



P.B.L Lesson Plan

Title

The way of waste

School

Name: Mariagerfjord Gymnasium

Country: Denmark

Web Site: <https://mf-gym.dk/>

Subjects involved/potentially involved

Subjects currently involved	Subjects potentially involved
29	300

Description of how the lesson plan was designed and implemented

The purpose of the lesson plan is to achieve an in-depth understanding of human climate behaviour. The ambition is for students to gain an understanding of why some individuals have climate-friendly attitudes, others not, and why some individuals are willing and able to translate their attitudes into climate-friendly actions. This will take place through a wide range of theoretical perspectives on climate behaviour, as well as analyzes of links between consumption and identity in a time of climate change. The lesson plan is structured around the general questions below (and one overall question more tangible), which give the thematic teaching a problem based learning approach which is related to the students' own life.

- The climate is changing - how do we react to climate change?
- Why do we (not) change our climate behaviour?
- Which roles do consumption and lifestyle play in a time of climate change?
- I consume therefore I am – is our identity linked to our consumption?
- Black Friday and/or sustainable consumption?
- Do we have the freedom to consume or the obligation to restrain our consumption?





- Our consumption creates challenges with waste management – how can this be solved at global, European, national and municipal level?

The lesson plan is a detailed step-by-step guide that outlines the teacher's objectives for what the students will accomplish during the course of the lesson and how they will learn it. This lesson plan was developed in social studies and was based theories connected to sociology, politics and economics. When designing and implementing "The Way of Waste" PBL lesson plan, the following overall components were considered:

Objective and Goals:

Clearly define the learning objectives related to waste issues in Denmark and the European Union.

Clearly defining the main problem (PBL):

"Denmark, with its first-place ranking in the Environmental Performance Index, is undeniably a global and European leader in sustainability.

According to the Global Waste Index, Denmark is also one of the best when it comes to waste management, ranking second behind South Korea. However, despite the country's success in handling its waste, a new study has revealed that Denmark is one of the worst when it comes to waste prevention. According to Eurostat, Denmark creates more waste per capita than any other country in the EU – as much as 845 kilos per person in Denmark every year."

Specify what students need to learn and understand by the end of the lesson.

How to start the lesson plan:

Begin the lesson with an engaging activity or question related to waste. This captures students' attention and activates prior knowledge.

For example, you could show a short video about waste management or ask students to share their experiences with recycling.

Direct Teaching/Modelling:

Present information about waste issues, including relevant facts, statistics, and policies. Here the problem is introduced.

Use of case studies and real-world examples to illustrate key points.

Discuss the impact of waste on the environment, economy, and society.

Guided Practice:

Engage students in activities that reinforce learning. These included:

Group discussions: Have students discuss waste reduction strategies or analyze waste-related data.

Visit of external stakeholders: Insight into decision-making processes related to waste management and a possibility to ask questions.

Hands-on tasks: Sort recyclable materials or calculate the carbon footprint of different waste disposal methods.

Output:

How can we solve the problem using what we have learned in social studies?

Assessment and Evaluation:

Determine how you'll assess student understanding. This could involve: Formative assessments during the lesson (e.g., quizzes, discussions).





Summative assessments (e.g., written reflections, projects) to evaluate overall learning.

Materials and Resources:

List the materials needed for the lesson (e.g., slides, handouts, videos). Ensure access to relevant resources (books, websites, guest speakers).

Closure:

Summarize the key points covered in the lesson.

Connect the content back to the initial objectives, that being the problem

Competencies and knowledge

Development of prerequisite competencies and/or knowledge

Prior Knowledge Assessment:

Prior to developing the PBL lesson plan, there was a minor assessment of what the students already knew about waste issues. This helped the teacher tailor the lesson plan to their existing understanding.

One could consider asking questions or conducting a brief discussion to get an insight into their familiarity with waste management, recycling, and environmental impact.

Background Information:

Provide relevant background information about waste in Denmark and the European Union.

Cover topics such as waste generation, disposal methods, recycling rates, and legal frameworks.

Explain terms like "circular economy," "landfill," and "sustainable practices."

Basic Concepts:

Ensure students understand fundamental concepts related to waste:

Different types of waste (organic, plastic, hazardous, etc.)

Environmental consequences of improper waste management

Benefits of recycling and reducing waste

Role of individuals, businesses, and governments in waste reduction

Critical Thinking Skills:

Encourage students to think critically about waste-related issues:

Analyze data on waste production and disposal.

Evaluate the effectiveness of existing waste management strategies.

Consider ethical dilemmas related to waste (e.g., balancing convenience with environmental impact).

Cross-Disciplinary Connections:





Integrate other subjects (e.g., science, economics, geography) to deepen students' understanding.

Explore waste-related topics from different angles (e.g., scientific processes, economic implications, geographical distribution).

