ISLAND SCHOOLS

Sustainable Transport

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ISLAND SCHOOLS

Session 1: Introduction

sessions and brainstorm the

imagining a future scenario for

ISLAND SCHOOLS

Session 1: Introduction

Sustainability challenge: Sustainable Transport
School type: Mixed age group, approx. 10-16 years
Week/Session number: 1

General description:

In this first week, pupils will be introduced to the topic of sustainable transport considering the complexities of economic, societal and ecological impact.

Pupils will explore transport from different angles, according to individuals (myself), the local community, the wider society, the world …
They will start with the Sustainable Development Goals (SDG) and make clear connections to relevant goals, using videos or websites. Teachers and pupils choose which goals they want to work with.

1. **Sustainable Transport and its impact.** Focus on the **relationship between individuals and society**, some questions and ideas on this:

- How does transport affect your island? Positively/negatively, what are the challenges and opportunities?
- Discuss the connections between transport and the community.
- Discussions between students, create a mind map and connect ideas.

2. **Sustainable Transport.** Look at different types of transport and how some types are more sustainable than others in terms of their social and environmental impacts? Discuss the effect of various types of sustainable transport.

Learning outcomes:

Students should be able to:

- Know SDG that relates to the project.
- Define and understand different types of transport.
- Explain the effects of different types of transport on individuals and society.
- Explain the effects of transport on climate, environment and nature.
- Contribute to the discussion on how transport can be made more sustainable in the future.

Materials needed: (teachers and students select what they think is most relevant to use

1. Access to computer, phone, tablet or another smart device.
2. SDG goals: short videos or visit the UN's own SDG website.

https://www.heimsmarkmidin.is/
https://sdgs.un.org/goals
https://sdgs.un.org/topics/sustainable-transport

3. Goals relevant to Sustainable transport are (integrate the SDG icons 4,6,7,8,11,13,14,15 (link to the description of these goals in the respective language, see below)
4. Blog, on-line material, ideas for discussions – below you will find a selection of material that teachers can choose from to get ideas for discussions and tasks:

- Basic description on sustainable transport:
https://www.youtube.com/watch?v=T9j42-V5cr0
- What is sustainable transport? Some ideas to look at:
https://climate.selectra.com/en/advice/sustainable-transport
- Sustainable transportation solutions for a sustainable future:
https://www.youtube.com/watch?v=yDz5bRy7AgI
- How can cities shift people to more sustainable transport:
https://www.youtube.com/watch?v=PzhwrDgrqUA
- Clean sustainable transport infrastructure:
https://www.youtube.com/watch?v=njCRLuDHw_c
- The sustainable transportation plan on Bainbrigde island:
https://www.youtube.com/watch?v=MJqKZhpCqIY

On-line material in Icelandic (considering sustainable transport and its economic, societal and ecological impact)

- The use of electricity in transport: https://www.youtube.com/watch?v=0KHnNjuOPBU
- Strætóskólinn: https://www.youtube.com/watch?v=ys7PG9XxSlk&t=2s
- Electric cars: https://www.youtube.com/watch?v=xzXHmKR435k&t=2s
- Walking: https://www.youtube.com/watch?v=QDPdl1Cls9k
- Public transport: https://www.youtube.com/watch?v=2UkTG0cz8Ro
- Cycling: https://orkusetur.is/myndbond/samgongur/?playlist=af09f22&video=f2deacb&fbclid=IwAR2BncPsQN4IKkeXBBIpRiQmFbhxa-46WMeN9RZgEUdgj8KnrJcLrrbqWI8
- Carpooling: https://www.youtube.com/watch?v=UghgJ1ukfM8
- On-line working: https://www.youtube.com/watch?v=I7YiZI5mvtw&t=14s
- Eco-driving: https://www.youtube.com/watch?v=VoawnnO6TT0
- Orkusetur: https://orkusetur.is/

SDG goals relevant to Sustainable transport

Each country can provide relevant link to their language

- Goal 4 – Quality Education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Target 4.7: By 2030 ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development.
- 4.7 Menntun fyrir alla - Icelandic
- 4.7 2 0 Œ . / 0 # 1 - Greek

- Goal 6 – Clean water and sanitation: Ensure availability and sustainable management of water and sanitation for all
- Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
- Target 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.
- 6.3 og 6.4 Hreint vatn og hreinlætisaðstaða- Icelandic
- 6.3 6.4 . . !) 0 !) . Œ $ 2 0 # 1 Greek

- Goal 7 – Affordable and clean energy: Ensure access to affordable, reliable, sustainable and modern energy for all.
- Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix.
- 7.2 Sjálfbær orka - Icelandic
- 7.2 - . . ! 0 ! 0 . - Greek

- Goal 8 – Decent work and economic growth: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- Target 8.8: Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.
- Target 8.9: By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products.
- 8.8 og 8.9 Góð atvinna og hagvöxtur – Icelandic
- 8.8 8.9 ù Œ ! 0 Œ " 0 ! . 1 . . Œ 2 # - Greek

