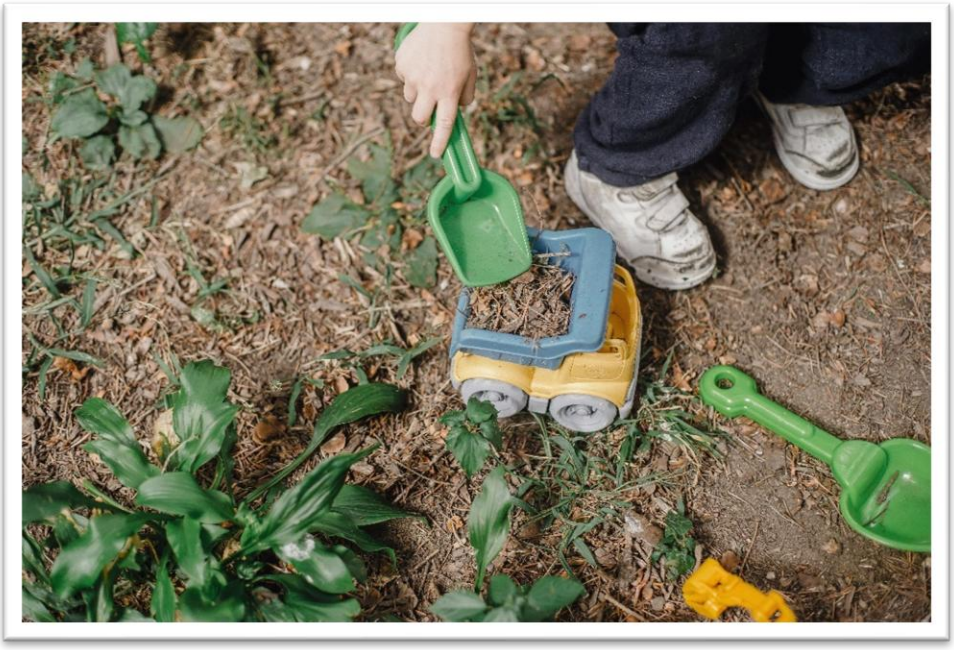
NATURE-BASED SOLUTIONS LEARNING ACTIVITIES FOR AGES 3 AND ABOVE

A Booklet for Non-Formal Educators



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Abstract	This set of Learning activities is designed to help educators, instructors and trainers in Youth Centers, Youth Camps, NBS and/or STEM Camps and other forms of non-formal instruction, bring the topic of nature-based solutions (NBS) to children and youth across Europe through structured and engaging approaches. The activities are divided into four indicative age groups (ages 3 to 16+) and are customized to various levels of knowledge about NBS, while also being linked to at least one of the GreenComp Sustainability Competence Areas and/or NBS societal challenge areas, and other applicable key skills and competences.
Keywords	Nature-based solutions; learning activities; non-formal education
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Introduction

This Booklet contains a set of **Learning activities** designed to help educators, instructors and trainers in Youth Centers, Youth Camps, NBS and/or STEM Camps and other forms of non-formal instruction bring the topic of nature-based solutions (NBS) to children and youth across Europe in an engaging and stimulating way.

The Learning activities can be easily replicated and modified according to educators' and children's / youth's needs, availability of resources and materials, and local settings. The activities are categorized into four indicative age groups (ages 3-6, 7-10, 11-15, and 16+) to facilitate the integration of the NBS topic based on the skills of the targeted participants in each age group. The difficulty level of each activity is represented in three categories that reflect the targeted NBS knowledge, e.g. "Fun and easy starters" (for beginners), "Getting the hang of NBS" (for those with some to average NBS knowledge), "NBS Experts in the making" (for those with advanced to expert NBS knowledge). Some of the activities include suggestions for alternative versions, and/or links to other activities from this Booklet.

The Learning activities are linked to at least one of the GreenComp[1] Sustainability Competence Areas and/or at least one of the 12 NBS societal challenge areas, as well as other key skills also relevant to formal education. In this way, "Nature-Based Solutions Learning Activities For Ages 3 and Above. A Booklet for Non-Formal educators" provides a bridge between the NBS knowledge (to be) obtained in non-formal and formal education settings, in order to enable the transferability of the knowledge and its lasting effect in each of the age groups.

NATURE-BASED SOLUTIONS (NBS) RESOURCES

This Booklet understands the term **"nature-based solutions" (NBS)** as: **"...** solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions. Nature-based solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem services."[2]

To use these Learning Activities more effectively, educators are encouraged to:

- Check out the list of **recent EU publications on nature-based solutions**.

[1] The GreenComp Framework. Digital version. Available at: https://education-for-climate.ec.europa.eu/community/book-page/greencomp-framework-digital-version
[2] Definition of nature-based solutions by the European Union. Available at: https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions_en

- Learn about the European Union's **GreenComp framework** for sustainability competences and how these can help students develop other skills
- Browse the **NBS EduWORLD portal** with information on projects, databases and resources related to NBS education, as well as the **teacher-specific resources** developed by NBS EduWORLD.
- Search for inspiration in **the Learning Scenarios** developed during the Integrating Nature-Based Solutions in Education Pilot (funded by the EC and coordinated by PPMI, in collaboration with EUN).
- Read about **Nature-based solutions: Transforming cities, enhancing well-being** (also available as a detailed PDF).
- Learn more about nature-based solutions by looking at NBS case studies in repositories, such as **NetworkNature**, **Oppla** and **Urban Nature Atlas**.
- Contact local NBS practitioners or scientists working in your area (they can be found through **Oppla**).
- Use the **"Ask Oppla"** and **NetworkNature Helpdesk** service to request help in case of any technical/scientific question on NBS.
- Read about the European Union's **European Green Deal** to understand the current EU strategy on climate change and COVID recovery
- Read the European Union's **Biodiversity Strategy 2030** to learn about the challenges Nature faces in Europe
- Stay up-to-date with the latest news in the NBS education sector.

ABOUT NBS EDUWORLD

The "Nature-Based Solutions Education Network" (**NBS EduWORLD**) is a European Commission-funded Horizon Europe project (Grant Agreement No. 101060525) that aims at nurturing an NBS-literate society, supporting a just transition to a sustainable future. For this, NBS EduWORLD creates an NBS community that facilitates synergies between NBS professionals and education providers and ensures free and easy access to NBS knowledge and resources for all. The project's Consortium comprises 16 partners from 13 European countries, all of whom visionary organizations and leading NBS / education stakeholders across Europe, who work together in the creation of an NBS EduWORLD, a community that makes a difference.

This booklet is supported by **Scientix**, the community for science education in Europe. Scientix® is an initiative of European Schoolnet.

A. LEARNING ACTIVITY FOR AGES 3-6

A1. "NBS – what's that about?"

Abstract

This beginner-level Learning activity presents the concept of nature-based solutions (NBS) in non-formal education to children aged 3-6 through discussions, use of relevant pictures and exchange of ideas.

Keywords

Nature-based solutions; sustainability; introduction; discussion

Description of the activity

To engage children in the concept of nature sustainability, educators start a discussion with questions, such as: *What is nature? Where can we find nature around us? Do we interact with nature in our everyday lives?*. Older children may contribute to the conversation, acting as a role model for the younger ones. Children add their responses to the first inner circle of a big poster with three different concentric circles by any medium they want (colouring, writing). In the next stage, educators start another topic, asking: *What problems does nature face? Is everything in nature as it supposed to be? Do we hurt nature with our activities?,* with picture prompts displaying problems that nature faces at local level in their country (natural disasters, etc). In this case, educators display pictures of floodings and wildfires. They use age-appropriate pictures and language, e.g. avoid using words like "disaster". While the discussion focuses on the broader impact on both nature and humans, educators help children add their responses in the second circle of the poster. Finally, in the third stage, educators ask: *How does nature solve these problems? How do humans solve these problems? How can we help?,* and help children understand that humans can take inspiration from what nature does to deal with such problems. They make the following suggestions and provide pictures to support their arguments:

- Nature deals with wildfires' impact by the plant life cycle. Humans can do the same.
- Nature has plants that can absorb a lot of water. Humans can take inspiration from that and plant such plants around areas where there are a lot of floods.

Children represent these discussions by colouring or writing within the outer circle of the poster.

Outcome of the activity

Through this Learning activity, students will gain basic understanding of the concept of nature-based solutions, which would provide a good basis for follow-up activities, related to NBS.

Additional information

Difficulty	Activity for: fun and easy starters
Indicative activity time	7' per discussion topic, followed by the coloring and drawing sessions (10' each), ~ 50' total time.
Material(s) used	• A2 / A1 / A0 paper (posters) • Colouring pencils • Colouring markers • Other materials (as available): stickers, finger paint, newspaper clippings, magazine clippings (for the work on the poster) • Pictures of natural disasters and societal challenges; water pollution, wildfires, deforestation, floods and other problems that nature faces • Pictures of trees, mountains, seas, rivers, plants, parks, forests, valleys, volcanoes, lakes and other natural elements
Suggested follow-up activities	Any activities presented for this age group
Variations	Educators may choose to lead the different stages of this activity during different days, depending on the needs of the children.
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Systems thinking **Area: Envisioning sustainable futures** ☒ Exploratory thinking
Link to Trends	Informal Learning, Visual search and learning, Collaborative Learning
Link to 21st century skills	Creativity, Collaboration, Environmental Literacy
Link to subjects / formal education	Environmental Studies

A2. "A plant anthology!"

Abstract

This is a continuous intermediate-level Learning activity, where children aged 3-6 explore their natural surroundings to collect and analyse leaves of plants, flowers and herbs indigenous (native) to the local environment, plant seeds and employ other populating practices to promote biodiversity preservation within nature-based solutions (NBS).

Keywords

Biodiversity; exploration; leaves; anthology; nature-based solutions

Description of the activity

Children are taken on short field trips to selected local areas, and are asked to identify the area they think is most in need of more plants and green spaces. For the upcoming weeks, children are encouraged to gather leaves of plants and trees native to their area, and to collect them in a block with papers or a notebook. Children are told that these will be their plant anthologies, with a short explanation by the educator of what that means: "Collection of plants', herbs' and flowers' leaves". Children benefit during this activity from the support of other educators/adults, and when possible, parents/guardians are also involved, aiding children during outings to gather new leaves. Children exhibit their collection each time they have an addition to it. They describe the plant leaves and educators help them identify them. To be able do that, educators should be familiar with the most typical flora in their local environment. After enough leaves are collected, children are taken to the destination that was deemed in need of more green spaces. Educators show children different pictures of the leaves they have been collecting and ask them to compare them to the predominant plants in the area, thus making meaningful connections. After the top three plants are identified, children are encouraged to plant the corresponding seeds for each plant in the targeted area, or employ other populating practices (i.e. cutting a leaf, leaving it in water until it grows roots, then replanting it, etc.). Before planting, educators explain why it is important for biodiversity preservation that the correct species are planted (and at the correct time), and why some species should not be planted there (linking again to maintaining biodiversity based on local nature / species).

