DISCOVER

4-H ENVIRONMENTAL EDUCATION AND CITIZENSHIP CLUBS

EXTENSION
UtahStateUniversity

DiSCOVER

4-H ENVIRONMENTAL EDUCATION AND CITIZENSHIP CLUBS

Natalie McHale | Katherine Veeder | Jennifer Groves | Stacey MacArthur
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Description

The Discover 4-H Clubs series guides new 4-H volunteer leaders through the process of starting a 4-H club or provides a guideline for seasoned volunteer leaders to try a new project area. Each guide outlines everything needed to organize a club and hold the first six club meetings related to a specific project area.

Purpose

The purpose is to create an environment for families to come together and participate in learning activities while spending time together as a multi-family club. Members will experiment with new 4-H project areas.

What is 4-H?

4-H is one of the largest youth development organizations in the United States. 4-H is found in almost every county across the nation and enjoys a partnership between the U. S. Department of Agriculture (USDA), the state land-grant universities (e.g., Utah State University), and local county governments.

4-H is about youth and adults working together as partners in designing and implementing club and individual plans for activities and events. Positive youth development is the primary goal of 4-H. The project area serves as the vehicle for members to learn and master project-specific skills while developing basic life skills. All projects support the ultimate goal for the 4-H member to develop positive personal assets needed to live successfully in a diverse and changing world.

Participation in 4-H has shown many positive outcomes for youth. Specifically, 4-H participants have higher participation in civic contribution, higher grades, increased healthy habits, and higher participation in science than other youth (Lerner et al., 2005).

Updated June 2017

Utah 4-H

4-H is the youth development program of Utah State University Extension and has more than 90,000 youth participants and 8,600 adult volunteers. Each county (Daggett is covered by Uintah County) has a Utah State University Extension office that administers the 4-H program.

The 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.

4-H Clubs

What is a 4-H Club? The club is the basic unit and foundation of 4-H. An organized club meets regularly (once a month, twice a month, weekly, etc.) under the guidance of one or more volunteer leaders, elects its own officers, plans its own program, and participates in a variety of activities. Clubs may choose to meet during the school year, only for the summer, or both.

Club Enrollment

Enroll your club with your local Extension office. Each member will need to complete a Club/member Enrollment form, Medical History form, and a Code of Conduct/Photo Release form (print these from the www.utah4h.org website or get them from the county Extension office).

Elect Club Officers

Elect club officers during one of your first club meetings. Depending on how many youth are in your club, you can decide how many officers you would like. This will typically include a president, vice president, pledge leader, and secretary. Other possible officers or committees are: song leader, activity facilitator, clean-up supervisor, recreation chair, scrapbook coordinator, contact committee (email, phone, etc.), field trip committee, club photographer, etc. Pairing older members with younger members as Sr. and Jr. officers may be an effective strategy to involve a greater number of youth in leadership roles and reinforce the leadership experience for both ages. Your club may decide the duration of officers–6 months, 1 year, etc.

A Typical Club Meeting

Follow this outline for each club meeting:

- ☐ Call to order–president
- ☐ Pledge of Allegiance and 4-H Pledge–pledge leader (arranges for club members to give pledges)
- ☐ Song–song leader (leads or arranges for club member to lead)
- ☐ Roll call–secretary (may use an icebreaker or get acquainted type of roll call to get the meeting started)
- ☐ Minutes of the last meeting–secretary
- ☐ Business/Announcements–vice president
- ☐ Club Activity–arranged by activity facilitator and includes project, lesson, service, etc. These are outlined by project area in the following pages.
- ☐ Refreshments–arranged by refreshment coordinator
- ☐ Clean Up–led by clean-up supervisor

