4-H
Water Project
Helper's Guide

Unit 1
Water Conservation
With the Water Lion

Unit 2
Incredible Water
With the Water Lion

Penn State Extension

Cooperative Extension
College of Agricultural Sciences
extension.psu.edu
Welcome to the 4-H Water project curriculum. As a helper and mentor, you are in a key position to support the positive growth and development of youth. This curriculum provides opportunities for you and youth to develop caring relationships as well as life-long appreciation for water conservation and quality.

Your Role
- Become familiar with the information in this guide and the two Water Lion Project Books
- Support youth in their efforts to set goals and complete the activities
- Help youth know themselves, including their strengths and weaknesses
- Incorporate the experiential learning cycle in all learning experiences
- Evaluate the impact

Helper’s Guide
This 4-H Water Project Helper’s Guide is designed to help an adult leader assist club members complete their project and to facilitate group activities for the Unit 1 Water Conservation with the Water Lion and Unit 2 Incredible Water with the Water Lion, Project Books.

Water Project Outcomes
Through participation in this project youth will
- better appreciate the importance of water and how it is measured.
- increase environmental understanding and stewardship of water.

The 4-H Water Project Books

These 3 project books focus on water with an emphasis on the following themes: Water Use, Water Consumption, Water Conservation, Properties of Water, Forms of Water, Water Cycle, Water Quality, and the Physical, Chemical and Biological Properties of Water.

They have been developed to be interactive and experiential. Youth will acquire life skills and water resource knowledge through each “learning-by-doing” activity. Each project book is designed to be developmentally appropriate for ages 8-16. Many activities can be used effectively as group activities.

Unit 1: Water Conservation with the Water Lion (D0670A)
The “Water Lion” gives an overview of the importance and distribution of water on earth and the need to use and conserve water wisely.

Unit 2: Incredible Water with the Water Lion (D0675A)
The “Water Lion” gives an overview of the fascinating physical and chemical properties of water. The water cycle and the importance of water to all of life is stressed.

Unit 3: Water Quality Matters! (D0680A)
The Water Quality Matters follows Leah and Jason as they learn how water quality is measured in Pennsylvania. You’ll learn about different water standards, participate in water quality tests, and use this criteria to determine the health of a stream.

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## Ages and Stages of Youth Development

### Grades 3-5: Characteristics
- Learn best when physically active
- Have a special attachment to older youth
- Are easily motivated
- Reading becomes an individual experience
- Attention span is about 45 minutes
- Acceptance by peer group is important
- Interests expand from home, to neighborhood to community
- Enjoy both cooperation and competition
- Show independence by seeking individual attention and sometimes disrupting the group
- Feelings of competence enhance self-concept
- Show loyalty to members of their own sex and antagonism toward those of the opposite sex

### Grades 3-5: Helper’s Tips
- Allow youth to participate in activities where they can use physical energy.
- Allow youth to choose an older youth to be their helper and role model.
- Use encouragement to keep them motivated.
- Allow time for youth to read on their own and think of activities before working with others.
- Use varied activities to keep them interested.
- Use the peer group to recognize good work, such as applauding completed activities and avoiding put-down.
- Talk to youth about their friends and neighbors and what goes on in their community. Involve them in service learning.
- Plan activities so that sometimes youth work together, sometimes compete with each others.
- Involve youth in selecting activities they would like. Give individual attention as needed.
- Provide activities that will let youth feel good about themselves and succeed.
- Encourage youth to participate in activities with older youth and adults.
- Assist youth in making realistic choices. Review their plans, discuss alternatives and help them weight options before making decisions.

### Grades 6-8: Characteristics
- Can take responsibility in planning and evaluating their own work
- Can plan their own social and recreational activities
- Can discuss current events, international affairs and social issues with some help
- Want to make decisions but still depend on adult guidelines
- Gain skills in social relations with peers and adults
- Peer pressure mounts, first from same sex, then from the opposite sex
- Can be quite self-conscious
- Strong emotional attachment to older youth and adults
- Choices are often unrealistic

### Grades 6-8: Helper’s Tips
- Give youth responsibility for group activities, including planning, implementing and evaluating.
- Provide opportunities for youth to work together. Form committees to plan recreational and social activities.
- Use discussion, activities and games that encourage awareness of current events and issues.
- Establish guidelines that give parameters for youth to follow.
- Provide activities which foster social interaction with peers and adults.
- Use peer pressure to influence positive behavior. Have group give encouragement to individuals.
- Avoid asking youth to share their work individually until they feel more comfortable with the group.
- Encourage youth to participate in activities with older youth and adults.
- Assist youth in making realistic choices. Review their plans, discuss alternatives and help them weight options before making decisions.

### Grades 9-12: Characteristics
- Personal philosophy begins to emerge
- Enjoy discussing world situations as well as personal activities
- Abstract thinking and problem solving reach a higher level
- Strong desire for status in peer groups
- High interest in social activity
- Need freedom from parental control to make decisions
- Widespread feelings of inferiority and inadequacy

### Grades 9-12: Helper’s Tips
- Use activities where youth search for experiences which will allow them to identify their own philosophies.
- Encourage discussion of events and feelings.
- Put youth into real-life problem solving situations.
- Develop a climate in which youth are encouraged and supported by peers.
- Encourage youth to plan and carry out their own social activities.
- Help youth realize that their decisions have consequences.
- Encourage and help youth see their positive worth.

**Acknowledgements:** National 4-H Cooperative Curriculum System, Inc. & Colorado State University Cooperative Extension
**Teaching and Learning Experientially**

**Experiential Learning Model**

1. Experience (Do): Individual or group experience. Involves doing. May be unfamiliar. Pushes learner to a new level.

2. Share (Reflect): Talk about the experience. Share reactions & observations. Freely discuss feelings generated by the experience. What did they do? What did they see? Feel? Hear? Taste? What part of the experience was most difficult? Easiest? What part was easiest?

3. Process (Discuss & Reflect): How the experience was carried out. How the themes, problems and issues were brought out. How specific problems were addressed. How did they go about doing this activity? What problems or issues came up as they did the activity? How did they deal with these problems? Why is the life skill they practiced important?

4. Generalize (Identify—Apply): General trends or common truths. Real life principals that surfaced. Key terms that capture the learning. What did they learn from the experience? How does this learning relate to other things they have been learning? What similar experiences have they had (with this life skill or subject matter)?

5. Apply (Discuss how): New learning can be applied to other situations. Issues raised can be useful in the future. Apply: How will you use what you learned? More effective behaviors can develop from new learning. Help participants feel a sense of ownership for their learning. Apply: Ask How can they use what they learned? How could what they learned in this experience relate to other parts of their life? How can they apply (the life skill practiced) in the future?