Outcome of the activity

This Learning activity is expected to enhance understanding of the importance of biodiversity and biodiversity preservation.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	Depends on the trips organized (e.g., from 1/2 day to several days), number of presentations per child, places that children decided need greenifying, etc.

Additional information

Material(s) used	• Block with papers/ spiral notebooks/any other alternatives • Leaves from indigenous plants and trees • Pictures of indigenous plants and trees that children collected • Seeds of indigenous plants and trees
Variations	• Educators may choose to do this activity any time of the year and during any season since each ecosystem has annual, perennials and evergreen plants. Additionally, educators may choose to have this activity as an on-going one throughout the year. In this way children get to explore the differences of plants in different seasons. • Educators may choose to organize a celebration displaying the children's collections and actions taken during this activity.
NBS resource(s) used	• Article on the importance of planting the correct species, e.g.: https://www.nationalgeographic.com/magazine/article/how-gardening-with-native-plants-can-teach-kids-eco-stewardship
Link to NBS Societal Challenge Areas	☒ Biodiversity enhancement
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Futures literacy **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Informal Learning, Project-based Learning, Outdoor Education
Link to 21st century skills	Environmental Literacy, Oral Communication, Initiative
Link to subjects / formal education	Environmental Studies

A3. "Mussels hard at work"

Abstract

In this intermediate-level Learning activity for non-formal education, adapted from the Learning Scenario "Let the mussels clean the oceans", children aged 3-6 discuss the ecological challenges faced by water ecosystems. Using mussels as a "living" nature-based solution (NBS), the activity provides knowledge on the functions of the mussels, as well as the opportunity to observe them in action.

Keywords

Mussels; water cycle; oceans; nature-based solutions

Description of the activity

Children are exploring the importance of water. After learning more about the water cycle and its importance to all living organisms (example of a video below), children benefit from age-appropriate discussions on the main challenges that water ecosystems face in today's world. Some indicative questions that educators ask are:

- How does water help us and other living things?
- Why do fish and plants in the sea need clean water?
- What happens when trash gets into the water?
- What can we do to help keep our water clean?
- How can we make sure we don't waste water?

In the second stage of this activity, children are divided in groups and are asked to create a poster showcasing these challenges. This poster is used to promote a second discussion about all the ways humans could help mitigate the dangers that come with these challenges (when possible, pictures are used as well to help children understand the challenges, as this concept can be abstract). Specific focus is placed on the fact that humans can take inspiration from ways that nature itself deals with such challenges. In the third stage of this activity, a story is read to the children, inspired by the "Let the mussels clean the oceans" Learning Scenario. In the last stage of this activity, a fish tank is introduced to children. The fish tank has two little fishes and two mussels. Children are invited to observe the fish tank weekly. To illustrate how mussels clean the oceans, small pieces of plastic are thrown in the fish tank. Children are asked to observe and see how long it will take for the mussels to clean the tank. To speed up the process in case time is limited, educators may remove the plastic pieces and attribute this to the mussels, simulating the effect they had in the story and making this type of NBS alive for children. In this way, children are inspired about actions they can take to protect or populate mussels and adopt NBS to tackle environmental challenges.

Outcome of the activity

This Learning activity evokes curiosity about marine life, and touches upon the importance of biodiversity preservation and reducing pollution in the water ecosystems.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	~2.5h
Material(s) used	• A4/A3 paper (posters) • Coloured pencils • Coloured markers • Fish tank • Fish
Variations	• Educators may choose to follow the activities mentioned in the NBS Learning Scenario "Let the mussels clean the oceans" (https://www.scientix.eu/resources/details?resourceId=129913) and adapt them to their needs. • Educators may choose to provide more resources regarding the water cycle and allow children to explore more facts about it (more videos, stories, books anything that is available to them).
NBS resource(s) used	• Video explaining the water cycle, e.g.: https://www.youtube.com/watch?v=TD3XSIE4ymo • Learning Scenario on mussels cleaning the ocean, e.g.: https://www.scientix.eu/resources/details?resourceId=129913 • A story, inspired by the mussels-related Learning Scenario, where mussels are cleaning the oceans (created by educators based on children's interests) • Article on how to get hold of mussels' eggs or adult mussels, e.g.: https://www.wikihow.com/Farm-Freshwater-Mussels
Link to NBS Societal Challenge Areas	☒ Biodiversity enhancement ☒ Water management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Adaptability ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Individual agency

Additional information	
Link to Trends	Informal Learning, Playful Learning
Link to 21st century skills	Problem-solving, Environmental Literacy
Link to subjects / formal education	Environmental Studies

A4. "The Mini Beasts' Hotel"

Abstract

In this intermediate-level Learning activity for non-formal education, while learning about mini beasts, children aged 3-6 participate in a scavenger hunt, discuss biodiversity topics and create their own "Mini Beasts Hotel" to promote knowledge about insect ecology and nature conservation.

Keywords

Mini beasts; hotel; ecosystems; biodiversity; nature-based solutions

Description of the activity

First, children learn about the importance of "mini beasts" (very small creatures, such as insects, spiders, and other invertebrates) and their contribution to ecosystems. Educators use an educative video to stimulate children's curiosity and motivation. Then, a Scavenger hunt is organised for them at a local park/forest, when children are trying to find mini beasts and explore them in their natural habitat. Next, children are divided in groups and create a big poster with their observations and lessons learned during their trip. This poster is used by educators to talk to them about the importance of biodiversity, as well as the fact that some mini beasts are facing extinction (i.e. bee). After brainstorming solutions and ways, with which children can help mini beasts, the concept of a mini beasts' hotel is presented to them. Educators also present some pictures of mini beasts' hotels to stimulate their imagination. After that, they are given the task to design a mini beasts' hotel themselves, specific to cater their favourite mini beasts. For the creation of the mini beasts' hotel, a second trip to the park/forest is organised, when children are asked to gather natural materials, they think will fit their design best. During the last stage of this activity, children start building their mini beasts' hotel and choose a suitable location in the yard to place them. By creating mini beasts' hotels, children engage with nature, learn about insect ecology and contribute to biodiversity / conservation efforts.

Outcome of the activity

At the end of the Learning activity, children are expected to have (improved) knowledge of "mini beasts" and their role in maintaining the different ecosystems.

Additional information

Difficulty	Activity for: NBS experts in the making
Indicative activity time	~4h. It varies depending on the time that children will spend on their trips, creating their posters, crafting mini beasts' hotels etc.
Material(s) used	• A4/A3 paper (posters) • Colouring pencils • Colouring markers

Additional information

	• Pictures of mini beasts' hotels. Link: Mini beasts hotels handmade kindergarten - Google Search • Natural materials
Variations	• Educators may choose to create one big mini bests' hotel or divide children in groups and ask them to create one for different types of mini beasts (bees, butterflies, beetles etc.). • Educators may choose to lengthen the initial part of this activity and present various materials about mini beasts to children (more videos, stories, books, poems, anything that can be accessible to them).
NBS resource(s) used	• A Video about Minibeasts, e.g.: https://www.youtube.com/watch?v=snhD7vnKh94
Link to NBS Societal Challenge Areas	☒ Biodiversity enhancement
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Informal Learning, Playful Learning, Project-based Learning, Outdoor Education
Link to 21st century skills	Creativity, Teamwork, Adaptability, Collaboration, Environmental Literacy
Link to subjects / formal education	Environmental Studies, Art Education (Arts and Crafts)

A5. "Try this, instead of that"

Abstract

In this intermediate-level Learning activity for non-formal education, children aged 3-6 discuss the effects of pollution caused by materials they use in their artworks, and the benefits of using natural materials instead, to promote understanding towards the (re-) using natural resources, with a look back at the nature-based solutions (NBS) introduced previously.

Keywords

Pollution; alternatives; artworks; nature-based solutions

Description of the activity

During this month, children focus on the pollution caused by materials they use as part of their activities. Discussions are led by educators who help children record their answers and reflections on a mind map by choosing any media they want (writing, drawing, using symbols etc.). While building on their awareness of NBS solutions, children begin to explore alternatives to pollutants like paint, plasticine, glue etc. A discussion is first led with children sitting in a circle. In the center of the circle, children are presented with natural materials and resources. Help is provided for them to start making connections between the pollutant materials they are using in their everyday life, and their natural alternatives (see materials listed below as examples that could be used). A list is made listing these alternatives. In the last stage of this activity and in the following weeks, children explore weekly the advantages and disadvantages of specific natural resources as a form of NBS, and brainstorm ways to improve them. They do that by being reminded and prompted by educators to choose the natural alternatives over the conventional materials they would normally use. At the end of the activity, children can create artworks/ arts and crafts with the natural alternatives.

Outcome of the activity

This Learning activity builds on children's initial understanding of NBS, as well as introduces the benefits from the use of natural resources versus man-made ones, in one of their favourite activities: arts and crafts.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	~1h for the completion of this activity. Children benefit from it, however, throughout the year when a natural alternative is being used instead of conventional materials, depending on the season.
Material(s) used	• A4/A3 paper • Example of list of alternative natural materials:

Additional information

	• Instead of playdough = a playdough made of sand, mud, flour, oil, and food coloring. • Instead of paint = mud water, water colored from herbs, flowers etc. • Instead of crayon = beewax crayons • Instead of glue = plant-based glue (made of flower) • Instead of glitter = dry and break down leaves • Instead of stamps = use potatoes and plant-based paint
Variations	• Additional practice of several art skills can benefit children's understanding of NBS.
Link to NBS Societal Challenge Areas	☒ Air quality ☒ Water management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Adaptability ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Individual agency
Link to Trends	Informal Learning
Link to 21st century skills	Problem-solving, Critical Thinking, Environmental Literacy
Link to subjects / formal education	Environmental Studies, Art Education (Arts and Crafts)

A6. "Hand-made compost area"

Abstract

In this intermediate-level Learning activity for non-formal education, by creating their own compost area through the nature-based solutions (NBS) perspective, children aged 3-6 learn about the benefits of waste reduction and soil regeneration practices, as well as touch upon some elements related to circular bioeconomy.

