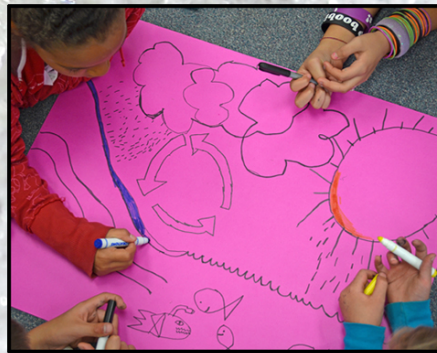




4-H Water Wizards

Educator Aids



UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

4-H Youth Development Program

4-H Water Wizards

Educator Aids



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Table of Contents

Introduction	5
Session 1: The Water Cycle – Nature’s Recycling System	
- Water Knowledge Chart	7
- Water Evaporation Experiment Data Sheet*	8
Session 2: Watersheds: Where We Live	
- Watershed Poster	9
Session 3: My Community Watershed – Keeping Our Waterways Clean	
- The Story	10
Session 4: Water Use and Conservation	
- Water Usage Ideas	12
- Class Water Usage Graph	13
- How Much Water Do We Use? Water Usage Chart*	14
- How Much Water Do We Use? Student Tally Sheet *	15
Session 5: Water Taste Test	
- Water Preference Graph	16
- Water Taste Test Sheet*	17
Session 6: Exploring Salinity	
- Water Distribution on Earth*	18
- Seed Test: How does saltwater affect seed growth?*	19
- Water Salinity Graph*	20
Session 7: Discovering Water Density	
- Water Density Chart*	21
Session 8: The Science of Soap Suds	
- Soap Suds Data Sheet*	22
Session 9: Exploring Service Learning	
- Making Our Community a Better Place	23
- Service Learning Project Ideas	24
Session 10: Planning a Service Learning Project	
- Project Planning Ideas	25
- Project Timeline*	26
Session 11: Project Evaluation	
- Project Evaluation	27
- Water Wizards Project Evaluation*	28

***These pages are also included in the Student Lab Book**



4-H Water Wizards Educator Aid Pages



Welcome to the 4-H Water Wizards program! You are beginning a 12-week journey where you will have the opportunity to facilitate several hands-on experiments to increase the knowledge and understanding about water and its importance to the planet in your students. In this program, students will learn about water and the environment, water properties, and service learning.

These Educator Aid pages contain the documents you will need to facilitate the many experiments and discussions you will conduct in the 4-H Water Wizards program, as well as the Student Lab Book pages and a glossary of terms.

Please note that the provided documents are meant to act as a guide and templates for you. You are welcome to use a flipchart, whiteboard, or chalkboard for in-person delivery and a whiteboard function on the computer or a blank electronic document for virtual delivery in place of using these documents. Do whatever make the most sense for your circumstances.

Session 1: Educator Aid

Water Knowledge Chart

What We Know About Water

What We Want to Know About Water

Session 1: Student Lab Book Page

Water Evaporation Experiment Data Sheet

Procedure:

1. Label the cups Sun, Shade, and Covered.
2. Using a measuring cup, partly fill the plastic cups with water so that there is the same amount of water in each cup.
3. Mark the water level on each cup with a permanent marker.
4. Cover the cup labeled Covered with plastic wrap and secure with a rubber band.
5. Place the cup labeled Sun and the cup labeled Covered in a place which receives a lot of sun light throughout the day. Place the cup labeled Shade somewhere out of the sun where it won't be disturbed.
6. After a day or two, mark the water level on each cup. Record any observations.

Predictions:

What do you think will happen to each of the three cups?

Data Collection:

Draw a picture of the three cups at the end of the experiment.

Date	Sun Cup Where placed:	Shade Cup Where placed:	Covered Cup Where placed:
	Beginning measurement:	Beginning measurement:	Beginning measurement:
	Ending measurement:	Ending measurement:	Ending measurement:

Observations: (Describe what happened)

Conclusion:

Session 2: Educator Aid

The Watershed Poster



Poster from: California Department of Water Resources and State Water Contractors.
www.water.ca.gov

Session 3: Educator Aid

The Story

This story is designed for you to insert names and places that personalize it for your community. Before reading the story, please identify and insert (where noted in red) the following places and characters.

