Lesson plan

using the STEAM method of teaching.

Topic: Can we use natural light, water and plants to improve the efficiency of the house?

Lesson 1: Selecting the right plot of land for the construction of the house

Geography: Exploring the topography and geology of the area, identifying potential natural hazards such as landslides or floods and identifying suitable land for the construction of the house.

Math: Calculating land size and shape, estimating construction costs, and budgeting for land acquisition.

Natural Sciences: Understanding soil types and their ability to support construction, identifying plant and wildlife species in the area, and identifying the impact of construction on the environment.

Lesson 2: Placing the house on the selected plot of the land

Geography: Identifying the orientation of the area, studying the climatic influence on the location of the house and its energy efficiency

Math: Calculating the size and shape of the house to suit the terrain and orientation of the area.

Natural Sciences: Understanding the impact of your house location on the environment, local flora and fauna, and water and energy cycles.

Funded by
the European Union

Educational tools and additional resources:

• Maps of the local area, topographies, satellite images and building plans

• Mathematical exercises for calculating the costs of purchasing the land and building the house

• YouTube videos explaining land concepts and house placement

• Games and art activities that help children better understand geography and natural science concepts, such as identifying plants and animals in the area and natural features important to house building.

Here are some examples of tasks from various school subjects that you can use in the session "How to place the house on your plot of land?" to help children learn how to take advantage of the environment, climate, topography and orientaGon in designing their dream home:

Geography: The task of researching and understanding the topographical features of the area where children live so that they can make informed decisions about locating their house. For example, they might research the terrain's elevation, slopes, sun and wind exposure, and the climatic history of the area.

Math: The task of doing math calculations to help size and place the house. For example, children could calculate the angles of incidence of sunlight and wind depending on the location of the house, to determine the optimal orientation and to maximize natural light and heat and to minimize the exposure to cold wind.

Arts: The task of creating drawings and models of their dream house, taking into account all aspects discussed in the previous session, such as location, climate and topography. For example, children could create a model that shows how the house is placed on the lot, how it is oriented, and how it takes advantage of natural light and the surrounding landscape.

Funded by
the European Union

Models:

Funded by
the European Union

Science: The task of researching the different types of building and insulation materials that can be used depending on the climatic characteristics of the area so that informed decisions can be made regarding the choice of materials and construction methods. For example, children could research sustainable and recyclable building materials, such as wood or beams, which can be used in cold, wet climates, and insulation materials, such as mineral wool or polyurethane foam, which can be used in hot and dry climates.

These are just a few examples of tasks from various school subjects that can be used in the session "How to place the house on your plot of land?" to help children better understand how they can build their dream home in an energy efficient way adapted to the specific needs of the area they live in.

Living environments:

https://read.bookcreator.com/dnGAgXDAtIUVeeQKsqwXNnzomdE3/73qmEHooQ8aitxR7tgvHXA

https://read.bookcreator.com/dnGAgXDAtIUVeeQKsqwXNnzomdE3/S756cqbkRg6UtqwT0sfEdA

Puzzle game:

https://im-a-puzzle.com/share/575d3950b44dbac https://im—a—

puzzle.com/share/0587d05efff585e

Lesson 2: Green Roofs

Benefits of a green roof

The garden has to be on the ground? Now, an environmentally friendly trend grows—on rooftops.

A green roof has many benefits at economic, ecological and societal levels. A green roof provides a rainwater buffer, purifies the air, reduces the ambient temperature, regulates the indoor temperature, saves energy and encourages biodiversity in the city. Green roofs are part of climate-proof construction. What's more, people are happier in a green environment than in grey surroundings. Below we explain the benefits one by

Funded by
the European Union

one.

A Living Roof

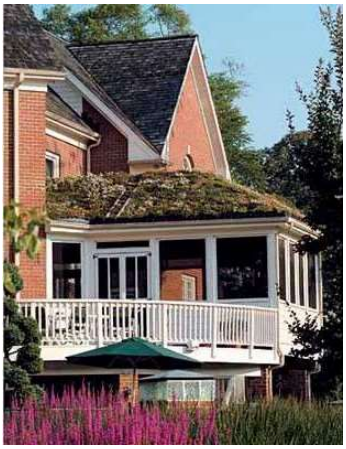
Called an eco-roof, garden roof, living roof, or vegetated roof, a green roof is a lightweight, layered roofing system that allows virtually maintenance-free plants to top a waterproofed substructure. If you've been hearing more about them lately, that's because the technology has become simpler, making installations, especially residential ones, more common.

https://homedesignlover.com/home-design/green-roofed-houses/

Runoff Reduction

The green roof of this unheated porch in the Chesapeake Bay area absorbs 27 percent of the rain that falls on it, reducing storm-water runoff that might pollute nearby rivers and streams. Homeowner Mark Gaulin, a roofer, installed “chicken ladders” to facilitate twice-yearly weeding of the roof, which is planted mostly with sedums, a family of hardy, drought-tolerant perennials.

Funded by
the European Union



Green Roofs - This Old House

Lower Heating Bills

Eco-roofs help to purify the air by absorbing pollutants; soak up rainwater, thereby reducing storm-water runoff that pollutes rivers and streams; and keep a rooftop 10 to 20 degrees cooler in the summer and warmer in the winter, which means lowered air conditioning and heating bills, fewer fossil fuels wasted, and a healthier environment. Green roofs also allow creative types to show some personality.

Urban Trends

Today, green roofs are mandatory for new buildings in some European countries. In the late ’90s, Chicago Mayor Richard M. Daley began searching for ways to reduce his city's urban heat-island effect, which occurs when dark surfaces such as parking lots and rooftops absorb and retain heat, spiking local air temperature and increasing smog. In 2001, he added a 21,000-square-foot green roof to the top of Chicago City Hall. The mayors of Atlanta and Portland, Oregon, have since followed suit.

Funded by
the European Union

Rădăcini în cer - Londra I BIM. Tehnologii | Proiecte (bimtechnologies.co.uk)

Extensive Roofs

While it might be possible to design your own green roof, it's advisable to hire an architect or landscape professional who has had some experience with green-roof systems. That expert will want to consult with a structural engineer who can advise you as to what kind of system you are installing. “Extensive” systems are the lighter, low-maintenance variety, usually planted with hardy, drought-tolerant perennials such as sedums and other succulents. Because an extensive system requires no watering or special care, it's environmentally preferred.

Funded by
the European Union

Extensive green roofs	Intensive green roofs
1. Tend to be simpler, with hardy plants and an average growing depth of two to four inches 2. Requires the least added structural support because they are lightweight 3. You need a little maintenance once established	1. Tend to be more complex, such as a fully accessible park with trees 2. It resembles conventional gardens or parks 3. Requires more structural support because they are heavier 4. Requires a higher initial investment 5. Requires more intensive maintenance

Funded by
the European Union