Keywords

Soil; soil regeneration; waste management; nature-based solutions

Description of the activity

As part of targeted practices to raise awareness about NBS, children explore the advantages of having a compost area. This helps them understand the benefits of waste reduction and soil regeneration practices. Additionally, it helps them think of cost-efficient ways to boost the success of other activities (i.e. "A garden up in the air"; "Edible garden"), as they can use the soil from the compost areas as fertilizer, mulch, nutrient soil, and compost tea (circular bioeconomy). In each step of the process, children are guided by educators. To begin, a designated area is determined in the yard, and a container/bin is placed there as the compost's area. In the second stage of the activity, children are guided on how to add the different parts of waste (most of which they have been collecting), in which sequence, as well as when to add water, mix, and leave the compost to rest during determined periods. Educators share their insights about each stage, the reasons why they are taken, as well as difficulties to be expected. After the compost creation, children decide how to use it, based on the yard's needs and their on-going projects.

Outcome of the activity

Through this Learning activity, children deepen their knowledge of NBS practices related to soil.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	~1h
Material(s) used	• Compost bin or container. • Shovel or pitchfork. • Water. • Green materials: kitchen scraps, coffee grounds, pruning discards from fresh plants, and grass trimmings. • Brown materials: fallen leaves, shredded tree branches, cardboard, newspaper, hay or straw, and wood shaving

Additional information

Suggested follow-up activities	A garden up in the air; My edible garden
Variations	• Educators may designate different areas and divide children in groups, telling them that these areas will be their own compost pits. Children can then compare the results of this activity.
NBS resource(s) used	• Video tutorial showing the steps for creating compost, e.g.: https://www.thespruce.com/how-to-make-compost-p2-1761841
Link to NBS Societal Challenge Areas	☒ Green space management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Systems thinking ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Adaptability ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Individual agency
Link to Trends	Informal Learning, Collaborative Learning
Link to 21st century skills	Environmental Literacy, Initiative, Adaptability
Link to subjects / formal education	Environmental Studies

A7. "My edible garden"

Abstract

In this advanced-level Learning activity for non-formal education, children aged 3-6 discuss their favourite fruit and vegetables, followed by planting some of them to create an "edible garden". In the process, children learn about biodiversity, useful practices of growing crops, and how biodiversity preservation through farming practices as nature-based solutions (NBS) could help solve some of the current societal problems.

Keywords

Nature-based solutions; biodiversity; garden; planting

Description of the activity

Children explore the natural processes of producing food by planting and eating the products of an "edible garden". To check their knowledge and build a common understanding, the educator starts a conversation on "What did you eat today?"; to identify their favourite fruit and vegetables. Then, children are divided in groups and are asked to create a poster showcasing their favourite local vegetables, fruit, and herbs. After they present their posters, children try to find out their top 5 choices. When their favourite ones are identified, educators reveal to them that they will be planting some of them (indigenous to the local environment, also taking into consideration possible allergies), creating in this way an "edible garden". The second stage of this activity includes the planting and caring for the crops in designated areas in the yard. In this process, children are learning more about the importance of biodiversity, soil health, and sustainable food production. In the third stage of this activity, children can enjoy the results from working on their edible garden (why not at a big gathering?). Children also benefit from discussions and connections made by educators between this activity and its contribution as a biodiversity-friendly solution to many societal problems (i.e. poverty, food scarcity, etc.).

Outcome of the activity

This Learning activity raises awareness about biodiversity, crops planting as a source of food production, and societal problems related to the availability of food.

Additional information

Difficulty	Activity for: NBS experts in the making
Indicative activity time	2h
Material(s) used	• A4/A3 paper (posters) • Pencils/pens/colored pencils/markers • Seeds of the selected vegetables, fruits, and herbs

Additional information	
Suggested follow-up activities	Mini Beasts' Hotel
Variations	• Educators may choose to have an open-air celebration and promote NBS while donating the vegetables to people passing by and letting them know about the children's initiatives. • Educators should check and verify whether the soil is fit for planting. If not, other alternatives can be provided ("small" edible gardens in pots etc).
Link to NBS Societal Challenge Areas	☒ Green space management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Adaptability **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Informal Learning, Outdoor Education, "Snack Learning"
Link to 21st century skills	Collaboration, Teamwork, Problem-solving
Link to subjects / formal education	Environmental Studies, Social Studies

A8. "Bird houses and bird feeders"

Abstract

In this advanced-level Learning activity for non-formal education, children aged 3-6 explore the animals/birds species living in trees, and discuss the dangers they face in their natural habitats because of humans. Children then build homes using natural resources, to promote the use of nature-based solutions (NBS) for biodiversity preservation.

Keywords

Biodiversity; animals; houses; trees; nature-based solutions

Description of the activity

Having as a goal to increase children's awareness about challenges related to biodiversity, children watch a video, which is a read-aloud story about all animal/bird species that live in tree trunks. Before children watch the video, they are asked to brainstorm different animals that use trees as their homes (birds, foxes, monkeys, etc.). When a sufficient number of examples is discussed, a hypothetical scenario is presented to them in the form of a question "What will happen to all these animals if we keep cutting down trees?". In the second stage of the activity, after children watch the video, educators take them on a short trip to a local park/forest. Their task is to observe trees and identify animals that might live there. Then children are asked to gather natural resources from all around (twigs, leaves, rocks, etc.). In the third stage of the activity, educators guide small groups of children to make bird houses and / or birdfeeders as a way to help birds that use trees as a home to overcome the challenges created by excessive logging, and to help bird feeders to attract birds to their new homes.

Outcome of the activity

This Learning activity raises knowledge about biodiversity through the exploration of species living in the forest, and the creation of homes for them by nature-based solutions (natural resources).

Additional information

Difficulty	Activity for: NBS experts in the making
Indicative activity time	~2.5h, depending on the time spent on the trip
Material(s) used	• Read-aloud story video on animals living in trees, e.g.: https://www.youtube.com/watch?v=ylwa4mMV4qc • Natural resources/materials • Resources on how to make birdhouses and birdfeeders, e.g.: ○ https://thehomeschoolscientist.com/easy-to-make-bird-feeders/

Additional information

	○ https://www.youtube.com/watch?v=deER614zEb4
Link to NBS Societal Challenge Areas	☒ Biodiversity enhancement ☒ Health and well-being
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Adaptability ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Individual agency
Link to Trends	Informal Learning, Project-based Learning, Playful Learning
Link to 21st century skills	Environmental Literacy, Problem-solving, Critical Thinking
Link to subjects / formal education	Environmental Studies, Art Education (Arts and Crafts)

A9. "A garden up in the air"

Abstract

In this advanced-level Learning activity for non-formal education, children aged 3-6 explore their immediate surroundings to view the problems associated with the lack of natural elements. Then, they create their own vertical garden as a way of tackling some of these issues through nature-based solutions (NBS).

Keywords

Nature-based solutions; vertical garden; green spaces

Description of the activity

Children are being taught about the benefits of nature and how natural elements (NBS) can help humans deal with a lot of problems (e.g., activity "NBS-What's that about?"). The discussion is being directed to the building's yard and the problems that can be encountered there. By focusing on topics, such as promoting green spaces, air quality, aesthetic enhancement in an age-appropriate way, they are learning more about problems and looking into how to address them with NBS. Educators lead the discussion and try to help children learn more about possible NBS that can help tackle the problems that are associated with the building. Among the NBS that are being discussed, educators reveal to children that they will be making vertical gardens. As children are activating their previous knowledge on NBS and creating a good foundation for this activity, they are also asked to gather transparent containers (jars or plastic bottles). Children are made aware that these will be used as pots. When all materials are ready, children are instructed to add seeds of their favourite local herbs, plants, and flowers. Educators are helping children to connect their containers together with threads. The end of the thread is used to hang the transparent pots on a wall, outside in the yard. After the potting is completed, children are rotating the role of the "plant waterer" and spray water on them daily. When the vertical garden blossoms, children enjoy their work in a celebration.

Outcome of the activity

Children work on their observation skills, learn to define key environmental problems, and look for their solutions through NBS.

Additional information

Difficulty	Activity for: NBS experts in the making
Indicative activity time	2h
Material(s) used	• Transparent containers • Seeds of plants, flowers, herbs • Thread

Additional information

NBS resource(s) used	• An example of a vertical garden project, e.g: https://www.youtube.com/watch?v=UCtAQOP3xuk
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Knowledge building for sustainable urban transformation
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Informal Learning, Project-based Learning, Playful Learning
Link to 21st century skills	Environmental Literacy, Adaptability, Initiative
Link to subjects / formal education	Environmental Studies, Biology

B. LEARNING ACTIVITIES FOR AGES 7-10

B1. "Nature storytelling: wildfires"

Abstract

In this beginner-level Learning activity for non-formal education, children aged 7-10 will first learn about nature-based solutions (NBS) and their importance though meaningful discussions. This will be followed by storytelling to raise awareness of the challenges faced by animal/bird species in their natural environments because of the harmful impact that humans inflict on nature.

Keywords

Nature-based solutions; natural disasters; wildfires

Description of the activity

Educators take children to the nearest park for a short field trip, where children first explore their surroundings, then sit down in a circle. Educators begin a discussion with children, using specific questions such as: "What is Nature?", "What problems does nature face?", and "How does nature solve each problem?". Educators place different pictures on the ground to stimulate children's imagination and activate their knowledge. The pictures correspond to answers to the questions. The discussion goes on until children understand that humans can take inspiration from the way nature handles a lot of problems in a natural way (i.e. through nature-based solutions). At the second stage of the activity, educators create a transcript of the story of an animal caught in a wildfire, e.g., "Birdie and the fire", so they can read it out loud to them. Children explore deeper connections to the story by reflecting to questions, such as:

- Who was your favourite character?
- What did your favourite character do?
- How did your favourite character survive the danger?
- How do you think that your favourite character felt when they had to face the wildfire?
- Have you ever heard of a wildfire? Where was it? What did you feel?
- What do can you do if you see a wildfire?

Children now watch the video, e.g., "Birdie and the fire" on an electronic device. Then, they are encouraged to create a small play based on the story they heard. They create characters, scenarios of activities before the wildfires, the scenes of the wildfires, and finally, recovery practices.

Outcome of the activity

This Learning activity provides basic understanding of nature-based solutions through meaningful discussions, real-life examples and storytelling.

Additional information

Difficulty	Activity for: fun and easy starters
Indicative activity time	~1h or more depending on how long children are engaged in role playing.
Material(s) used	• Electronic device, e.g. laptop, tablet, or similar • Pictures of natural habitats, natural disasters, and nature-based solutions. • A video showing the story of a bird in a wildfire, e.g. Birdie and the fire: https://www.youtube.com/watch?v=N6wHhH8R2JA • A transcript of the story from the video • Props (optional)
NBS resource(s) used	• Education resources on nature-based solutions from resource repositories, e.g. those of NBS EduWORLD, Oppla, NetworkNature, etc.
Suggested follow-up activities	All activities presented for this age group
Variations	• This activity can be carried out in an indoor setting as an alternative. • Educators can record children's shows and/or invite parents to a short live event.
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Land regeneration ☒ Natural and climate hazards
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Playful Learning, Outdoor Education, Informal Learning

Additional information	
Link to 21st century skills	Environmental Literacy, Communication, Creativity
Link to subjects / formal education	Environmental Studies, Art Education (Drama)

B2. "Daylighting"

Abstract

In this beginner-level Learning activity, children aged 7-10 will learn about the effects of daylighting as a nature-based solution (NBS), which will then be supported by an exploratory trip to a local area to put the knowledge into practice.

