

Sustainable Development Goals for Pupils

#9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



Imprint

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Sustainable Development Goals for Pupils



Target 9.b is: "Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities".

It has one indicator: "Proportion of medium and high-tech industry value added in total value added"

Target 9.c is: "Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020".

It has one indicator: "Proportion of population covered by a mobile network, by technology"

Achieving SDG 9 relies on collective action and a shared responsibility to invest in a better future. Working on innovation, improving infrastructure and inclusivity, we can address the challenges from development while keeping the planet for future generations.

Activity #1	Title of the activity
Sustainable Development Goal 9	Game on SDG 9
Objectives of the activity	
<ul style="list-style-type: none"> - To encourage critical thinking, creativity, and problem-solving skills. - To encourage teamwork and collaboration among players, at the same time to improve communication and presentation skills. - To provide an engaging and interactive way for pupil to learn about SDG 9 and the significance for a sustainable future. - To raise awareness about the importance of technology and innovation in addressing global challenges. 	
Details for the activity	
<p>Materials: Images representing different aspects of technology, innovation, and infrastructure (displayed on a screen).</p> <p>A computer, tablet or smartphone</p> <p>Stopwatch.</p> <p>Notepad and pencils.</p> <p>Duration – 60 minutes</p> <p>Group number – 20 pupils aged 10-14 (or one class)</p>	
Instructions and tips for teachers	
<p>Introduction (10 minutes):</p> <p>The teacher starts the lesson by discussing the importance of innovation, technology, and infrastructure in our daily lives and shares the learning objectives for the lesson.</p> <p>Later shares a video about the goal: https://www.youtube.com/watch?v=J57rRolByqY</p> <p>https://www.youtube.com/watch?v=HjX4rlMP-eg</p>	

Game explanation (10 minutes):

First the teacher divides the pupils in two groups.

The game starts with a player from the first team selecting an image from the screen but the other group is out of the classroom. The player has two minutes to discuss with his group how to describe it for the other group. Later he/she has 60 seconds to describe the image without revealing what it is. The pupils can use words, phrases, or gestures to present it without directly stating it.

Pupils from the other group take turns guessing what the image represents based on the description. Pupils have 30 seconds to make their guesses.

If a player correctly guesses the concept within the time limit, they earn a point. The student who is explaining also earns a point for effectively describing the image.

Pupils change who is explaining the photo. Continue playing until everyone or until the time limit is reached.

The photos that need to be explained are:

- Smartphone
- Wind Turbines
- Solar Panels
- Robotics
- High-Speed Train
- Astronaut
- Network cables
- 3D printer
- Hydroelectric Dam
- Charging station for electric vehicle
- Biomedical research laboratory

Conclusion and assessment (15 minutes):

Talk with the pupils in reflecting on the lesson:

What did pupils learn about technology, innovation, and infrastructure? How was teamwork and communication and did it play a role in the game?

And why in their opinion SDG 9 is important for a sustainable future.

Instructions for students

Pay attention to the instructions from the teachers.

Collaborate with other students for their group in order to complete the task in a timely manner.

Think about SDG 9 and how did teamwork and communication skills play a role in this short game?

Pay attention to the videos, as they will be of great help when you play the game related to SDG 9.

Resources and further reading:

https://en.wikipedia.org/wiki/Sustainable_Development_Goal_9

United Nations (2017) Resolution adopted by the General Assembly on 6 July 2017, Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313)

<https://sdgs.un.org/goals/goal9>

<https://www.youtube.com/watch?v=J57rRolByqY>

<https://www.youtube.com/watch?v=HjX4rlMP-eg>

<https://www.theschoolofphotography.com/tutorials/how-to-take-good-photos-with-a-phone>

<https://todayshomeowner.com/eco-friendly/guides/how-many-homes-can-be-powered-by-a-wind-turbine/>

<https://www.sunrun.com/go-solar-center/solar-articles/how-long-do-solar-panels-really-last>

<https://adamasuniversity.ac.in/scope-of-robotics-engineering-in-the-department-of-mechanical-engineering/>

<https://www.railway-technology.com/features/the-10-fastest-high-speed-trains-in-the-world/>

<https://www.pexels.com/search/astronaut/>

<https://www.pexels.com/search/network%20cables/>

<https://www.pexels.com/search/3d%20printer/>

<https://www.pexels.com/search/hydro%20electric%20dam/>

<https://www.pexels.com/search/charging%20station%20for%20electric%20vehicles/>

<https://www.pexels.com/search/charging%20station%20for%20electric%20vehicles/>

<https://www.rahpc.org.rw/professional/advisory-boards/biomedical-laboratory-sciences>

Annex:

<https://drive.google.com/drive/folders/1znOtb7yduQLXovimNAHS5-DJV6aOXp-WE?usp=sharing> (cards)