Essential Elements of 4-H Youth Development

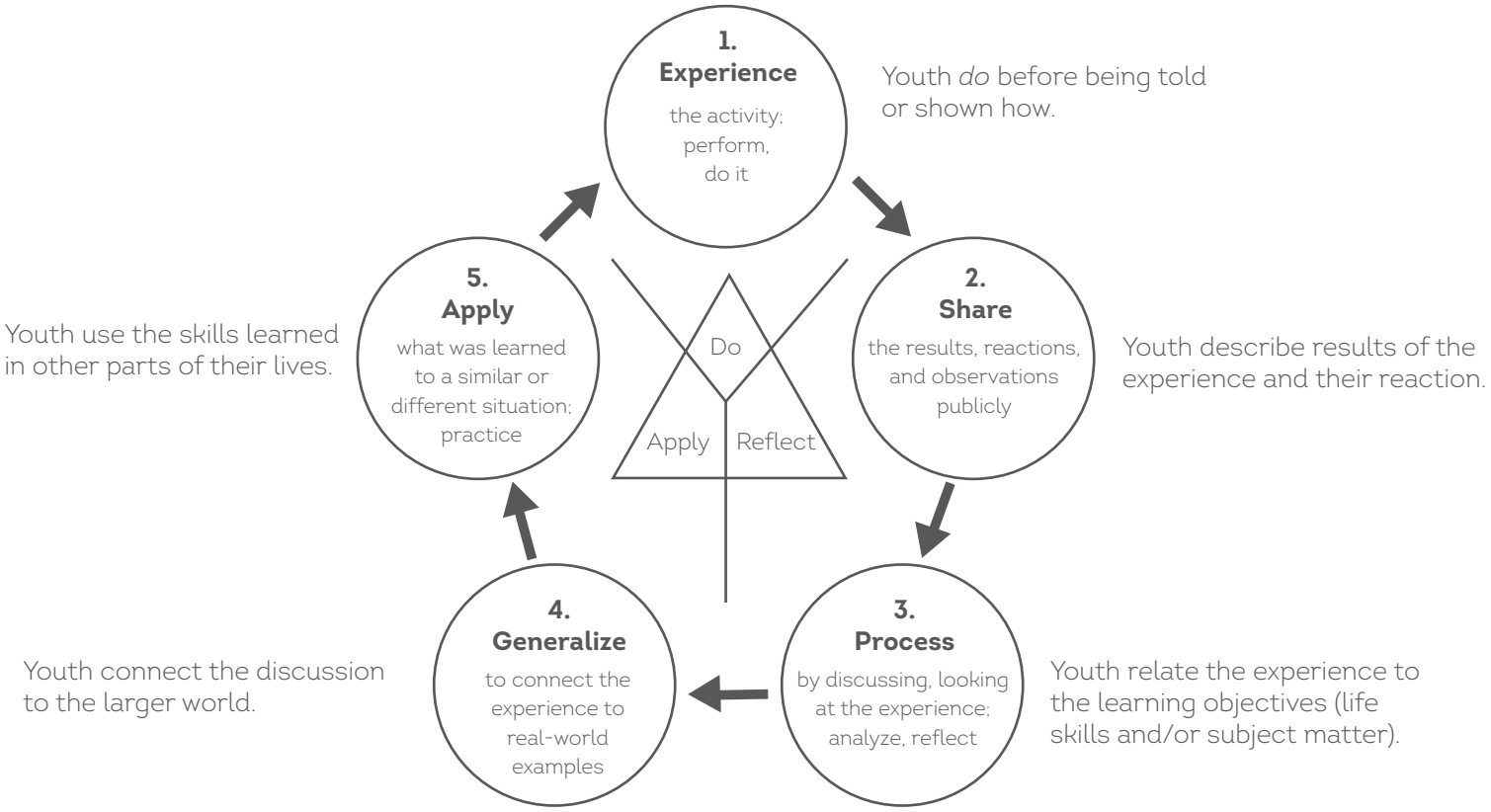
The essential elements are about healthy environments. Regardless of the project area, youth need to be in environments where the following elements are present in order to foster youth development.

1. **Belonging**: a positive relationship with a caring adult; an inclusive and safe environment.
2. **Mastery:** engagement in learning, opportunity for mastery.
3. **Independence:** opportunity to see oneself as an active participant in the future, opportunity to make choices.
4. **Generosity:** opportunity to value and practice service to others.