A skill is a learned ability to do something well. Life skills are abilities individuals can learn that will help them to be successful in living a productive and satisfying life. In the Targeting Life Skills (TLS) Model categories of life skills are identified and divided on the basis of the familiar four H’s from the 4-H Clover that represent Head, Heart, Hands, and Health. Two general categories of skills are included under each of the four headings.

The goal of youth programming is to provide developmentally appropriate opportunities for young people to experience life skills, to practice them until they are learned, and be able to use them as necessary throughout a lifetime. Through the experiential learning process, youth internalize the knowledge and gain the ability to apply the skills appropriately.

**Targeting Life Skills (TLS) Model**

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**Acknowledgements: Targeting Life Skills Model, by Pat Hendricks, Iowa State University**
Overview of the Project Unit

Unit 1 of the 4-H Water Project, *Water Conservation with the Water Lion*, is intended for youth ages 8-11 and can be completed before or after Unit 2, *Incredible Water with the Water Lion*. *Water Conservation* is designed to teach youth about water conservation in the home, yard, and community. Youth will also learn about the many different ways we utilize water in the home and school. The Member’s Guide is illustrated with the “Water Lion” character, who demonstrates water-wise ways.

Lesson types include youth experiments, group demonstrations, and field experiences. Each “in class” activity can be done during a single class or group meeting. The lessons in this book are based on the principle that children learn best by doing. Some home exercises are included to allow the children to build on the concepts they learn in meetings and to encourage family involvement. The lessons were constructed so that they build upon each other, but various sections and/or activities could be used as stand-alone lessons. You are encouraged to modify the lessons and activities to suit your space, time, and facilities, as well as the children’s interests and prior knowledge.

Completing the *Water Conservation* project will open youth’s eyes to the realization that every living thing depends on water, and that it is important for everyone to appreciate and conserve it. The goal of the curriculum is to help each youth develop “water consciousness” - an awareness of water’s vital importance in our everyday lives. Youth will also learn specific ways that they can conserve water. The final goal of this curriculum is to encourage family involvement in learning about water conservation.

**Educational Objectives**
Water Conservation is broken down into 3 sections intended to meet the following educational objectives:

**Section 1: Water Use**
*Objective: Understand that water is a natural resource that we need to survive and that we use for many of our daily tasks.* *(4.3.4A, 4.3.4B, 4.5.3A, 3.1.3.A2)*

**Section 2: Wasted Water**
*Objective: Recognize that water is not an unlimited resource and that many of our daily activities actually waste the water that is available to us.* *(4.5.4A, 3.3.4.A4)*

**Section 3: Water-Wise Ways**
*Objective: Identify simple techniques and technologies that can be used to conserve water as a natural resource.* *(4.5.4A, 3.4.3.B2, 3.4.5.B2)*
Unit 1: Water Conservation with the Water Lion
Section 1: Water Use

**Educational Objectives:**

- Youth will
  - Identify 5 different ways water is utilized in the home or school.
  - Describe the difference between direct and indirect water use.
  - Determine their average daily water use.

**Background:**

Many people use water without thinking about where it comes from, how much they are using or what life would be like without indoor plumbing. The first step in water conservation is to become aware of how much water is used in various tasks.

Many people wonder why it matters how much water they use. What differences can the actions of one person make, right? Wrong! This program is not just about water conservation. It’s about making connections between our everyday actions and our impacts on the planet. Everything we do has consequences and unfortunately, most of the things we do have a negative effect on the environment. The amount of water we use affects how much fresh water will be available in the future and how much wastewater we generate. It takes energy and chemicals to treat this wastewater so it can be released safely into the environment. The amount of water we use affects how much fresh water will be available in the future and how much wastewater we generate. It takes energy and chemicals to treat this wastewater so it can be released safely into the environment. The amount of hot water we use affects how much power is needed to heat the water. Every method of power generation has some harmful effect on the environment. Being concerned about the health of our planet should include trying to minimize your negative impact on the environment.

**Materials needed:**

- Project Book
- Pencil
- Calculator

**Key Terms (Vocabulary):**

- Conservation
- Indirect water use
- Direct water use
- Consumption

**Time Consideration (Duration):**

This activity requires the youth to conduct a home survey on three consecutive nights.

**Setting:** Indoors or Outdoors

**PA Educational Standards:**

- 4.3.4A
- 4.3.4B
- 4.5.3A
- 3.1.3.A2
Have youth lift a gallon jug full of water and ask them the probing question, “Do you think you could carry 50 of these gallons of water in your house every day?” (“What about 370 gallons?”) Remind youth that we are lucky to be able to simply turn on the faucet in our home and get water. Some people in the world have to carry their water into their houses every day.

Youth can take turns reading the information in the project book to provide more complete information on water use. Utilize the question boxes on pages 7 and 8 to get youth to begin thinking about the concept of water use.

**Activity 1 - Average Water Use Tally**
- Youth will track their personal water usage during three 24 hour periods.
- They should include water used, personally, inside and outside of the home (at a friend’s house, school, restaurant, etc.)
- Step-by-step directions can be found on page 9 of the project book.
- Keep a tally chart of each youth’s water use for each of 3 days.
- At the completion of the 3 day period, have youth calculate their average dairy water use for the 3 days.
- Have youth answer the reflective questions on page 13 and then utilize the questions to hold a group discussion about personal water usage.
Unit 1: Water Conservation with the Water Lion
Section 1: Water Use

1. **Describe 5 different ways you use water in your home/school.**

2. **Explain the difference between direct and indirect water use.**

3. **Determine if your average home water use is above or below average.**

**Extensions (Related Activities):**

1. **Don’t Use It All Up!** Water consumption activity from Project Food, Land and People. Youth participate in a sponge demonstration to help them understand that people are consumers of resources. (available at [http://www.foodlandpeople.org/Do%20not%20use%20it%20all%20up.pdf](http://www.foodlandpeople.org/Do%20not%20use%20it%20all%20up.pdf)).

2. **Water Write** Activity from Project Wet Curriculum and Activity Guide. Through a variety of writing and reading activities, youth explore their feelings for and understanding of water-related topics. Note: this activity may be used for any of the units in this book, depending on the writing topic. (Contact your County Extension Office to learn how to borrow or obtain a copy).

**Assessment Opportunities or Evaluation:**

1. Describe 5 different ways you use water in your home/school.

2. Explain the difference between direct and indirect water use.

3. Determine if your average home water use is above or below average.
Unit 1: Water Conservation with the Water Lion
Section 2: Wasted Water

Educational Objectives:
Youth will
- Understand how leaks add up to substantial waste, calculating how many gallons are wasted by a leaky faucet.
- Demonstrate how to check faucets and toilets for leaks.

Background:
Without water, you would not be alive, nor would anything else. Water makes up an average of 60 percent of the human body. A person can live for only four or five days without water. Within our bodies, water allows our joints to move smoothly, helps us digest our food, helps carry nutrients to all parts of the body, and removes wastes.