Activity #2	Title of the activity
Sustainable Development Goal 9	Challenge on Sustainable Development goal 9
Objectives of the activity	
<ul style="list-style-type: none"> - To encourage critical thinking, creativity, and problem-solving skills. - To encourage teamwork and collaboration among players, at the same time to improve communication and presentation skills. - To provide an engaging and interactive way for pupil to learn about SDG 9 and the significance for a sustainable future. - To raise awareness about the importance of technology and innovation in addressing global challenges. 	
Details for the activity	
<p>Materials – pen and paper</p> <p>Duration -90 minutes</p> <p>Pupils - 20 pupils (divided in group or all class)</p>	
Instructions and tips for teachers	
<p>Introduction (10 minutes):</p> <p>The teacher starts the lesson by discussing the importance of innovation, technology, and infrastructure in our daily lives and shares the learning objectives for the lesson. Later shares a video about the goal: https://www.youtube.com/watch?v=J57rRolByqY https://www.youtube.com/watch?v=HjX4rlMP-eg</p> <p>Division in groups (10 minutes)</p> <p>Pupils should discuss four real-world challenges related to industry, innovation, or infrastructure.</p> <ol style="list-style-type: none"> 1. Zero waste challenge 2. Clean and renewable energy sources in your municipality 3. Sustainable transportation system 4. Inclusion of people using digital technology <p>The students are divided into 4 groups depending on the challenge they chose regarding which pupil selects one challenge from the list.</p> <p>Discussion and brainstorm (35 minutes)</p> <p>Pupils have 15 minutes to discuss their chosen challenge. They can use books, the internet, or other resources to gather information about the challenge, existing solutions in the world and potential innovations that can help them in addressing the problems.</p> <p>Pupils have to explain in 30 minutes what is the problem, why it is important to solve it, how they would do it in an innovative way and how would the population would benefit from it.</p>	

Presentation (15 minutes)

Each group presents their innovative solutions to the class. Pupils need to be clear and persuasive in their presentations. They should speak how it can potentially impact in achieving SDG 9.

Conclusion and assessment (10 minutes):

Talk with the pupils in reflecting on the lesson:

What did pupils learn about technology, innovation, and infrastructure? How was teamwork and communication and did it play a role in the game?

And why in their opinion SDG 9 is important for a sustainable future.

Instructions for students

Pay attention to the instructions from the teachers.

Collaborate with other students for their group in order to complete the task in a timely manner.

Think about SDG 9 and how did teamwork and communication skills play a role in this short game?

Pay attention to the videos, as they will be of great help when you discuss the challenges related to SDG 9.

Carefully do a research on the challenge your group chose, you will learn and it will be easier when you discuss it

Activity #3	Title of the activity
Sustainable Development Goal 9	Quiz on Sustainable Development Goal 9
Objectives of the activity	
<p>- To introduce to the students Sustainable Development Goal 9: To work on increasing the students' knowledge on this Sustainable Development Goal and to show them how it is relevant to their everyday life.</p> <p>- To promote problem solving and to engage the students through interactive activity on the platform h5p.org</p>	
Details for the activity	
<p>Describe the activity.</p> <p>Material – Laptop, smartphone</p> <p>Duration – 60 minutes</p> <p>Group number – 20 pupils aged 10-14</p>	
Instructions and tips for teachers	
<p>Main part (30 minutes):</p> <p>Quiz</p> <p>1. What is essential for economic growth and improving living conditions related to Sustainable Development Goal 9? _____is essential for economic growth and improving living conditions.</p> <p>2. What are clean energy sources and their potential? Clean energy sources such as _____ and _____ have the potential to reduce the carbon footprint. Access to _____ energy empowers urban but also rural areas with new _____ jobs and better living conditions. By 2030 it is recommended to achieve a bigger part of Sustainable Development Goal 9 targets and indicators and access to clean energy is essential when combining _____ development with _____ preservation.</p> <p>3. What is resilient infrastructure related to Sustainable Development Goal 9? Resilient infrastructure means _____ damage, making sure that _____ are safe and if difficult circumstances arise quick recovery and adaptation is needed. Resilient infrastructure is not just solving and avoiding _____ shocks; also the _____, _____ and _____ aspects of one community. The goal is to increase the capacity to absorb and bounce back from disruptions, but also to minimize the _____ impact on the environment. In resilient infrastructure we can include _____, _____, _____, _____ and _____.</p>	
Anex	
<p>Drag and drop quiz on h5p page: https://veljanparizov1.h5p.com/content/1292019933170549777 https://veljanparizov1.h5p.com/content/1292021523908795377 https://veljanparizov1.h5p.com/content/1292021561943395517 https://veljanparizov1.h5p.com/content/1292035367129961697 https://veljanparizov1.h5p.com/content/1292035401926727467</p>	