Keywords

Daylighting; water systems; soil; nature-based solutions

Description of the activity

Children explore the concept of "daylighting" and its relevance as a nature-based solution, given that this practice entails the opening of buried watercourses, rivers, or drainage systems by removing the soil layers above. Educators help children understand further that daylighting allows rivers to have more space for eventual expansion, which can mitigate floodings and has positive effects on the environment and aesthetic of the surrounding areas. In the second stage of this activity, children are asked to pinpoint in the map areas, where they could practice daylighting by pinpointing locations next to rivers. When an area is chosen, children are taken on a trip there. After wearing protective equipment (gloves, boots, etc.), children are prompted to daylight freely.

Outcome of the activity

This Learning activity allows children to actively practice daylighting as a nature-based solution, thus gaining hands-on experience in flood prevention.

Additional information	
Difficulty	Activity for: fun and easy starters
Indicative activity time	~1.5h, varies depending on the time children will spend daylighting
Material(s) used	Map of the local area • Protective equipment (gloves, boots etc.) • Information sheet about daylighting: https://unalab.eu/sites/default/files/2021-06/NBS%20Cards.pdf
Suggested follow-up activities	Weekly gardening workshops
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Water management

Additional information

Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Playful Learning, Informal Learning, Outdoor Education
Link to 21st century skills	Communication, Collaboration, Initiative and Self Direction, Environmental Literacy
Link to subjects / formal education	Environmental Studies, Social Studies

B3. "Soil Investigation"

Abstract

Children aged 7-10 will, in this intermediate-level Learning activity related to nature-based solutions (NBS), participate in field trips in their local area to collect, and then explore, different soil samples through planting practices. Children then present their findings in a mini report, following observations and discussions.

Keywords

Soil; nature-based solutions; regeneration

Description of the activity

Educators take children on short field trips to different destinations in their local area. The goal is to gather samples of soil (at least four) to examine their quality and health. Children put the sample in different containers (i.e. small yogurt containers). After they gather their samples, children write down observations about each sample (e.g., how it looks, how it feels, how it reacts to water). When all four samples are gathered, children plant a sunflower seed in them. Based on the speed of germination and the quality of the plants that bloom, educators discuss with children and help them make conclusions about the soil types and their qualities. Based on the data collected, a graph is created by the children, and a risk area is identified. Children discuss the benefits of soil for biodiversity. Children then write a mini report, detailing their findings and suggesting next steps to apply soil regeneration practices as examples of NBS. Younger children may need more help from educators than older ones.

Outcome of the activity

This Learning activity supports soil exploration within the context of nature-based solutions and allows children to take small steps of "action" by proposing measures to restore soil in areas in need.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	Varies, depending on the destinations that will be picked. For the observations, final conclusions, and the letter composition, an approximate 1h is advised
Material(s) used	• Yoghurt containers • Spoons/ short shovel • Sunflower seeds • Paper • Pencils/pens

Additional information

Suggested follow-up activities	Seed packs
Variations	• Educators can involve the children in the soil regeneration activities as well. • Educators might choose to provide younger children that do not know how to write well yet with a template (a table with different cells for each item: how it looks, how it feels, how it reacts to water). This template can also have some predetermined visuals as possible responses so children can simply circle the response that best fits their experience (a smiley face = It looks healthy).
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Land regeneration
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Project-based Learning, Outdoor Education, Informal Education
Link to 21st century skills	Environmental Literacy, Problem-solving, Critical Thinking
Link to subjects / formal education	Environmental Studies, Biology, Chemistry

B4. "Designing rain gardens"

Abstract

In this intermediate-level Learning activity, children aged 7-10 explore the concept of "rain gardens" related to nature-based solutions (NBS), research local plant species, and then construct their own rain garden designs using natural resources they have gathered.

Keywords

Biodiversity; rain garden; designing; nature-based solutions

Description of the activity

Children are introduced, though videos, to the concept of rain gardens and their importance in managing stormwater runoff, conserving water, and supporting biodiversity. A discussion is then led about the challenges that rain gardens address, such as preventing erosion, reducing pollution, and replenishing groundwater. Children, during the second stage of this activity, begin to research and gather information about native plant species suitable for rain gardens, as well as the layout and features typically found in such gardens. Educators guide them in sketching a design for their rain garden model, considering factors like slope, water flow, and plant placement. Meanwhile, and as the designs are nearing their completion, children are tasked with gathering materials to construct their models with. Educators offer guidance when needed, as well as an already created model, to inspire children further. They advise children to gather cardboard or foam board for the base, natural materials to be used instead of typical craft supplies (twigs, stones, moss etc.), paper (so that children can draw plants and their features), and containers for simulated water. When all materials are gathered, children begin building their models in groups. Educators intervene when needed, and offer ideas and ways to deal with challenges as they arise, so children can benefit from further connection to the concept of rain gardens and their applicability as an NBS. At the final stage of this activity, educators encourage children to reflect on their experiences designing and building their rain garden models, discussing what they learned and how they can apply this knowledge to real-world situations. Depending on the needs of the children, the educator will: a) provide guiding questions to think individually, or b) divide the children in different groups to present in front of the others.

Outcome of the activity

Through this learning activity, children develop research and design skills, while creating rain gardens and gaining hands-on experience in environmental care and nature-based solutions.

Additional information

Difficulty	Activity for: getting the hang of NBS

Additional information

Indicative activity time	~4h, depending on the time that children want to dedicate on their models
Material(s) used	• Internet access (in this case a computer too) or other resources for children to conduct research • A4/A3 paper (for the design) • Coloured pencils • Coloured markers • Materials for the construction of the rain garden models (carton, threads, paper rolls etc.) • A completed rain garden model for inspiration • Natural resources/materials
Variations	• Given sufficient time and resources, educators may choose to involve children in a real-world construction attempt. • While exploring the concept of rain gardens, educators may choose to provide a short glossary of terms for the older students, and pictures for the younger ones. • For the research part of this activity, educators should ensure that older children (9-10) only have access to links and sites that are verified by them first. For the younger children (7-8), educators may choose to stick to books / magazines / print outs (whatever is available to them).
NBS resource(s) used	• Video on rainwater harvesting 3D mode, e.g.: https://www.youtube.com/watch?v=NvVVrp0Rcvs • Video tutorial on building a rain garden, e.g.: https://www.youtube.com/watch?v=Q2EoHBnCCII • Video on rain gardens, e.g.: https://www.youtube.com/watch?v=ZHeY6CUAS8s
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Knowledge building for sustainable urban transformation ☒ Land regeneration ☒ Water management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures**

Additional information	
	☒ Exploratory thinking **Area: Acting for sustainability** ☒ Individual agency
Link to Trends	Project-based Learning, Informal Learning, Playful Learning
Link to 21st century skills	Environmental Literacy, Collaboration, Communication
Link to subjects / formal education	Environmental Studies, Art Education (Arts and Crafts)

B5. "Weekly gardening workshops"

Abstract

In this continuous intermediate-level Learning activity for children ages 7-10, the importance of biodiversity preservation is discussed with a link to nature-based solutions (NBS), and different plant species are explored though weekly gardening workshops. Children take care of local plant species by learning and practicing a variety of gardening skills to help protect and nourish them.

Keywords

Biodiversity; preservation; planting; gardening; nature-based solutions

Description of the activity

Through NBS, children discuss the importance of biodiversity, planting the right species, and ways to protect biodiversity. Children participate in "hands-on" weekly workshops on gardening skills as a hands-on example of what they can do to protect biodiversity. Each week, an educator leads a workshop on a specific skill related to species children are planting / taking care of (e.g., checking when the plant needs water, when it needs repotting, proper trimming methods, etc.). Children participate in small groups, and they are given a weekly task when possible, so they can practice the targeted skills. At the end of each week, educators lead a discussion and ask children to self-assess their understanding of the targeted skills, which informs the educators about future considerations, while children are given the chance to practice sustainable gardening practices with a focus on biodiversity. At the end of the activity, children are reminded of the discussion they had before about biodiversity, and are asked to share what they have learned from the weekly gardening related to that discussion.

Outcome of the activity

This activity fosters hands-on learning and reflection on biodiversity conservation efforts.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	~1h per session
Material(s) used	• Equipment will vary depending on the targeted skill during each week.
Suggested follow-up activities	Pollinators amongst us
Variations	• When it comes to the self-assessment part of this activity, educators may choose to provide children with a template naming

Additional information

	the skill and possible responses that young children could choose from (i.e. visuals), or empty rows for the older children to freely provide their reflections.
NBS resource(s) used	• Video on biodiversity in the EU, e.g.: https://multimedia.europarl.europa.eu/en/video/x_N01-AFPS-210608-BIOD • Video on biodiversity for kids, e.g.: https://www.bbc.co.uk/bitesize/topics/z7c72v4/articles/z674g7h
Link to NBS Societal Challenge Areas	☒ Green space management ☒ New economic opportunities and green jobs
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Project-based Learning, Outdoor Education, Informal Education
Link to 21st century skills	Communication, Collaboration, Productivity and Accountability, Environmental Literacy
Link to subjects / formal education	Environmental Studies, Biology

B6. "Mini landscape architects"

Abstract

In this advanced-level Learning activity, children ages 7-10 learn about the career of a Landscape architect in nature-based solutions (NBS), and investigate their surroundings to see how a Landscape architect could improve them through NBS. Then, children design and discuss their own suggestions for improvement.

Keywords

Landscape architecture; green spaces; nature-based solutions; design

Description of the activity

Children are told that the focus this week will be on landscape architecture. A presentation is used about a landscape architect, showcasing the career's connection to NBS, as well as other important key job aspects (tasks, challenges etc.). Children are asked to continue brainstorming possible cases when the work of landscape architects can be useful in promoting NBS to tackling certain problems. For this part of the activity, slides are prepared by the educators and added to the same presentation. Educators lead the discussions and guide students throughout its duration. Reflections made by children are kept as notes in a new slide. In the second stage of this activity, children are taken to the yard and are asked to think carefully in groups about the different spaces that are of vital importance to them (football area, playground equipment). Then they are asked to identify some problems (lack of green, too much sun in certain spots etc). To reach a consensus, a spokesperson/team-leader is designed per group. After identifying some problems, children are divided in groups and are given the task to create posters depicting possible NBS. After that, they present their designs to one another. At the end of the presentation, children give feedback to each presentation (2 things they liked, and something that could be improved). To boost children's imagination, educators show them similar activities completed by other children. Lastly, the designs will pass from a second editing process, where children will be able to make changes based on the feedback they have received.

