

NBS EduWORLD - Project Education Learning Unit Template - DRAFT

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Learning Unit (LU) Planning Template - High Level Overview

Name of Learning Unit (LU) Topic		Planning a Nature-inspired design Field Trip: Innovations in NBS architecture and engineering with the SDGs					
NBS Context (e.g. urban rural, coastal)	NBS keywords complete checklist at the end of the document	Other Keywords (topics other than NBS) add in Other below	Linked or complementary concepts to NBS (to assist curriculum integration)	Prior learner knowledge of NBS (high, moderate, low/none)	Prior instructor knowledge/ skills/ competences of NBS or equivalent	Key EU NBS resources used (for instructor preparation) include link	Type of LU - lecture, workshop, field trip/site visit
any				moderate	moderate		Field Trip / Site Visit
Target academic subject / discipline / professional area or group	Target learners/ groups [age range of learners] if applicable	Min/ Max # of learners (if applicable)	Sector (e.g, professional, higher education, community)	Prerequisites required of learners if applicable (education)	EQF (European Qualifications Framework) level (or Irish NFQ) indicative only	Time for LU (aim is 50 minutes per learning unit)	Course delivery format (e.g. in-person, hybrid, online)
Architecture, planning, engineering	undergraduate or postgraduate higher	n/a	professional or higher education		EQF 6 - Irish NFQ 7/8 Ordinary/H	50 minutes	In-person / On-site
Overall Purpose	Offer a framework to plan a field trip or site visit to showcase innovative nature-inspired design in architecture and/or engineering.						
LU Summary (2-3 sentences)	Nature-based solutions are effective in their implementation with architecture and engineering processes in their nature-inspired design. This learning unit offers reflective questions and components to interrogate when designing a site visit or field trip to view nature-inspired design in-person. Examples of innovations in NBS nature-inspired design provide a context for analysis and debate for learners before and after the site visit. The connection of nature-inspired design and the Sustainable Development Goals (SDGs) demonstrates how architecture, engineering and design contributes to addressing key challenges facing the planet.						
Learning Outcome 1	Analyse the components of innovation in nature-inspired NBS in the context of architecture and engineering processes and/or design for a field trip/site visit.						
Learning Outcome 2	Compare nature-inspired NBS in the learner's context drawing on criteria and good practice examples of innovation.						
Learning Outcome 3	Debate with fellow learners on what makes for effective NBS in architecture and engineering design and how to apply this to the learner's own context and work/learning environment.						
Learning Outcome 4	Interrogate how NBS design can contribute to addressing the Sustainable Development Goal targets.						

Activities and Elements of Learning

Aim that each learning unit include at least 4 activities for an interactive learning experience

Time (duration of activity)	Aims - linked to NBS concepts or topics)	Link to Learning Outcome	Learning Activity [PPT Slide # - if applicable]	Teacher action/activity (Learner action/activity)	Confirmation of learner's learning (assessment of learning)	Link to online NBS resources (and/or academic resources with DOI as relevant)	Offline resources and materials (e.g. post-its,)
00:00:00 (5 minutes)	Introduction to NBS and nature-inspired NBS in architecture, engineering and design. Presentation of the SDGs	1,4	Slides for context	Outline definitions and explore the connection between NBS architecture, engineering and design. Present an overview of the SDGs. ASK: Given the NBS definition, how do you see NBS impacting in the architecture, engineering and design work of buildings and spaces?	Learners agree with definitions and components presented. Ask any supplementary questions to gain more information		

00:05 (5 minutes)	Enable learners to reflect on their own personal and professional experiences and criteria of NBS in design and what makes for a good site visit location.	1, 2	PowerPoint (or verbal sharing of content)	<p>What is your professional or personal experience of NBS? Offer examples of locations or sites or NBS projects</p> <p>ASK: Given the NBS definition, what do you see as key criteria of NBS impacting in the architecture, engineering and design work of buildings and spaces? Ask: what factors might make for a good NBS field trip/site visit?</p>	Learners respond to the questions.	FIND: factors for a good site visit for NBS	
00:10 (10 minutes)	Explore the role of the SDG targets in NBS design	4	PowerPoint and discussion	<p>Present example an overview of the NBS-SDG connection. Give an example of how SDG targets are present in NBS design. ASK: In this example, what details would you like to see or ask about to gain further insight on the architecture, engineering or design aspects of this NBS?</p>	Learners consider the NBS and consider the factors that make them promote the SDGs following overview of examples from across the EU and SDG 11.	Faivre et al (2017) NBS and the EU https://www.sciencedirect.com/science/article/pii/S0013935117316080	