(Information retrieved from: http://www.4-h.org/resource-library/professional-development-learning/4-h-youth-development/youth-development/essential-elements/)

4-H "Learning by Doing" Learning Approach

The Do, Reflect, Apply learning approach allows youth to experience the learning process with minimal guidance from adults. This allows for discovery by youth that may not take place with exact instructions.



4-H Mission Mandates

The mission of 4-H is to provide meaningful opportunities for youth and adults to work together to create sustainable community change. This is accomplished within three primary content areas, or mission mandates, - citizenship, healthy living, and science. These mandates reiterate the founding purposes of Extension (e.g., community leadership, quality of life, and technology transfer) in the context of 21st century challenges and opportunities. (Information retrieved from: http://www.csrees.usda.gov/nea/family/res/pdfs/Mission_Mandates.pdf)

1. **Citizenship:** connecting youth to their community, community leaders, and their role in civic affairs. This may include: civic engagement, service, civic education, and leadership.
2. **Healthy Living:** promoting healthy living to youth and their families. This includes: nutrition, fitness, social-emotional health, injury prevention, and prevention of tobacco, alcohol, and other drug use.
3. **Science:** preparing youth for science, engineering, and technology education. The core areas include: animal science and agriculture, applied mathematics, consumer science, engineering, environmental science and natural resources, life science, and technology.

Getting Started

1. Recruit one to three other families to form a club with you.
    a. Send 4-H registration form and medical/photo release form to each family (available at utah4h.org)
    b. Distribute the Discover 4-H Clubs curriculum to each family
    c. Decide on a club name
    d. Choose how often your club will meet (e.g., monthly, bi-monthly, etc.)
2. Enroll as a 4-H volunteer at the local county Extension office (invite other parents to do the same)
3. Enroll your club at the local county Extension office
    a. Sign up to receive the county 4-H newsletter from your county Extension office to stay informed about 4-H-related opportunities.
4. Identify which family/adult leader will be in charge of the first club meeting.
    a. Set a date for your first club meeting and invite the other participants.
5. Hold the first club meeting (if this is a newly formed club).
    a. See *A Typical Club Meeting* section above for a general outline.
        i. Your activity for this first club meeting will be to elect club officers and to schedule the six project area club meetings outlined in the remainder of this guide. You may also complete a-d under #1 above.
    b. At the end of the first club meeting, make a calendar outlining the adult leader in charge (in partnership with the club president) of each club meeting along with the dates, locations, and times of the remaining club meetings.
6. Hold the six project-specific club meetings outlined in this guide.
7. Continue with the same project area with the 4-H curriculum of your choice (can be obtained from the County Extension Office) OR try another Discover 4-H Club project area.

Other Resources

Utah 4-H website: www.Utah4-h.org
National 4-H website: www.4-h.org
4-H volunteer training:
To set up login:
http://utah4h.org/volunteers/training/
To start modules: http://4h.wsu.edu/volunteertraining/course.html
(password = volunteer)

References

Information was taken from the Utah 4-H website (utah4h.org), the National 4-H Website (4h.org), the Utah Volunteer Handbook, or as otherwise noted.

Lerner, R., M. et al. (2005). Positive youth development, participation in community youth development programs, and community contributions of fifth grade adolescents: Findings from the first wave of the 4-H Study of Positive Youth Development. Journal of Early Adolescence, 25(1), 17-71.

We would love feedback or suggestions on this guide; please go to the following link to take a short survey:
https://goo.gl/iTfiJV

4-H ENVIRONMENTAL EDUCATION AND CITIZENSHIP CLUB *Meetings*

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4-H Club Meeting 1

Exploring Nature's Space in Your Place

Supplies

- Pens/pencils

Nature Journals

- Thin cardboard (e.g., cereal or cracker boxes)
- Paper
- Rubber bands
- Sticks (appropriate size for binding)
- Scissors
- Hole punchers
- Rulers
- Decorating materials (e.g. markers, stickers, etc.)
- Paper trimmer (if available)

Walkabout

- Binoculars
- Magnifying glasses and/or hand lenses
- Device to take photos (e.g., camera, cell phone, etc.)
- DIY nature journals

INTRODUCTION

In this club we will explore nature in our own backyard. Today we will create our own nature journals to record observations made with our senses during a walkabout outdoors.