Outcome of the activity

With this Learning activity, children learn some basic principles of landscape architecture for NBS and address relevant issues they have identified.

Additional information

Difficulty	Activity for: NBS experts in the making
Indicative activity time	~1.5h
Material(s) used	• PowerPoint presentation (or equivalent) on landscape architecture • A4/A3 paper (posters for the designs) • Coloured pencils

Additional information

	• Coloured markers • Website with relevant designs to boost imagination, e,g.: https://sites.google.com/caue75.fr/cours-oasis/groupe-scolaire-laugier-fourcroy-renaudes#h.jp0k7sw08wlh
NBS resource(s) used	• Career sheet for Landscape architect in NBS, e.g.: https://www.scientix.eu/resources/details?resourceId=29125
Suggested follow-up activities	Designing rain gardens; Pollinators amongst us
Variations	• In the final stage of this activity, educators may choose to help children work towards turning some of their suggestions into reality (i.e. green corners in suitable spaces, creating a green path for people to cross from one side of the yard to the other). • Educators may choose the type of presentation they will use (PowerPoint, poster, whiteboard notes, direct instruction), based on their needs.
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Knowledge building for sustainable urban transformation ☒ New economic opportunities and green jobs
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Individual agency
Link to Trends	Vocational Education, Informal Education, Playful Education
Link to 21st century skills	Communication, Collaboration, Initiative and Self-direction, Leadership
Link to subjects / formal education	Environmental Studies, Vocational Education

B7. "Mini NBS Internships"

Abstract

This continuous advanced-level Learning activity presents children ages 7-10 with the opportunity to find out about several career pathways in nature-based solutions (NBS), discuss the skills needed for each, and roleplay them as experts and trainees.

Keywords

Nature-based solutions; roleplay; careers

Description of the activity

Children benefit from a presentation on different NBS careers and why such careers are important. The presentation includes slides aimed at grasping children's interest, as well as the main responsibilities for each career, a clear explanation why the career promotes NBS, and challenges and interesting facts about each of them. After the NBS careers are presented, children are asked to guess some more activities that these professionals do. In the second stage of this activity, children are prompted to divide themselves in groups based on their favourite career. Once the groups are defined, educators designate a leader in each team. The leader takes the role of the career expert and the rest of children in the group act as their trainees. The goal is for the leaders to help trainees perform different tasks during this role-playing game. After the agreed time passes, another leader is appointed within the team and a new cycle of tasks begins. Educators share feedback, explanations, or ideas about tasks with the children. This game can go on as long as educators see children engaged. Each week, new NBS careers are presented to children. Alternatively, they switch teams to focus on another from the previous week's careers.

Outcome of the activity

This Learning activity evokes curiosity about NBS careers.

Additional information	
Difficulty	Activity for: NBS experts in the making
Indicative activity time	~1.5h, depending on how long children will be engaged in role playing
Material(s) used	• PowerPoint presentation (or equivalent) • Props (optional)
Suggested follow-up activities	Mini landscape architects
Variations	• Educators may choose the type of presentation they will use (PowerPoint,

Additional information

	poster, whiteboard notes, direct instruction), based on their needs.
NBS resource(s) used	• Career sheets with NBS experts, e.g.: https://www.scientix.eu/community/partner-projects/nbs
Link to NBS Societal Challenge Areas	☒ New economic opportunities and green jobs
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking **Area: Envisioning sustainable futures** ☒ Exploratory thinking
Link to Trends	Vocational Education, Informal Education, Playful Education
Link to 21st century skills	Communication, Collaboration, Initiative and Self-direction, Leadership
Link to subjects / formal education	Environmental Studies, Vocational Education, Art Education (Drama)

B8. "Pond designs"

Abstract

This advanced-level Learning activity for children aged 7-10 looks into ponds as an example of nature-based solutions (NBS), their usefulness to the environment, and biodiversity conservation in particular. Children investigate their local nature in short visits to parks, forests and other areas and then with the help of the educators, design their own ponds to improve these areas, after which they report on their findings.

Keywords

Ponds; designs; nature-based solutions

Description of the activity

Contributing to children's understanding of different forms of NBS, pictures are presented to them related to ponds, as well as information about a project's actions to investigate ponds, and how ponds can be used as NBS to positively impact biodiversity conservation. After the project's resources are explored, children are taken to local parks, forests or other selected areas, and are asked to investigate. The goal is for them to explore if the area is home to wildlife and how easy it is for it to survive (what are the food sources, water sources, etc.). The younger children should have the instructions written, as this is a complex topic. When a list with high-risk areas is created, children are asked to create designs of their own ponds, to be included in a report explaining their findings and conclusions. The designs include materials and step by step guides inspired by the project website's resources.

Outcome of the activity

This Learning activity promotes practical understanding about ponds and relevant nature conservation efforts.

Additional information

Difficulty	Activity for: NBS experts in the making
Indicative activity time	Varies depending on the number of destinations that will be visited and explored.
Material(s) used	• Materials to draw/design the pond • Materials/ electronic devices to write letter
Suggested follow-up activities	Designing rain gardens; Mini Landscape architects
Variations	• Educators may choose to create a presentation depicting the resources found in the project's site. Educators can also

Additional information

	choose the type of presentation that they will use (PowerPoint, poster, whiteboard notes, direct instruction), based on their needs.
NBS resource(s) used	• Website of a project/initiative with the aim to protect ponds and promote their benefits from changes in climate and land use, e.g.: https://ponderful.eu/activities/scenarios-and-modelling/
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Water management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Project-based Learning, Informal Learning, Playful Learning
Link to 21st century skills	Environmental Literacy, Collaboration, Communication
Link to subjects / formal education	Environmental Studies, Art Education (Arts and Crafts)

B9. "Pollinators amongst us"

Abstract

While learning about pollinators and the importance of green spaces to them, in this advanced-level Learning activity related to nature-based solutions (NBS), children ages 7-10 put together seed packs that they distribute in the form of a game to help spread the seeds and attract pollinators, in addition to constructing homes for the pollinators.

Keywords

Pollinators; planting; ecosystems; nature-based solutions

Description of the activity

Children are learning about pollinators' contribution to the local ecosystems and biodiversity. They also explore the pollinators' role in plants' life cycles and different types of pollinators as an attempt to avoid the common misconception that it is only bees that populate flowers. Educators use a video about pollinators to motivate children and ignite their curiosity. At a trip to a local park/forest, children are asked to observe and create drawings of the local plants that pollinators seem to naturally be attracted to. Next, children are asked to create and/or designate spots in the yard, where they could create small gardening areas. The goal is for them to create more spaces in the area that are attractive to pollinators. A discussion is led to help children understand that this has benefits for all sides involved. Pollinators benefit from more feeding areas, plants get to reproduce, and the yard's users enjoy a lively environment. Once the areas are designated, children plant seeds of the various plants that are attractive to pollinators and were explored before or practice other populating practices (i.e. cutting a leave, leaving it in water under it grows roots and then replanting it). This can be done in the form of a game, e.g. shaping "seed packs" in the form of a ball that is distributed while playing a variation of dodgeball (given that the substance of the seed packs is safe for throwing and impact), or hitting different targets for points, different flowers, herbs and other plants can start being populated. This will attract pollinators like bees and other mini beasts. Seeds should be chosen based on the plants found locally, and depending on the season. At the final stage of this activity and after the plants start to grow, children prepare some nesting sites for the pollinators. Small crafts, such as bee hotels, are made and placed carefully, when possible, for pollinators to use and lay eggs in safely.

Outcome of the activity

This Learning activity raises awareness about pollinators, and the importance of preserving biodiversity, while also offering the opportunity to actively participate in biodiversity enhancement practices in a playful way.

Additional information

Difficulty	Activity for: NBS experts in the making

Additional information

Indicative activity time	~2h. Depends on how long children will engage in the play-based stage.
Material(s) used	• Local plant, flower or herb seeds. • Soil • Clay powder • Water • Bucket • Carton egg case (to place the packs and let them dry) • Coloured carton paper (we used blue, green, and white). • Information about the game, e.g. dodgeball: • https://en.wikipedia.org/wiki/List_of_dodgeball_variations • Video with guidelines on creating seed packs, e.g. this video • Tutorial on creating seed packs, e.g.: https://littlebinsforlittlehands.com/make-seed-bombs-earth-day-activity/ • Materials to create bee hotels
Suggested follow-up activities	Weekly gardening workshops
Variations	• Educators may choose to not proceed to the planting stage. Instead, they could ask children to prepare posters depicting the lessons learned through their explorations. • Educators may choose to provide more resources to help children explore the importance of pollinators to a greater extent.
NBS resource(s) used	• Video to explore the importance of pollinators, e.g.: https://www.youtube.com/watch?v=eDxZojp9yNg • Guide on building a bee hotel, e.g.: https://www.ecoexplorers.com.au/how-to-build-a-native-bee-hotel-with-kids/ • Video on how to build a bee hotel, e.g.: https://www.youtube.com/watch?v=oSnv64T6OqM
Link to NBS Societal Challenge Areas	☒ Biodiversity enhancement ☒ Green space management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing

Additional information

	Area: Envisioning sustainable futures ☒ Exploratory thinking ☒ Adaptability **Area: Acting for sustainability** ☒ Individual agency
Link to Trends	Playful Learning, Informal Learning, Outdoor Education
Link to 21st century skills	Environmental Literacy, Problem-solving, Adaptability, Creativity, Collaboration, Communication
Link to subjects / formal education	Environmental Studies

C. LEARNING ACTIVITIES FOR AGES 11-15

C1. "Getting to know NBS"

Abstract

In this beginner-level Learning activity for children ages 11-15, natural disasters and societal challenges are used as an introduction to the need for nature-based solutions (NBS), after which NBS concepts are presented and explored through case studies. Children participate in the discussions and create posters to reflect the learnings.

Keywords

Natural disasters; societal challenges; nature-based solutions; introduction

Description of the activity

Educators show children a PowerPoint presentation with different case studies of natural disasters and other challenges that societies face. Facts are presented shortly. Children are divided into groups and are encouraged to research and brainstorm about possible solutions to address the impact of each of the natural disasters that they explored before. They record their answers in big posters in any media they desire (in writing, colouring, printing pictures, etc.). In the second stage of the activity, educators use the same PowerPoint to present NBS, their importance, the NBS Societal Challenge Areas, and provide examples. At the third and final stage, children are encouraged to reflect on the posters and update them, making sure they are linked to NBS. Then they present their case studies and the NBS they came up with.

