



Lesson Two

Plenty of Plants

Lesson Overview

This lesson covers the skills of planting a seed and seedling, basic plant science (parts of the plant and their function), introduces the concept of native prairie plants as our natural ecosystem in the Great Plains, introduces plant families and basic plant identification.

Lesson Objectives

Participants will learn the technique of planting a seedling.

Participants will learn how to sow a seed.

Participants will be able to identify plants in their garden.

Participants will learn the parts of a plant and their function.

Participants will learn the difference between annuals and perennials.

Participants will be able to identify one native or prairie plant.

Time Needed

1 hour

Staff Needed

2 Garden Educators

Key Terms

Annual

Plants that perform their entire life cycle from seed to flower to seed within a single growing season. All roots, stems and leaves of the plant die annually. Only the dormant seed bridges the gap between one generation and the next.

Perennial

Plants that persist for many growing seasons. Generally the top portion of the plant dies back each winter and re-grows the following spring from the same root system (e.g. Purple Coneflower).

Biennial

Plants which require two years to complete their life cycle. First season growth results in a small rosette of leaves near the soil surface. During the second seasons growth stem elongation, flowering and seed formation occur followed by the entire plant's death.

Prairie

An extensive, level or slightly undulating, mostly treeless tract of land in the Mississippi River valley, characterized by highly fertile soil and originally covered with coarse grasses, and merging into drier plateaus in the West.

Wild Plants/ Native Plants

Native plant is a term used to describe plants endemic (indigenous) to a given area in geologic time. This includes plants that have developed, occur naturally, or existed for many years in an area (e.g. trees, flowers, grasses, and other plants).

Genus

A principal taxonomic category that ranks above species and below family, and is denoted by a capitalized Latin name, e.g., Leo.

Species

A group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding. The species is the principal natural taxonomic unit, ranking below a genus and denoted by a Latin binomial, e.g., Homo sapiens.

Conservation

Preservation, protection, or restoration of the natural environment, natural ecosystems, vegetation, and wildlife.

Introduction to Lesson Two

Plant Identification

It is very important that gardeners know what is growing in their garden. This lesson focuses on really getting to know the plants, their functions, and their life cycle. They should be familiar with what they are planting as well as the weeds growing in their garden. Proper identification is key when it comes to both plants and insects, in order to know which are helpful, which are harmful, which are edible, and which are not.

Labeling the Garden

For new gardeners (or little ones) it may take a few times to remember how to identify a tomato plant, a zucchini, basil, or clover. Each time you come to the garden try to take a few minutes walking around and identifying everything. Labeling the plants with stakes or rocks can help those who are able to read, but no matter the age we should all learn to identify plants by their features – leaves, stems, flowers. You will find that with practice children will be able to identify everything in the garden.

Activity One - Plant Walk

Materials // Handout List of Common Wild Plants, Books with pictures of Native Plants, Books with pictures of common garden weeds, Garden gloves

Ages // All Ages

Time // 15 - 30 minutes depending on the area and whether there are good plants for identifying/foraging

Activity Description //

Go around the garden and see what wild growing plants you can find. Take a small leaf or stem so that you can identify them. After a few plants are collected come back together in a circle and talk about them, are any of them prairie plants? Bring books with pictures of native plants and common weeds so that you can work to identify them. When they are identified tape them using clear tape to a piece of card stock paper, and keep for future reference. Discuss the importance of identifying all plants before harvesting or using them. Make sure participants wear gloves for this activity if they would like to. Some people can be sensitive to certain plants, just by touching them.

Activity Two - Plant Families

Materials // Laminated papers listing the different plant families, seed packets

Ages // All Ages

Time // 15 minutes

Activity Description //

Did you know plants have families? They do! Share why it is important to know the plant families --

1. Different families grow well together, and others do not.
2. Knowing the plant families is also important when we are saving seed.
3. We need to “rotate” or plants each year, or grow them in different spots.

Explain that plants have two names – a genus and a species. To learn about all the names plants have lay out a variety of seed packets. Have laminated sheets on the ground (throughout the garden) or table with the family names. Invite participants to take a seed packet and run (or walk) to the laminated sign listing the various plant families where they think their seed packet should go. When you are finished, repeat another time so they get the opportunity to start memorizing them.