- Name of your community (town/city)
- Youth's name (youth #1)
- Youth's name (youth #2)
- Uncle's name (Man's name)
- Family name (i.e., Smith, Lee, Hernandez)
- Name of prominent company
- Name of lake or water source
- Name of local auto shop or garage
- Name of agriculture crop grown in your area

Students should apply substances at points in the story noted in ***bold italic***.

An Afternoon in (insert name of your community)

(Youth #1 name) and (Youth #2 name), siblings who live in (name of your town/city), were sitting on the front porch steps of their home. Their uncle (Man's name), a local landscape contractor, was inside with mom and dad. He was delivering ***fertilizer*** for their lawn.

They heard a call from inside the house.

"Youth 1 and Youth 2, will you get your wagon and take it to the back of Uncle (Man's name) car," Mr. (Family name), their dad, asked. "I need to unload the fertilizer." (Youth 1) and (Youth 2) said, "Okay Dad, we are on our way".

When (Youth 1) and (Youth 2) reached the back of their Uncle's car, (Youth 1) exclaimed, "Boy what a huge sack of fertilizer." Uncle (Man's name) replied, "It's left over from my job fertilizing the golf course. It takes a lot of ***fertilizer to make a golf course green*** and beautiful." Their dad nodded. "I want my new lawn to look as beautiful as a golf course, so we will put all this on my lawn and see what happens."

The phone inside rang and Mom called out, "Honey, your boss from (name of company) is on the phone." Dad went inside to take the call. When he came back, he no longer looked as pleased as he was a moment ago.

"Kids, I have to go to work. A pipe blew at the plant and ***oil is leaking*** into the drainage system. I need to go and look. Afterwards, I will go over to Granddad's for a short visit. Do you two want to come along?"

"No dad, if it is okay with you and mom, (Youth 2) and I want to ride out to (name of lake or water source) for a bit today," (Youth 1) replied.

"If it is alright with your mom, it is okay with me," Dad said. "But before you go, could you please pick up the **dog poop** on the front lawn?" Then he hurried to leave, wanting to get back home and work in the yard.

(Youth 2) turned to (Youth 1) and said, "I'll pick up the dog poop, and you go to get our bikes from behind the garage." (Youth 1) ran off to get the bikes. (Youth 2), shovel in hand, went to work picking up the **dog droppings**. As she shoveled them up, she wondered what she was going to do with them. I'll just pile them in the gutter she thought. I'll have this job done in no time at all.

(Youth 1), meanwhile, had returned with the bikes. "(Youth 2), the chains are full of dirt and the bikes are hard to peddle. We will have to clean them. We just need to get a small amount of gasoline in a shallow pan to wash the bike chains in, and then wipe them with oil. We can do it right here in the driveway." Together they quickly removed the chains from their bikes and prepared to clean them. Oops! As (Youth 2) tipped the gas can, some of **the gas spilled** onto the driveway. "Now for the oil," (Youth 1) said, as he squeezed the oil can to coat the chains. "Oh darn, now I have made an **oil mess**, too."

Careful not to get their feet in the spills, the children replaced the bike chains and discussed how to clean the mess up. "I think we should get the hose and wash the **oil and gas** spills into the street," said (Youth 2). "Good idea," returned (Youth 1), "What will we do with the dirty gas left in the pan?"

(Youth 2) smiled. "I know, let's take it up the street to the new construction site. There is lots of **bare soil** there and we can pour the **gas** into the dirt." (Youth 1) nodded in agreement saying, "That is a great idea."

Their tasks completed, (Youth 1) and (Youth 2) went into the house to ask their mom for permission to bike to the (name of lake or water source). When she heard their request to go to (name of lake or water source), she smiled. "That will be good exercise for you both. Be careful of cars. I am going to go across town to (Name of local auto repair shop or garage) and get the oil leak fixed in my car. It has been **leaking oil** for a couple of weeks and I have been too busy to get it fixed."

(Youth 1) and (Youth 2) jumped on their bikes, glad to be free and finally on their way to the (name of lake or water source). As they peddled down the street, a truck sped by, **papers blowing** out from the truck bed. (Youth 2) called out to (Youth 1), "Look! That truck is 'raining' papers. What a litter bug!"

Meanwhile, Mr. (Family name) had finished supervising the repairs at the plant and was on his way to visit his parents at the farm. Turning up the drive to the farmhouse, he noticed milk cows fenced in a small pasture close to the house. The air was fragrant with the smell of **manure**. He knew he was back on the farm.

It was quiet at the farm and, hearing a sound of snipping coming from behind the house, he went to the back yard where he found his mom working in the rose garden.