PRIOR TO THE MEETING

1. Make an example of a natural journal, using the same materials you plan to provide.
2. Identify an appropriate nature space near the meeting area for a walkabout.

What to Do:

WHY NATURE JOURNALS?

A nature journal is a place to grow your thoughts, feelings, ideas, activities, observations, and relationship with the natural world. Your own nature journal provides an opportunity to study the natural world, to grow a deeper relationship with the Earth, and to develop a greater awareness and appreciation for the Earth. A nature journal is an opportunity for personal growth and to study the changing natural world.

WHAT IS A WALKABOUT?

Historically, a walkabout refers to a rite of passage in Australia during which Indigenous male adolescents would undergo a journey where they live in the wilderness for as long as 6 months to make a spiritual connection and traditional transition into adulthood. Today, environmental educators use the term to refer to an experiential way of connecting individuals with nature. As the word implies, a walkabout simply involves walking about without a plan, exploring nature as it comes to you, stopping to investigate when the mood strikes, and observing the wildlife, plants, sounds, scents, and other natural phenomenon that one may come across while walking about.

Activity #1
DIY NATURE JOURNALS

Time: 20 minutes

1. Create the front and back cover of the journal using cardboard. Use scissors or a paper trimmer to achieve the size desired, making sure both covers are the same size. Rulers will be helpful to keep the lines straight.

2. Cut the paper that will fill the journal using the cardboard covers as your template to ensure they are the same size. Aim for about 20 pieces of paper.

3. Begin to construct the binding using a hole punch to make two holes about a quarter of an inch from the edge on the same side, one near the top and the second near the bottom. Do the same with the paper, making sure the holes in the front cover, back cover, and paper line up.

   Note: If there is a design on the cardboard, decide now what side you would like to be visible when the journal is closed. There will be time to decorate the cover at the end.

4. Cut a stick to match the length of the journal's binding. With the paper and cardboard covers stacked in the order desired for the finished journal, align the stick over the punched holes.

5. Complete the binding by looping one end of a rubber band around the stick, and pull the other end through the hole at the top of the journal. Turn the journal over and pull the rubber band down the backside of the journal, bringing the free end through the bottom hole, and back to the front of the journal. Wrap the free end of the rubber band around the bottom end of the stick.

6. Decorate the journal using markets, stickers, or natural materials!

See this link for images: http://themagnifyingglass.typepad.com/weblog/2011/03/bookmaking-for-children-nature-journal-with-twig-binding.html

Time: 20 minutes

1. Escort participants to the predetermined walkabout location. Make sure they bring their DIY nature journals and a pen or pencil. A nearby stream, pond, forest, park, or natural trail is ideal, but if none of these are nearby, a backyard, playground, or an empty lot are also options. Keep in mind, this location will need to be accessible throughout the year so that participants are able to make comparisons between visits (e.g., weather, new wildlife, different insects, color changes in plants, etc.).

2. Distribute observation tools such as binoculars, hand-lenses, magnifying glasses, cameras, or any other available equipment that might enhance exploration. Encourage participants to use these tools to explore their surroundings, setting boundaries for safety if necessary.

3. Participants can record their findings in written or picture form inside their DIY nature journals. Encourage them to use their senses (e.g., what do you see, hear, feel, smell, and possibly taste?) and to keep their thoughts brief. Deeper reflections will occur in the next activity.

4. If appropriate, students may pick grasses or leaves to press in between the pages of their DIY nature journals. Express the importance of only taking a small sample size to maintain the habitat.

5. If your nature space to explore is especially small, it is also an option to have students select a "sit spot." Walk with the participants to the chosen destination, and have each of them choose their own spot within that space where they can sit quietly for 10 to 15 minutes to watch, listen, and examine the nature around them.

