their view of Forest use vs Forest protection.

- What do you use the forest for?
- What relationship do you have to the forest?
- How has your knowledge of the forest changed?
- How would you like the use of the forest to change during your lifetime?
- What would you like to tell the three people you interviewed about the forest?
- Is there anything else you want to tell us regarding the task of the debate about the forest?

Activity 2: Forest debate, a role-play on “Forest use vs Forest protection”

The aim of the activity Forest debate, a role-play on “Forest use vs Forest protection” is to engage students in collaborative authentic activities to evaluate evidence and support claims. Further, it enables students to use evidence and claims to formulate creative solutions. For the debate, students are divided into groups representing the following stakeholders: private forest owners, forest companies, the public, environmental organizations, indigenous Sámi communities, and public authorities. Students roll the dice to get appointed with an individual age, gender, role in the stakeholder group, and personal traits. To prepare for the debate, students investigate authentic media and literature and contact experts for further clarification and guidance. The debate can take place in the classroom and involves cases such as:

A municipality wants to cut down the forest and build housing in a local area that is currently used for recreation. A citizens’ proposal suggests that it is more important to keep the forest for people’s health and well-being. The question to consider is: “Should a citizens’ proposal have an impact on the decision about how to use local and accessible forest considering the municipality’s new needs?”

The activity is presented through the student- and teacher resources below. Since the teacher resources are guiding, please read those first.

Key concepts of the activity: Argumentation, Social Justice, Reflection activities

Students’ resources – Role-play, background & advice

The activity can be introduced to the students 2-3 weeks before the activity with an invitation to a Consultation Day. The aim of this is to set the scene and communicate the expectations of the role-play and debate. For example:

Welcome to the Consultation Day where the importance of the forest for a sustainable society will be discussed. The cases of the xxx will be decided!

Actors from various organizations and interest groups have gathered to debate and make decisions in specific cases concerning forest use in relation to, for example, jobs, human health, biodiversity, and other nature values. You are an important person from the xxx community, are invited to the debate.

Instruction to students for the preparations:

To prepare for the debate, the teacher will inform about where to find information about the case(s) and the different stakeholders views. Furthermore, contact information to different stakeholders and their organisations are made available, and can help you to prepare for your role.

Advice to students for the roleplay:

- Bring something typical of your role in your actor group. It can help clarify your role and your characteristics through the role play.
- Argue a point with personal commitment using evidence and reason.
- Listen carefully and considerately to what others have to say.
- Have you gotten to know views of your "enemy"? Prepare responses to the other stakeholder groups' arguments that you know will come up.
- Don't forget to listen to other players. Do you hear any information that you can use in some way?
- Respect the views of others. All participants have a right to put their views forward and be listened to.
- It is okay to change your character’s mind during the game. Also, if opponent characters change their minds, let them do so.

Instructions for the students in Swedish are found in the following links:

- Preparations for the roleplay: <https://skogslabbet.se/elev/forbered-for-rollspelet/>
- The roleplay: <https://skogslabbet.se/elev/rollspel-debatten-om-skogen/>

Teachers' resources – Role-play, context and support

The purpose of the roleplay "Consultation Day" is for the students to develop knowledge and action competence. By acting as a specific stakeholder during the debate, the students gain knowledge about how different stakeholders view how the actual forest should be managed, and what support there is for the specific views. The roleplay give opportunity to practice argumentation, critical evaluation and learn about pros and cons for the different views. Supporting young people in acting as knowledgeable agents through inquiry and roleplay promote critical citizenship education, and can increase students interest and engagement for a future science career.

To use an authentic (local) case has many benefits since it creates engagement. It can, however, also create stressful situations for the students if they already have an idea about that specific forest. It might be difficult to act according to a stakeholder having an opposite view of the personal view; both difficulties in making strong arguments, and if successful, create worries that others will think that it is your true position. A fictive case will avoid that. One example of a fictive case focusing the debate on sustainability follows:

The company "Green products" wants to launch a new clothing brand - where all products consist of material from the Swedish forest. The manager Felicia Syren, a civil engineer in materials technology, says: "In the textile sector, we struggle with major environmental challenges. We need to find alternative that is better for the environment and something that is circular, i.e., can be used again or is renewable. The forest's resources could be part of the solution." The question to be debated is if the community will devote resources to the company.

First, introduce the activity to the students 2-3 weeks in advance and plan for lesson time for them to prepare for their roles individually as well as in groups (same type of stakeholders together).

Second, support students in preparing for their roles, i.e., support them to find information about their stakeholder's viewpoints. It is beneficial if students work in groups, and already have knowledge about digital search strategies. To make it more authentic, this phase can be prepared by for example

- Create a chat forum with the OSCs or invite them to school.
- Prepare short videos with different stakeholders/OSC members or prepare powerpoint-presentations.