"What are you doing, Mom?" he asked. Looking up, his mother smiled and replied, "I'm clipping the roses and **spraying pesticide** to kill those darn aphids that are sucking my plants dry. Your dad is **out in the fields plowing** and preparing the fields for planting. Sorry he won't be able to visit."

"That's okay mom," Mr. (Family name) replied, "I just wanted to come borrow the pesticide sprayer and the fertilizer spreader. I want to work on my lawn today. His mom smiled and replied, "Help yourself from the farm shed, your father **fertilized and sprayed pesticides** on the (name of local crop) field last week. He won't need the little you will take for your yard and garden."

Mr. (Family name) glanced up and noticed that storm clouds were building. "Mom, I'll collect the things I came for and be on my way. I'd like to be home before it rains. (Youth 1) and (Youth 2) are out on their bikes and I want to be sure that they get home safely."

Session 4: Educator Aid

Water Use Ideas

Ideas for Designing a Study

Ways We Use Water in Our Homes

Session 4: Student Lab Book Page

How Much Water Do We Use?

Water Usage Chart

Water activity	Average number of gallons used
Brush our teeth	1 gallon
Flush the toilet	3 gallons
Hands and face washing	1 gallon
5-minute shower	25 gallons
10-minute shower	50 gallons
Face and leg shaving	1 gallon
Dishwater per load	15 gallons
Dishwashing by hand	8 gallons
Clothes washing (machine)	25 gallons
Glasses of water drunk	8 oz per glass = 1/16 th of a gallon

Information courtesy of USGS – Water Use <https://water.usgs.gov/edu/activity-percapita.php>

Session 4: Student Lab Book Page

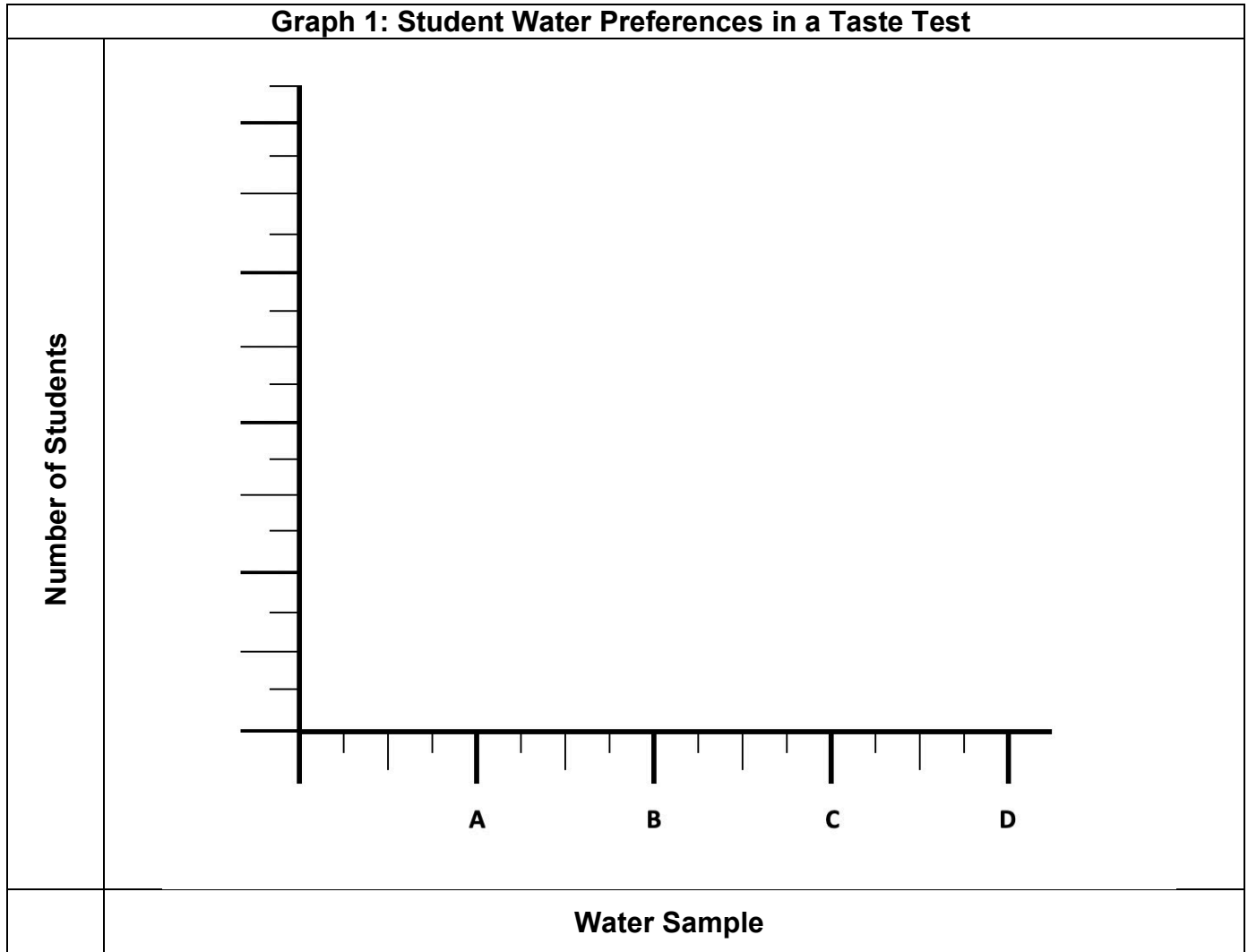
How Much Water Do We Use?