Earth is the only planet that we know of that has liquid water on its surface. Seventy percent of the Earth’s surface is covered with water. However, most of that water is in oceans and therefore is not drinkable without extensive treatment.

Topic Introduction:
Read pages 14 & 15 of the project book together to begin a discussion about the value of water is as a limited resource.

Tips for Activities in Youth Book:
Activity 2
Youth will calculate the amount of water wasted by a faucet with a steady drip. After offering a guess as to how long it will take for the “leaky faucet” to fill the 2 cup measure.
Youth complete the calculations, as instructed, and determine how many gallons per year that “leaky faucet” would waste.

Activity 3
Youth check their home, school or group meeting place faucets and toilets for leaks according to the step-by-step instructions on page 17 of the project book.
Unit 1: Water Conservation with the Water Lion
Section 2: Wasted Water

Extensions (Related Activities):

1. Hung Up on Water Conservation Activity from North Wales Water Authority. Youth will make paper plate representations of the world’s water supply. Youth will draw pictures of examples of water being wasted and conserved. (available at http://nwwater.com/index.cfm/nodeID/d6395bc1-9f7f-412d-8c8a-f1df2dce1b73/fuseaction/showContent.page).

Assessment Opportunities or Evaluation:

1. Have youth calculate the amount of water wasted with varying rates of drips.

Levels:
- Grades 1-3

Time Consideration (Duration):
- Activity 2 45 to 60 minutes
- Activity 3 45 minutes

In both cases, the activity can be started, walked away from, and returned to later.

Setting: Indoors

Materials needed:
- 2 cup measuring cup
- Faucet
- Toilet
- food coloring
- Calculator

Key Terms (Vocabulary):
- Salt water
- Fresh water
- Glacier
- Iceberg
- River
- Lake
- Atmosphere

PA Educational Standards:
- 4.5.4A
- 3.3.4.A4
Unit 1: Water Conservation with the Water Lion
Section 2: Wasted Water

DROUGHT IN PENNSYLVANIA

Educational Objectives:
Youth will
- Understand that drought is fairly common in Pennsylvania.
- Understand the consequences of droughts.
- Members will learn about recent droughts in Pennsylvania.
- Members will be able to explain how droughts are described and measured.

Background:
Pennsylvania receives an average of 42 inches of precipitation each year. This amount of precipitation allows Pennsylvania farmers to grow a wide variety of crops without irrigation. Pennsylvania has seen its share of droughts in recent years. Regional droughts were recorded in 1998, especially in the northwest part of the state. Severe to extreme droughts occurred in 1999 throughout much of the state; eastern Pennsylvania was particularly hard hit. Most of the state started the year 2000 still in a state of drought.

Many people think about water availability only during droughts. Short-term voluntary water conservation measures are effective during droughts. However, many people don’t want these measures to be made permanent or required. Many consumers also resist increased water fees designed to encourage water conservation.

The following are the phases of drought preparedness in Pennsylvania:
- A drought watch is posted to alert citizens and public water suppliers that drought-related problems may surface in the near future if weather conditions continue. Citizens are asked to conserve water voluntarily, with the objective of reducing water use by 5 percent in the affected areas.
Unit 1: Water Conservation with the Water Lion
Section 2: Wasted Water

DROUGHT IN PENNSYLVANIA

Background: (continued)

- A drought warning signals public water suppliers to prepare for potential water supply shortages and encourages intensive voluntary conservation measures. The objective is to reduce water use by 10 to 15 percent in the affected areas.

- A drought emergency calls for public resources and government bodies to respond to actual emergency conditions. During this phase, the governor may call for mandatory water use restrictions. Water use should be reduced by 15 percent to ensure adequate public water supplies.

The Palmer Drought Index is one common measure of the severity of a drought. The index uses temperature and rainfall information in a formula to determine dryness.

Topic Introduction:

Ask the youth if they or their families have ever done anything differently at home during a drought. Did they practice voluntary conservation measures? These are usually sufficient to conserve water during relatively mild or infrequent droughts, but if more drastic measures are needed, the government can set mandatory conservation requirements.

Activity:

1.) Help the youth use the World Wide Web to find current information about drought and precipitation in their area. Alternatively, you can print out information from the Web before this lesson and photocopy it for each youth.

Here are several good places to start:

- The National integrated Drought Information System (http://www.drought.gov/)
- The Pennsylvania Department of Environmental Protection (http://www.depweb.state.pa.us - search for keyword “drought”)
- National data and information about the Palmer Index on the National Weather Service/NOAA website (http://www.drought.noaa.gov)
- US Drought Monitor (http://www.drought.unl.edu/dm)
- USGS PA Water Science Center (http://pa.water.usgs.gov/drought)
Depending on the data the members find and the drought conditions in Pennsylvania and the United States as a whole, help the members analyze, interpret, and discuss the information they find. Here are some ideas for questions they might be able to answer: In which drought area do they live? How are droughts measured or described? What was the most severe Palmer Drought Index value for their area during a recent drought? They might also find information about where the closest groundwater level monitoring well and/or weather station is located. If you are in a drought, ask the members how the current drought compares with previous droughts, based on the information available.

Extensions (Related Activities):

Depending on the data the members find and the drought conditions in Pennsylvania and the United States as a whole, help the members analyze, interpret, and discuss the information they find. Here are some ideas for questions they might be able to answer: In which drought area do they live? How are droughts measured or described? What was the most severe Palmer Drought Index value for their area during a recent drought? They might also find information about where the closest groundwater level monitoring well and/or weather station is located. If you are in a drought, ask the members how the current drought compares with previous droughts, based on the information available.
Unit 1: Water Conservation with the Water Lion
Section 3: Water Wise Ways

**Educational Objectives:**

Youth will
- Assess their daily habits for water conservation opportunities.
- Identify 3 changes they will make in daily habits that will conserve water in their home.

**Background:**

Conserving water should not be inconvenient. It is a matter of making small changes in the way you do things and incorporating those changes for life. Once you get used to the changes, you might find it very satisfying to know that your small actions are making a difference in your community’s water resources. Then you might be motivated to make some larger changes in your life to conserve even more water.

**Topic Introduction:**

Water conservation is not hard it just requires us to think before we act.

**Tips for Activities in Youth Book:**

Youth will use the list provided on pages 19 through 22 as a checklist of habits that conserve water and identify several of these habits that they will try to develop.

**Extensions (Related Activities):**

1. Conduct a Water Walk around your school, community center, or meeting place looking for examples of water use, misuse and conservation.
2. Have youth create a picture or essay on the This is how I will conserve water worksheet and hang them to decorate the classroom or meeting space.

**Assessment Opportunities or Evaluation:**

Write a letter to a friend or family member explaining why water conservation is an important goal to pursue.
1. On a day with little or no wind, position a sprinkler in the center of a flat lawn. Place clear, straight-sided glasses around the yard within reach of the sprinkler spray.