Most Common Annual Vegetable Plant Families //

Alliaceae	Onion Family	Garlic, Onion, Leek, Chives
Amaranthaceae	Amaranth Family	Beets, Amaranth, Quinoa, Spinach, Lamb’s Quarter, Celosia
Apiaceae	Carrot Family	Parsley, Carrot, Dill, Celery, Cilantro, Fennel
Asteraceae	Aster Family	Echinacea, Dandelion, Sunflower, Sunchoke, Artichoke
Brassicaceae	Mustard Family	Broccoli, Cabbage, Brussels, Kale, Collards, Rutabaga, Turnip, Arugula
Curcubitaceae	Cucumber Family	Melons, Cucumbers, Watermelons, Squash, Pumpkins
Fabaceae	Bean Family	Beas, Peas, Chickpeas, Soybeans, Lentil, Clover, Alfalfa
Lamiaceae	Mint Family	Basil, Sage, Mint, Thyme, Rosemary, Lavender, Beebalm
Poaceae	Grass Family	Corn, Wheat, Barley, Oats, Rice
Solanaceae	Tomato Family	Potato, Tomato, Peppers, Tomatillo, Eggplant

For more use the handouts — Identifying 50 Major Plant Families

Activity Three - Parts of the Plant

Materials // Laminated papers listing the different plant families, edible vegetables & fruits that represent part of the plant, paper plates, knife for cutting veggies & fruits

Ages // All Ages

Time // 20 minutes

Activity Description //

It is crucial to learn the different parts of a plant and their functions, so that we can better understand what happens in the garden. Use the "Plant" poster with labeled parts and go over how everything works. Next, bring a variety of common vegetables & fruits that represent the different parts. Break participants into teams and see if they can match the correct produce item that we eat with its part. Lay laminated signs out on a table or the ground representing each part and have them lay items from their own garden or from the store/farmer's market next to the correct sign.

- Seeds** Function: Seeds serve several functions for the plants that produce them. Key among these functions are nourishment of the embryo, dispersal to a new location, and dormancy during unfavorable conditions. Seeds fundamentally are means of reproduction
- Roots** Function: grow under the ground. They absorb water and nutrients. They also hold the plant in place.
- Stems** Function: hold the leaves, flowers and fruits. They provide support to the plant. They also distribute the nutrients from the roots to the different parts of the tree.
- Leaves** Function: they are the food makers of the plant. They contain the green pigment called chlorophyll, they absorb sunlight needed by the plants.
- Flowers** Function: they make the plants look beautiful. They have different colors, sizes and shapes. Some flowers are fragrant, others are not. Some flowers develop into fruits.
- Fruits** Function: they contain the seed. Some fruits have one seed like mango, others have more than one seed like guava. Not all fruits can be eaten.

Seeds: Popcorn, Sunflower Seeds, Quinoa

Roots: Carrots, Beets, Radishes

Stems: Green Onions, Celery, Chives

Leaves: Spinach, Kale, Lettuce, Collards, Arugula

Flower: Broccoli, Edible Flowers (dandelions, nasturtiums)

Activity Four - All About A Seed

Materials // Seedlings in different stages of growth, visual aid to show how seeds germinate and different types of seeds

Ages // 6-18

Time // 10 minutes

Activity Description //

Describe the parts of a seed (powerpoint or poster visual) and show how plants grow out of the seed. Bring plants from the greenhouse if possible to show the different stages of germination.

