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# NURTURING LIFE

## Library and Take-home Gardens

### Overview

Children explore what living things need to survive and thrive by creating and caring for a garden. Options are outlined for creating a garden plot outdoors (where appropriate) or in a container indoors at the library, as well as small gardens housed in environmentally-friendly soda bottles — reused for the children to take home!

### Type of Program

- Facilitated hands-on experience
- Station, presented in combination with related activities
- Passive program
- Demonstration by facilitator

### What's the Point?

- We belong to a complex system of interacting water (and ice), air, and land that fosters life.

### Activity Time

45-60 minutes

### Intended Audience

**Families** or other mixed-age groups, including children as young as 5 years old *with assistance from an older child, teen, or adult*  
**School-aged** children ages 8-9  
**Tween, teens, and adults**

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### Facility Needs

- Access to water

Option #1: Outdoor garden

- An outdoor garden area approximately 4' x 4' or larger

OR

Option #2: Indoor container garden

- An indoor area near a window (that is sunny for at least half of each day and at least 3' long or longer)
- An indoor or outdoor gathering space

- 2 tables

OR

Option #3: Take-home garden

- An indoor or outdoor gathering space
- 2 tables

## **Materials**

### **For the Facilitator**

- 2-3 pitchers or watering cans
- 1 pair of scissors (for Option #3)
- 1 permanent marker (for Option #3)
- Brief Facilitation Outline* page (below)

### **For Each Group of 10-15 Children**

*Garden Option #1: Outdoor Garden*

- Plants and/or seeds appropriate for your geographic region
- 3–5 hand trowels/shovels

*Garden Option #2: Indoor Container Garden*

- 10-15 seeds or small indoor plants appropriate for your needs (light conditions, watering, etc.)
- OR  10-15 cuttings
- AND
- Rooting hormone powder or gel (available at most garden centers or department stores with garden centers)
- 2-4 cups for scooping dirt/sand/rock (e.g. measuring cups or disposable drinking cups)
- 1 (0.5 cubic foot or larger) bag of gravel or pea rock for the bottoms of containers
- Containers (pots or long window containers)  
Also consider recycled containers such as tomato or strawberry (produce) containers, etc.
- Soil, enough to fill your containers to approximately ½ inch below the rim
- For xeriscaping: Use a sandy mix, as described in the “Preparation” section or a “succulent and cactus” mix

### Garden Option #3: Take-home Garden

- 10-15 seeds or small indoor plants      OR       10-15 cuttings

AND

- Rooting hormone powder or gel (available at most garden centers or department stores with garden centers)
- 1 (0.5 cubic foot or larger) bag of gravel or pea rock for the bottoms of containers
- 10-15 (1 L or 20 oz.) clean, empty, plastic bottles (no lids/caps), cut in half as described under Preparation
- 1 (8 quart or larger) bag of soil (sandy mix described in the “Preparation” section or a “succulent and cactus” mix)
- 3 (10-yard) rolls of duct tape (in fun colors, if possible)
- 10-15 adhesive labels or cards on which to note plant care information, including plant name, lighting, temperature, and watering/feeding requirements

### Recommended Plants and Seeds

It is important to use plants and/or seeds that are appropriate for your intended garden location (indoors or outdoors). Particular attention should be paid to the lighting, soil, and water conditions of the intended planting location. It is recommended that you research appropriate plants for your growing zone or consult a garden center/plant nursery/master gardener in your area. There are many options for your garden — it can be edible, hardy/drought tolerant (xeriscaping), flowers (for cutting), etc. Below you will find a list of recommended plants that may be suitable and readily available (seasonally) for many locations, growing zones, and gardening options.