2. Turn the faucet on all of the way and start the timer. Adjust the positions of the glasses as needed to be sure they catch water from the sprinkler.

3. Watch the water level in the glasses. When it reaches one-half inch, turn off the faucet and record the time. That’s as long as it takes that sprinkler to deliver the lawn’s weekly allotment of water.
1.) Youth can repeat this procedure at home if possible (if they have access to a hose and sprinkler). The whole family can be engaged in the activity and have a discussion about whether or not they are wasting water when they water their lawn.

2.) Use a rain gauge to account for natural watering from rain
A rain gauge is any straight-sided container set outside to collect rain and snow. Rain gauges can be bought inexpensively in hardware stores or home stores or you can make your own out of any narrow, straight-sided, clear glass or plastic container. The container should be marked with a permanent pen in quarter-inch segments up to about 5 inches from the bottom. It’s best to mount either a store-bought or home-made rain gauge on a small pole stuck in the ground so it doesn’t blow over in the wind. A rain gauge should be placed in an area with no roofs or overhanging trees, and out of the way of where people work and play.

Since your rain gauge tells you how much rain falls, you can adjust how much you water your lawn to maintain a constant watering rate of about one-half inch per week. For example, if your area gets one-quarter inch of rain on Wednesday, then when you water your lawn that Saturday, you need to water for only half the usual time because the rain has met half of the lawn’s water needs. By not watering in a week during which rain has met your lawn’s needs, you can save a lot of water!
Overview of the Project Unit
Unit 2 of the 4-H Water Project, *Incredible Water with the Water Lion*, is intended for youth ages 8-11 and can be completed before or after the completion of Unit 1, *Water Conservation with the Water Lion*. *Incredible Water* is designed to teach youth about water itself; its existence, properties, states of matter, cycles and more. Water is a major part of the Earth’s system, which is constantly changing as air, soil and rocks interact with water every day. Understanding the basics of water is the key to understanding many of the other things going on in our world, whether that’s our own body systems and those of our pets, livestock or wildlife; how plants grow to produce food, building materials, fabrics, shelter and oxygen; how hills and valleys form, glaciers are made, lakes are filled and rivers flow; or how clouds, snow, fog and rainbows form in the atmosphere. Completing the *Incredible Water* project will open youth’s eyes to just how much water affects their everyday lives.

Educational Objectives
Incredible Water is broken down into 4 sections intended to meet the following educational objectives:

Section 1: Water, Water Everywhere!
Objective: Understand the basic need for water in all living things by examining the amount of water in our own bodies and in the natural foods we eat. (*3.1.3.A2, 4.3.4.A*)

Section 2: Water’s Three Forms
Objective: Demonstrate how adding and taking away heat changes water, and the phase changes that occur when water goes from solid to liquid and liquid to gas by generating evaporation and condensation. (*3.2.3.A1, 3.2.3.A3, 3.2.4.A5, 3.2.5.A1, 3.3.4.A4*)

Section 3: Unique Properties of Water
Objective: Identify and describe the unique properties of water that allow it to support life on Earth by experimenting with insulation, cohesion and more. (*3.2.4.A1, 3.3.4.A2*)

Section 4: The Water Cycle
Objective: Explain the basic components of the water cycle, including how it occurs in different forms and different locations underground, on the surface and in the atmosphere by observing transpiration, clouds and watershed models (*3.3.5.A4, 3.3.6.A4, 4.1.5.B, 4.2.3.A, 4.2.4.A, 4.2.5.A, 4.2.6.A*)
Unit 2: Incredible Water with the Water Lion
Section 1: Water, Water, Everywhere!

Educational Objectives:
Youth will
- Understand the basic need for water in all living things
- Learn to calculate how much water is in their bodies and food

Background:
Water is everywhere—in our food, our bodies, in plants, soil, and oceans. We cannot live without water. We think more water is made every time it rains, but in reality, the same water that was here during the dinosaur’s time, is still here today. We can neither add to nor subtract from the amount of water on the Earth.

Any resource that can replenish itself naturally over time is called a renewable resource. A natural resource that does not replenish itself or cannot be re-grown is called non renewable.

If people use up a renewable resource faster than it can replenish itself in nature, it becomes a nonrenewable resource.

Water can renew itself through the water cycle, which you will learn about later in this book. If people use water faster than Nature can renew it, it becomes a nonrenewable natural resource.

Topic Introduction:
Ask youth to name places on Earth where they can find water. They will most likely list bodies of water such as lakes, rivers, oceans and possibly water from faucets around the house or school. Ask them to think about water in the room with them right at that moment. Do they know that there is water in their bodies and in all living things?

Tips for Activities in Youth Book

Activity 1 - How Much Water Is In Your Body?
- Using your weight and simple mathematical equation, you can determine how much of your body is water.
- You will need a bathroom scale and a calculator (or someone to help with math if necessary).
- Basic facts used here: Approximately 2/3’s of your body is water. A gallon of water weighs approximately 8 pounds.
Activity 2 - How Much Water Is in Your Food?

- This activity uses time to measure the loss of water from an apple slice. It will take several days, so it is best done at home between group meetings or in a school classroom.
- If you have a kitchen scale, you could also weigh the slice before and after to see the change.
- **Interesting fact:** Bobbing for apples is possible because the volume of water in an apple is what makes it float. Apples are over 80% water.

**Extensions (Related Activities):**

1. Compare different fruits and vegetables to see which lose the most weight when drying, and therefore contain the most water.
2. Try rehydrating limp celery slices by soaking them in water, and measure the water weight gained.
3. Using large pieces of butcher paper, have youth trace each other’s whole body outlines and then color them in to represent the percentage of their bodies that are made of water (measure 2/3rds of their height)

**Assessment Opportunities or Evaluation:**

1. Have youth explain how raisins can be made from grapes
2. Have youth explain why water is so important for them to drink every day
Unit 2: Incredible Water with the Water Lion
Section 1: Water, Water, Everywhere!

Supplemental Activity:

**HOW OLD IS THE WATER YOU ARE DRINKING?**

**Educational Objectives:**
Youth will
- Understand that today’s water has been around for a long time
- Be able to define renewable and nonrenewable natural resource

**Background:**
There is no way to create new water on Earth. Instead our water is constantly moving through the water cycle and renewing itself. The water we drink today has been cycling on Earth for as long as the Earth has existed.

**Activity:**
1. Get a glass of water.
2. Look at it very closely and for a minute or longer.
3. What do you see?
4. How old do you think the water is?
5. Where did it come from?
6. Where else has this water been?

**Assessment Opportunities or Evaluation:**
1. Have youth tell the difference between a renewable and nonrenewable natural resource.
2. Discuss when water is a renewable resource? Nonrenewable?
3. Ask youth if we can make new water?