Activity #3
GUIDED NATURE JOURNALING

Time: 10 minutes

Once participants have had the opportunity to explore freely, it is often helpful to provide them with concrete prompts of what to write or draw in their nature journals. Here are some ideas that should help participants get started.

1. Once they are done exploring, bring them to a designated journaling space. This may either be outside or back in the meeting room.

2. Set up a journal entry. This may include the date, location, time, weather conditions, vegetation characters, human impacts and disturbance, etc.

3. Ask students to write the following in their journal:
    a. One word or sentence to describe something they heard
    b. Two words or sentences to describe something they saw
    c. Three words or sentences to describe something they felt

4. Additional ideas to inspire youth:
    a. Draw a detailed sketch of something they saw (plant, insect, tree, whole scene, etc.)
    b. Trace a pressed leaf, grass, seed, flower, etc.
    c. Field guide information about a plant or animal they see
    d. Write a poem about what they see, hear, feel, or smell
    e. Writing prompts:
        i. "I notice..."
        ii. "I wonder..."
        iii. "It reminds me of..."

5. Allow time for participants who are willing to share what they wrote or drew in their journals.

Reflect

- What was the coolest thing you saw today?
- What more would you like to know about that "cool thing?"

Apply

- How does recording your observations and thoughts in a nature journal help you better connect or understand the natural world?
- How could you answer your question about the "cool thing" you discovered? Consider designing an experiment.

4-H MISSION MANDATES

Citizenship

Youth will explore the outdoors in their neighborhood, allowing them to be engaged and well-informed about their natural surroundings and gain an understanding of their place within it.

Healthy Living

Youth will be encouraged to spend more time outdoors, building healthy habits to achieve optimal physical, social, and emotional well-being.

Science

Youth will practice inquiry to make observations about the natural world. They will use scientific tools to collect and record their findings.

ESSENTIAL ELEMENTS

Belonging

Exploring the natural world together and eventually sharing their findings, thoughts, and ideas with each other will help to create a connection with their peers and their surroundings.

Independence

Learning about the importance of their backyard habitat will provide youth with the knowledge and motivation to protect these important ecosystems.

Generosity

Youth will learn the importance of respecting the natural world.

Mastery

Youth will practice using scientific tools to improve data collection techniques.

References:

The Magnifying Glass: an online nature journal. Bookmaking with Children: Nature Journal with Twig Binding. Retrieved from http://themagnifyingglass.typepad.com/weblog/2011/03/bookmaking-for-children-nature-journal-with-twig-binding.html

Walkabout. (n.d.) In Wikipedia. Retrieved from https://en.wikipedia.org/wiki/Walkabout

Sierra Journal. Keeping a Nature Journal. Retrieved from http://vault.sierraclub.org/education/nature_journal.asp

4-H Club Meeting 2
Helping Out in Your Hood

Supplies

- Computers or tablets
- Internet connection
- Large paper or white board
- Nature journals
- Pens/pencils

INTRODUCTION

In this club we will explore nature in our own backyard. Today we will learn about Citizen Science and research organizations we can work with to contribute to scientific research.

PRIOR TO THE MEETING

Research citizen science projects that are available in your community. Your 4-H group will want to spend time once or twice a month engaging in your chosen citizen science project. A consistent involvement will help keep participants interested and engaged, as well as make them feel that they made a significant contribution.

What to Do:

WHAT IS CITIZEN SCIENCE?

Citizen science is a research project where the general public volunteers their time to assist scientists in their research. Citizen scientists can support professional researchers in a lot of ways – by submitting data, sharing experiences or spreading valuable information. Scientists benefit from more data to analyze and a pool of volunteers willing to help.

Citizen science has many benefits for participants as well:

1. Creates a sense of community and place
2. Develops critical thinking and a multitude of other valuable skills
3. Reaches different types of learners
4. Helps participants understand that research isn't just for scientists
5. Allows participants to feel a sense of importance in that what they are able to contribute will have a value in reaching a larger scientific goal

Anyone can be a citizen scientist – all you need is a passion for nature and helping your community!