- Plants:
  - Vegetables (cucumber, pepper, pumpkin, etc.) — annual, edible
  - Herbs (basil, thyme, parsley, mint, etc.) — annual, edible
  - Marigolds (flowering) — annual
  - Zinnia (flowering) — annual
  - Petunia (flowering) — annual
  - Cosmos (flowering) — annual
  - Daylilies (flowering) — perennial, zones 3–10
  - Hosta (flowering) — perennial, zones 3–9
  - Columbine (flowering) — perennial, zones 3–9
- Seeds (annuals):
  - Balloon Flowers
  - Zinnia (cut flower)
  - Sunflower (edible)
  - Petunia (flowers)
  - Shasta Daisy (cut flowers)
  - Corn Flowers (cut flowers)
  - Cucumber (edible, climbing)
  - Basil (edible)
  - Sweet Peas (climbing)

- Xeriscaping (see note below):
  - Jade Plant (*Crassula argentea*) cuttings — Indoor and zones 9a–11 outdoors
  - Hens and Chicks (*Sempervivum*) — Indoors and zones 3–11 outdoors
  - Silver Mound (*Artemisia*) — Indoors or zones 3–7 outdoors
  - Living Rock (*Lithops spp. and Pleiospilos spp.*) — Indoors and zones 9b–11 outdoors  
\*\*Prefers very dry conditions!\*\*
  - Lavender (flowering, fragrant) — Indoor and zones 5–10 outdoors
  - Pansy (flowering) — Indoor and zones 2–11 outdoors
  - Sages (*Salvia officinalis*) — Zones 4–10 outdoors
  - Purple Coneflower (flowering) — Zones 3–9 outdoors  
\*\*Draws many birds and butterflies\*\*

*Note: Xeriscaping is a form of gardening that utilizes very hardy, drought-tolerant plants. One of the main goals of xeriscaping is water conservation, but this is not the only advantage. Additional benefits of xeriscaping include less maintenance, no need for pesticides or fertilizers, increased property value, and increased wildlife habitat. Most regions have a variety of native plants that may be used in this type of landscaping. Garden centers, plant nurseries, and master gardeners are excellent sources of information regarding appropriate plant selection when planning a xeriscaped garden in your area. To learn more about xeriscaping, please visit [eartheasy](#).*

### Recipe for a Sandy Soil Mix

A sandy soil mix may be purchased as a “succulent and cactus” mix at most garden centers. However, you may also create your own by following this easy (and less expensive) recipe: Mix together equal amounts of peat moss, coarse sand, and perlite. Perlite is used to help prevent water loss and soil compaction. All these ingredients should be readily available at a garden center or hardware store.

## Supporting Media

### Books

#### *Gardening Projects for Kids*

Jenny Hendy, Southwater, 2012, ISBN: 978-1780190198

Fun projects, like “grass head man” and painted pots, add a new twist to gardening for kids. Appropriate for ages 5 and up.

#### *101 Kid-Friendly Plants*

Cindy Krezel, Ball Publishing, 2007, ISBN: 978-1-883052-54-6

A comprehensive guide to using nontoxic flowers, vegetables, trees, and houseplants, includes seventeen gardening projects. For children ages 6 and up.

#### *Kids' Container Gardening: Year-Round Projects for Inside and Out*

Cindy Krezel, Chicago Review Press, 2010, ISBN: 978-1883052751

Kids learn about their climate zones, the essential supplies for gardening, and other useful information for growing plants! Appropriate for age 6 and up.

## **Preparation**

### **Beginning six months before the activity**

- Decide which type of garden(s) best fits your facility's/community's needs (as well as your budget!). Take your [growing zone](#) and environmental conditions into consideration when selecting plants/seeds.
- If desired, involve your tween advisory council (if you have one) in the planning process. Perhaps even have them raise the funds to purchase plants for a community garden!
- Determine which garden option(s) to facilitate. Option #3 is recommended to be conducted in support (conclusion) of either option #1 or option #2, but may be used on its own if desired.
- Prepare and distribute publicity materials for programs based on this activity. If possible, build on the children's knowledge by offering multiple science, technology, engineering, art, and mathematics (STEAM) programs. See the STAR\_Net resources listed at <http://community.starnetlibraries.org/resources> for ideas.