**Extensions (Related Activities):**
1. Contact your local conservation district and learn three ways to conserve water.
2. Check out the State Department of Environmental Protection website to find more fun activities.

Acknowledgement "How old is the water you are drinking?" activity from http://www.kidzone.ws/WATER/index.html
Unit 2: Incredible Water with the Water Lion
Section 2: Water’s Three Forms

**Educational Objectives:**

Youth will
- Demonstrate how adding and taking away heat changes water.
- List the three most common states of matter

**Background:**

Water can commonly be found in three states of matter; solid (ice), liquid (water) and gas (water vapor).

Increasing energy, such as in the form of heat, increases molecular movements. When the motion of the molecule increases because of an increase in heat energy, water will change from solid to liquid and then from liquid to gas. The warmer the water is, the more space there is between molecules and the more motion they express.

When liquid water molecules get so far away from each other that they turn to gas, it is called evaporation. When they come back together and return to the state of liquid water it is called condensation.

Freezing and melting are the terms used to describe matter changing from liquid to solid and vice versa. In some unusual cases solids can change directly to gas in a process called sublimation. A good example of this is with dry ice (frozen Carbon Dioxide) which becomes a cloudy gas and is frequently used for special fog effects.

**Topic Introduction:**

Have youth describe what water looks like and feels like? They will most likely describe water in its liquid form. Tell them you think that water feels hard (like ice) or looks soft and fluffy (like a cloud) and see if they can guess what kind of water you are talking about.

**Tips for Activities in Youth Book**

Activity 3 - Witness Evaporation and Condensation
- This activity must be done with adult supervision
- Have the youth wear a hot mitt (oven glove) while holding the lid over the boiling water

PA Educational Standards:
- 3.2.3.A1, A3, B2
- 3.2.4.A1
- 3.2.5.A1
- 3.3.4.A4
Unit 2: Incredible Water with the Water Lion
Section 2: Water’s Three Forms

**Extensions (Related Activities):**

1. Use a candy thermometer to watch the temperature changes during the activity.
2. Try breathing onto a mirror or glass window to see water vapor from our own bodies.
3. Explore phase changes in other substances (melting butter, making ice cream or even dry ice turning to gas if available).

**Assessment Opportunities or Evaluation:**

1. Have youth draw a cycle of water from solid to liquid to gas and back to liquid and label where evaporation and condensation occur.
2. Have youth name places on Earth where water can be found in each of the three different phases.

**Levels:**
- Grades 3-6
- Ages 8-11

**Time Consideration (Duration):**
- Preparation: 5 mins
- Activity: 25 mins

**Setting:** A kitchen or other facility with a stove top

**Materials needed:**
- Ice
- Pan with lid
- Stove top
- Hot mitt
- Supervising adult

**Key Terms (Vocabulary):**
- States of Matter
- Solid
- Liquid
- Gas
- Molecule
- Evaporation
- Condensation

**PA Educational Standards:**
- 3.2.3.A1, A3, B2
- 3.2.4.A1
- 3.2.5.A1
- 3.3.4.A4
Unit 2: Incredible Water with the Water Lion
Section 2: Water’s Three Forms

Supplemental Activity:

HUMAN MOLECULES

Educational Objectives:
Youth will
- Observe the effect of temperature on molecule movement
- Identify the three states of matter for water

Background:
In this activity youth will have the chance to play the part of water molecules and experience the changes a water molecule experiences in each state of matter.

Activity:

Set-up
1. Depending on the number of participants, choose a towel or bed sheet that when laid out on the ground, will allow for just enough space for each person to stand with little room for movement (i.e. it should be crowded when everyone stands together on it)
2. Lay the towel or bed sheet out in a large open room or outdoors (be prepared for kids to run and move at the end of the activity)

The Activity
1. Inform youth that today they will each represent a molecule of water and that the towel/sheet on the ground represents an ice cube tray.
2. Have all of the youth line up on the towel or sheet, standing shoulder to shoulder to form an ice cube.
3. After any giggling/silliness passes, ask the youth to comment on how much space each water molecule has and how easy or difficult is to move when in the form of ice (solid water).
4. Now tell the youth that they are warming up, and one at a time choose a youth to melt by shining a flashlight on his or her shoulder, informing each one to leave the “ice cube tray” because they have spilled out. Continue until about 1/3 of the “molecule” youth have been spilled. (those who have spilled can stand aside or sit on the ground)
HUMAN MOLECULES (cont’d)

Activity (cont’d):

5. Explain to youth that the remaining molecules in the “ice cube tray” are now in the form of liquid water. Allow them to spread out some. Repeat the previous questions about how much space they have and how easy it is to move.

6. Now really heat things up. Hand out flashlights to the youth who previously spilled out. Have everyone shine their light (heat) on the remaining molecules shoulders and tell the youth they are evaporating into the form of water vapor (gas). Tell them they no longer need to stay in a container and they are free to move wherever they want in the air. Allow the flashlight youth to join in the movement.

7. Have everyone gather (or condense) back to the sheet or towel and repeat the questions one more time about how much space they had and how easy it is to move as a gas molecule.

8. Re-cap the experiment and the differences between water molecules in a solid, liquid or gaseous state.

Levels:
- Grades 3-6
- Ages 8-11

Time Consideration (Duration):
Preparation: 5 mins
Activity: 25 mins

Setting: A large open room or outdoor space

Materials needed:
- A bed sheet or towel
- Flashlights (enough for about 1/3 of the participants)

Key Terms (Vocabulary):
- States of Matter
- Solid
- Liquid
- Gas
- Molecule

PA Educational Standards:
- 3.2.3.A1, A3, B2
- 3.2.4.A1
- 3.2.5.A1
- 3.3.4.A4

Extensions (Related Activities):

1. Demonstrate the movement of water molecules using a clear glass of water and few drops of food coloring. Allow youth to watch the food coloring disperse without agitating the water. Repeat the experiment with hot and very cold water (not frozen) to see what effect it has on the time it takes for the color to disperse.

1. Repeat the activity with two shades of food coloring so the youth can see the colors mix together and form a new color.

Assessment Opportunities or Evaluation:

1. List the three states of matter and other names for water in each state
2. Describe what happens when you add energy/heat to water molecules
Unit 2: Incredible Water with the Water Lion
Section 3: Unique Properties of Water

**Educational Objectives:**

Youth will
- Identify and describe the unique properties of water that allow it to support life on Earth

**Background:**

A solvent is a substance that dissolves another substance (known as a solute). A general factor that determines whether a substance will dissolve in a solvent is its polarity. Polar solvents have molecules whose electric charges are unequally distributed, leaving one end of each molecule more positive than the other. The charged molecules attract similar but oppositely charged polar solutes, almost like a magnet. Because of its high polarity, water is called the universal solvent. There are also non-polar solvents which dissolve non-polar solutes.

