THE WATER CYCLE

THE SCIENCE AND ART OF WATER SMART

CONTACT

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To Schedule
https://form.jotform.com/222194566571158

GRADE LEVEL

Grades 4+

SKILLS

- Following Directions
- Averages
- Scientific Process
- Extrapolation

CLASS NEEDS

- 50 minutes
- whiteboard

TRACKS: 1

SUMMARY

This interactive education program focuses on the water cycle and water waste. Students learn about desert climate, local water resources and the major processes of the water cycle.

Students conduct a scientific experiment to determine how much water is wasted from a simulated leak utilizing mathematical averages, multiplication, and extrapolation.

OBJECTIVES

- Define water efficiency.
- Understand vocabulary terms: evaporation, transpiration, percolation, condensation, and precipitation.
- Understand water resources and water loss.
- Apply the scientific process and evidence-based assessment to resolve problems.

EDUCATION STANDARDS

- Operations and Algebraic Thinking
- Number and Operations - Fractions
- Measurement and Data
- Earth and Space Science E1
- Life Science L1, L2

FLUSH: HOW CITIES USE AND REUSE WATER

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GRADE LEVEL

Grades 4+

SKILLS

- Water Cycle
- Vocabulary
- Calculation
- Application

CLASS NEEDS

- 50 minutes
- whiteboard

TRACKS: 2-6

SUMMARY

Flush is an interactive education program where students learn about the City of Goodyear Water Cycle. The program expands the concept of the natural water cycle to explain how humans use and reuse water in engineered systems.

Students learn about local and regional water resources, water infrastructure and water reclamation and reuse, and the science of wastewater treatment. The program concludes with a discussion on how water waste impacts the different components of the urban and natural water cycle.

OBJECTIVES

- Define water efficiency.
- Understand how humans engineer systems to use, treat, and distribute water resources.
- Understand how humans impact natural systems.
- Understand the impact of inefficiency on larger systems.

EDUCATION STANDARDS

- Operations and Algebraic Thinking
- Number and Operations - Fractions
- Measurement and Data
- Earth and Space Science E1
- Life Science L1, L2

DO TREES REALLY SWEAT?

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GRADE LEVEL

Grades 4+

SKILLS

- Group Work
- Scientific Process
- Calculation
- Application

CLASS NEEDS

- 90 minutes
- whiteboard
- outside activity
- access to hose bib

TRACKS: 2 - 6

SUMMARY

This interactive education program teaches students the principles of efficient landscape irrigation. The students review plant anatomy and function, learn the molecular properties of water, and understand how water moves through soil and plants.

Students participate in an activity to determine the information required to calculate how much water a grass and/or grass requires to be healthy. Finally, students conduct an experiment to calculate how much water an irrigation system uses and create an efficient watering schedule. This experiment requires the class to work outside and a hose bib connection.

OBJECTIVES

- Define water efficiency.
- Describe the plant anatomy and processes including: xylem, phloem, adsorption, adhesion, cohesion, and transpiration.
- Learn irrigation system components.
- Use mathematics to analyze data
- Apply information to a real world situation

EDUCATION STANDARDS

- The Number System
- Expressions and Equations
- Geometry
- Statistics and Probability
- Measurement and Data

GREEN GRASS DONE RIGHT!

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GRADE LEVEL

Grades 4+

SKILLS

- Area & Volume
- Comparison
- Calculation
- Application

CLASS NEEDS

- 90 minutes
- whiteboard
- outside activity
- access to sprinklers

TRACKS: 4

SUMMARY

This interactive education program teaches students the principles of efficient landscape irrigation. Building on concepts learned in "Do Trees Really Sweat?", students participate in a hands-on, group activity to visualize the calculations as cubes of water.

Students perform calculations to determine how much water a hypothetical irrigation system is using (how many cubes of water), compare it to what is efficient (cube of water) and create an efficient watering schedule.

OBJECTIVES

- Define water efficiency.
- Learn the components of an irrigation system (i.e. controller) in a hands-on activity.
- Calculate how much water an entire landscape needs to be healthy and efficient.
- Learn how to set an efficient irrigation schedule using an irrigation controller.

EDUCATION STANDARDS

- The Number System
- Expressions and Equations
- Geometry
- Statistics and Probability
- Measurement and Data
- Earth and Space Science E1
- Life Science L1, L2

PARDON MY GREEN HOUSE GASES!

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GRADE LEVEL

Grades 10+

SKILLS

- Resource Management
- Estimation
- Calculation
- Application

CLASS NEEDS

- 50 minutes
- whiteboard

TRACKS: 5

SUMMARY

This interactive education program demonstrates the connection between water use, energy use, and the associated greenhouse gas emissions. The class reviews the scientific concepts of the greenhouse effect, greenhouse gases, and climate change.

The students then participate in an activity to understand how greenhouse gas molecules trap heat. The students learn why energy is required for water use (i.e., treatment, supply, distribution, heating) and why water is necessary to create energy. Finally, the students will work in groups to calculate the reduction in greenhouse gas emissions that results from reducing water use.

OBJECTIVES

- Define water efficiency.
- Understand the greenhouse effect.
- Understand the impact of increased greenhouse gases on the planet.
- Understand how water use impacts greenhouse gases through energy use.

EDUCATION STANDARDS

- Number and Quantity
- Algebra
- Functions
- Statistics and Probability
- Earth and Space Science E1

KEEPING IT COOL WITH WATER CHEMISTRY

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GRADE LEVEL

Grades 10+

SKILLS

- Chemistry
- Scientific Process
- Mathematic Application
- Troubleshooting

CLASS NEEDS

- 50 minutes
- whiteboard
- 5 minute class prep

TRACKS: 6

SUMMARY

This interactive education program teaches students the principles of efficient operation of cooling towers. Students gain an in-depth understanding of evaporation and a basic understanding of how cooling towers function.

Students learn about water chemistry and its application in operating cooling towers. Students use scientific equipment to measure water chemistry in two water samples and calculate current cooling tower efficiency, maximum efficiency, and the amount of water savings that would result by adjusting the water chemistry.

OBJECTIVES

- Define water efficiency.
- Understand water-cooled systems.
- Understand the phase changes of water and minerals.
- Understand how water quality controls water efficiency in cooling towers.

EDUCATION STANDARDS

- Number and Quantity
- Algebra
- Functions
- Statistics and Probability
- Earth and Space Science E1