Seed Coat - protects the seed

Cotyledon - stored food

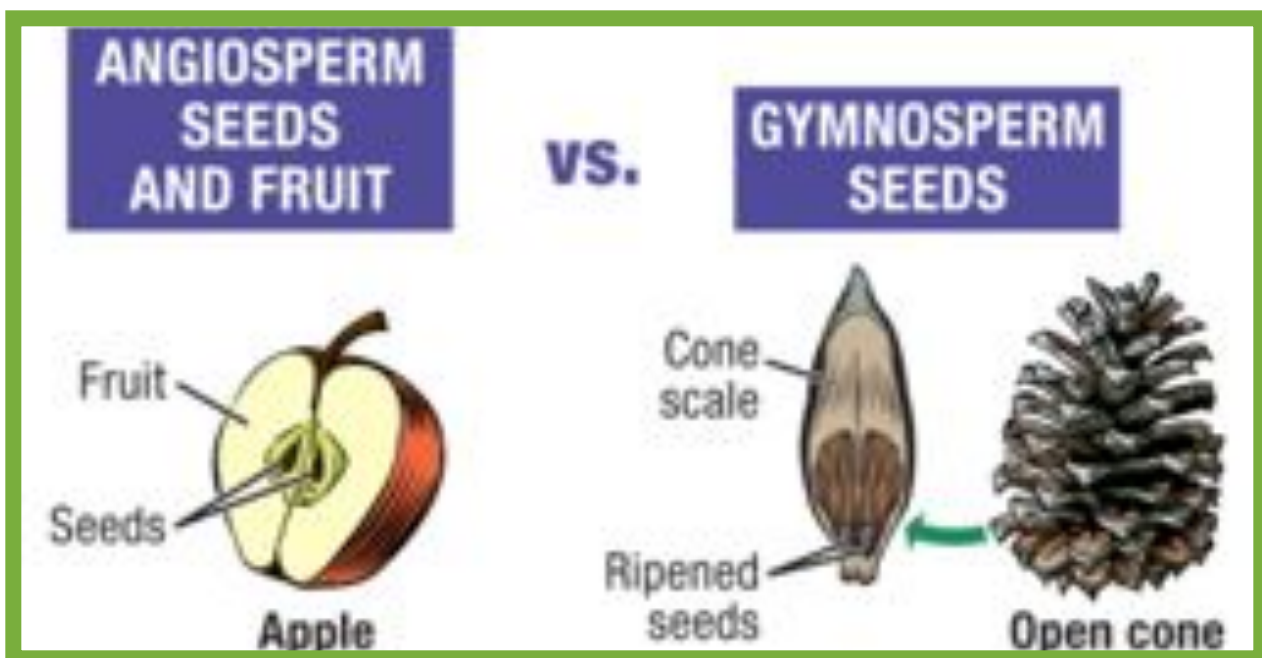
Embryo - baby plant

Then describe the two types of seeds angiosperms (covered seed) and gymnosperms (naked seeds). Ask if they can come up with examples of each of these and why there might be these differences?

Angiosperm - Apple

Gymnosperm - Pine cone

What foods do we often eat that are actually seeds?



Activity Five - Guest Speaker - Park Ranger/ Conservation Specialist or Greenhouse Manager

Activity Description //

Invite a local park ranger or conservationist to come and share their experience and knowledge about native plants and prairies with your participants. If they are able, invite them to bring samples of plants or seeds that are growing in their area or site they manage. Have them explain their job and the work they are doing to maintain native plants as well as wildlife!

Places to contact for speakers near Omaha --

Fontanelle Forest

Hitchcock Nature Center

Neale Woods Nature Center

Botna Bend Park

Activity Six - Seed Matching Game with Vegetables or Prairie Seeds

Materials // Glass jars (like baby food jars) filled with different seeds, 10 – 20 jars. Laminated seed cards one that matches with every jar of seed. Paper plates for pouring seeds out for more exploring.

Ages // 6-10 (school age)

Time // 15 minutes

Activity Description //

Place the participants in teams. Set out small glass jars (baby food jars work great!) of different seeds and laminated sheets listing each plant with a picture. Let them play a matching game. If you have older kids make it a race to see which team can correctly identify the seeds first. If you have younger kids sit with them and go through the seeds together. Let them hold the seeds & experience the different textures. Sensory play is key to having fun in the garden.

Activity Seven - Prairie Plant and Animal Game

Materials // Prairie plant and prairie animal laminated cards

Ages // 6 - 18

Time // 15 minutes

Activity Description //

Hand out prairie plant & animal cards with descriptions, you act them out without saying the name of the plant or animal. The participants have to guess which plant or animal you are. After the teacher has demonstrated a few then allow the participants to try and act out and describe the different plant or animal without giving away its name.

Split participants into two teams and make it a contest to see who can identify the most correct.

Activity Eight - Plant Body

Materials // None needed

Ages // 2 - 10

Time // 5-10 minutes

Activity Description // Have the participants stand up, tell them their legs are roots, their center is the stem, their arms and their fingers are leaves, and their head/hair is the fruit or the flower. When you say a vegetable or fruit, they have to wiggle and/or move the part of their body that correlates to that type of plant. Try easy examples for young ones, and more advanced examples for older participants.