**Key Terms (Vocabulary):**
- Absorb
- Cohesive forces
- Adhesion

**PA Educational Standards:**
- 3.2.4.A1
- 3.2.6.A2

**Levels:**
- Grades 3-6
- Ages 8-11

**Time Consideration (Duration):**
Preparation: 5 mins
Activity: 25 mins

**Setting:** At a table

**Materials needed:**
- Measuring cup
- Thermometer
- Bowl
- Wax Paper
- Pencil or Pen
- Ruler
- Toothpicks
- Medicine Dropper
- Penny
- Water

**Tips for Activities in Youth Book**

**Activity 4 - Water Holds and Absorbs Heat**
- Use very cold water to make this experiment more reliable
- The water should stay relatively cool, not just be an average of the two temperatures.
- When vacationing at the beach, you may notice that the ocean is much cooler in June than in August, even if the air temperature is the same, because it takes a long time for the water to absorb enough heat to warm up.

**Activity 5 - The Forces of Water**
- A look at Cohesive forces (trying to stretch and separate water) and adhesion (observing water clinging to a surface)
- Cohesive forces should hold the water drop together as it’s moved along the wax paper. Both cohesion and adhesion help the water drops to stay on top of the penny.
Unit 2: Incredible Water with the Water Lion
Section 3: Unique Properties of Water

Extensions (Related Activities):

1. What happens if you add just a little cold water to a lot of hot water? or just a little hot water to a lot of cold water?

2. Drinking water through a straw is made possible by the adhesive and cohesive forces of water. This is also very similar to how plants suck water out of the ground through their roots and move it all the way to the tips of their leaves. Have a straw sipping party and pretend you are growing trees.

3. Try filling a glass of water so full that it seems to fill higher than the top of the glass without spilling.

Assessment Opportunities or Evaluation:

1. Have youth describe how water could protect our bodies from getting too hot

2. Float a paperclip on top of a glass of water and have youth explain how that’s possible

Levels:
- Grades 3-6
- Ages 8-11

Time Consideration (Duration):
- Preparation: 5 mins
- Activity: 25 mins

Setting: At a table

Materials needed:
- Measuring cup
- Thermometer
- Bowl
- Wax Paper
- Pencil or Pen
- Ruler
- Toothpicks
- Medicine Dropper
- Penny
- Water

Key Terms (Vocabulary):
- Absorb
- Cohesive forces
- Adhesion

PA Educational Standards:
- 3.2.4.A1
- 3.2.6.A2
Supplemental Activity:

**WATER—THE SUPER SOLVENT**

**Educational Objectives:**
Youth will
- See how water is a more efficient solvent than other liquids
- Understand that water dissolves polar solutes

**Background:**
In this activity, you will compare the ability of water, alcohol, and vegetable oil to dissolve certain solids. **CAUTION:** Rubbing alcohol is flammable, an eye irritant, and has fumes.

**Activity:**

1. Assign a number (1 through 9) to each of your cups or jars.
2. Pour ½ cup of water into the cups numbered 1-3.
3. Pour ½ cup of rubbing alcohol into the cups numbered 4-6.
4. Pour ½ cup of vegetable oil into the cups numbered 7-9.
5. Place 1 Tablespoon (Tbs) of sugar in cups 1, 4, & 7.
6. Place 1 Tbs of salt in cups 2, 5, & 8.
7. Place 1 Tbs -size piece of margarine (room temp) in cups 3,6,& 9.
8. Stir the contents of each cup vigorously for 1-2 minutes (or cover & shake if you have jars with lids).
9. Consider the following questions:
   - How well does each solvent (liquid) dissolve the solute (solid)?
   - Which liquid dissolved the most solids?
   - From this experiment would you conclude that sugar is polar or nonpolar? Why?
**Unit 2: Incredible Water with the Water Lion**

**Section 3: Unique Properties of Water**

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**WATER—THE SUPER SOLVENT (CONT’D)**

**Extensions (Related Activities):**

1. Demonstrate the concept of charges being attracted to each other using polarized magnets.

2. Have youth come up with other items around the kitchen/house that are often used by combining with water to form solutions and experiment with combining these solutes with other solvents to see what happens.

3. Try a mystery exercise. Give youth several mystery solvents (including one that is water) and known solutes and have them try to determine which solvent is the water by observing the effects of making solutions.

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**Assessment Opportunities or Evaluation:**

1. Identify two polar solutes you can find in your kitchen

2. Explain why water is so good at dissolving most solutes

3. Describe what happens when polar solutes are added to a non-polar solvent

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**Levels:**
- Grades 3-6
- Ages 8-11

**Time Consideration (Duration):**
- Preparation: 15 mins
- Activity: 20 mins

**Setting:** Indoors or Outdoors

**Materials needed:**
- Liquid measuring cup
- Tablespoon
- 9 clear cups/jars
- 9 spoons
- Rubbing alcohol
- Water
- Vegetable oil
- Sugar
- Salt
- Margarine

**Key Terms (Vocabulary):**
- Solvent
- Solute
- Polar
- Universal Solvent

**PA Educational Standards:**
- 3.2.4.A1
- 3.2.6.A2
Unit 2: Incredible Water with the Water Lion
Section 4: The Water Cycle

**Educational Objectives:**

Youth will

- Recite the basic stages of the water cycle
- Explain the concept of a watershed

**Background:**

The Water Cycle is critical to all life. The cycle occurs when water evaporates, condensation happens, precipitation occurs, and collection takes place on the earth. Then the cycle repeats itself, over and over again.

Water evaporates into the atmosphere through the sun shining on surface water (like in a stream or the ocean) but it also passes from underground, through plants and into the air in a process called transpiration.

Collection is when water gathers in liquid form on Earth. When it rains, water travels over the land (and sometimes underground) to a body of water (stream, lake, aquifer, etc...). Any land that leads water to specific waterway is known as its watershed.

**Time Consideration (Duration):**

Preparation: 15 mins
Activity: 30 mins

**Setting:** Indoors with a sunny window and Outdoors on a day with some clouds.

**Materials needed:**

- Plant
- Baggie & Twist tie
- Scale
- Aluminum foil
- Spray bottle
- Cup
- Medicine dropper
- Paper & pencil

**Key Terms (Vocabulary):**

- Evaporation
- Condensation
- Precipitation
- Collection
- Watershed

**PA Educational Standards:** 3.3.5.A4, 3.3.6.A4, 4.1.5.B, 4.2.3.A, 4.2.4.A, 4.2.5.A, 4.2.6.A

**Tips for Activities in Youth Book**

**Transpiration Demonstration**

- In part 1, you will be observing a plant over 30 minute intervals, so it would be helpful to plan other activities in between. You should see condensation on the bag that comes from water transpiring out of the plant’s leaves.
- In part 2, several days must pass, so this is best done at home or in a school classroom. The soil will dry out and lose weight as the plant transpires the water.