Student Tally Sheet

Water Use Activity	Put a check mark for each time activity took place.	Fill in number of gallons used each time for this water use.	Total number of gallons used.

Session 5: Educator Aid

Water Preference Graph



Data Table

Water Sample	A	B	C	D
Class Average				

Session 5: Student Lab Book Page

Water Taste Test Score Sheet

Individual Scores

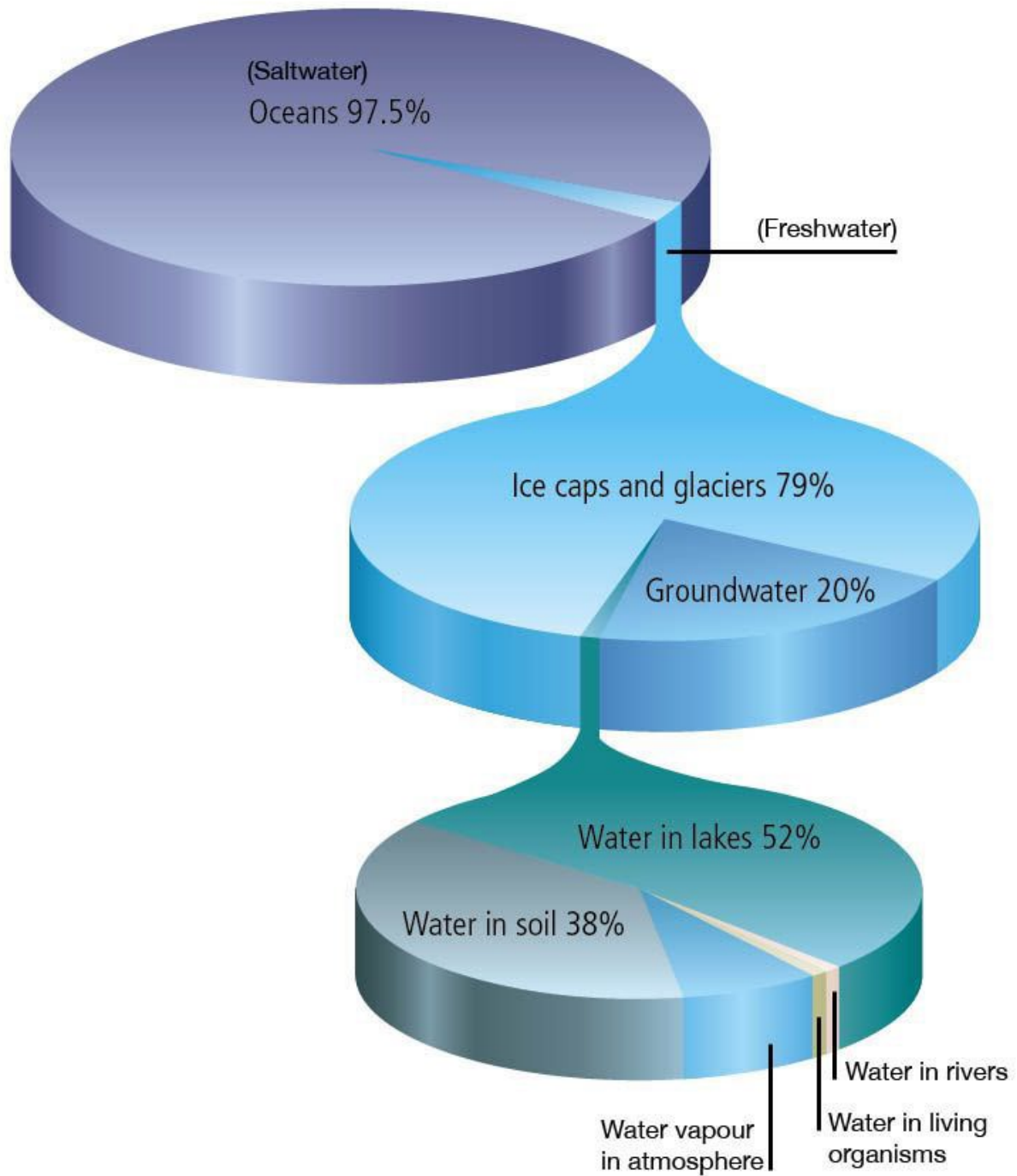
Water Sample	Score	Rank	Comments
A			
B			
C			
D			

