

Trucks and the environment

Lesson plan for teachers



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STEP AHEAD II

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Trucks and the environment

The aim of the lesson:

To motivate the students to think about the impact of heavy road traffic on the environment.

Activity No.1

Part of the lesson: **EVOCATION**

The aim of the activity: To introduce the topic of the impact of heavy traffic on the environment.

Step 1	Brief description of the activity	<p>Mysterious questions based on associative thinking.</p> <p>Ask students four questions about trucks and fuel consumption which is directly proportional to CO₂ production. Students will work in groups and their task is to write possible answers to each question. Time: 2 minutes/question.</p> <p>What do you think:</p> <ol style="list-style-type: none"> 1. How is the number 10 000 connected to truck? 2. How is the number 100 connected to truck? 3. How is the number 150 000 connected to truck? 4. How is the number 25 connected to truck?
	Instruction (what you need to tell the students)	<p>You will work in groups and your task is to write possible answers to each of the 4 questions. Time: 2 minutes/question. One member of the group will write your answers on the whiteboard.</p>

Step 2	Brief description of the activity	<p>Summary of students' answers. Don't evaluate, just summarize what students wrote. After the summary, ask students to figure out how are the figures connected to the topic "trucks and environment" and what do they think the correct answers to the questions might be from the listed ones, written on a whiteboard. Use the group brainstorming method.</p> <p>Gradually shift the focus and attention to the topic of impact of the trucks on the environment.</p> <p>Work in plenary, with a whiteboard. Time: 2 minutes for answers.</p>
	Instruction (what you need to tell the students)	We will summarize together what you wrote. After the summary, try to please think on how are the numbers linked to the topic "trucks and environment".
Tools for the activity (everything you need to take to the classroom)		Flipchart or whiteboard, markers, papers, pen or pencil, notebook, audio-visual technique/ppt attached
Estimated time (max. 40 min.)		15 minutes
Notes		

Activity No. 2

Part of the lesson: **APPRECIATION**

The aim of the activity: To let the students think about possible solutions to the previously listed problems.

Step 1	Brief description of the activity	<p>Explanation.</p> <p>Find the important and right answers written on the whiteboard, which are relative to our topic. Let the students think for a while and then explain the previous questions and figures.</p>
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	<p>Instruction (what you need to tell the students)</p>	<p>Now we will together find the answers to the questions asked in the beginning of the lesson, which are relative to our topic.</p> <ul style="list-style-type: none"> • Existence of 10000 average trees compensates CO₂ production of one average truck. • 100 t of CO₂ produces one average truck per year. • 150 000 km is average amount of kilometres per year of one average truck. • 25 l is average fuel consumption of one truck per 100 km. <p>CO₂ production is directly proportional to fuel consumption.</p>
	<p>Brief description of the activity</p>	<p>Allow time for students' reflection/feedback on what they just heard. After a while, work with the text in attachment 1 (or choose any other relevant text, for the example pls see the other possible sources listed in "Notes" section). Let students work in the groups again. Each group can work with the same text, or each group can get a different text. The task is to read it and prepare the explanation for the other groups about the key content and new information they learnt.</p> <p>To work with the text, you can use the INSERT method.</p>
<p>Step 2</p>	<p>Instruction (what you need to tell the students)</p>	<p>Work in the groups again. Your task is to read the text, using the marks</p> <p>✓ <i>I knew</i> + <i>new information</i> ? <i>I want to/need to clarify this</i> - <i>In contradiction with what I thought</i></p> <p>After finishing, prepare notes that will help you explain what you read to the rest of the class. What was the key information for you that draw your attention?</p>
<p>Tools for the activity (everything you need to take to the classroom)</p>		<p>Flipchart or whiteboard, markers, papers, pen or pencil, notebook, audio-visual technique.</p>

Estimated time (max. 40 min.)	20 minutes
Notes	<p><i>Other possible sources to be used:</i></p> <ul style="list-style-type: none"> • https://transportgeography.org/?page_id=5711 • https://sciencing.com/effects-car-pollutants-environment-23581.html • https://www.thebalancesmb.com/how-transportation-pollution-impacts-the-environment-4158543

Activity No. 3

Part of the lesson: **REFLECTION**

The aim of the activity: Reflection on new knowledge, formulating conclusions and summarising learnt content. Based on new knowledge let students think about other ways to decrease CO₂ produced by heavy road transportation... (eat local products, shorter delivery time of goods & less traffic etc.)

Step 1	Brief description of the activity	Presenting new information after reading the texts to the other groups. Peer – to peer learning. Students can choose the way they want to present and teach the others about what they learnt.
	Instruction (what you need to tell the students)	<p>Now you learnt something new about the impact of the trucks on the environment and some of the measure taken to decrease it. Present the others with what you learnt through the questions asked at the beginning and the articles you worked with. Mention what was the most interesting for you, new and in contrary with what you thought before.</p> <p>Why do you think it is important to decrease CO₂ from heavy road transportation?</p>
Step 2	Brief description of the activity	Interesting things about our topic. Let students watch two videos and let them think for a while, what are the possibilities to decrease the fuel consumption (CO ₂) and other ways of reducing the impact of trucks on the environment. Try to let students think about other possible ways to