Examples: Carrot (roots)

Spinach (leaves)

Tomato (fruit)

Lettuce (leaves)

Celery (stem)

Beets (root)

Broccoli (flower)

Peppers (fruit)

Activity Nine - Grow! The Life Cycle of a Plant

Materials // White board or white roll of paper to write down cycles

Ages // Ages 2 - 8

Time // 5 - 10 minutes

Activity Description // This is a great activity for participants to connect with life cycles. Ask them what cycles they are familiar with – plant cycle, animal cycle, moon cycle, tide cycle, etc.

Have the participants crouch down to start out as a seed. Make noises and movements like rain and have them inch upwards (the seed is growing). Invite them to keep pretending they are growing into whatever garden plant – vegetable or fruit – they would like to become. Then have them raise their arms and move them all around, back and forth, these are their flowers that need to be pollinated.

Have the garden teachers be the pollinators (bees, moths, bats) they must chase the flowering vegetables and fruits to pollinate them (by tagging them). Once they are tagged they must freeze and say what kind of vegetable or fruit they became.

For example – tomatoes, calendula, sunflower, peppers, or broccoli.

Activity Ten - Planting the Garden

Materials // Trowels, seeds and seedlings, gloves, watering can and water source

Ages // All Ages

Time // 30 minutes

Activity Description // It is most likely Spring or early Summer at your garden site. Now is time to start preparing the soil for planting and planting.

METHOD

First, you need your seed bed (or garden) to be smooth and free of any large clumps or debris. Remove any woody material, trash, rocks, large clumps of dirt. Use a fine tooth rake to comb the soil and create even and level planting areas. Read your seed packets to determine how close together or far apart to plant rows.

Direct seeding:

Dig furrows using a hoe or a trowel, depending on the size of your bed and how much you are planting. Furrows are small trenches where you will drop your seed. Make sure to first look on the seed packet for the planting depth. Most seeds don't like to be planted very deep, so if the seed packet says 1/8th of an inch, don't plant it any deeper. Drop your seed according to spacing (or sprinkle it if you are working with tiny seeds like lettuce). Cover your furrows gently with soil. Water lightly to prevent your seeds from getting flushed out, but soak thoroughly.

Transplanting:

The first step is preparing the garden bed and creating a level space (see above). Transplanting is the act of putting seedlings that were grown in a greenhouse or indoors into the garden bed. Care should be used when taking the seedlings out of their seed cells or pots. Show participants how to squeeze the bottom of the cell or pot where the roots are, and gently remove the plant. Seedlings need to be planted so that all the roots are covered and part of the stem. This is important so that the delicate stems do not break with winds. Space the seedlings apart according to the seed packet. After transplanting make sure to water the seedlings around their base, this will help settle the roots.

Activity Eleven - Plant Identification

Materials // Wooden Garden Stakes, Markers/Pens, Tempra Paint, Weather-proof Paint, Sharpies, Flat rocks, Paint Brushes

Ages // All Ages

Time // 10 - 15 minutes

Activity Description //

It is important to keep track of all the plants in our garden. One of the easiest ways is to paint and/or write on wooden garden stakes and put them next to your plants or seeds. Below is a list of common garden vegetables, herbs, and fruit in both English and Spanish. Feel free to include both words (one on each side) that way you can practice the names in Spanish, or if you are a Spanish-speaker you can practice the English!

Another easy way is to get weather-proof paint and medium or large-sized rocks. Paint the rock with a nice coat, then paint the name of the vegetable on the rock. After they have dried, place the rocks in the garden beds next to the plant they will identify.

Activity Twelve - Harvesting and Using Prairie Plants

Materials // Two folding tables, Prairie Plant Uses Handouts, Nine Natives to Know Handout

Ages // All Ages

Time // 15 - 20 minutes

Activity Description //

If there is space in a garden bed or in the ground plant a few prairie plants and talk about their uses. If there isn't space a large planter will do, and will add some nice color to the garden. The easiest prairie plants to incorporate would be – Echinacea (purple coneflower), Prairie sage, Blazing Star, Compass Plant, Milkweed

Use Handout “Prairie Plant Uses” in the resource section and follow the instructions. Set up two stations, one for prairie plants for food, and one for prairie plants for medicine. Use handout “Nine Natives To Know.”

