

## Overarching Enduring Understanding

**Students will explore and learn how buildings and the environment can work together to create great spaces to live that work with and support the natural environment.**

### FLOW OF INSTRUCTION

**2-ESS1-1.** Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

**2-ESS2-1.** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

**2-ESS2-2.** Develop a model to represent the shapes and kinds of land and bodies of water in an area.

**2-ESS2-3.** Obtain information to identify where water is found on Earth and that it can be solid or liquid.

**2-PS1-4.** Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

**2-LS2-1.** Plan and conduct an investigation to determine if plants need sunlight and water to grow.

**2-LS2-2.** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants. [NYSSLS: Develop a simple model that illustrates how plants and animals depend on each other for survival.]

**2-LS4-1.** Make observations of plants and animals to compare the diversity of life in different habitats.

**Investigation: Building Your Green Building (summative challenge, introduced in week 1 or 2, completed in weeks 8, 9, and 10)**

*This summative challenge is the driving force behind the activities and lessons in this unit—the reason **why** students are working through the smaller investigations. With that in mind, we think it's best to introduce the summative challenge at the beginning, even though students won't technically be working on it until the end of the unit.*

In the summative challenge students will design and “construct” a green home that is suitable for the area in which they live. To build their house they must understand the following concepts as they relate green architecture: the natural resources in the area (2-ESS2-2, 2-LS4-1), the biodiversity of the area (2-LS4-1), the climate of the area (2-PS1-4), and the natural hazards in the area that occur on a short time scale (2-PS1-4, 2-ESS1-1) and the natural hazards in the area that occur on a longer time scale (2-ESS1-1, 2-ESS2-1). **Enrichment version—Have students use a region of their choice, although they will need to do more research.**

**Investigation: What's Available? (mini-research activity, occurs during weeks 4–6)**

In this investigation students gather information from various sources on the natural resources available in the area. This includes **determining where water can be found, on Earth and in their region** (2-ESS2-3), as well as understanding options for building materials and plant life (2-LS4-1, 2-ESS2-1). At the conclusion of What's Available? students must summarize their findings on a map of the United States as well as a map of the region as **a model of the shapes and kinds of land and water in those respective areas** (2-ESS2-2). At the end of the investigation students will make conclusions about how the natural resources in the area will influence their design for their green building.

**Investigation: What's It Like Outside? (mini-research activity, occurs during weeks 7–9)**

In this investigation students gather information from several sources about the types of natural disasters/natural hazards in an area, with the goal of understanding the design criteria for their green building. They will need to gather information to **provide evidence that Earth events can occur quickly** (flooding, earthquakes, snowstorms, forest fires) or **slowly** (wind and water erosion) (2-ESS1-1). As part of their conclusions for this part of the investigation they will need to **compare different green building strategies to slow or prevent air or water erosion** (2-ESS2-1). Students will also need to gather data on temperature associated with the region to determine potential hazards that may occur from it being hot or cold. As part of this effort they will need to **determine what type of changes may occur due to the temperature and which ones are reversible or irreversible** (2-PS1-4).

**Investigation: Which Is Better? (comparison activity, occurs during week 10)**

In this comparison activity students will compare two architectural or building strategies **designed to slow or prevent wind or water from changing the shape of the land** and decide, with a justification, which one they think is better. Alternatively, they can propose a third solution but must explain why they believe their solution is better through direct **comparison with the other two solutions presented.** (2-ESS2-1)

**Investigation: The Wall Is Alive! (hands-on activity, occurs during weeks 3–10)**

In this investigation students will design living walls and then **plan out and conduct an investigation to monitor how they grow under different conditions** (2-LS2-1).

Living walls, basically a wall of plants, are used quite frequently in green building design and in urban settings where more plant life is desirable. This investigation begins with a short research activity during which the class outlines the design criteria for a living wall. These criteria include identifying **plants that are common to the area** (2-LS4-1) and creating an initial model on how the **plants in their living wall may interact with other animals in their region** (2-LS2-2).

After constructing their living wall and determining a range of growing conditions that **use varying amounts of water and sunlight**, students will **monitor and compare plant growth.** (2-LS2-1).

As the plants in the walls are growing students will research at least one other region and, by **comparing plants and insects native to that region versus their own**, they will compare what plants would be best used for a living wall in that location (2-LS4-1). After their research students will refine their models of how the plants in their living walls would interact with the animals in the area, **specifically highlighting how plants and insects depend on each other for survival through nourishment** (plant supporting insect/animal) and **pollination** (insect/animal supporting plant) (2-LS2-2).

<b>Unit</b>	Green Architects
<b>Grade Level</b>	Grade 2
<b>Price</b>	\$725 – Full Curriculum Unit
	\$15 – Living Wall Companion Pack
	\$15 – Green Building Companion Pack

Parts List – Full Curriculum

Component Name and Description	Approximate Cost	Source
<b>Printed materials</b>		
Educator Guide (1)		
<i>My STEM Stories™</i> notebooks (30)		Electronic copies available on the unit website.
<i>My STEM Explorer Notes™</i> notebooks (30)	NA	Printed materials available through replacement kit purchase.
Timelines sheets (1 set)		
Introductory investigation data recording sheets (30)		
<i>Which is Better? You Decide!</i> comparison cards (6 sets)		
<b>Provided equipment and materials</b>		
National Geographic Kids Beginner's World Atlas	\$20.00	Amazon
Earth-Friendly Buildings Bridges and More: The Eco-Journal of Corry Lapont	\$20.00	Amazon
Wild Buildings and Bridges: Architecture Inspired by Nature	\$15.00	Amazon
Insect Pollinators	\$10.00	Amazon
Animal Pollinators	\$10.00	Amazon
Living wall containers (15)	\$25	Amazon
Plastic stands (15)	\$20	Dollar Store
Binder clips (15)	\$12	Dollar Store
Seeds	\$20	Garden Store
Green building starter kit (1)	\$50	Craft Store
<b>Common equipment and materials required but not provided</b>		
soil	<\$5	Garden Store
water	NA	Tap
Local seeds	< \$5	Garden Store
Packing tape or plastic wrap and sharpies	< \$5	Dollar Store

Companion packs come individually bagged for easy distribution

### Parts List – Companions

Living Wall Companion
Living wall containers (1)
Plastic stands (1)
Binder clips (1)
Seeds
Soil holder (1)
Soil
Investigation notebook

Green Building Companion
Box for house starting point
Crayons (4 pk)
Individual green building starter kit
Investigation notebook