00:10 (20 minutes)	Plan the visit/Tour of NBS architecture/engineering/design examples	2,3, 4	Identify at least 2-3 architecture/engineering/design strategies applying NBS ; Responding to Reflective questions linked to the SDGs. (as relevant to stop on a field study/site visit)	Consider a site visit considerations (who, what, where, when, why, how) as a group discussion. Consider stops (or provide photo slides) at 4 to 6 architecture/engineering/design examples of NBS. Ask: what makes this NBS good for architecture/engineering/design? ASK: How could this NBS address the SDG targets?	Learners consider and debate the purpose and logistics of a site visit and identify the best stops for a site visit based on their professional/personal knowledge of NBS in their context. They also consider how the NBS is important from an architecture, engineering and/or design perspective and for SDG targets.		Tour/photos as presented by learners
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00:40 (10 minutes)	Final reflective question to explore aspects of the key elements of architecture/engineering/design of NBS and impact on the SDGs	2,3, 4	Complete tour stops and summarise locations and NBS applied	Ask: what are the benefits of applying NBS for architecture/engineering/design purposes at this time? - summarise the factors Ask: why wasn't NBS used in other places? Have you seen other NBS in your communities? Present an example of the alignment of NBS design and the SDGs. ASK: How can NBS you are professionally/personally familiar with can address the SDG targets?	Learners respond to the questions, initiate discussion		Tour/photos as presented by learners
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NBS- Application of Curriculum, Trends and Skills

Curriculum integration (how it may connect to curriculum)	
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<p><u>Teaching & Learning Trends employed</u></p> <p>Highlight all that apply</p> <p>(Source)</p>	<p>Project-based learning: e.g., students work in groups on a research project on greenhouses and the greenhouse effect, alternatives to waste management or investigate what are the views of their peers on climate change.</p>	<p>Peer learning: e.g., students work in groups, evaluate the work of their peers, or develop assessment questions to assess peers.</p>	<p>Problem-based Learning: e.g., students are introduced to a problem and challenged to find a solution together based on the information provided to them.</p>	<p>Student-centred learning: the learning scenarios are not based on classical instruction by the teacher, but they are expected to actively engage students in the lessons.</p>	
<p>21st Century Skills</p> <p>Highlight all that apply</p> <p>(Source)*</p>	<p>Creativity: e.g., students think of various solutions for promoting a better lifestyle in their communities or encourage greener solutions to their schools' issues.</p>	<p>Information/Media literacy: students explore examples of NBS, research similar solutions in other communities.</p>	<p>Collaboration: e.g., students work in groups and engage in task division to produce outputs.</p>	<p>Critical thinking: e.g., students learn that a debate on deforestation or climate change does not consist of two opposing camps only but involves many stakeholders with different perspectives.</p>	<p>Communication: e.g., students present their work to the whole class and learn to put forth strong arguments based on facts.</p>

*Gras-Velázquez, À., Mulvik, I. B., Campodonio, A., Nada, C. & Pocze, B. (2020) *Nature-Based Solutions in education - Validation report, European Commission, August 2020* [accessed on 25/03/2024 <https://files.eun.org/NBS/NBS-pilot-validation-report-final.pdf>] p.8.

