NO WATER? NO PROBLEM!

A program by Oklahoma 4-H Youth Development & Oklahoma Water Resources Center

SKILL: SCIENCE TIME: 20-30 MIN

OBJECTIVES:

Students will:

- Be able to define the term xeriscape.
- Develop an understanding of xeriscape landscaping principles.
- Explore plants that are best suited for a drought tolerant climate in Oklahoma.

LESSON:

Slide 1 — Have up when students are coming into the room.

Slide 2: Drought

Who can tell me what a drought is? A **drought** is a period when rain does not fall as much as it should. During times of drought, many things can suffer from lack of water.

What are some things that might suffer when we have a drought? Our rivers and lakes may get too low. Plants and trees may not get enough water to grow and may begin to die. The aquifers may become too low to be able to provide water for communities.

Can you tell me what percentage of our water use at home goes to watering landscapes? About 30-40% of the water used at home is used to water landscapes. That's a lot of water! This session is going to show you some things that can be done to reduce that water usage on landscaping.

VOCABULARY

- Drought
- Xeriscape
- Annuals
- Perennials
- Tree
- Shrub
- Groundcover
- Climber
- Ornamental Grass
- Drip Irrigation
- Trickle Irrigation
- Mulch

MATERIALS

- Use "No Water? No Problem!" PowerPoint along with the lesson to present the information.
- Examples of xeriscape plants, irrigation supplies, and mulch would enhance the lesson and provide hands on visuals that could be passed around during discussion.

Slide 3: Xeriscape

Does anyone know what Xeriscape is? Xeriscape is using specific types of plants that do not require a lot of water in your landscaping and yard. It also includes using specific types of watering techniques and things like mulch to help hold the water in the ground. Things like the placement of plants in relationship to the sun and shady areas is also important in designing a xeriscape landscape.

Slide 4 & 5: Annuals & Perennials

First, let's talk about types of plants that are good to use in Oklahoma that don't need as much water to survive. There are different types of plants. **Annuals** must be planted each year. They only last for one growing season. **Perennials** are planted and will return year after year.

Slides 6: Annuals

Some examples of Annuals include:

- Lantana
- Madagascar Periwinkle
- Marigold
- Mexican Bush Sage
- Firebush
- Spider Flower
- Mexican Zinnia
- Ornamental Peppers

Slides 7: Perennials

Some examples of Perennials, plants that can last more than one growing season, include:

- Autumn Sage
- Black-Eyed Susan
- Blanket Flower
- Blue False Indigo
- Shasta Daisy
- Coneflower
- Daylily

Does anyone know what other types of plants are used in xeriscape? There are some trees, shrubs, groundcovers, climbers and ornamental grasses that can also be beneficial in a xeriscape design.

Slides 8-9: Trees

A **tree** is a woody plant that has a trunk that is 3 inches or more in diameter and generally grows over 20 feet tall. These are just a few trees you might recognize or even have in your yard that work well in a xeriscape design:

- Arizona Cypress
- Caddo Sugar Maple
- Chinese Pistache
- Juniper
- Oklahoma Redbud
- Sawtooth Oak

Slides 10-11: Shrubs

A **shrub** is also a woody plant, but they have several perennial stems that stand up or are close to the ground. Shrubs are generally less than 13 feet tall, and the stems are no more than 3 inches in diameter. Let's look at a few of the shrubs you might recognize that are drought tolerant:

- Rose of Sharon / Hibiscus
- Crapemyrtle
- Deciduous Holly
- Sumac
- Yaupon Holly

Slide 12: Groundcover

Does anyone know what a groundcover is? A **groundcover** spreads out and covers a larger space than other plants. They are also not very tall. Groundcovers are sometimes planted on a slope in a yard so that you don't have to mow the slope. They are sometimes planted around a tree and are used in flowerbeds to cover a larger space. Some examples of groundcover that grow well in Oklahoma include:

- Creeping Phlox
- Junipers
- Lilyturf or Monkey Grass
- Santolina

Slide 13: Climbers

Climbers are plants that will grow vertically. They are sometimes planted on a trellis, by an arch or arbor, by a fence, or next to a house. Some examples include:

- Boston Ivy
- Climbing Roses
- Crossvine
- Virginia Creeper

Slide 14: Ornamental Grasses

Ornamental Grasses are the last type of plant that can be planted to help conserve water. These grasses are not the grass your yard is covered in and that we walk on. It is simply something pretty to put in a flowerbed. Ornamental grasses grow to different heights, but some can get as tall as 8-11 feet! They mostly grow in clumps. Some examples of ornamental grasses that grow well in Oklahoma include:

- Maiden Grass
- Ravenna Grass
- Switch Grass
- Mexican Feather Grass

Can anyone tell me when is the best time of day to water plants outside? The early morning hours are the best time to water. This is when the least amount of evaporation occurs, and plants can get a better drink.

