Water Resources and Sustainability: Student Activity Workbook

Learning Objectives

- Understand the water cycle and its importance to life on Earth
- Calculate and analyze personal water footprint
- Develop strategies for water conservation
- Explore the cultural significance of water resources

Warm-Up Activity: Our Water World (15 minutes)

Think about your daily interaction with water and complete the following:

1. List five ways you used water today:

   _____

2. Estimate how many liters of water you think you use daily:

   _____

The Water Cycle Investigation (30 minutes)

Group Experiment: Creating a Mini Water Cycle

Materials needed:

- Clear plastic container with lid
- Warm water
- Ice cubes
- Food coloring (optional)

Procedure:

1. Pour warm water into the container
2. Place ice cubes on the lid
3. Observe what happens over 10 minutes
4. Record your observations in the table below

Time (minutes)	Observations	Water Cycle Stage
2		
5		
10		

Water Footprint Calculator (20 minutes)

Calculate your daily water usage by completing this table:

Activity	Average Usage (L)	Your Daily Count	Total (L)
Shower (8 min)	65L		
Toilet Flush	6L		
Hand Washing	2L		
Drinking Water	2L		
Total Daily Usage:			

Water Conservation Challenge

Based on your water footprint calculation, create an action plan to reduce your water usage:

My Water Conservation Goals:

1. I will reduce my shower time to _____ minutes

2. I will save water by:

3. My target daily water usage is:

Cultural Water Stories (25 minutes)

Research Task:

In groups, research one of these ancient civilizations and their relationship with water:

- Ancient Egypt and the Nile
- Mesopotamia between the rivers
- Greek water management systems
- Roman aqueducts

Record your findings:

1. Civilization chosen: _____
2. Main water source: _____
3. Water management methods: _____
4. Lessons we can learn: _____

Global Water Crisis Investigation

Case Study: Water Scarcity Around the World

Examine these regions facing water challenges:

Region	Challenge	Impact	Solutions
Cape Town, South Africa	Day Zero Crisis		
California, USA	Drought		
Chennai, India	Water Shortage		

Water Quality Testing Experiment

Materials needed:

- Water samples from different sources
- pH testing strips
- Turbidity tube
- Thermometer
- Microscope (optional)

Record your findings:

Water Source	pH Level	Turbidity	Temperature
Tap Water			
Pond Water			
Rainwater			

Water Technology Innovation

Modern Water Solutions Research

Research one of these water technologies and complete the analysis:

- Desalination plants
- Water recycling systems
- Smart irrigation
- Atmospheric water generators

Technology Analysis Framework:

1. Technology name:
2. How it works:
3. Benefits:
4. Limitations:
5. Cost considerations:
6. Environmental impact:

Mathematical Modeling: Water Usage Patterns

Data Analysis Exercise:

Create a line graph showing your household's water usage over one week:

Calculate:

1. Average daily usage:
2. Peak usage day:
3. Percentage change between highest and lowest usage:

Water Conservation Campaign

Create a Public Awareness Campaign

Campaign Elements:

1. Target audience:
2. Key message:
3. Slogan:
4. Visual elements:
5. Distribution channels:

Design your campaign poster here:

Final Assessment

Reflection Questions

1. What was the most surprising thing you learned about water resources?
2. How has your attitude toward water usage changed?
3. What actions will you take to conserve water in your daily life?
4. How can you influence others to be more water-conscious?

Final Reflection and Assessment

What I Learned About Water:

How I Will Help Conserve Water:

Questions I Still Have:

Teacher Assessment

Criteria	Achieved	Comments
Understanding of Water Cycle		
Water Footprint Calculation		
Conservation Planning		