Development of competencies and/or knowledge the experience aims to create

When designing the PBL lesson plan "Way of Waste", there were some key areas of competencies and knowledge that were in focus:

Environmental Literacy:

Develop students' understanding of environmental issues related to waste.

Teach them about the impact of waste on ecosystems, climate change, and human health.

Foster a sense of responsibility and stewardship toward the environment.

Critical Thinking and Problem-Solving:

Encourage students to analyze waste-related challenges critically.

Help them identify innovative solutions for waste reduction, recycling, and sustainable practices.

Engage in discussions and activities that require problem-solving skills.

Systems Thinking:

Explore waste management as a complex system involving various stakeholders (individuals, businesses, governments).

Discuss the interconnectedness of waste generation, disposal, and resource use.

Consider the circular economy model and its implications.

Data Literacy:

Equip students with the ability to interpret data related to waste.

Teach them how to read waste-related statistics, graphs, and charts.

Discuss the reliability and limitations of data sources.

Ethical Awareness:

Explore ethical dilemmas related to waste management.

Discuss trade-offs between convenience and environmental impact.

Encourage students to make informed choices based on ethical considerations.

Collaboration and Communication:

Provide opportunities for group work and collaboration.





Teach effective communication skills for advocating waste reduction and influencing others.

Global and Local Perspectives:

Compare waste issues in Denmark with those in other European Union countries (especially Romania, the country with the lowest waste per capita in the EU).

Discuss policies, regulations, and international efforts to address waste. Highlight local initiatives and community involvement.

Furthermore, there were competencies related to the social studies A-level curriculum in Denmark:

A) apply and combine knowledge of sociology, economics and politics to explain current challenges in society and solutions to them

B) distinguish between different types of arguments and statements, including description and assessment

C) examine current political decisions, including the importance of the EU.

D) analyzing problems and selecting priority issues with regards to pollution, garbage, waste management. Choosing priorities involves looking at the causes and impact of problems as well as analyzing solutions.

E) investigate and assess the interaction between technological development and the development in society in general

F) use knowledge, concepts and academic contexts from the core subject as well as simple theories to explain and discuss societal issues

G) demonstrate knowledge of the subject's identity and methods

H) formulate professional issues and collect, critically evaluate and process Danish and foreign language material, including statistical material, to investigate and discuss issues and draw conclusions

I) examine and document a policy area, including the importance of the EU and global conditions

Topics involved/potentially involved

Topics actually involved

Circular Economy

Waste Generation Trends





Waste Prevention Strategies
 Waste Management Policies
 Resource Efficiency
 European Green Deal

Topics additionally involved

Circular Economy
 Waste Generation Trends
 Waste Prevention Strategies
 Waste Management Policies
 Resource Efficiency
 European Green Deal

Authors

Teachers who worked on the design and implementation

Name	Class	Subject
Christian Møller Larsen	1e (2022/23)	Social studies

PBL methodology: groupwork

The topic was already decided, and the task was this:

“All pupils must create an innovative product that addresses the following question:

How can we minimize waste and how can we convince politicians to take action with regards to the growing waste problem?

The target group is Europeans of the same age, so the product must be in English. It can be a poster, video infomercial, a rap, a brochure, etc. You decide, it just has to be able to catch the attention of your peers.”

Group Formation (4-5 pupils)





Research
Problem Solving
Product Creation
Presentation and Sharing
Students reflect on their PBL experience: What did they learn?

Tools and applications

Video maker programs
Power Point
Canva
TikTok

Pedagogical Impact - Feedback

Below is the observed impact of the PBL "Way of Waste" lesson plan:

Student Engagement:

Generally, the students participated actively in groupwork and discussions and the were motivated to explore waste-related topics.

Understanding:

The students grasped the key concepts related to waste management and where able to connect theoretical knowledge to real-world scenarios.

Student Involvement in Pathway Development

The students engaged rather well in groupwork and discussions. Many actively contributed with ideas and asked questions.

Many students seemed genuinely interested in waste-related topics and showed curiosity and motivation to learn about waste management.

The students shared responsibilities, listening to each other, and build on collective knowledge in the groups.

Critical elements

Even though there were clear roles and responsibilities in each group, some students were still unsure about their responsibilities.

Some pupils have poor collaboration skills, especially pupils with different behaviour challenges (e.g. autism, attention-deficit/hyperactivity disorder).





Produced materials

Type of produced material			
x	A waste reduction campaign.	x	Informative posters or presentations.
x	A recycling guide for the school.	x	Informative presentations.
x	A rap track about waste management	X	An infomercial

Other

Links to the resource(s)
<i>Lesson plans in pdf format + any useful material (ex: worksheets)</i>
Attached the e-mail.

Evaluation method and tools (grading rubrics etc)

Self-Reflection:

Students were asked to reflect on their own contributions.

Students wrote about what they learned and how they contributed to the group.

