

PRACTICAL ACTIVITY

Title	<ul style="list-style-type: none"> ○ Technologies of agrifood future – Vertical Farming
Part of the training course referred to in this lesson	<ul style="list-style-type: none"> ○ <input type="checkbox"/> Part 1 General information about sustainability and CE Part 2 Specific Information about: <ul style="list-style-type: none"> <input type="checkbox"/> Wood sector <input type="checkbox"/> Plastic sector X Agrifood sector
Duration	45 min or more
Location	Outside or balcony
Specific location requirement	Garden, balcony or class
Equipment needed	<ul style="list-style-type: none"> ● Seeds ● Fertiliser ● Ground dirt ● Pots ● Stacked shelves <p>Optional:</p> <ul style="list-style-type: none"> ● Automatic watering system ● Temperature control ● Artificial light
General Learning objective(s) according to the Bloom Taxonomy https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/	<ul style="list-style-type: none"> X Create Produce new or original work (design, assemble, construct, investigate, formulate) <input type="checkbox"/> Evaluate Justify a stand or decision (appraise, argue, defend, critique, select, support) <input type="checkbox"/> Analyze Draw connections among ideas (differentiate, organize, relate, compare, distinguish, test, experiment) X Apply Use information in new situations (execute, implement, solve, use, demonstrate, operate) <input type="checkbox"/> Understand Explain ideas or concepts (classify, discuss, describe, identify, locate, translate) <input type="checkbox"/> Remember Recall facts and basic concepts (define, duplicate, list, memorize, repeat)

<p>Specific learning objective(s)</p>	<ul style="list-style-type: none"> ● To experience eco-friendliness using gardening skills ● To empower creativity in agrifood field 																
<p>Cognitive, socioemotional and behavioural outcomes based on https://www.unesco.org/sites/default/files/2018-08/unesco_education_for_sustainable_development_goals.pdf</p>	<p>Learning objectives for SDG 11 “Sustainable Cities and Communities”</p> <p>Cognitive Learning Objectives</p> <ul style="list-style-type: none"> - The learner knows the basic principles of sustainable planning and building and can identify opportunities for making their own area more sustainable and inclusive. <p>Socio-emotional learning objectives</p> <ul style="list-style-type: none"> - The learner is able to feel responsible for the environmental and social impacts of their own individual lifestyle. <p>Behavioral learning objectives</p> <ul style="list-style-type: none"> - The learner is able to promote low-carbon approaches at the local level. - The learner is able to co-create an inclusive, safe, resilient and sustainable community 																
<p>Green skill(s) addressed</p>	<table border="0"> <tr> <td>X Creative problem-solving</td> <td>X Management skills</td> </tr> <tr> <td>X Forward-thinking</td> <td><input type="checkbox"/> Impact quantification</td> </tr> <tr> <td><input type="checkbox"/> Monitoring skills</td> <td><input type="checkbox"/> Life-cycle management</td> </tr> <tr> <td><input type="checkbox"/> Analytical skills</td> <td><input type="checkbox"/> Science skills</td> </tr> <tr> <td><input type="checkbox"/> Lean production</td> <td>X Waste management</td> </tr> <tr> <td>X Maintenance and repair skills</td> <td><input type="checkbox"/> Environmental auditing</td> </tr> <tr> <td><input type="checkbox"/> Pollution prevention</td> <td>x Ecosystem management</td> </tr> <tr> <td><input type="checkbox"/> Eco-design</td> <td><input type="checkbox"/> Other _____</td> </tr> </table>	X Creative problem-solving	X Management skills	X Forward-thinking	<input type="checkbox"/> Impact quantification	<input type="checkbox"/> Monitoring skills	<input type="checkbox"/> Life-cycle management	<input type="checkbox"/> Analytical skills	<input type="checkbox"/> Science skills	<input type="checkbox"/> Lean production	X Waste management	X Maintenance and repair skills	<input type="checkbox"/> Environmental auditing	<input type="checkbox"/> Pollution prevention	x Ecosystem management	<input type="checkbox"/> Eco-design	<input type="checkbox"/> Other _____
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<p>Step by step instructions to implement the activity</p>	<p>Introduction:</p> <p>The world’s population is estimated to grow to 9.7 billion by 2050, creating a number of issues over the next few years. There will be boosted demand for high-value animal protein food, a trend that is being raised by urbanisation and rising income worldwide.</p> <p>The most important action to implement is, therefore, increasing agricultural efficiency and ensuring a climate-resilient agricultural system. More entrepreneurs and technology specialists have joined the aggrotech movement in recent years, as the cultural approach of the food industry is undergoing an indispensable transformation.</p> <p>One of the future’s most efficient ideas - Vertical farming is the practice of growing crops in vertically stacked layers. This is made achievable by using growing shelves suspended on a wall or a fence and implementing</p>																

hydroponic techniques to sustain the plants.

Try by yourself!

Step-by-step:

Don't let the lack of gardening space put you down because in-home vertical farming is both a viable option and a rewarding experience.

Do the research of seeds of plants that can grow in the climate of the county in which the school is located. Teachers should explain very briefly to students the benefits of vertical farming. Then technical steps are written below.

- Firstly, set up your shelves on top of another with space in between them.
- Secondly, set up your watering system and check if it actually works properly and if water reaches all parts of the shelves.
- If you are lucky enough to get a lot of natural light, congrats, but in another case set up your artificial light across the shelves at an angle so it gives as much direct light as possible.
- Begin with stacking the pots on the shelves.
- Plant your seeds in the ground.
- Add some fertiliser.
- Turn on your artificial light and water systems.
- Enjoy your work and see the progress and some results in a week or few.

Benefits:

- Vertical farming reduce space consumption
- Can be easily adapted in the urban area
- Responding educational needs to grown in a limited space
- Reducing transportation cost of production
- All year and 24/7 cultivation
- Preventing climate change-related hazards

You will make a positive impact on the environment. This technique has a good potential, as it assures control over many production variables. It not only mitigates the number of inputs consumed but also grants for control over crop microbes and parasitic insects. This allows substantially shorter crop cycles and year-round production.

You can try to prepare a vertical farming simulation and school, home, balcony or organize a sort of competition among classes that create such vertical farming system

<p>Assessment tool / methodology</p>	<p>Feedback from the participants on the strong and weaker points of the practical activities and its usefulness.</p> <p>Assessment and reflection for the students:</p> <ol style="list-style-type: none"> I. What worked well and why? II. How do you find the suitable place for vertical farming? III. What have you learned? IV. Did you believe in vertical farming success in your country? V. In what way was the experience beneficial? VI. How do you intend to use this gained skills, knowledge and experience? VII. Any other comments?
<p>Additional resources</p>	<p>none</p>
<p>Source</p>	<p>none</p>