VIGNETTE

A Sustainable Chemical Factory

INTERACT

Co-funded by the European Union

In a 11th grade (students aged 16–17), students work on a task in which they design a sustainable chemical factory.

A pre-university class at a small urban school is doing a cross-disciplinary sustainability project, involving the subjects of geography, economics, and chemistry. Over the course of several weeks, students will form a consultancy group. Their task is to advise on the design of a sustainable chemical factory. This factory must produce either adipic acid (a preservative) or titanium dioxide (a pigment). From a geographical, economic, and chemical perspective, the factory must be designed to be as sustainable as possible, so that it can be built next to a nature reserve located near the school.

→ The project description

At the start of the project, students work on → an assignment mapping climate measures and how they relate to those measures. They do this by placing a set of measures on a "values cross" and describing their own position in relation to each measure. Students are asked to discuss this at home.

PLANNING

Lesson	Activity/theme
1, 2	Introduction to the project: A Hopeful Future – In-depth exploration
3	Ice Ages and Contemporary Climate Change
4, 5	The Climate Issue, Climate Policy
–	Christmas Break
6	Group work on the project – Cross-disciplinary collaboration
7	Preparing for the conference
8	Conference with design presentations
9	Reflection on the conference

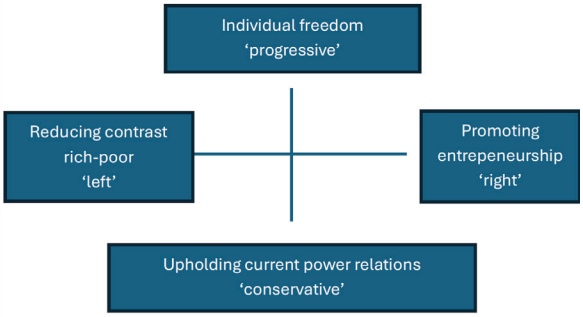
DURING → LESSON 6, THERE IS A DISCUSSION ABOUT THE IMPACT OF AN INDIVIDUAL FACTORY:

Student A: "Climate change isn't only caused by those chemical factories, right?"
Teacher: "No, definitely not. But we're focusing on that now, because otherwise the topic becomes way, way too broad. So right now, you're specifically working on the substances released by that factory and what effect they have."

GEOGRAPHY TEACHER AT THE START OF THE PROJECT IN HER → JOURNAL:

My expectations are that a few students will participate enthusiastically, and that one student (A) will be very skeptical about the topic of climate change. That might lead to some discussion."

VALUES CROSS FROM HOMEWORK ASSIGNMENT



EXCERPT FROM → THE HOMEWORK ASSIGNMENT:

9. Can you and your parents/guardians create a plan to take a small step toward a more climate-neutral lifestyle? To do this, first match the major measures below with actions your family can take together.

In the following lesson, the teacher decides not only to share these experiences but also to have students challenge their own positions by gathering arguments for the opposite viewpoint. Students then discuss this exploration in small groups, following the rule: "We listen, we don't judge."

TEACHER DURING LESSON 2:

"I thought it was important not to skip over the conversation about everyone's opinions after lesson 1. If a student wants to have an opinion, that's fine, but then you need to know what you're choosing. We were actually supposed to talk about paleoclimatology, but I've deliberately postponed that."

FROM AN → INTERVIEW, AFTER LESSON 6:

Interviewer: "That was actually a very geographical question you asked—about impact."
Student A: "Then why do you make a cause-effect diagram?"
Interviewer: "Why do you think?"
Student A: "I get that you need to understand the consequences, but I think the connection is a bit far-fetched. As if one factory is responsible for rising sea levels, you know? I understand you have to look at it globally, but then I feel like the point of the assignment kind of gets lost."

TEACHER, IN AN → INTERVIEW AFTER THE PROJECT:

"This made me even more aware of the political dimension it has. […] There's a sensitivity to it that's also political, and that quickly triggers reactions around the dinner table. So […] I'm very aware of the student's environment."
Interviewer: "And what does 'correct' mean in that context?"
Teacher: "Well, for me, it means trying to be as fact-based as possible. Letting as little of my own opinion shine through as I can, but still trying to play devil's advocate. Showing students that multiple perspectives are possible."

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