- Goal 11 – Sustainable cities and communities: Make cities and human settlements inclusive, safe, resilient and sustainable.
- Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
- Target 11.4: Strengthen efforts to protect and safeguard the world's cultural and natural heritage.
- Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
- 11.2, 11.4 og 11.6 Sjálfbærar borgir og samfélög – Icelandic
- 11.2, 11.4, 11.6 ú +1 0" Œ) 0 ")2 20" - Greek

- Goal 13 -Climat Action: Take urgent action to combat climate change and its impacts.
- Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
- 13.3 Aðgerðir í loftslagsmálum - Icelandic
- 13.3 û! 1 . 2 . - Greek

- Goal 14 – Live below water: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
- Target 14.1: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution
- 14.1 Líf í vatni -Icelandic
- 14.1 ý& 12 0!) - Greek

- Goal 15 – Life on land: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
- Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
- 15.1 Líf á landi - Icelandic
- 15.1 ý& 12 120! - Greek

Structure and activities:

1. **Teachers introduce the Sustainable Developmental Goals (SDG)** and make clear connections to relevant goals listed above, making use of videos or websites.

- Students in small groups choose to work with two or three goals using computers/phones.
- Discussion between students, on the relations between individuals, society and transport and the goals. Why do we need these goals? What do they call for? What is the meaning of the goals? To whom do they apply?
- Groups introduce the goals they worked on for the rest of the students and teachers. Later this week following work on their assignments they could introduce their work for more people, even record their presentations.

2. **Introduction via videos on Sustainable Transport.**

- Use one (or more) of the recommended video-links to introduce the concept. Keep in mind the connection to Climate Change. This will serve as an intro/opening for the work in coming weeks.

3. **Sustainable transportation.** Teachers and students discuss the work ahead and focus on the relationship between individuals, society and sustainable transport.

- Make a KVL/KWL assignment about sustainable transportation (Kann – vill vita– hef lært: See Icelandic guidelines; https://menntastefna.is/tool/kvl-kennsluadferdin/ English: KWL - The Teacher Toolkit
- How do individuals and society depend on transport and how does transport depend on individuals and society?
- Discussion between students, create a mind map and connect ideas.
- Discuss the connections between humans/individuals and the transport.

4. **Transport.** Provide basic information on transport in general.

- Think about and list up different kind of transport.
- What types of transport do I have in nearest surrounding and in the island? How is my life related to transport?
- What is the economic, societal and ecological impact of transport on your Island.
- What type of transport is sustainable?
- What can I do to have a positive impact on sustainable transportation?
- Students visit the websites and look for videos on sustainable transport and report on what they see and hear. Make a summary of the site or a video.

Output/wrap-up, feedback and assessment:

The visible outcomes of students' work that can be used to assess their learning will vary according to the goals and topics they choose, but they might be in various forms such as, posters, concept maps, videos or PowerPoint presentations. They, however, should be made to address authentic audience such as people/parents/local government who might be invited to come and listen and give feedback. Even if audience from the local community are not invited students could nevertheless present their products to each other and be given roles as listeners to give feedback (to ask questions, probe for meaning etc).

Session 2: Analysing the data collected

Sustainability challenge: Sustainable Transport
School type: Mixed age group

Week number: 2 and 3

General description:

This lesson plan consists of 2 separate sessions. The first session outlines a period of research and data collection. The second sees time being spent analysing this information and making sense of this in preparation for presentations in Week 4.

Part 1 sees pupils undertake research on what renewable energy source would best serve their island using practical tasks. They'll be sorting and refining this information in the subsequent session.

Learning outcomes:

At the end of these 2 weeks, pupils are able to...

- Conduct field research in their local area
- Compile the data they have gathered
- Describe the information they have gathered
- Explain their findings

Materials needed:

Measuring Wind Speed

- Paper cups or yoghurt pots
- Tape or glue
- Straws or sticks or pencils

Measuring Wind Direction

- A bottle of bubbles

Measuring Cloud Cover

- A mirror
- A white board pen

Measuring Waves

- A decibel reader app

Measuring rivers

- Two poles/flags/stakes/markers of some kind
- A bight coloured ball

Structure and activities:

Warm Up:

At one point in time, travel posters were an important way to advertise places to people around the world. Start by showing some travel posters to the class as examples. Together, identify the key features of a travel poster – what are the characteristics of the best ones? Next, ask the class to design their own travel posters for their island. When doing so, ask them two questions:

- How would they like people to travel to the island?
- How do they think people will actually travel to the island and on the island?

These questions will open up discussions on transport to the island and on the island. We want travel to be as environmentally friendly as possible but for that to happen we need access to renewable energy. The class will now being an investigation to find out what renewable energy works best for their island.

Data gathering:

The class will create their own equipment to measure and evaluate different renewable energy sources themselves. This lesson plan gives examples for wind energy, solar energy, hydro and wave energy but you can deviate from this to measure geothermal or any other energy source if you wish.