Slides 15-16: Watering Techniques

Do you know what strategies you can use to water efficiently?

Using a **drip or trickle irrigation** system instead of a spray or sprinkler gets the water directly to the roots quicker and doesn't require as much water. These are hoses have small holes in them and they are laid out on the ground around the plants.

Set up the watering system on a timer and only water a couple times a week. This will help save water as well.

Making sure that you don't water when it is raining or right after a good rain will also help with wasting water.

If you only have a spray or sprinkler available to water with, put an empty tuna can in the area where you are watering. When the can is full, you have watered enough in that area.

Slides 17: Mulches

Mulch is something that can be used in flowerbeds to help with water conservation. **Do you know what else mulch might be used for?** Mulch can be used to create pathways, to prevent weeds from growing, to protect the roots, and to help control soil erosion.

What do you think mulch is made from? Mulch can be made from wood or bark such as Cedar or Cypress. These are a natural insect repellant. Straw or hay can also be used as mulch. Pine needles work well to add acid to the soil which plants like. Rubber from old tires can also be used as mulch. This type of mulch does not disintegrate like wood or hay. Rocks can also be used as mulch. River rock, lava rock, and gravel of all kinds are examples of rock used for mulch.

Slide 19: When to Water Grass

How do you know when your grass needs to be watered? If you leave footprints when you walk on your lawn, it needs water. The grass is too dry to bounce back once it is walked on. Another sign is the grass may turn a dull grey-green color. Give grass a good soaking so that the water gets down to the root system where the water is most needed.

Let's Clean Up and Review

What is xeriscape?

> Xeriscape is using specific types of plants that do not require a lot of water in your landscaping and yard.

Why do we use plants that are drought tolerant to landscape?

Besides drought tolerant plants, what are some other things we can do to conserve water in the landscape?

What does the grass look like when it needs watering?

> If you leave footprints when you walk on your lawn, it needs water. Another sign is the grass may turn a dull grey-green color.

Ideas To Extend Learning on Xeriscape:

- Give students seedlings to take home and plant. Give them instructions on planting and watering to get roots established.
- Plant a tree at the school as a class that doesn't need much water after it is established.
- Provide seeds for one of the annuals or perennials and plant in a cup. When they get big enough, take home and plant in flowerbed or plant in a flowerbed at the school.

Oklahoma Aqua Times Related Lessons:

Water You Know

The 40 Gallon Challenge

Rain Roulette

Lessons can be found at: https://4h.okstate.edu/projects/science-and-technology/oklahoma-aqua-times/index.html

OSU Publications on Xeriscape and Oklahoma Plants:

These materials may be good to review prior to the lesson or to share with teachers.

Drought-Tolerant Plant Selections for Oklahoma (E-1037) — Has Photos

http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-9103/E-1037.pdf

Drought-Tolerant Plant Selections for Oklahoma (HLA-6444) — Has No Photos

http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-9240/HLA-6444web.pdf

Oklahoma Proven Website — http://www.oklahomaproven.org/

Plant Selection Factors Fact Sheet (L-433)

http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-8906/L-433.pdf

All You Need To Know About Mulch (L-436)

http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-8912/L-436.pdf

Xeriscape Garden Plants for Oklahoma (L-333)

http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-6994/L-333%20Xeriscape%20plants.pdf

Lesson adapted from 4-H2O For You: Xeriscape, Texas A&M AgriLife Extension Service, Guadalupe County

OKLAHOMA WATER RESOURCES CENTER

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PASS Standards

Grade Level	Standard	Science and Engineering Practices	Cross Cutting Concepts
4th	**4.ESS2.1:** Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.	Planning and Carrying out Investigations	Cause and Effect
4th	**4.ESS3.2:** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	Designing Solutions	Cause and Effect
5th	**5.ESS3.1:** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environments.	Obtaining, Evaluating, and Communicating Information	System and System Models
7th	**7.ESS3.1:** Construct a scientific explanation based on evidence for how the uneven distrbutions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.	Constructing Explanations	Cause and Effect
7th	**7.ESS3.3:** Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.	Constructing Explanations	Cause and Effect
7th	**7.ESS3.4:** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	Engage in Argument from Evidence	Cause and Effect