# Nature-Watch Activity Kit

## Herb Garden Greenhouse

(Nature Watch Kit #164s)

This page includes the Next Generation Science Standards (NGSS) mapping for this kit and a Science, Technology, Engineering, and Math (STEM) chart (on back) to use in adapting and extending this activity to other subject areas.

**164s Kit Contents**

| Item | Kit Size 1 | 25 |
|---|---|---|
| Greenhouse Base | 29 | 108 |
| Greenhouse Lid | 29 | 108 |
| Peat Pellets | 100 | 400 |
| Basil Seed Packet | 1 | 2 |
| Dill Seed Packet | 1 | 2 |
| Cilantro Seed Packet | 1 | 2 |
| Fennel Seed Packet | 1 | 2 |
| Spoon Straws | 25 | 100 |
| ID Round label (strips of 5) | 26 | 104 |
| Manual | 1 | 1 |
| Sample Photo | 1 | 1 |
| Take home instruction sheets | 25 | 100 |

**Next Generation Science Standards Alignment**

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

K-ESS3-1. Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.

1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are alike, but not exactly like, their parents.

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

3-LS1-1. Construct an argument that plants and animals have unique and diverse life cycles but all have in common birth, growth, reproduction and death.

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.

MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

**See Back for STEM Extensions Chart**

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## Science

Are your students interested in how different conditions effect plant growth, or what components (soil, sunlight, water) are most important for plants to grow? Have teams set up experiments to identify how changing one variable can cause one type of herb to grow better or not as well. Break students into small groups and have them select one herb to test, and swap seeds with other groups so that each has multiple seeds of one type of plant. Then instruct students to identify a variable to test. And set up different conditions under which to grow the seeds.

For example, are students interested in how light impacts growth? They can set up a **treatment group** that is concealed within a shoebox and receives no light and a **control group that** has normal conditions (regular light). Students should keep all other things the same between groups (provide the same amount of water, keep at the same temperature, etc.) and record when the first plant shoots emerge from the soil and record regular measurements for several weeks. Are there any differences in the growth rate, size, color, or taste of the plant? Do different herb types respond differently to the treatment groups?

Some students may be interested in how fertilizer impacts their plants, and this is a great opportunity to set up another test and make predictions. Ask students what things they think could help their herbs to grow faster. Do they think adding fertilizer could change the rate of growth, size of leaves, or other measurable characteristics? Do they anticipate different herbs would have different responses? Do they think different types of fertilizer could create different responses? Is there such a thing as adding too much fertilizer? Have students choose one of these questions or a related one to test. What do they think will happen?

## Technology

Online there are many videos and websites that document the growth and development of various species of plants that are ecologically and economically important to humans. Have students research these and then create their own short films documenting the growth of their plants with key points in development identified. Encourage them to present these to each other and critique the work of their peers.

## Engineering

Plants will need regular water over vacation breaks or on weekends, so ask students to design a simple irrigation system for their plants. Encourage them to look at example DIY systems online to inform and inspire their design.

## Math

Challenge students to imagine how to build a larger scale greenhouse for their plants. Provide them with a list of materials and their associated cost as well as estimates of the cost of labor to build their greenhouse. Who can build the best structure with the lowest budget?

Have students create blueprints for their greenhouse that are designed to scale. Challenge them to account for supporting the weight of materials like glass or plastic or steel. What angles can they use in their construction of the greenhouse in order to make it more effectively trap heat and moisture?