#### *Garden Option #1: Outdoor Garden*

- Select a garden plan appropriate for your geographic region.
  - If possible, invite a Master Gardener to evaluate the library's grounds for an outdoor garden and assist the children during the activity
  - If desired, contact landscape architects, such as at the [National Gardening Association](#), to work with your facility to create a custom garden, taking care to select plants appropriate to your location (or for xeriscaping, if that option is to be used).
- Arrange for long-term care of the garden, perhaps by having a sign-up sheet for the participants to return to the library to water the garden, pull weeds, and fertilize as necessary.

#### *Garden Option #2: Indoor Container Garden*

- Arrange for long-term care of the garden, perhaps by having a sign-up sheet for the participants to return to the library to water the garden and fertilize as necessary.

### **The day before the activity**

#### *Garden Option #1: Outdoor Garden*

- Prepare the soil and have the area ready for planting.

#### *Garden Option #2: Indoor Container Garden*

- Prepare an area for planting in containers.

### *Garden Option #3: Take-home Garden*

Prepare the bottles to serve as planting containers:

- Precut the tops off the plastic bottles and tape the cut edge with a little duct tape (or masking tape) to avoid any sharp edges. Cut the bottle a little over half way from the bottom.
- Check the fit of the bottle top and bottom. The bottle top should fit over the bottom section a bit (approximately one inch of overlap). You may need to make a small (half-inch) vertical slit down the side (near the top) of the bottom section to achieve the proper fit (see examples below).
- Prepare plants/seeds as needed.



*Example of a plastic bottle properly prepared for the take-home garden (option #3).*

### How to Take Cuttings and Propagate a Jade Plant

Propagation of selected succulents like the jade plant, *Crassula argentea*, is done mainly with cuttings; either leaf or stem cuttings will work. Leaf cuttings are easier to work with but take much longer to become a “jade plant.”

**Materials needed:** A sharp knife, liquid or powder rooting hormone (available at gardening and hardware stores), a pot, suitable soil, a parent plant (the plant from which you will take the cutting), an area where you can work, some paper towels or something to help clean up and on which to place cuttings. It is best to prepare cuttings before your program (day of).



#### *Instructions for propagating using a Leaf Cutting:*

1. Place soil in the pot or container you will be using for your new jade plant and water thoroughly, letting it drain while you prepare the rest of your items.
2. Cut the leaves off the parent plant and set them aside on a paper towel to dry. (Do steps #1 and 2 before the program.)
3. Give each child a leaf cutting.
4. Have them dip the cut end into some rooting hormone, either liquid or powder. If using powder, you may need to moisten the stem to get the powder to stick).
5. Have the children make a small hole in the dirt with a stick or their finger.
6. Place the cutting into the hole, trying not to rub off too much of the rooting hormone in the process.
7. Carefully press the dirt around the cutting.
8. Place the planted cutting in a warm, shaded place for 3–4 weeks, and then gradually

expose the plant to sunlight, moving it closer to full sun week by week. This allows the plant to develop a tolerance and increases the success of your plant. Explain to the children that it will take time, but that their leaf will develop roots and eventually grow into a jade plant that looks like the parent plant. Be sure to send plant care instructions home with the children if using with garden option #3.

Source: *Jade plant care and propagation*

## **Activity**

### **1. Share ideas and knowledge.**

- Introduce yourself and the library. Help the participants learn each other's names (if they don't already).
- Frame the activity with the main message: We belong to a complex system of interacting water (and ice), air, and land that fosters life.
- Invite the participants to talk about what they already know about taking care of living things and what life needs, in general, to survive. Use open-ended questions and invite the children to talk with you and each other. Guide the conversation toward identifying the four requirements for life: nutrients (food), water, warmth (energy), and shelter (stable environment).

Use discussion to help the participants start to think about their prior experiences and build new understandings about what life needs. Some conversation-starters are:

- What do you provide for your pets to help them survive?
- What are some things you would need to have with you or find to survive in the wilderness?
- Do you think other planets or moons in our solar system could support life? Why do you think so?