Third, prepare the set-up and rules for the role play and communicate them clearly to the students. As a teacher you act as Chair and make sure that all stakeholders get their voices heard, and that there will be a democratic decision at the end of each case. Encourage passion and commitment, but stick to the rules of the debate in the roleplay. It might be necessary to limit the time for each stakeholder's address, and for the respondents' replies.

Finally, plan for a follow up session after the debate where the students, in mixed groups with one from each stakeholder, reflect over the role play "Consultation Day".

- How did they feel during the role play?
- Have they changed their mind regarding the case(s)?
- What type of arguments were put forward? Fact-based, value-based or other?
- Discuss how an argument can be formulated to be even stronger.

Teachers' guide in Swedish is found in the following links:

- Introduction and instructions to the debate:
<https://skogslabbet.se/lektionspaket/manniskan-och-skogen/debatten-om-skogen/debatten-om-skogen/#1399>

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- Preparations for the roleplay (time: 60 min):
<https://skogslabbet.se/lektionspaket/manniskan-och-skogen/debatten-om-skogen/debatten-om-skogen/#1417>
- The roleplay (time: 120 min):
<https://skogslabbet.se/ovning/manniskan-och-skogen/debatten-om-skogen/debatten-om-skogen/rollspel-debatten-om-skogen/#1397>

Additional resources – The Forest Lab & questions to evaluate activity

The teacher can use the following questions to allow the students to reflect upon how the activity or the complete TLS (activity 1-3) have influenced their view of Forest use vs Forest protection.

- How interesting did you find the Forest debate? (5-step Likert scale)
- What was most interesting about the Forest debate?
- How instructive did you find the Forest debate? (5-step Likert scale)
- What did you learn from the Forest debate?
- How has your knowledge about the forest changed?
- How would you like the use of the forest to change during your lifetime?
- Is there anything else you want to tell us regarding the task the Forest debate?

• Activity 3: Investigation of how the forest debate is portrayed by the media

The aim of this activity is to enable students' engagement in meaningful science-society interaction and development of critical thinking competence. It enables students to gain insights into the work and considerations of a journalist and highlight core aspects which distinguish journalism from opinion-makers with different agendas. A journalist from local media is invited to meet with the students. In preparation, students get familiarized with a piece of local media content selected by the journalist in collaboration with the teacher. For example, they can be assigned with reading a theme-related, recent, and authentic newspaper article. Based on the article, they write a short reflection on whether they found the article balanced (or unbalanced) in relation to the perspective of different stakeholders. During the in-class activity, students are also offered an opportunity to engage with the journalist by reflecting on the article and asking questions about journalism.

Key concepts of the activity: Argumentation, Social Justice, Reflection activities, Democratic participation

Students' resources – News media content & analytical questions

Students prepare for the meeting and discussions with the journalist by analyzing the selected piece of media content. The media content that is selected for this activity should be of local or national relevancy. It is therefore difficult to make general suggestions for articles to use. We present two examples, one from Sweden and one in English from BBC.

The newspaper article used in the Swedish classrooms concerned an investigation and conflict between a large Forest company and Biologists about if the company are logging forests younger than the regulation allows. The article is titled "Forest companies cut down forests younger than regulations allow". Scan the QR-code to view the Swedish article.



Scan the QR-code to view the article (in Swedish only)

One example of a suitable newspaper article in English is presented in the link below. The article is about studies arguing that large-scale tree planting can harm the environment rather than benefit

climate action. The article is titled “Climate change: Planting new forests ‘can do more harm than good’”.

- <https://www.bbc.com/news/science-environment-53138178>

The questions below can be used to guide students in their review of the feature in preparation for the meeting with the journalist:

- Are the opinions presented in the media feature balanced?
- Are the arguments presented as equally urgent and strong? Does some particular participant’s argument or narrative take precedence?
- How is the article angled? It is often clear from the title and preamble (the first sentences of the text).
- Are there additional questions that the journalist could have, or should have, asked?
- Considering the balance, should the journalist have interviewed someone else and if so who, and what questions should the journalist have asked them?
- Who is responsible for the content? How credible do you think the source is, and why?

Teachers’ resources – Suggested lesson outline & questions to evaluate activity

The lesson plan should be developed in collaboration with the participating journalist but some suggestions of aspects to include are listed below:

- How do journalists work?
- What are important considerations for professional journalists?
- Interview technique: how do you ask questions to get relevant answers?

The following questions, possibly distributed via GoogleForms, could be used to allow students to reflect upon the article:

- Is the article balanced?
- If YES, in what way is it balanced?
- If NO, in what way is it unbalanced?

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