		decrease CO ₂ from heavy road transportation... (eat local products, longer delivery time of goods etc.).
	Instruction (what you need to tell the students)	<p>Watch the videos and think about the possible ways to decrease the fuel consumption thus CO₂ production of the truck. What other ways, apart from decreasing fuel consumption can be applied in relation to trucks and general heavy road transportation impact decrease on the environment? What are the possibilities to limit heavy road transportation that we can all support?</p> <ul style="list-style-type: none"> • Influence of truck aerodynamics on fuel consumption https://youtu.be/grZlpm4SQZc?t=35 • Truck fuel saving technology https://youtu.be/Ro_Btic8jdk?t=34
Step 3	Brief description of the activity	<p>Unfinished sentences. Ask students to finish the sentences...</p> <ul style="list-style-type: none"> • It is important to decrease CO₂ from heavy road transportation because/as/otherwise... • CO₂ from heavy road transportation can be decreased by..... • To decrease fuel consumption, truck producers use/plan to use.... <p>I can personally contribute to the decrease of CO₂ from heavy road transportation by/if....</p>
	Instruction (what you need to tell the students)	<p>Finish the sentences:</p> <ul style="list-style-type: none"> • It is important to decrease CO₂ from heavy road transportation because/as/otherwise... • CO₂ from heavy road transportation can be decreased by..... • To decrease fuel consumption, truck producers use/plan to use.... <p>I can personally contribute to the decrease of CO₂ from heavy road transportation by/if....</p>

<p>Tools for the activity (everything you need to take to the classroom)</p>	<p>Flipchart or whiteboard, markers, papers, pen or pencil, notebook, audio-visual technique for video – projection, unfinished sentences for each student written on a paper or on a whiteboard.</p>
<p>Estimated time (max. 40 min.)</p>	<p>10 minutes for Step 1 Steps 2 and 3 might need an extra time and might be used as a lesson/topic extension. You can use step 2 as an evocation/in the beginning of the next lesson, that you can run in relation with this topic.</p>
<p>Notes</p>	<p>Step 3 can be assigned to students as a homework.</p> <p><i>Other possible sources to be used:</i></p> <ul style="list-style-type: none"> • https://www.nibusinessinfo.co.uk/content/reduce-environmental-impact-transport-logistics • https://www.epa.gov/transportation-air-pollution-and-climate-change/what-you-can-do-reduce-pollution-vehicles-and-engines • https://www.dpti.sa.gov.au/_data/assets/pdf_file/0011/167564/ITLUP_Solutions_and_Actions_Reducing_Environmental_Impacts.pdf

ANNEX 1

Cleaner, safer trucks

Source: <https://www.transportenvironment.org/what-we-do/cleaner-safer-trucks>

Trucks have a major impact on global warming, the air we breathe, and the safety of pedestrians, cyclists and other road users.



Trucks have a major impact on global warming. While only accounting for 2% of the vehicles on the road in the European Union, they are responsible for 22% of road transport CO2 emissions and 15% of road collision fatalities, which is 4,000 EU citizens a year. What's more, road freight transport is [projected to increase](#) by 56% between 2010 and 2050. This means Europe needs to tackle truck emissions urgently to decarbonise transport.

The good news is that the EU is acting and that technology is developing rapidly too. Europe's first truck CO2 standards were agreed in 2019. In another first, Europe also agreed a 'direct vision' standard for trucks in 2019, along with design changes to enable truck-makers build safer and more aerodynamic cabs. But much remains to be done.

From more fuel efficiency to zero emissions trucks

T&E works on making trucks more fuel efficient and reducing their CO2 emissions while at the same time starting the shift away from fossil fuel trucks to zero-emission vehicles. With battery technologies improving, cities cleaning up their air, and looking at the recent [announcements](#) from different European truckmakers, electric trucks will enter our markets fast in the coming years. Industry players and companies also [support our call](#) for more fuel-efficient and zero-emission trucks. But we now need the supply and infrastructure to make this shift away from diesel and gas happen.

We are particularly focused on [CO2 standards](#) for trucks and the EU's upcoming revision of these targets in 2022. Truck CO2 standards agreed in 2019 require new trucks to be 15% more fuel efficient by 2025. For 2030 the emission reduction target is 30%. This will reduce the CO2 emissions coming from trucks while at the same time helping drivers and companies to save money and fuel. From 2025 truckmakers that sell more than 2% zero and low-emission trucks will gain a bonus. In the revision in 2022, ambition needs to be increased to really kickstart the market for low and zero-emission trucks.

The [reform](#) of the weights and dimensions legislation in 2019 means that truckmakers can put cleaner and safer truck cabs on the road from September 2020. The work on truck efficiency is complemented by our work on road charging and fuel taxation. At the same time we reject claims that increasing the load capacity of lorries (megatrucks) contributes to lower emissions in road freight in any meaningful way.

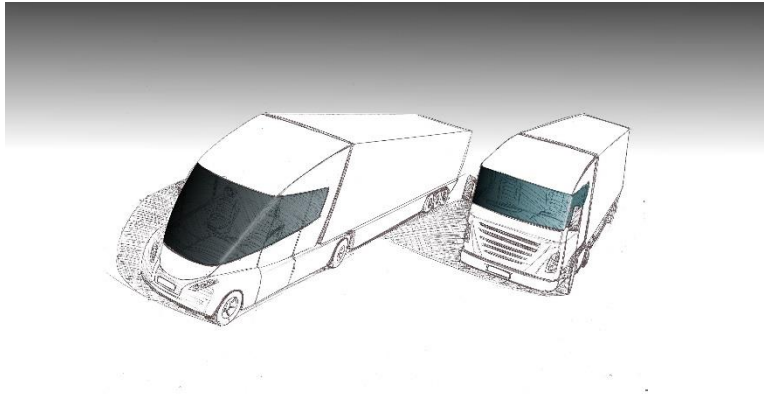


Image courtesy of PEM Motion GmbH

NOTES:



The opinions presented in this document are the views of the STEP AHEAD II project partnership and do not have to express the opinions of the EU.