- ### **2. Connect the discussion to the global systems that make life possible.** Use examples that the participants brought up in the discussion. Invite the participants to think of the local environment (or, better yet, have this discussion outside!) to look for evidence of the systems of water (and ice), air, and land that make life possible.

Say you're on a basketball team. The five of you play together beautifully, moving up and down the court. If one of your teammates gets injured, the team can't perform as well.

The same is true of Earth's five systems. The water (and ice), air, land, and life systems are a team. (Scientists refer to these systems as the hydrosphere, cryosphere, atmosphere, geosphere, and biosphere, respectively.) What affects one affects the whole team.

Your community is important to Earth because your environment is linked to Earth's systems.

3. **Optional (time permitting): Research how to grow a garden**, either to beautify the library or to take home with them. Have small groups look through the books together and discuss useful tips for gardening, then regroup and summarize everyone's findings about taking care of plants:
  - One-time needs: Soil, seeds/plants, pot/garden area, etc.
  - Ongoing needs (i.e., life's needs): Sunlight, nutrients, water, etc.
4. **Create a garden.** Invite the children to work as a group to put their knowledge of life to the test by sustaining life in a garden! Make sure to follow the planting instructions that came with your plants or seeds. Conduct one or more of these options:

*Garden Option #1: Plant an outdoor garden on the grounds of the facility.* Make sure to water the new plants/seeds carefully after planting (with close adult supervision).

*Garden Option #2: Plant an indoor garden in a container(s).* Work as a group, taking turns, to plant the garden. Make sure to water the container garden after planting, using either a pitcher or watering can.

*Garden Option #3: Invite participants to construct a take-home garden in a bottle.* Explain that their bottle will require all of the ingredients for life that were discussed, and they will be responsible for taking care of them at home. Have the participants follow these steps:

- a. Put  $\frac{1}{2}$ – $\frac{3}{4}$  cup (you may use an 8-oz. plastic cup) of gravel into the bottom of the bottle.
- b. Add 2 cups of the soil mix into the bottle. The soil should fill up to about  $\frac{1}{2}$ –1 inch below the top of the bottom section of the bottle.
- c. Place a plant or seed into the soil according to package directions. (For jade plant (or other) cuttings, follow the jade plant instructions above.)
- d. Add about  $\frac{1}{2}$  cup of water to your bottle, or until there is approximately 1 inch of water in the bottom of the bottle (in the rocks).
- e. Replace the top of the plastic bottle so that it fits around the outside of the bottom.
- f. Secure the top of the bottle (without cap) in place with a piece of duct tape.

Give each participant a note card or label and use the permanent marker to note the appropriate plant care instructions. Optional: Hand out preprinted plant care labels to each child and have them affix it to the side of their bottles.

5. **Conclude.** Your garden is a reminder of life's needs and our connection to the planet we call home.

## **Correlation to Standards**

### **National Science Education Standards**

#### *Grades K–4*

#### Life Science – Content Standard C

##### *The Characteristics of Organisms*

- Organisms have basic needs. For example, animals need air, water, and food; plants require air, water, nutrients, and light. Organisms can survive only in environments in which their needs can be met. The world has many different environments, and distinct environments support the life of different types of organisms.

#### Life Science – Content Standard D

##### *Properties of Earth Materials*

- Soils have properties of color and texture, capacity to retain water, and ability to support the growth of many types of plants, including those in our food supply.

#### *Grades 5–8*

#### Life Science – Content Standard C

##### *Regulation and Behavior*

- All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment.
- Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival. Fossils indicate that many organisms that lived long ago are extinct. Extinction of species is common; most of the species that have lived on the earth no longer exist.

#### Earth and Space Science – Content Standard D

##### *Structure of the Earth System*

- Land forms are the result of a combination of constructive and destructive forces. Constructive forces include crustal deformation, volcanic eruption, and deposition of sediment, while destructive forces include weathering and erosion.
- Water covers the majority of the earth's surface.

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### Brief Facilitation Outline

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