Outcome of the activity

Through this Learning activity, children build foundational knowledge on NBS.

Additional information	
Difficulty	Activity for: fun and easy starters
Indicative activity time	~3h
Material(s) used	• A2 / A1 / A0 papers • A PowerPoint presentation about NBS • Internet access
Suggested follow-up activities	all activities presented for this age group
Variations	• If internet access is not possible, educators can present children with information in any

Additional information

	medium available, and let them research on their own. • Educators can focus on case studies relevant to their local / national level. • The case studies can be presented in various forms (PowerPoint, pictures, posters, etc).
NBS resource(s) used	• Databases with NBS Case studies, e.g.: https://progireg.eu/ and https://oppla.eu/nbs/case-studies • Information on the 12 NBS Societal challenge areas, e..g: https://op.europa.eu/en/publication-detail/-/publication/edab5ab8-94b7-11ee-b164-01aa75ed71a1/language-en/format-PDF/source-303181336
Link to NBS Societal Challenge Areas	☒ Air quality ☒ Biodiversity enhancement ☒ Climate resilience ☒ Green space management ☒ Health and well-being ☒ Knowledge building for sustainable urban transformation ☒ Land regeneration ☒ Natural and climate hazards ☒ New economic opportunities and green jobs ☒ Participatory planning and governance ☒ Social justice and social cohesion ☒ Water management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency

Additional information	
Link to Trends	Informal Learning, Collaborative Learning
Link to 21st century skills	Creativity, Collaboration, Environmental Literacy
Link to subjects / formal education	Environmental Studies

C2. "Hydroponic garden"

Abstract

This continuous beginner-level Learning activity for children aged 11-15 explores nature-based solutions (NBS) through the creation of a hydroponic garden, seed and soil experimentation.

Keywords

Hydroponic garden; seeds; arts and crafts; nature-based solutions

Description of the activity

Children are asked what elements plants and green species need, to survive and grow. After responses are collected and written on a whiteboard, educators challenge children to guess what would happen if the elements they have chosen (e.g., water, sunlight, soil) were to be removed. Educators also touch upon the importance of biodiversity preservation. After brainstorming, children divide themselves in groups, and test their theories. One group will test what happens to seeds that are provided with sun and water, but no soil; another group will test seeds that have soil and water, but no sun; another group will test seeds that are in soil and have sunlight, but no water. After their experiments are concluded and children begin to understand that seeds can exhibit resilience even without being planted in soil, they are told that they will be creating "hydroponic gardens". The gardens can be placed indoors or outdoors, depending on the building. By creating and maintaining a hydroponic garden, children learn about water conservation, green space efficiency, and soil preservation. For this activity, children are asked to plant seeds of flowers, plants and herbs that are indigenous to the local area, and wrap them gently in a cotton. Once the roots start appearing, children place the seedlings inside bottomless pots. Meanwhile, they gather containers, similar to yogurt containers, which have a lid. In the next stage, using the top of the bottomless pots, children mark their outline on the containers' lids. Educators help children cut the inside part of the lid, following the outline created, to create a hole that can fit the bottomless pot. Then they also cut the bottom of the containers. In the final stage, children put the bottomless pot inside the hole on the lid of the containers and place the containers in a big box close together. By filling the box with water and adding a few nutrients in the following weeks, children will see their flowers, plants and herbs grow without soil. Water will be replenished when needed. As this is an ongoing activity, children can be reminded how this NBS can save water, preserve soil, and provide different ways to do green management efficiently.

Outcome of the activity

This Learning activity promotes learning about hydroponic gardens, water conservation, efficient green space use, and soil preservation.

Additional information

Difficulty	Activity for: fun and easy starters

Additional information

Indicative activity time	~2h
Material(s) used	• Yogurt containers or equivalent + lids • Bottomless pots • Big box • Cotton beddings • Nutrients
Suggested follow-up activities	Our own nature-based climate shelter; Mini green terrace; Purifying plants
NBS resource(s) used	• Video introducing hydroponics, e.g: https://www.youtube.com/watch?v=dPTvh7wTgbA
Link to NBS Societal Challenge Areas	☒ Biodiversity enhancement ☒ Green space management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Adaptability ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Informal Learning, Project-based Learning, Playful Learning
Link to 21st century skills	Adaptability, Initiative, Environmental Literacy
Link to subjects / formal education	Environmental Studies, Biology

C3. "Art for NBS"

Abstract

This beginner-level Learning activity helps children aged 11-15 raise awareness among the general public on the key role played by nature-based solutions (NBS) in addressing societal challenges related to the environment, while using art as the medium.

Keywords

Art; social challenges; solutions; natural resources; nature-based solutions

Description of the activity

Children have had the chance to engage in a variety of activities that highlight the importance of NBS. Additionally, they have examined numerous social challenges that NBS seek to address. As part of helping children understand the importance of advocating for NBS, raising awareness, and appreciating NBS' benefits, they engage in activities designed to create an art exhibition for this cause. Educators explain that there are many ways to advocate for NBS, such as through educational workshops, community projects, or public campaigns. One equally powerful method is to create an art exhibition showcasing the benefits of NBS. Thus, children are informed that they will be exploring how art can be used as a tool for this purpose. Children are divided into groups based on the challenges that interest them the most and are tasked with creating artworks that depict the 'before and after NBS' scenarios. While they are still responsible for presenting information about NBS and the social issues they address, this method may allow students to connect more deeply with the topic and engage different audiences during presentations.

Outcome of the activity

This Learning activity helps students participate in awareness raising about NBS among the general public.

Additional information

Difficulty	Activity for: fun and easy starters
Indicative activity time	Varies, depending on children's posters
Material(s) used	Free choice of materials (i.e. canvas, painting resources etc.)
Link to NBS Societal Challenge Areas	☒ Social justice and social cohesion
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Supporting fairness

Additional information

	☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Political agency ☒ Collective agency ☒ Individual agency
Link to Trends	Informal Learning
Link to 21st century skills	Self-direction, Collaboration, Leadership, Civic-ethical and Social-justice Literacy
Link to subjects / formal education	Environmental Studies, Social Studies, Art Education (Art)

C4. "Figuring out NBS Careers"

Abstract

In this intermediate-level Learning activity, children aged 11-15, think about their future careers in the nature-based solutions (NBS) sector. The need for such careers is made clear through discussions on the challenges faced by today's societies and by exploring different case studies.

Keywords

Careers; nature-based solutions

Description of the activity

A guided discussion is initiated with the children over the careers they would like to pursue in the future. After that, children present their dream careers and explain the reason behind their choice. Children write their dream careers down on post-it notes and categorise them (careers that are harmful for the environment; neutral regarding the impact to the environment; positive impact / needed to promote greener societies). At the second stage of the activity, children are presented with different case studies of natural disasters and other societal problems, as well as different NBS that address them. Educators are asking children to identify what all these solutions have in common and accommodate the discussion is a certain way, until children reach the conclusion that humans can draw inspiration from nature to apply natural-based solutions to different problems. The EU's definition of NBS is also presented to allow for deeper connections. In the third stage of this activity, children are divided into groups and motivated to come up with careers that could be relevant to the case studies. After they write down their responses, educators encourage children to explore and research other sources independently for more specific NBS careers, and add to their earlier selection. For this they work in groups, sharing with each other their thoughts and opinions as they alter their initial choices. After each group presents their reflections, a final question is set for children "Did you encounter any NBS career that you found useful and could possibly follow in the future?".

Outcome of the activity

This Learning activity allows children to explore NBS careers as a means to solving environment-related problems in societies and encourage them to consider green career paths.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	~2h

Additional information

Material(s) used	• Post-it notes • Paper • Pencils/pens • Electronic devices, e.g. Laptop(s)/tablet(s) or similar + internet access
Suggested follow-up activities	Green interviews
Variations	• In case there is no internet connection or laptops, educators may choose to present case studies/career sheets etc. in any other medium they find proper. • Depending on the children's English level, further resources can be explored, e.g. podcasts or interviews on NBS careers: https://www.scientix.eu/nl/projects/steam-partnerships/nbs • For the younger children (11-13), the EU definition for NBS might be too complex. Educators are advised to either allow children to search for the definition of the words provided, or already provide them with a glossary of terms.
NBS resource(s) used	• NBS Case studies, e.g.: https://progireg.eu/_____ and https://oppla.eu/nbs/case-studies • Examples of NBS careers, e.g.: https://www.euroclimatejobs.com/ , https://www.scientix.eu/nl/projects/steam-partnerships/nbs • Definition of NBS by the EC, e.g.: https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions_en
Link to NBS Societal Challenge Areas	☒ New economic opportunities and green jobs
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking

Additional information

	Area: Envisioning sustainable futures ☒ Adaptability **Area: Acting for sustainability** ☒ Individual agency
Link to Trends	Vocational Education, Informal Education, Collaborative Learning
Link to 21st century skills	Communication, Collaboration, Environmental Literacy
Link to subjects / formal education	Environmental Studies, Vocational Education

C5. "Green interviews"

Abstract

This intermediate-level Learning activity helps children aged 11-15 deepen their knowledge on the importance of nature-based solutions (NBS) careers through discussions, performing their own research on relevant careers, and preparing targeted questions for NBS experts.

Keywords

Societal challenges; Nature-based solutions; careers; preparedness

Description of the activity

Children explore various case studies of natural disasters and societal challenges, and examine the NBS use in tackling them. Educators guide discussions to help children realize a common thread: drawing inspiration from nature to address diverse problems. The EU definition of NBS is also presented as a means of enhancing the understanding of the concept. Educators highlight the importance of NBS careers, as today's citizens should be ready to tackle such problems. After that, children are encouraged to search through the resources of an NBS project, e.g. "Integrating Nature-Based Solutions in Education", in particular interviews of NBS professionals. Their goal is to pick a NBS career that they find interesting, go through the available information, and come up with more questions for the experts. After all questions are collected, educators announce that children will be able to ask these questions in an upcoming activity that will be organised, during which NBS experts will attend live or online and answer all these questions (for that, educators would need to plan the visits ahead of time).