Measuring Wind Energy:

The class are going to work together to create anemometers – instruments used to measure wind speed. Picture instructions can be found at the end of this lesson plan.
To measure wind direction, blow some bubbles and see what direction they go in. This could influence the best place to put wind turbines.

Measuring Solar Energy:

The class are going to work together to create an instrument to measure cloud cover. Cloud cover is measured in Oktas. Take a mirror and divide it into 8 squares using a pen or whiteboard marker:

Hold the mirror so it faces the sky. The sky will be reflected in the mirror. Count how many squares have clouds in them. This will allow you to measure how much cloud cover is in this area at this time. If 0 boxes have clouds in them then the score is 0 Oktas – the sky is clear and could be good for solar energy. If all boxes have clouds, then it scores 8 Oktas. It is very cloudy an solar energy might not be reliable here. Think about how these scores may change at different times of year and factor this into your decision.

Measuring Wave/Tidal Energy:
Big waves generate the most energy. It is difficult and unsafe for us to travel out to see to measure them but luckily large wave also make lots of noise! Download a decibel measuring app on a smart phone or another device and visit a safe piece of coastline. Using the app, measure how loud the waves are. Which part of the island has the largest waves? This would be the best place for wave/tidal energy.

Measuring Hydro Energy:
Visit part of a local river. Place one flag or pole at a point on the bank of the river. Place the second pole or flag a few metres downstream. Record the distance between the two poles/flags. Then, drop a bright coloured ball or something else that floats into the water at the first pole/flag. Time how long it takes for it to get to the second pole/flag. Repeat this a few times. Then calculate how fast the river is: speed = distance ▯ time. Fast rivers produce the most energy. Which river on the island is best for hydroelectric power?

Session 2:
Time will be spent putting together a visual proposal. This proposal will showcase the results of your investigations and explain which energy source is best for your island and why. This will be shared with your partner school and can also be shared with local representatives.

Decision making happens in different ways on islands across Europe. Prepare to share information with your partner island on how decisions are made on your island. Is there a Mayor? Is there a council? Does decision making happen on the island? Does decision making happen on the mainland? Do certain groups have certain roles?

If the children wish to make change on their island, who is the person they contact?

Feedback and wrap-up:

After completing their data gathering, learners reflect and evaluate upon the process. To consolidate understanding of the impact that tourism has on your island, encourage learners to complete a numeracy task. Cycling a bicycle for 1 hour can generate as much as 100 watts of power. How long would they have to cycle to power:

- A PS5 or a Nintendo Switch for an hour
- Fully charge their mobile phone
- Keep their fridge running for 24 hours
- Boil pasta for 10 mins
- Power a computer for their virtual meeting with their partner school?

Session 3: Get to know your partner island

Sustainability challenge: Sustainable Transport
School type: Mixed age group

Week number: 4

General description:

Learners travel virtual to their partner island. They are introduced to the challenges of sustainable transport on their partner island and they create groups to solve each challenge.

Learning outcomes:

At the end of this session, learners are able to:

- Identify the renewable energy resources on their partner island
- Acknowledge the similarities and differences between renewable energy and sustainable transport for each island and the reasons for these differences

Materials needed:

- Laptop with stable connection and a camera
- Zoom/MS Teams/Google Meet/etc
- Powerpoint/Keynotes/etc

Structure and activities:

Preparation:

Prior to this session, learners should decide upon how they would like to share the information they have gathered in the previous session with their partner island. This can be done through a powerpoint, a video, a show and tell, posters, etc. This aspects should be student lead and they will already be familiar with this process from their series of lessons on Ocean Plastics.

The presentation may cover the following themes:

- What transport currently exists on the island? Public transport, cars, etc
- How is this transport fuelled?
- What transport links connect the island to the mainland or other islands?
- What sources of renewable energy can be found on the island?
- Which sources are most suitable for your island? Why is this?
- Which sources are not suitable for your island? Why is this?
- How can someone go about making change on your island? Who makes decisions about things that happen or change on the island?

Teachers from both schools should agree on the date and time of the presentations to allow for ample time for learners to preprepared and practice their presentations. These presentations may be saved to a shared drive (OneDrive, GoogleDrive, Dropbox, etc) to allow for learners to revisit this material while they work on their chosen challenge.

The Presentations:
In a predetermined manner, learners will deliver their presentations to their partner school via a video call. The school that went second for the Ocean Plastics presentations should go first this time.

After the presentations:
After the presentations, the teacher makes mixed groups of students for future work. These can be the same groups used in Ocean Plastics or different groups if the teacher wishes.

Once a medium for communication has been decided upon, an ice breaker should be used to get the conversation started e.g. 'What is the one type of food that is loved in your country that is difficult to find anywhere else?'

Feedback and wrap-up:
At this point of the session, learners should be familiar with the modes of transport of their partner island and renewable energy resources. This can be established through regular questioning, formative assessment strategies and the use of plenaries. The use of these is open to teacher discretion.