Digital Escape Room Master Sheet

The Green Guardians' Quest

Topic: Ecological Footprint

Subject: Social studies with interdisciplinary components of numeracy and literacy across learning.

Broader learning objective(s):

a) Social Studies - People, place and environment (curriculum)

I can discuss the sustainability of key natural resources and analyse the possible implications for human activity. **SOC 4-08a**

I can develop my understanding of the interaction between humans and the environment by describing and assessing the impact of human activity on an area. **SOC 4-10a**

Literacy (creating texts - LIT 4-29a) and Numeracy (fractions, decimal fractions and percentages - MNU 4-07a) across learning.

Education Scotland. (n.d.). *Curriculum for excellence: Experiences and outcomes*. https://education.gov.scot/media/wpsnskgv/all-experiencesoutcomes18.pdf

b) Embracing complexity in sustainability - 3.3. adaptability (competence framework)

To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk.
Knowledge goal - 4, Skills goal - 2 & Attitude goal - 2

1.1. Valuing sustainability, 2.2. critical thinking, 2.3. problem framing, 4.2. collective action and 4.3. individual initiative across learning

Bianchi, G. Pisiotis, U., & Cabrera, M. (2022). *GreenComp – The European sustainability competence framework* (EUR 30955 EN). Publications Office of the European Union. https://data.europa.eu/doi/10.2760/13286

Lesson learning objective(s):

1. During this activity, students will explore essential data points and information needed to measure an individual's ecological footprint based on their daily life activities.
2. At the end of this activity, students will understand the factors that contribute to an individual's ecological footprint.
3. At the conclusion of this activity, students will provide context-appropriate recommendations to effectively reduce the calculated ecological footprint and express their personal stance towards the results in writing.

Target group: Secondary school	**Age:** 13-14	**Formation:** Individual	**Time:** 45 - 60 minutes
Purpose: Subject mastery		**Structure:** Sequential (multiple scenes)	

Summary:
In this digital escape room, students will embark on an eco-adventure to learn about the ecological footprint and how to calculate it by collecting various data points. The activity is divided into three main scenes (food, housing, transportation), each presenting data in the form of challenges and media related to aspects of an individual's daily life. Students will explore these scenes, interact with hotspots, and solve challenges following a sequential learning structure created using the scenario builder. The goal is to calculate an individual's ecological footprint and discuss the results, along with suitable solutions to reduce it.

Main story outline:
Welcome to the vibrant town of GreenGrove! A group of young friends discovered something extraordinary. Their town had been selected to become a model of sustainability for the region, and they were chosen as GreenGrove's first Green Guardians. To succeed, they first needed to understand ecological footprints. Follow along their adventure and help them calculate their ecological footprint together!
The wise town librarian, Mrs. Evergreen, explained to them the importance of an ecological footprint — measuring the demand placed on Earth's ecosystems by human activities. She gave each of them a special mission to uncover the ecological footprint of Taylor, a beloved member of GreenGrove's community, through three different scenes: food, housing, and transportation.

Your ultimate goal is to gather data to calculate Taylor's ecological footprint and explore solutions you could suggest to reduce it. With your help, GreenGrove can take its first steps towards becoming a shining example of sustainability for the region to follow.
Will you join them on their quest to improve GreenGrove's ecological emissions and make the world a greener place? Equip yourself with the calculator tool and begin the journey now!

Cover page media:
https://www.canva.com - cover
https://www.footprintcalculator.org/home/en - ecological footprint calculator
Self-recorded: Narrator & background music

Story title - scene 1: Food

Narrative: In the first scene, the learner examines an individuals' food choices and eating habits.

Challenge:
1. The learner investigates a meal plan, identifying and analyzing dietary habits.
2. The learner calculates the percentage of unpackaged and locally grown food using a receipt.

AI image prompt: 2D image
The inside of a small-sized cozy grocery store, one food aisle, filled with organic and unwrapped vegetables, a cash register in the center, no people, realistic style.