**Topic Introduction:**

Water moves in lots of different ways. It doesn’t just flow downhill and through pipes. Sometimes it seeps into the ground. Sometimes it evaporates into the air. Sometimes it gets sucked up into plants. We can observe the movement of water through the water cycle.
**Unit 2: Incredible Water with the Water Lion**

**Section 4: The Water Cycle**

**Tips for Activities in Youth Book (cont’d)**

**Activity 6 - Make a Watershed**
- Using crinkled aluminum foil to create a simulated landscape works really well, you may want to crumple out some newspaper to mold the aluminum foil around, which will help it stay in shape.
- You could have the youth draw on the foil with permanent marker in places they predict the water will collect.
- Any water that was lost, you can say washed away in streams to another place downstream.
- Even though groundwater is stored underground, the towel pieces on the peaks help to model the way that soil can soak up some water like a sponge and store it in an aquifer.

**Activity 7 - Clouds Exploration**
- Cotton balls, glue sticks and blue paper are another great way to recreate the clouds you see, instead of drawing them.

**Extensions (Related Activities):**

1. Try adding “pollutants” to your watershed models. Sprinkle a little dry tempura paint or colorful drink mix powder in various places around the watershed. What happens to those pollutants when it rains?
2. Have youth write short stories about the adventures of a drop of water.
3. Create cloud identification guides, either by drawing the different clouds or making them with cotton balls on paper, and then binding them together into books.

**Assessment Opportunities or Evaluation:**

1. Have youth explain the various steps of the water cycle.
2. Show youth a body of water on a map (lake, river, stream, etc....) and ask them to explain where that water comes from before it fills the lake, river, stream...

**Levels:**
- Ex: Grades 3-6
- Ex: Ages 8-11

**Time Consideration (Duration):**
- Preparation: 15 mins
- Activity: 30 mins

**Setting:** Indoors with a sunny window and outdoors on a day with some clouds.

**Materials needed:**
- Plant
- Baggie & Twist tie
- Scale
- Aluminum foil
- Spray bottle
- Cup
- Medicine dropper
- Paper & pencil

**Key Terms (Vocabulary):**
- Evaporation
- Condensation
- Precipitation
- Collection
- Watershed

**PA Educational Standards:** 3.3.5.A4, 3.3.6.A4, 4.1.5.B, 4.2.3.A, 4.2.4.A, 4.2.5.A, 4.2.6.A
Unit 2: Incredible Water with the Water Lion
Section 4: The Water Cycle

Supplemental Activity:

LIVING THE WATER CYCLE

Educational Objectives:
Youth will

- Gain a better understanding of the water cycle
- Understand the connection between precipitation, evaporation, condensation, and collection

Background:
In this activity, youth will act out the stages of the water cycle in an outdoor setting.

Activity:
The story “Living the Water Cycle” is to be read by the teacher or mentor. Those parts are in italics text below. The terms of the water cycle are included beneath each story segment for adaptation of the activity for older youth.

The story of “living the water cycle”.

The sky has darkened with rain clouds, and it appears that at any second, millions of tiny rain droplets may begin to fall.

Have children spread out within vicinity of the storyteller and to ‘pretend’ they are just one of the millions of rain drops getting ready to reach the earth’s surface.

Older youth may already know the term “condensation” in which water vapor in the air gets cold, changes back into liquid, forming the clouds and rain droplets.

Suddenly, the rain begins. Some rain droplets hit the ground softly, and others drop on it with a “SPLOSH”

When the youth hear the word “SPLOSH”, invite them to fall to the ground where their rain drop splashes.
Older youth may know the term “precipitation” when so much water has condensed that the air can no longer hold it. The clouds get heavy and water falls back to the earth.

Many of the rain drops that fall on grass are pulled INTO the soil beneath the grass and plants, and the roots of the plants drink the water up. But sometimes during a VERY hard rain, the rain drops begin to roll across the ground, feeling themselves being pulled down to the lowest place, down, down, down until they roll to a stop all-together in a puddle.

This is the point to invite youth to lay still and then feel which way their bodies are pulled downhill, down slope and to simply allow gravity to roll them in the direction that their bodies would naturally flow. Some youth will find themselves gathered together at a low point. Use this gathering to invite them to explain how they ended up at the same location. This will enable the other youth who were “renegade” raindrops flowing away from natural gravity to understand how the puddle phenomena is a part of the rain fall.

Older youth: “Collection is where the rain water collects after it falls to the earth, including the oceans, lakes, rivers, streams, and puddles. The sun breaks through from behind the cloud, and warms the ground and the rain droplets. As the rain droplets warm in the sun, they can feel themselves becoming lighter, and lighter, as if they are being sucked up by the warmth of the sun. The rain droplets are suddenly light as air, and reach to the sky, finding themselves floating higher, and higher, no longer are they little rain drops, but they are invisible water droplets.

As the mentor facilitates this exercise, demonstrate how one might “wake up to the warmth of the sun”, initially stretching from the ground, and then reaching to the sky. As the mentor explains how a rain droplet might warm up to the sun and being pulled back to the sky, reach up to the sky, going to tip toes. Encourage youth to “release” their rain drop to the sky when they are as high as they can get with their arms and tip toes.
LIVING THE WATER CYCLE (CONT’D)

Older youth: Evaporation is when the sun heats up water in rivers, lakes, oceans and puddles and turns it into a vapor or stream that can return to the air.

Oh how nice to enjoy the sun. But wait, a rain cloud is forming. Look up and see how all of the water droplets that were released are now coming together, darkening the sky, and it looks like it’s about to rain again. Ready? Find your starting place, and let’s tell the story again.

By repeating the story a second or third time, it allows the participants to experiment on where their rain droplet will fall, and how it will be pulled by gravity to other locations.

Extensions (Related Activities):
1. Explain why rain drops fall from the clouds.
2. Explain what happens when the rain drops fall to the earth.
3. Explain what happens to the rain drop when sun begins to warm it.

Assessment Opportunities or Evaluation:
1. The previous activity (Living the Water Cycle) may bring questions about what happens to rain that soaks into the soil. Explain that the pull into the soil is very similar to the pull that they felt when their rain droplet rolled down a slope. Discuss how rain droplets in the soil are pulled towards a stream, creek, pond or other body of water.
2. Ask children to imagine if the raincloud were over the sea? The North Poll? A city with many roves and paved streets? Include other landscapes that may be within the children’s own neighborhood.

Resources:

Unit 1: Water Conservation with the Water Lion

**Atmosphere**: the air surrounding the earth which contains water droplets.

**Calibrate**: to set or check the measurement of a device

**Conservation**: the wise and least use of something considered special, such as a natural resource like water.

**Consumption**: to use.

**Direct water use**: a person’s own individual water use such as drinking, bathing, washing dishes and watering the lawn.