Activity Thirteen - Sprouts or Microgreens

Materials // Pint Mason Jars, Cheesecloth, Rings or Rubber bands, Sprouting Seeds (Broccoli, Brussels, etc.), flat tray, soil/germination mix, watering can, microgreen seeds, scissors

Ages // All Ages

Time // 10 - 15 minutes

Activity Description // Sprouts or micrograms are a fun and easy project for all ages. The best part is that they grow very fast & you can eat them.

For sprouts — this is a 3 day activity, so explain to participants that they will need to do Day 2 and Days 3 through 5 at home (or at their garden site, if they are there every day). Bring jars showing each day, and send participants home with seeds they can sprout at home or in the classroom and the instructions. Sprouts in an individual mason jar are recommended for older participants. Please explain the process to the site staff and encourage them to keep the mason jars in the classroom. Sprouts do not need soil to grow, just water!

Instructions for sprouts —

DAY 1: Pour radish (or other sprouting seeds) seeds into a glass mason jar

- Fill jar with water
- Place sprout screen, cheesecloth, or pantyhose on top and screw ring on or secure with rubber band
- Set aside on kitchen counter for the rest of the day

DAY 2: Pour water out of jar through the sprout screen, cheesecloth, or pantyhose

- Rinse with fresh water (fill jar then pour water out)
- Place jar at an angle in a bowl to allow excess water to drain; set aside

DAYS 3-5: Each day rinse with fresh water and tip in bowl until your seeds have sprouted

Instructions for microgreens — For all (but especially younger participants because the process is easier) “direct seed” microgreen seeds into a flat tray in the classroom (or outside in the garden). Put near a sunny window if indoors. These need to be watered every day!

Once the sprouts and/or microgreens are ready to harvest they can be clipped with scissors and added to a salad or on top of pita with hummus!



sprouts on pita with beet hummus

harvesting sprouts in the classroom



Activity Fourteen - Prairie & Wildflower Seed Book

Materials // Seeds (use older ones that probably wouldn't germinate), waxed paper, card stock or cardboard, needle & thread (for binding), twine, stapler, anything to decorate the books like markers, pens, paints, etc.

Ages // All Ages

Time // 20 minutes

Activity Description

Have a variety of seeds, waxed paper, card stock paper, and cardboard ready. Also have materials to decorate the outside of the book out on a table. Fold paper pages together, cut cardboard to make the cover, place seeds in waxed paper (put glue on waxed paper to make them stick if you want), staple the waxed paper "pockets" to the card stock. Make sure to label what the seeds are on the page. They can take this home so they will remember the different seeds. See example book to give you a better idea.

Activity Fifteen - From Seed to Fruit

Materials // One plant in every stage

Ages // 2 - 10

Time // 5 minutes

Activity Description //

Bring a few items in each stage - seed, sprout (cotyledon), seedling, transplant (seedling ready to go in the ground), plant setting fruit or going to flower (if possible), and then the actual fruit. A great example is a tomato. Let participants explore each stage. Ask them what they notice!

Activity Sixteen - Starting Seedlings Indoors (for late summer or Fall)

Materials // Plug trays, germination mix, seeds, watering can

Ages // All Ages

Time // 15 - 20 minutes

Activity Description //

Starting seeds in plug trays and watching them grow in a greenhouse is a great skill for everyone to have. Explain to participants that there are some seeds we “direct seed” or sow right in the garden and there are other seeds that need to be grown out and then transplanted. We can start our own transplants even in the summer.

Seeds to sow during summer — kale, swiss chard, collards, broccoli, cabbage, flowers, cauliflower, head lettuce (romaine), etc.

Step One - Timing

Pay attention to the seed packets & the “when to start indoors” date. You will use this date, and work backwards depending on what the seed packet says.

Step Two – Seeding Equipment

Here are some options – seed trays with plugs, yogurt cups, seed-starting tray with cell pack inserts, single flat with furrows, soil blocks. Show participants the various options. Note that anything you start a seed in must have holes in the bottom for proper drainage. Also note that seeds germinate better when they are in a small space, that way they have complete access to the nutrients and can be watered properly.