Outcome of the activity

This Learning activity deepens knowledge on NBS careers, and the skills and responsibilities related to each of them.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	~3h
Material(s) used	• Electronic devices, e.g. laptop(s) + internet access • Paper • Pencils/pens
Suggested follow-up activities	Figuring out NBS Activities

Additional information

Variations	• Educators may contact the NBS experts instead of inviting them over, and transfer the children's questions to them. • In case there is no internet connection or electronic devices, educators may choose to present case studies and other resources in any other medium. • For the younger children (11-13), the EU definition for NBS might be too complex. Educators are advised to either allow children to search for the definition of the words provided, or already provide them with a glossary of terms.
NBS resource(s) used	• NBS Career chats and interviews with NBS professionals, e.g. from the "Integrating Nature-Based Solutions in Education" project resources: https://www.scientix.eu/nl/projects/steam-partnerships/nbs.
Link to NBS Societal Challenge Areas	☒ New economic opportunities and green jobs
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Vocational Education, Informal Education, Collaborative Learning
Link to 21st century skills	Communication, Environmental Literacy
Link to subjects / formal education	Environmental Studies, Vocational Education

C6. "Mini green terrace"

Abstract

In this intermediate-level Learning activity, children aged 11-15 learn about the benefits of green roofs as a nature-based solution (NBS) and design their own green terraces, taking into account key elements from other activities (e.g. edible garden, pollinators garden, hydroponic garden, etc.).

Keywords

Green roof; green terrace; nature-based solutions; designing

Description of the activity

After reviewing the benefits of having green roofs as a form of NBS through guided discussions and presentation of certain resources, children are tasked to explore and experiment by creating designs that showcase suggestions for the creation of a green terrace. In this way, they will be able to put their knowledge in action as they have been learning about NBS. Children's first task is to choose the terrace, which will be the centre of their activities in the following weeks. For this task, educators provide them with possible options (their building's terrace, other community buildings' terraces, or buildings that can accommodate such a study in the city). Children explore the terrace's potential and discuss in groups the creation of possible corners, areas with stations for activities, the inclusion of an edible garden, pollinators' garden, hydroponic garden etc. Children discuss these alternatives in groups, and they design a draft poster showcasing their suggestions. After presenting their posters to each other a voting process begins, which aims to the selection of approaches that are favoured by the majority. When a consensus is reached, children gather in groups again to create their final poster, which can then be showcased to parents and other educators.

Outcome of the activity

This activity promotes NBS through the creation of green terraces.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	Varies depending on the extent of work that children and educators will put on the transformation of the terrace
Material(s) used	• A3/A5 paper posters • Colouring pencils • Colouring markers
Suggested follow-up activities	My edible garden; Hydroponic garden; Art for NBS

Additional information

Variations	• If there are available resources, children may already start building portable gardens (i.e. using big boxes that can be used as the base for a hydroponic garden etc.) • Children may write a report on the process of creating their own terrace.
NBS resource(s) used	• Resources providing information about green terraces as NBS, e.g.: NBS Cards.pdf (unalab.eu)
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Knowledge building for sustainable urban transformation
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Informal Education, Project-based Learning
Link to 21st century skills	Problem-solving, Critical Thinking, Environmental Literacy, Adaptability
Link to subjects / formal education	Environmental Studies

C7. "Nature's air purifiers"

Abstract

In this intermediate-level Learning activity, children aged 11-15 touch upon examples of air pollution and how nature-based solutions (NBS) can help mitigate some of the harm done through nature's own air purifiers – plants. Children then explore relevant species, local to their environment.

Keywords

Air pollution; purifying; nature-based solutions; biodiversity

Description of the activity

While turning children's attention to air pollution and its various causes, an activity is introduced as an example of how NBS can bring about benefits and counteract the effects of air pollution. Children explore the case of chemical-based air fresheners and deodorants as an example of indoor air pollution. After a discussion on the topic, the hazards imposed to humans' health from such practices are highlighted, as well as the necessity for more green and sustainable alternatives. Children are asked to brainstorm such alternatives. Help and guidance is provided by educators when needed, and the discussion is focused on the health and air purifying capacities of certain plants (i.e. related to oxygen emission during the night; natural fragrance, etc.). In the second stage of this activity, children explore cards that depict such air purifying plants. The aim is to cross-examine their characteristics, as well as identify purifying plants that are indigenous to their local area. The concept of native species is also introduced. After children vote on their favourite plants and provide their reasoning, educators can look into enabling the planting those plants, thus making a link to biodiversity preservation in the local context.

Outcome of the activity

This Learning activity provides knowledge on air pollution and plant species as natural air purifiers.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	~3h
Material(s) used	• Information for preparing cards on indigenous plant use e.g. through *this leaflet* or similar • Information on clean air, e.g. through this website • (optional): local air purifying plant species, planting tools

Additional information	
Suggested follow-up activities	Hydroponic garden, Art for NBS
Variations	• If the purifying plants that were discussed are available for planting, children can participate in the process and observe the benefits in the following weeks.
Link to NBS Societal Challenge Areas	☒ Green space management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Systems thinking ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Informal Learning
Link to 21st century skills	Adaptability, Problem-Solving, Environmental Literacy
Link to subjects / formal education	Environmental Studies, Biology

C8. "Our own nature-based climate shelter"

Abstract

In this advanced-level Learning activity, children aged 11-15 explore the application of nature-based solutions (NBS) through the concept of nature-based climate shelters by learning about the profession of a landscape architect and designing their own nature-based climate shelter, after reviewing in detail their immediate surroundings.

Keywords

Nature-based solutions; nature-based climate shelters; designing; landscape architect

Description of the activity

In the first stage of this activity, a presentation is used to help children focus on the NBS career of a Landscape Architect. Information about the career is presented in an appealing way, with the objective of including ways that this profession can promote NBS' positive impact. Selected resources such as a career profile, are also used. In the second stage of this activity, children are told that they will have the chance to explore aspects of this profession more directly. With the aim to create a design in groups with suggestions on how to turn their yard into a nature-based climate shelter, children will benefit from exploring in-depth greening approaches, sustainability, and green space management skills. After children are divided into groups, educators present selected resources retracted from four case studies cities on turning schools into nature-based climate shelters, e.g. as elaborated in the COOLSCHOOLS project. They are presented with the final nature-based climate shelters and other green solutions that were adopted in the case studies. After this initial brainstorming activity, children are taken to the yard and are asked to examine all corners and spaces available, their task is to make a list of all the resources and elements that they would like to keep. Another task for them is to think of thematic spaces they would like the new nature-based climate shelter to have. They are also told that the focus should be on thinking of spaces that promote NBS. In the second stage of this activity, children are asked to draft their designs in groups, bearing in mind what they have learned in the previous stage. After presenting their ideas to one another, a big final poster is made including the NBS solutions and ideas selected by majority votes. Lastly, children write a report showcasing their knowledge and suggestions for further action.

Outcome of the activity

This activity promotes NBS careers and creative thinking through the prism of NBS.

Additional information	
Difficulty	Activity for: NBS experts in the making
Indicative activity time	~3h

Additional information

Material(s) used	• Post-it notes • A2 / A1 / A0 papers • Pencils/pens • Electronic devices, e.g. laptop(s)/tablet(s) + internet access
Suggested follow-up activities	Hydroponic garden; Art Exhibition; Mini green terrace
NBS resource(s) used	• Information on the Operation Recreation (Brussels) case study, e,.g: The 'Operation Recreation' (Brussels) case study • Information on the 'Groenblauwe Schoolpleinen' (Rotterdam) case study, e.g.: The 'Groenblauwe Schoolpleinen' (Rotterdam) case study • Information on the 'Refugis Climatics' (Barcelona) case study, e.g: The 'Refugis Climatics' (Barcelona) case study • Information on the 'Oasis' (Paris) case study: The 'Oasis' (Paris) case study • Landscape Architect NBS career sheet, .e.g: https://www.scientix.eu/resources/stem-careers/job-profile?articleId=1652567 • Information on the COOLSCHOOLS project: COOLSCHOOLS project
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Knowledge building for sustainable urban transformation
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency

Additional information	
Link to Trends	Informal Education, Collaborative Learning, Peer Learning
Link to 21st century skills	Adaptability, Problem-Solving, Critical Thinking, Environmental Literacy
Link to subjects / formal education	Environmental Studies, Social Studies

C9. "A Drama Play: A Town's Journey to NBS"

Abstract

The play "A Town's Journey to NBS" is a dynamic, educational dramatic play designed for students aged 11-15, as an advanced Learning activity that uses a creative approach to raise awareness on the importance of nature-based solutions (NBS) and their central role in addressing environmental challenges. By depicting a town's struggle with rapid urban expansion and the consequences from this, the play illustrates how communities can come together to implement sustainable practices. In the process, children learn more about various NBS careers, e.g., environmental scientists and urban planners.

Keywords

Roleplaying; drama; nature-based solutions; greenifying

Description of the activity

Children participate in the play "A Town's Journey to Green Solutions", with roles division as described below. Educators ensure the availability of suitable set design and props to aid the performance (students can be involved in creating the props).

Roles Breakdown:

- Mayor, Council Members, Concerned Residents, Environmental scientist, Ecologist and Conservation Biologist, Landscape Architect

Props and Set Design:

- Town Hall Meeting: For meetings and discussions.
- Nature Scenes: Big posters with paintings, representing the town before and after the implementation of NBS.
- Urban Expansion: Big posters with paintings, representing concrete buildings and construction sites.
- NBS solutions: Big posters with paintings, representing wetlands, green roofs, vertical gardens etc.

Scene 1: The Town Hall Meeting

The play opens in a small town that is on the verge of expansion. The mayor, eager to modernize, proposes expanding the town with more concrete buildings and less green spaces. A town hall meeting is held, where citizens express their concerns about the potential environmental impact. The main point in this scene is to prepare the viewers for later, when they will have to present the conflict.

- **Participating characters**: **Mayor and Council Members** (concerned about budget and resources and supports the Mayor's vision), **Concerned Resident 1**: worried about environmental impact, **Concerned Resident 2**: represents the younger generation's voice.

Scene 2: Urban Expansion

The town begins to face problems, such as increased flooding, air pollution, and loss of biodiversity. Residents discuss their concerns, highlighting how the expansion has disrupted their lives and the environment.

- **Participating characters: Concerned Resident 1** (faces flooding issues because of lack of green to keep the water contained), **Concerned Resident 2** (experiences reduced air quality because of the lack of trees), **Concerned Resident 3** (notices a decline in local wildlife, which is affecting their business).

Scene 3: The Crisis Meeting

The Mayor, realizing the need for change, calls for an intervention meeting. Experts and Residents come together to brainstorm solutions. The concept of NBS is introduced as a potential approach. Experts present different NBS that could solve the town's problems, such as creating green roofs, vertical gardens, planting trees and plants, and restoring wetlands (or other suggestions based on the local setting). They discuss the importance of various careers in implementing these solutions.

- **Participating characters: Mayor**, **Environmental scientist** (introduces NBS), **Concerned Resident 4** (advocate for community involvement), **Ecologist and Conservation Biologists** (discusses the importance of maintaining biodiversity), **Landscape architect** (talks about integrating green spaces into urban areas**.**

Scene 4: NBS

The community comes together to implement the suggested NBS. They plant trees, create community gardens, and restore wetlands, etc. The scene continues the collective effort and the positive changes it brings. The town reflects on the successful implementation of NBS and plans for the future. The mayor and citizens discuss how they can continue to integrate NBS into their urban planning.

