

SDG13 Climate Change Engage Game Design



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Lesson 9: Working with Nature: Nature-Based Solutions & Green Infrastructure

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: Working with Nature: Nature-Based Solutions & Green Infrastructure

How and why should we rethink the way we design our villages, towns and cities?

Adapting to climate change involves rethinking how we design the places where we live, work and play. This lesson introduces learners to the closely associated concepts of 'nature-based solutions' and 'green infrastructure'. Key terms related to these concepts are defined. The lesson challenges learners to rethink how and why the places they are familiar with could and should be redesigned.

Vocabulary: Biodiversity; Connectivity; Drainage Management; Green Infrastructure; Green Roof; Green Wall; Habitat; Mutual Benefit; Multi-functionality; Nature-Based Solutions; Resilience.

In this lesson, the learner will:

- develop an awareness of 'why' we should design with nature and 'how' we can do this
- be introduced to the concepts of nature-based solutions and green infrastructure
- scan for specific information
- summarise and paraphrase
- share opinions
- apply new concepts

Materials

- Flipped Classroom: Vocabulary
- Video: 'Nature-Based Solutions'
- Poster size paper
- Markers, coloured pens

4 QUALITY EDUCATION



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



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Activity Instructions

Activity 1 Defining Key Vocabulary (15 mins)

1. Watch the video recording: 'Nature-Based Solutions & Green Infrastructure'.
2. Divide the learners into small groups of 4-5. Ask the learners for any words from video they don't understand. Write these words on the board. Allow 5 minutes for each group to complete Steps 1-3 below. Allow an additional 5 minutes for Step 4.
 - Step 1: Allocate each group a word from the board (or a word from the vocabulary list) to become an expert in.
 - Step 2: Each group brainstorms what the word means (own ideas).
 - Step 3: Using dictionaries and/or online resources, each group researches the meaning of the word.
 - Step 4: Nominate a person from each group to explain the meaning of their group's word to the class, inclusive of examples.

Activity 2 Applying Concepts (35 mins)

1. The learners stay in their groups from Activity 1. Follow Steps 2-6 below.
2. Each student group draws a map of the neighbourhood in which the school is located, noting the main landmarks, such as roads, shops, churches, housing estates and parks.
3. Instruct each group to use the 'green infrastructure' approach shown in the video [from Activity 1] to suggest and draw on their map three key nature-based solutions they could introduce to enhance the climate change resilience of the neighbourhood.
4. Explain that each suggested solution they come up with should connect with the principles of the green infrastructure approach that is in the video (Activity 1), namely that each solution should: (a) be able to be used for many purposes [multi-functionality], b) provide benefits for people and nature [mutual benefit], and (c) provide opportunities for animals, people and water to move around [connectivity] - see example of a woodland in the video.
5. Encourage learners to use online resources to identify and examine examples of nature-based solutions/green infrastructure ideas that they may find inspiring.
6. Inform the learners that they will have an opportunity to work on their maps in the next lesson. Ask the learners to continue thinking about what they have learnt in class and develop ideas for inclusion on their map in the next lesson.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

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EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson,

Option A: reduce the amount of time in Activity 1 by using Lesson 9's flipped classroom worksheet. Divide the learners into groups and have each group complete the Flipped Classroom worksheet on vocabulary and the nature-based solution case studies. In class, learners share what they have learnt, discuss aspects of the case studies and, as a class, identify locations they are familiar with in the locality where they could introduce some of the nature-based solutions they have explored.

Option B: Have learners record their definitions and meanings digitally to create a collectively produced glossary.

Extension: For a longer lesson, each group takes a particular area in the locality and draws a larger, more detailed map of that area, and undertakes Activity 2, Steps 2 - 6. Assemble the maps produced by the different groups on a wall or on the floor. Each group explains what they have proposed regarding nature-based solutions. Discuss with the learners how the different proposals on the different maps now assembled into one giant map could be connected e.g., a connecting woodland, shrub-lined grassy walkway or wildflower-lined drainage channel.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Activity 1 video: 'Nature-Based Solutions & Green Infrastructure' <https://youtu.be/0nYJFzPoya0>

Additional Resources:

'Nature-based solutions for natural flood management', produced by Earthwatch Europe (1 min 39 secs): <https://youtu.be/-F6M3RWsJH0>

'Urban Nature-Based Solutions: What are they and why are they so important?' (3 mins 12 secs): <https://youtu.be/SRXx0QyxBFo>

'Urban Nature-Based Solutions: Buildings and Neighbourhoods' (3 mins 37 secs): <https://youtu.be/wlOj2R697GQ>

See also flipped classroom worksheet for further links on nature-based solutions

Local Trip / Expertise / Additional Work and Assessments

Visit the offices of the local authority (city or county council) to speak with town planners about the green infrastructure interventions they are making in the locality (or invite a planner from the local authority to speak to the class about this topic; this could be via Zoom).

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13 CLIMATE ACTION



Look up the meaning of these words and complete the first part of the worksheet. Using your own words develop definitions to create a glossary.

BIODIVERSITY

CONNECTIVITY

**DRAINAGE
MANAGEMENT**

GREEN ROOF

GREEN WALL

**GREEN
INFRASTRUCTURE**

HABITAT

MUTUAL BENEFIT

MULTIFUNCTIONALITY

**NATURE-BASED
SOLUTIONS**

RESILIENCE



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13 CLIMATE ACTION



Explore the websites below and make some notes for in-class discussion about each of the examples

Case Studies:

- Green Infrastructure in Worcestershire (9 mins 6 secs) produced by the Worcestershire GI Partnership conveys the green infrastructure concept in layperson's terms using examples from Worcester City:

https://youtu.be/etdPM_mUGK0

- AIPH Green City Guidelines' "Case Study Collection" webpage:

<https://aiph.org/green-city/guidelines/case-studies/case-studies/>

- Green Cities Europe "Best Practice Inspiring Projects" webpage:

<https://uk.thegreencities.eu/best-practices/page/2/>

- EU Repository of Nature Based Solutions "Case Studies" webpage:

<https://oppla.eu/case-study-finder>

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