<p>GreenComp - European Sustainability Competency Framework <u>Highlight all that apply</u></p> <p>(Source) 1- Embodying Sustainability Values and 2 - Embracing Complexity in Sustainability (see pp.13-14)</p>	<p>1.1 Valuing Sustainability: To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values</p>	<p>1.2 Support Fairness: To support equity and justice for current and future generations and learn from previous generations for sustainability</p>	<p>1.3 Promoting Nature: To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems</p>	<p>2.1 Systems Thinking: To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.</p>	<p>2.2 Critical Thinking: To assess information and arguments, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.</p>	<p>2.3 Problem Solving: To formulate current or potential challenges as a sustainability problem in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems</p>
<p>GreenComp - European Sustainability Competency Framework <u>Highlight all that apply</u></p> <p>(Source) 3- Envisioning sustainable futures and 4 - Acting for Sustainability (see pp.13-14)</p>	<p>3.1 Futures Literacy: To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future.</p>	<p>3.2 Adaptability: To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk. generations and learn from previous generations for sustainability</p>	<p>3.3 Exploratory Thinking: To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods.</p>	<p>4.1 Political Agency: To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability.</p>	<p>4.2 Collective Action: To act for change in collaboration with others.</p>	<p>4.3 Individual Initiative: To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet</p>

Author and organisation to credit when using the LU	Centre for Social Innovation - Trinity Business School, Trinity College Dublin
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NBS Keywords Checklist (tick here below)

	<i>Forest Preservation</i>
	<i>Forest Restoration</i>
	<i>Forest enhanced management for woodfuel harvest</i>
	<i>Forest Production</i>
	<i>Grassland Preservation</i>
	<i>Grassland Restoration</i>
	<i>Grassland grazing management</i>
	<i>Coastal Preservation</i>
	<i>Coastal Restoration</i>
	<i>Coastal maintenance of slope vegetation</i>
	<i>Maintenance of coastal, floodplain and riverine vegetation</i>
	<i>Agroforestry</i>
	<i>Reduce tillage and carbon restoration practices</i>
	<i>Agricultural intensification</i>
	<i>Urban forests and green spaces</i>
	<i>Urban green roofs</i>
x	Climate-change adaptation and mitigation
x	Sustainable cities/ sustainable communities
x	Re-naturing cities/ re-naturing communities
x	Urban regeneration
x	Coastal resilience

Teacher Resources (If 'Notes' are used in the related PowerPoint presentation please indicate here)	Learner Resources (e.g. academic articles or links) for advanced reading or review (citation in individual cells)
	NBS
	Faivre et al (2017) NBS and the

	Multi-functional watershed management	
	Enhancing the insurance value of ecosystems	
x	Sustainability of the use of matter and energy	
x	Sustainable development	
x	Innovating with nature	
x	Biodiversity	
	Nature-based enterprises	
	Nature-based entrepreneurship	
	NBS and new business and investment models	
	Citizen participation, stakeholder/community consultation	
	Disaster risk reduction	
	Risk management and resilience	
x	NBS policy development and implementation	
	NBS research	
	Green infrastructure	
	Green finance / sustainable finance	
x	Ecosystem services and ecosystem-based approaches	
x	Rural municipal/local authority/government planning	
x	Coastal municipal/local authority/government planning	
x	Urban municipal/local authority/government planning	
	Improving well-being and quality of life	
x	NBS and new business and investment models	
	NBS and CCAM (Connected, Cooperative and Automated Mobility)	
	Other 1: (Please specify)	nature-inspired innovations
	Other 2: (Please specify)	
	Other 3: (Please specify)	

Keywords Source 1: United Nations Environment Programme (2020). *The Economics of Nature-based Solutions: Current Status and Future Priorities*. United Nations Environment Programme Nairobi., p.5. (keywords above in italics)

Keywords Source 2: Faivre N, Fritz M, Freitas T, de Boissezon B, Vandewoestijne S. (2017)'Nature-Based Solutions in the EU: Innovating with nature to address social, economic and environmental challenges.' *Environ Res.* 2017 Nov;159:509-518. doi: 10.1016/j.envres.2017.08.032. Epub 2017 Sep 8. PMID: 28886502.

Keywords Source 3: European Commission (2015). *Towards an EU Research and Innovation policy agenda for Nature-Based Solutions & Re-Naturing Cities: Final Report of the Horizon 2020 Expert Group on 'Nature-Based Solutions and Re-Naturing Cities' Full Version*. Luxembourg: Publications Office.