- **Participating characters: all**

Outcome of the activity

This activity fosters an understanding of sustainable development and greenifying actions, and inspires children to consider NBS careers.

Additional information

Difficulty	Activity for: NBS experts in the making
Indicative activity time	Varies depending on the extent of work that children and educators will invest in the play (creating the props, background paintings, dialogues, etc).
Material(s) used	• A3/A5 paper posters • Colouring pencils • Colouring markers

Additional information

	• Paint • (optional) clothes to correspond each role
Suggested follow-up activities	Every activity for this age group
Variations	• Educators and children may create a chorus with songs and messages for the viewers. • Educators and children might decide to prepare a script for each of the roles, instead of a spontaneous roleplay.
NBS resource(s) used	Information materials about different types of NBS, or NBS case studies.
Link to NBS Societal Challenge Areas	☒ Green space management ☒ Knowledge building for sustainable urban transformation
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking **Area: Acting for sustainability** ☒ Collective agency
Link to Trends	Collaborative Learning, Playful Learning, Informal Learning, Vocational Education
Link to 21st century skills	Problem-solving, Environmental Literacy, Civic, ethical and social-justice literacy
Link to subjects / formal education	Environmental Studies, Vocational Education, Art Education (Drama)

D. LEARNING ACTIVITIES FOR AGES 16+

D1. "Unmasking the NBS Societal Challenges Areas"

Abstract

In this beginner-level Learning activity for youth aged 16 and above, nature-based solutions (NBS) are introduced through the NBS societal challenge areas and integrated discussions on the ways, in which NBS helps address the problems faced by society. Youth create posters to present the areas, using them to raise awareness among the general public on the topic.

Keywords

Nature-based solutions; societal challenges; case studies

Description of the activity

Young adults have had the chance to engage in several activities that promote NBS. Additionally, they also explored several social challenges that NBS are trying to cover and address. For this activity, the young adults are asked to form groups based on an NBS societal challenge area that they feel passionate about. Their task is to formulate a paper poster including the presentation of the targeted NBS societal challenge area, ways it impacts life in the local and global level and information about selected NBS that could prove useful when dealing with such problems. Regarding NBS, the young adults are advised and guided when needed to focus on case studies, 'before and after' NBS implementation information, highlighting in this way the NBS' contribution. Additionally, the young adults are gathering pictures and other informative materials during their research. When the drafts are completed and approved by the educators, the young adults are beginning the second stage of this activity which is the creation of a big poster depicting the information they have gathered. Once posters are ready, the young adults practice presenting them to one another. In the final stage of this activity, the young adults are taking their posters to selected spaces throughout the city and present their ideas to the public promoting in this way NBS awareness.

Outcome of the activity

In this Learning activity, youth builds foundational knowledge on NBS through the NBS societal challenge areas and promotes awareness about NBS to the general public.

Additional information	
Difficulty	Activity for: fun and easy starters
Indicative activity time	Varies, depending on the posters

Additional information

Material(s) used	• A3/A5 paper posters • Colouring pencils • Colouring markers • Stickers
Variations	• If the young adults have already worked on the adaptation of an NBS, pictures can also be presented in the posters (i.e. hydroponic gardens) as good practice evidence. • If certain NBS adaptations can be transferred easily (i.e. hydroponic gardens), they can also be brought to the presentation stand.
NBS resource(s) used	• Information on evaluating the impact of nature-based solutions, e.g. this article • Article on using NBS to address global societal challenges, e.g. https://portals.iucn.org/library/sites/library/files/documents/2016-036.pdf • Map showing NBS around the world, e.g.: https://una.city/ • NBS case studies, e.g. https://progireg.eu/ or https://oppla.eu/nbs/case-studies
Link to NBS Societal Challenge Areas	☒ Air quality ☒ Biodiversity enhancement ☒ Climate resilience ☒ Green space management ☒ Health and well-being ☒ Knowledge building for sustainable urban transformation ☒ Land regeneration ☒ Natural and climate hazards ☒ New economic opportunities and green jobs ☒ Participatory planning and governance ☒ Social justice and social cohesion ☒ Water management
Link to GreenComp Competences	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Supporting fairness ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Problem framing **Area: Envisioning sustainable futures** ☒ Exploratory thinking

Additional information

	Area: Acting for sustainability ☒ Political agency ☒ Collective agency ☒ Individual agency
Link to Trends	Informal Learning,
Link to 21st century skills	Self-direction, Teamwork, Collaboration, Leadership, Civic-ethical and Social-justice Literacy
Link to subjects / formal education	Vocational Classes, Environmental Studies, Social Studies

D2. "Career market: NBS"

Abstract

In this intermediate-level Learning activity, youth 16 and above learn about the importance of careers in nature-based solutions (NBS), explore the skills needed, and compare different NBS careers using a variety of resources.

Keywords

Nature-based solutions; careers; market; experts

Description of the activity

To build young adults' awareness on the importance of NBS and the significance of pursuing careers that address various environmental challenges, educators show a video to them. The video serves as an introduction to the topic and to spark an initial discussion. Educators guide further discussions with questions, such as: "What are Nature-Based Solutions?", "How do they benefit both nature and communities?", "Can you think of careers that might involve working with NBS?". In the second stage, educators divide the young adults into four groups, with a laptop/tablet/other similar electronic device per group. The young adults are encouraged to explore different careers on the internet. The task is simple: read as many NBS job listings as possible and write down on a large sheet of paper all the skills needed for each NBS career. At the end, the young adults review their notes to observe any patterns. If certain skills are repeated, they should be highlighted. After that, each group presents their findings to the other groups and shares any reflections they had. In the third stage, the young adults continue to work in groups. Each group receives a set of cards with information about several NBS careers, which educators have prepared based on the information available, e.g. by using "Career Sheets". Each young adult then chooses a card and tries to guess, individually or in pairs, what this NBS career entails and what skills are needed for it. The young adults keep track of their responses and, at the end, share their reflections with the other groups, comparing the similarities and differences. In the final stage, the young adults focus on and interview with an NBS professional, e.g. an interview with a Nature-based Landscape Architect. To complete this stage, they must work in groups to fill out a rubric with three questions. "What do I already know about this career?" and "What do I want to know?" are completed before watching the interview. After watching it, in pairs or in groups of four, the young adults complete the column with the third and final question, "What did I learn?". They are then free to research NBS careers that interest them, either individually or in groups, and complete this rubric for other careers as well. At the end, they present their favorite NBS careers.

Outcome of the activity

This activity promotes understanding of the importance of green jobs, and builds knowledge on different NBS careers.

Additional information

Difficulty	Activity for: getting the hang of NBS
Indicative activity time	~4h
Material(s) used	• Papers • Pencils/pens • Laptop(s)/tablet(s) + internet access
Variations	• If there is no internet connection or laptops, educators may present the information on paper or in any other form. • Depending on the children's English level, further resources can be explored, e.g. podcasts/series/interviews: https://www.scientix.eu/nl/projects/steam-partnerships/nbs
NBS resource(s) used	• Electronic devices, e.g. laptop(s)/tablet(s) or similar + internet access • Video on the importance of NBS, e.g.: https://www.youtube.com/watch?v=mdBoX5FSG8w • NBS-related job postings, e.g.: https://unjobs.org/themes/nature-based-solutions • Resources on NBS careers for preparing the cards, e.g.: https://www.scientix.eu/nl/projects/steam-partnerships/nbs • Interview with an NBS professional, e.g. Landscape Architect: https://steamit.eun.org/nature-based-landscape-architect/
Link to NBS Societal Challenge Areas	☒ New economic opportunities and green jobs
Link to GreenComp Competences addressed	**Area: Embodying sustainability values** ☒ Valuing sustainability ☒ Promoting nature **Area: Embracing complexity in sustainability** ☒ Critical thinking **Area: Envisioning sustainable futures** ☒ Adaptability **Area: Acting for sustainability** ☒ Individual agency

Additional information	
Link to Trends	Informal Learning, Mobile Learning, Vocational Education
Link to 21st century skills	Self-direction, Civic-ethical and social-justice Literacy
Link to subjects / formal education	Vocational Classes, Environmental Studies, Social Studies

D3. "NBS Career charts"

Abstract

This advanced-level learning activity introduces nature-based solutions (NBS) career chats to youth aged 16 and above, as a way of getting to know experts in the NBS field by hearing about their professional experience in their own words, and understanding the educational and professional pathways, as well as skills needed to achieve these careers.

Keywords

Nature-based solutions; careers; experts; chats

Description of the activity

Educators explore online career chats that have been organised for young adults with relation to the promotion of NBS careers, where an NBS expert speaker participates with the task to inform and introduce young adults and children to their NBS field. In this activity, educators watch some of the existing career chats with the youth (e.g. with a Co-founder Environmental Cooperative; Leading Professional in Water Resilient Cities; Nature-Based Landscape Architect; Research Scientist in Nature-Based Solutions, etc.). The NBS expert's aim is to share about their education and professional experiences, as well as inform about their work-related duties and responsibilities. In this way, young adults can see the field from the perspective of an individual already working in it, explore challenges and interesting points, as well as get individualised advice from the expert. The educator then leads a discussion to elaborate on the main career objectives, paths to getting there, and skills needed, taking suggestions from the students. Students elaborate their findings by creating their own career objectives with relation to any of these careers.

Outcome of the activity

This activity promotes NBS careers and the importance of green jobs.

Additional information

Difficulty	Activity for: NBS experts in the making
Indicative activity time	~2.5h for the session and preparing questions
Material(s) used	• Laptop/tablet/similar electronic device • Internet access
Suggested follow-up activities	All activities presented for this age group
Variations	- Educators can find information on such events online by browsing sites, e.g., Scientix - the community for science education in Europe: https://www.scientix.eu/events.

<table>
<tr><th colspan="2">Additional information</th></tr>
<tr><td></td><td>- Educators can check for any current NBS career events, to which they can register for free and bring the young adults to.
- Educators can organise a live career chat, during which an NBS expert is invited to speak to the young adults face-to-face or online.</td></tr>
<tr><td>NBS resource(s) used</td><td>Recordings of career chats with NBS experts, e.g.: https://www.scientix.eu/community/partner-projects/nbs</td></tr>
<tr><td>Link to NBS Societal Challenge Areas</td><td>☒ New economic opportunities and green jobs</td></tr>
<tr><td>Link to GreenComp Competences addressed</td><td>
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<tr><td>Area: Embodying sustainability values</td></tr>
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<tr><td>☒ Futures literacy
☒ Exploratory thinking</td></tr>
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NBS EduWORLD Project partners

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