

Seed Balls

(Adapted from Lady Bird Johnson Wildflower Center Seed Ball lesson plan)



Objectives

Students will be able to:

- define the importance of native plants.
- describe environmental problems associated with invasive species.
- identify humans roles in preventing invasive species and promoting native plants.
- identify common native plants in the Austin area and their importance.
- create a seed ball to promote native species planting and learn what a seed needs to germinate.

TEKS

Kindergarten: 1A, 2A, 2E, 4B, 5A

1st Grade: 1.1A, 1.2A, 1.2E, 1.7A

2nd Grade: 2.5D, 2.7A, 2.9A, 2.9B

3rd Grade: 3.5D, 3.7A, 3.10

4th Grade: 4.7A, C

5th Grade: 5.5C, 5.59

Materials

- Wildflower ID cards/wheels
- *Grow Green Native and Adapted Landscape Plants*
- 1 gallon bag terracotta clay
- 1 gallon bag dry organic compost
- 1 quart bag of assorted seeds
- 6 Sets of measuring cups
- 6 Mixing bowls
- 6 Spray bottles
- 1 Bucket (fill halfway with water)

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Lesson Overview

The chart below outlines how to structure and use this activity in a classroom setting as well as the order in which to present the objectives covered.

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|---|--|
| Setup and Materials | <ul style="list-style-type: none"> Cover desks with tables or complete activity outdoors. Seed ball making is messy! Fill a bucket half full of water for hand washing. |
| Introduction (see Background) | <ul style="list-style-type: none"> Define native plants and discuss the importance of native plants. What do seeds require to germinate into plants? <i>water, soil, sunlight</i> How do invasive plants compete with native plants for these requirements to survive? What role do we as humans play in preventing invasive species and/or promoting native species? One way is to make seed balls and plant native! Define biodiversity. (Compare diversity to a pizza restaurant that serves only one kind of pizza vs. one with a buffet.) Explain how invasive plants reduce biodiversity due to high reproductive capacity and lack of consumers (unfair competition). What would our forests and city streets be like if we had only one kind of plant? |
| Activity (see Activity Outline) | <ul style="list-style-type: none"> Make and spread seed balls. |
| Conclusion and Solutions (see Conclusions and Solution chart) | <ul style="list-style-type: none"> Significance of native plants. Benefits of native plants for our water quality. |

Vocabulary

| | |
|-----------------------|---|
| Habitat | The place where an organism lives. |
| Native Plant | A plant endemic (indigenous) or naturalized to a given area. |
| Biodiversity | The number and variety of organisms found within a specified geographic region. |
| Invasive Plant | A plant that displaces natives and cause economic or environmental harm to human health. |
| Compost | Mixture of decomposing living materials, which include plants, animals, fungi, and microorganism, that is used as fertilizer. |
| Clay | Very small particles of soil that stick together holding in water and nutrients but has poor soil drainage. |

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Background

Biodiversity

A diversity of plants helps our ecosystem and wildlife by: 1) providing nectar, seeds, and fruit; 2) increasing insect numbers to provide the greatest variety of food sources for wildlife; and 3) providing year-round color. For example, an oak tree can provide food, shelter, and places to raise baby birds. Planting and promoting native plants and wildflowers adds beauty to our city, conserves water, attracts wildlife, and protects our water quality since there is less need for chemical sprays.

Native plants are species that were present in the local landscape at the time of European settlement. Over thousands of years, these plants have adapted to the climate, soil and water conditions of the area. Since they are well adapted to their region, native plants tend to need less water and fertilizers, and therefore less maintenance, than do other plants. Local wildlife have similarly adapted to their surroundings, so native plants best meet their food and cover needs, and provide good places for them to raise their young. In general, native plants will not out-compete other plants in a natural area or more broadly in an ecosystem but instead generally enhance biological diversity.

Although native plants bring lots of value to our natural landscapes they are being taken over by invasive plants. Invasive species of plants are those that have been transplanted into a new environment, either intentionally or unintentionally. Invasive species are one of the top threats to biodiversity (variety of life).

Common Invasive Plants in Austin: Waxleaf Ligustrum, water hyacinth, Chinaberry, *Hydrilla*, Privet, Giant Cane, Nandina, Johnson Grass, Mediterranean Mustard, and Japanese honeysuckle.

| Non-Native, Exotic, Invasive Plants |
|---|
| Germinate quicker and grow faster - dominate space |
| No natural predators - seeds not eaten so continue to grow. |
| Monopolize nutrients or water |
| Harm animal habitats |
| Increase erosion because do not stabilize soil with roots |
| Produce more seeds - create monocultures |

Transport of Invasive Plants

What are some ways that humans spread weed seeds?

- Vehicles: Cars, trucks, trains, motorcycles
- Recreation: Hiking, Camping, Bicycling, Clothing/Gear
- Animals: Horses, Dogs, Livestock
- Collecting: Picking weed flowers or buying and planting weedy plants, like French Broom, in our yards

What can we do to promote native plants and/or minimize non-natives?

- to stop the spread of invasive weeds
 - Prevent
 - Pull
 - Plant Natives
 - Educate Others
- to remove and control the spread of invasive weeds

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- Manual – pulling, digging and cutting
- Mechanical – mowing and plowing
- Biological – grazing, insects, and plant diseases
- Cultural – prevention and education
- Chemical – herbicide as a last resort

Seed Balls

Seed balls are a method for distributing seeds by encasing them in a mixture of clay and soil humus. Some native North American tribes used forms of seed balls. More recently natural farmer Masanobu Fukuoka has applied them, as have others inspired by his work. He has worked for over fifty years, throughout the world, implementing this beautifully simple method of rehabilitating damaged lands. This cheap, low maintenance method of re-vegetation and agriculture requires no water, other than natural rainfall.

Seed balls are simply scattered directly onto ground, and not planted. They could be useful for seeding dry, thin and compacted soils and for reclaiming derelict ground. This method takes a fraction of the time or cost of other methods to cover large areas and is also very applicable in small areas.

The clay and humus ball prevents the seeds from the drying out in the sun, getting eaten by predators like mice and birds, or from blowing away. When sufficient rain has permeated the clay and the seeds inside sprout they are protected within the ball that contains nutrients and beneficial soil microbes. Seed balls are particularly useful in dry and arid areas where rainfall is highly unpredictable.



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Activity – Seed balls

1. Divide students into 6 groups.
2. Distribute 1 tray, 1 mixing bowl, measuring cup, clay, compost, and seeds to each group
3. Mix 1 ¼ cup (5 parts) clay, ¾ cup (3 parts) compost, and ¼ cup (1 part) assorted seeds. As students add each ingredient discuss the importance of the ingredient.
4. Using the spray bottle, mist with water until mixture sticks/binds together like cookie dough.
5. Take a pinch of the finished mixture and roll (in the palm of your hand) into penny-sized round balls.
6. Distribute seed balls at service project area or have students place in a baggy if they will be taking the seed balls home.
7. Wash hands in the bucket of water.
8. Use the wildflower identification wheels and the *Grow Green Native and Adapted Landscape Plants* to identify the seeds present in the seed balls.

Conclusion and Solutions

- Review the importance of native plants?
- How do native plants help our local creeks?

Additional Resources

Armadillo Clay, 3307 East 4th Street, Austin, 78702 – sells red clay for making seed balls

LBJ Wildflower Center www.wildflower.org

GrowGreen Native and Adapted Landscape Plants Guide www.growgreen.org

Invasive Plant field guides

- www.texasinvasives.org
- www.austintexas.gov/sites/default/files/files/Watershed/plants/invasiveplants.pdf