**Drought**: a prolonged period of dry, rainless weather.

**Fresh water**: water that is not salty and therefore valuable for direct water use.

**Glacier**: huge masses of ice that never fully melt, found on land often found on mountain tops.

**Habit**: a way of behaving that is repeated

**Iceberg**: huge masses of ice detached from a glacier, found floating in the ocean.

**Indirect water use**: water use that occurs in manufacturing and processing such as the water used to generate electricity. We don’t always see this water use but it accounts for 7/8ths of the total water use per person of water in the United States.

**Lake**: in land body of standing water.

**Precipitation**: rain or snow that results when so much water has condensed in the atmosphere that the air can no longer hold it.

**River**: a natural stream of flowing water.

**Salt water**: water that contains too much salt for most uses. 97% of the planet’s water is found in oceans which contain salt water.
**Water Projects Glossary**

**Unit 2: Incredible Water with the Water Lion**

**Absorb:** the process in which heat is taken in by water and not reflected, transmitted or passed on to another medium or substance.

**Adhesion:** when unlike molecules (like water molecules and the molecules making up the wall of a drinking glass) cling together due to attractive forces.

**Cohesive forces:** The attractive force that holds together individual water molecules in liquid form.

**Collection:** where the rain water collects after it falls to the earth, including the oceans, lakes, rivers, streams, and puddles.

**Condensation:** water vapor in the air gets cold, changes back into liquid (this is how clouds, fog and rain forms).

**Drought:**

**Evaporation:** when water is heated and it turns into a vapor or stream that can return to the air.

**Gas:** one of the three states of matter. Water becomes a gas (water vapor) when it is heated to its boiling point.

**Liquid:** one of the three states of matter. Water exists as a liquid when it is warmer than its freezing point but cooler than its boiling point.

**Molecule:** the smallest particle of a substance (like water) that retains all of the properties of that substance.

**Nonrenewable:** A natural resource that does not replenish itself or cannot be re-grown (such as oil, natural gas, and sometimes water).

**Polar:** molecules whose electric charges are unequally distributed, leaving one end of each molecule more positive than the other.

**Precipitation:** when so much water has condensed that the air can no longer hold it. The clouds get heavy and water falls back to the earth.

**Renewable:** natural resource that can replenish itself naturally over time.

**Solid:** one of the three states of matter. Water becomes a solid (ice) when it is cooled to its freezing point.

**Solute:** A substance dissolved in another substance, like salt in water.

**Solvent:** A substance, usually a liquid, capable of dissolving another substance.

**States of Matter:** the distinct forms that different phases of matter take on. The three most common are solid, liquid and gas.

**Universal Solvent:** a substance capable of dissolving all other substances. This name has been applied to water.

**Watershed:** an area of land that drains (over and underground) to a common body of water such as a lake, stream, or river.
4-H Science Interest and Abilities Evaluation:
Be sure to evaluate the impact on youth by asking them to answer the following questions both BEFORE and AFTER they complete the 4-H Water Project:

**Science Interest:**
Indicate the extent to which you agree or disagree with the following statements.
(Select ONE in each row.)

<table>
<thead>
<tr>
<th></th>
<th>I don’t know</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like science.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Science is boring.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Science is useful for solving everyday problems.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>When I graduate from high school, I would like to have a job related to science.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I do science-related activities that are not for schoolwork.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**Science Abilities:**
Please let us know how often each of these statements is true for you.
(Select ONE in each row.)

<table>
<thead>
<tr>
<th></th>
<th>I don’t know</th>
<th>Never</th>
<th>Sometimes</th>
<th>Usually</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can use specific science knowledge to form a question.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can ask a question that can be answered by collecting data.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can design a scientific procedure/experiment to answer a question.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can record data accurately.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can analyze the results of a scientific investigation.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**Skills for Everyday Living Survey:**
This evaluation system will help 4-H Youth Development professionals share the value of local youth development programs with legislators, parents, other agencies as well as internal stakeholders. Penn State Cooperative Extension makes every effort to provide valid documentation to show the difference that the programs are making in the lives of youth we work with everyday. Skills evaluated are decision making, critical thinking, communication, goal setting and solving problems.

This survey is both a Pre-test and Post-test. The pre-test should be conducted at the start of the program year or the beginning of the program. The survey is completed by the youth individually. It is important to emphasize there are no right or wrong answers. The post-test should be administered at the last program meeting of each year or at the end of the program. The program must meet at least five times for the survey to be valid.

You may access a downloadable copy of The Skills for Everyday Living Survey by going to [http://www.humanserviceresearch.com/youthlifeskillsevaluation/](http://www.humanserviceresearch.com/youthlifeskillsevaluation/)

For further information on either of these evaluations contact your County 4-H Youth Development Educator.
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- Thank you Kristen Saacke Blunk, for permission to use the activity “Living Water Cycle”, as published in the 4-H Nature Start Mentor’s Guide Book Copyright 2010 by Penn State Cooperative Extension.

RESOURCES


- Project WET Foundation (©1995) Project Wet Curriculum and Activity Guide, Project WET Foundation, 1001 W. Oak Street, Suite 210, Bozeman, MT 59715. 1866-337-5486; E-mail: info@projectwet.org; Web Site: www.ProjectWet.org
RESOURCES

Storybooks which Compliment the 4-H Water Project Curriculum
Use this children’s literature to expand youth understanding and appreciation.

This fun rhyming story explores the potential interconnectedness between a small pond and the many other different bodies of water on earth. While Marco dreams of catching fish which find their way into the pool where he is waiting, readers are reminded of the importance of treating our waterways with care.

This scientific fact based story is written in rhyme. Readers follow little Droplet as he travels around the world through the water cycle, in its 3 forms – liquid, solid and vapor. Readers will come to appreciate the vital role water plays in life.

This supplement offers activities that extend the exploration of unique properties of water and water geography. It includes a section for applied knowledge.

This carefully illustrated true story follows the historical changes and influence of the Nashua River in Massachusetts. Readers will come to appreciate the role the river had in the history of the area. The will also appreciate the effect people had on the river and role Marion Stoddart and the Nashua River Cleanup Committee had on restoring the river after decades of industrial and residential pollution.

This picture book portrays the water cycle against in all its forms against the backdrop natural landscapes. It includes accurate scientific explanations of each painting for educational purposes.

This picture book helps children understand the vital role water plays in human lives. They also learn about global water sources. Each photograph is accompanied by an explanation of location and significance.
4-H MOTTO
“To Make the Best Better”

THE 4-H PLEDGE
I pledge my Head to clearer thinking,
my Heart to greater loyalty,
my Hands to larger service,
and my Health to better living,

For my club, my community, my country, and my world.

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