Step Four – Wet the Soil Mix + Sow the seeds

This is key – get your soil mix moist before sowing your seeds. You can do this by pouring the mix you need into a large bucket and getting it uniformly moist, or putting the soil mix in your tray/cells and then soaking it with water. Leave it for a while, then come back and sow your seeds.

Seeding Technique - Read the seed packet, most seeds do not need to be planted very deep at all. Make a small indent in the middle of the cell or pot with your index finger, place seed into the indentation, push the seed down a little more if needed (according to seed packet). Dust with more potting or germination mix. One or two seeds per cell is good. If there are two or more seeds that germinate, you will need to pull one out once they begin to grow, to allow enough space (unless you are sowing into a flat without cells).

Step Six – Watering & Care

Trays with seeds sown into them must be watered every day, sometimes multiple times a day. They should never be allowed to dry out. This will decrease or eliminate the chances of germination. Make sure you water them thoroughly so the cells are watered all the way to the bottom.

Activity Seventeen - Annual or Perennial?

Materials // One laminated sign that reads “Annual,” one laminated sign that read “Perennial,” and signs with various flowers, fruits, and vegetables drawn on them.

Ages // All Ages

Time // 15 - 20 minutes

Activity Description //

This game can be played like “sharks and minnows.” Hand out signs to each participant with a different fruit, vegetable, flower, nut, etc. on it that they would be familiar with. Explain to participants the different between annuals and perennials. Annuals grow for one year only and perennials grow year after year. Group the participants that are annuals together and let them look at the different annual options. Do the same with perennials. Then, have all the participants line up. The leader will say “annuals!” and all the of annuals will try to run past the leader to the other side without getting tagged. If they ran and they were not actually an annual plant then they have to find a place in the field/running area to sit down. They are out, but they can tag the other participants as they run past. Likewise for perennials. If they ran but they were not a perennial they are out and they must come into the middle of the field and sit down to help tag. Any participant that made it to the other side and was correct gets to keep running. Switch sides until everyone is sitting down and there is only one participant left. If there are multiple participants left at the end (because they were right every turn) then they all get to be the leaders the next round.

You can also play this game using the parts of the plant. You will call out “leaves!” and all the plants that you harvest and consume the leaves will run to the other side. You will call out “roots” and likewise. This is a great way to be active and also check for understanding.

Another activity is to walk around the garden and identify each plant and whether it is an annual or a perennial.

SNACK // Veggie Wraps

Ingredients

One 8-ounce package cream cheese
1 tablespoon fresh chopped basil
1 teaspoon fresh minced chives
1 tablespoon fresh chopped parsley
1 tablespoon lemon juice
Salt and freshly ground black pepper
6 taco-sized flour tortillas
1 pound thinly shaved turkey
3 carrots, julienned
1 cucumber, julienned

Directions

Mix the cream cheese, basil, chives, parsley, lemon juice, and sprinkle with salt and pepper together in a bowl. Lay out the tortillas and spread with the herb cream cheese mixture. Next, layer on the turkey, carrots and cucumber onto each tortilla. Like making sushi, roll the tortillas up tightly, then wrap in plastic wrap and refrigerate, about 1 hour. When ready to serve, unwrap the sushi rolls and slice into quarters.

SNACK // Cilantro, Basil or Kale Pesto

Ingredients

1 bunch cilantro, basil or kale
1/2 cup roasted walnuts
2 cloves garlic, minced
1 1/2 tbsp lime juice
1/3 cup olive oil
salt to taste
whole wheat crackers

Directions

Mix all ingredients in a food processor!

SNACK // Herb Iced Tea

Ingredients

Mint leaves or Thyme leaves

Ginger

Hibiscus Tea bags

Boiling Water

Local Honey

Ice Cubes

Sparkling Water

Directions

Mint iced tea is easy and fun to make in the garden. If you have glass jars you can fill them with mint & water, place a tight fitting lid on top and let sit in a sunny place for at least 1 day. Pour the liquid over ice, add a small amount of honey if you need. Mix with a little sparkling water for a fizzy treat. Thyme, Ginger Root, and Hibiscus are other great options for sun tea.

Books

Plant a Pocket of Prairie

Out on the Prairie

The Prairie That Nature Built