Tools and media:
- Fake receipt

https://expensesreceipt.com/grocery-furniture-store-for-online-receipts.html

Answer key:
Beef or lamb - 0; Pork - 0; Fish - 3; Poultry - 3; Eggs & cheese/diary - 9
→ move scale to often

• Meal plan https://openai.com Source: Adapted from OpenAI, 2024. • Self-recorded: Background music	Locally grown - 2 out of 14 (roughly 14%) Unpacked - 4 out of 14 (roughly (29%) → move scale to a total of 43%
Hint: -	Time: 10 minutes

Story title - scene 2: Housing	
Narrative: In the second scene, the learner analyzes an individuals' housing type, household, and energy consumption.	
Challenge: 1. The learner utilizes hotspots and analyzes the immediate environment to gather necessary information. 2. The learner measures the percentage of renewable energy and calculates the house size used in the given scenarios.	
AI image prompt: 360° image A row brick house in a green neighborhood, filled with solar panels on the roof of the house, street view perspective, lights shining from inside, four trash bins, no people.	
Tools and media: • 360° scene with different hotspots https://unsplash.com - solar panel • Trash bins (2D scene) Self-recorded audio *AI image prompt: Two full green trash bins with T. Green written on them, friendly neighborhood, trees in the background.* • Front door (2D scene) *AI image prompt: Front door, one doorbell sign for Green Taylor, one doorbell sign for Green H.* • Information panel (ThingLink 2D scene) *AI image prompt: Brick house wall, information panel showcasing a house.* https://www.canva.com - leaflet • Self-recorded: Background music & character	**Answer key:** Row house (housing type); brick construction (material); lights on (yes - access to power); solar panels (renewable sources - roughly 43%) →3600 kWh : 8429 kWh x 100 = 42,7% Taylor has more trash than his neighbor Number of people (3 - household) 16.4m x 22.19m = 364m2 (house size); This house has passive heating, ventilation, advanced temperature control, and low electric use. (Efficiency-centered design)
Hint: -	Time: 10 minutes

Story title - scene 3: Transportation	
Narrative: In the third scene, "garage," the learner listens to an individual's travel activities and preferred modes of transportation. Each piece of information provides necessary data for further calculations.	
Challenge: 1. The learner calculates the average fuel consumption of a car and motorbike. Additional hotspots and a monologue provide information about the individual's travel habits.	
AI scene prompt: 2D image Garage in a green neighborhood, street view perspective, one car inside the garage, broken scooter, train tracks in the background	
Tools and media: • Car interior with dashboard (360° scene) *AI image prompt: Fancy black car interior, dashboard.* https://www.canva.com - Sticker • Broken motorbike https://sketchfab.com/ - 3D model https://openai.com - technical data • Storyline Self-recorded audio https://openai.com - story • Highest consumption category • Self-recorded: Background music	**Answer key:** 632 km per week 632 km : 39,5L = 16L per 100km No carpooling Motorbike not in use; 3.9l/100kms or 60mpg (average fuel consumption) 4 (x2) x 47km = 376km by train 3 x 73km = 219km by bus Bus + train = 595km in total 13h x 4 = 52h spend flying/year Mobility (see calculator summary)
Hint: -	**Time:** 10 minutes

Final scenes: Learner's share their findings to the board of GreenGrove
Task: Your final task to officially become a GreenGrove guardian! Submit your information on the 'Earth Overshoot Day,' the number of Earths required to sustain Taylor's current resource consumption, and additional relevant facts and data into the Google Form. Share solutions for effectively taking positive actions in response to this scenario. Write a brief 150-word speech expressing your personal stance and thoughts on the outcomes to convince the GreenGrove board to officially announce you as guardians and give you approval to make changes on behalf of the town. Good luck!

<table>
<tr><td colspan="2">AI scene prompt: 2D image
One person standing in front of the GreenGrove board members, a large table, big windows, various plants in pots.</td></tr>
<tr><td>Tools and media:
• Self-recorded: Narrator (last task)
https://forms.gle/VRi6EvRGn19Szs8w7 - Google Form
https://trello.com - collect solutions

• GreenGrove guardian statue (reflection)
https://forms.gle/AvGaVzCPfjozU4AU7 - Google Form
Self-recorded audio
AI 360° image prompt: On top of a hill showing two golden statues, surrounded by a city, hilltop with grass, forests and rivers.</td><td>Answer Key:
Sust4in4bility

GreenGroveGuardian!</td></tr>
<tr><td colspan="2">Time:
15 - 20 minutes</td></tr>
</table>