Key

5 = Excellent
4 = Very Good
3 = Passable
2 = Not Very Good
1 = Really Awful

Session 6: Student Lab Book Page

Water Distribution on Earth



Earth Forum, Houston Museum of Natural Science

Session 6: Student Lab Book Page

Seed Test: How does saltwater affect seed growth?

Purpose: Test the effect of saltwater on the germination and growth of plants.

	Sample A	Sample B
Variable: amount of salt water		
Hypothesis: I think		
Results		
Day 1: How many seeds germinated?		
Day 2: How many seeds germinated?		
Day 3: How many seeds germinated?		
Day 4: How many seeds germinated?		
Day 5: How many seeds germinated?		
Conclusion: I learned		

Session 6: Student Lab Book Page

Water Salinity Graph

40				
39				
38				
37				
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14				
13				
12				
11				
10				
9				
8				
7				
6				
5				
4				
3				
2				
1				
ppt*	Sample A	Sample B	Sample C	Sample D

*parts per thousand

Session 7: Student Lab Book Page

Water Density Chart

		Color of Water
Density of Water	Light (not dense)	
	↓	
	↓	
	Heavy (very dense)	

Session 8: Student Lab Book Page

Soap Suds Data Sheet

Let's look at four (4) different samples of water:

Distilled
Tap
Bottled Mineral Water
Salt water

Predictions:

Which type of water do you think is the softest and will make soap suds the quickest?

Which type of water do you think is the hardest and will take the longest to make suds?

Observations:

Type of Water	Number of Drops
Distilled water	
Tap water	
Bottled mineral water	
Salt water	

Session 9: Educator Aid

Making Our Community a Better Place

Volunteer

Community

Session 9: Educator Aid

Service Learning Project Ideas

Group Project Ideas

Session 10: Educator Aid

Project Planning Ideas

Session 10: Student Lab Book Page

Project Timeline

Every project needs a detailed project plan. The plan will outline all the tasks that need to be done, who will do them, and when they will be accomplished.

- Identify specific tasks to be accomplished to address your community problem.
- Decide when each task needs to be done. Make sure that you give enough time for each task.
- Decide who will be the team leader for each task.

Project Name			
Project Goal			
Target Completion Date			
Action Item	Who Will Do It	Due Date	Done
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

Session 11: Student Lab Book Page & Educator Aid

Project Evaluation

Project Name		
Project Goal		
How did the project meet the needs of our school or community?	Describe how you felt about the project.	
What worked well in the project?	If you were going to do this project again, what would you do differently?	

4-H Water Wizards Evaluation for Students

School you attend: _____ Date: _____

Did you like participating in 4-H Water Wizards? Yes No

List three things you learned in 4-H Water Wizards.

1.

2.

3.

Can you name two water issues in our community?

1. _____

2. _____

Which 4-H Water Wizards activities were your favorites? (Choose only two)

- _____ Evaporation activity
- _____ Building a model watershed
- _____ Enviroscope® (the plastic town)
- _____ Measuring your family's water use
- _____ Guest presenter who spoke about wetlands
- _____ Bottled water taste test
- _____ Water salinity (growing radish seeds and the floating egg)
- _____ Water density (colored water in straws)
- _____ Testing soap suds
- _____ Planning and doing a community service project

Are you using less water since participating in 4-H Water Wizards? Yes No

If so, what are you doing to conserve water?