Activity #1
WHAT CAN I OFFER TO SCIENCE?

Time: 10 minutes

With the many Citizen Science projects available worldwide, everyone should be able find a project they can contribute to. Often projects require various levels of commitment and training, so it is important to consider these factors before volunteering. As a group, spend some time discussing what you are able to contribute to a Citizen Science project. On a large piece of paper or a white board, record your responses to the following questions:

- Time: How much time or how often are we able to commit?
- Accessibility: How far are we able to travel? Do we have access to transportation?
- Interests: What are our interests? More specifically, what type of science am I interested in? What would I enjoy doing?
- Knowledge and resources: What knowledge and/or skills do we have to offer? What resources do we already have that may be utilized? What resources might we need?
- Community: What does my community need? What can we do as a group?

Determine the guidelines for your group and have participants record them in their Nature Journals.

Activity #2
RESEARCH CITIZEN SCIENCE PROJECTS

Time: 25 minutes

Find a citizen science project that the group can realistically contribute to on a regular basis, ensuring it fit the guidelines for your group determined in Activity 1. Sharing the computers and/or tablets, in small groups participants will research various projects, using their nature journals to record how well they fit the criteria for each category.

The following websites offer some fantastic possibilities for citizen science projects that are appropriate for both individuals and groups:

- National Geographic: http://nationalgeographic.org/idea/citizen-science-projects/
- PBS Kids: http://pbskids.org/scigirls/citizen-science
- National Wildlife Federation: https://www.nwf.org/Wildlife/Wildlife-Conservation/Citizen-Science.aspx

Some of these may require minimal training for the group leader, but the benefit to the students is well worth the effort.

Another option is citizen science mobile applications for smartphones, tablets and other gadgets, which can turn just about anyone into a citizen scientist. App-equipped wireless devices give users worldwide the ability to act as remote sensors for all sorts of data as they go through their daily routines. Examples include:

- Project Noah – A tool to explore and document wildlife and a platform to harness the power of citizen scientists everywhere.
- iNaturalist.org – A place where you can record what you see in nature, meet other nature lovers, and learn about the natural world.

Lastly, many state and local governments and community environmental groups have their own citizen science programs. To learn about available citizen science programs in your state, contact your local university, cooperative extension or government office.

Unable to find a Citizen Science project that fits your needs? There are many onetime community service projects that allow students to get outside in nature AND can be done on a whim:

- **Pick up trash** in your chosen nature space, neighborhood, park, or school yard. This is always an option since trash seems to be ever-present. Supply students with garden gloves and re-usable trash bags, then get outside! To keep it interesting, have a bathroom scale on hand so trash can be weighed and charted. Take photographs along the way to make it memorable.
- **Plant native seeds.** Depending on the time of year, plant native flower seeds, herb seeds, or vegetable seeds in a community garden or other nearby, chosen garden plot where you have permission; or in fall, harvest seeds from your own garden or the garden of someone you know to be used for next year and/or shared with others.
- **Take a hike** with younger siblings and friends. Get them outdoors to explore nature. Create a color scavenger hunt where children need to find an item in nature to represent all of the colors found in an 8-crayon coloring box (black, brown, green, blue, purple, red, orange, yellow).
- **Geocache** in your neighborhood! Explore already created geocaches or look into setting up a geocache of your own. Go to geocaching.com to learn how. Take a walk around your neighborhood to search for possible sites.

Activity #3
BECOMING A CITIZEN SCIENTIST

Time: 10 minutes

Have each small group briefly present their top choice from their research. After each group has presented, vote to determine which citizen science project the group will be volunteering with!

If there is time, create a schedule for when you will participate.

Reflect

- Today's class was about helping our environment and community. Is there an environmental issue that concerns you? What is it?
- If you were to do something that would address this issue, what would you do?

Apply

- Are there any citizen science projects you can participate with on your own time?

References:

National Wildlife Federation. Citizen Science. Retrieved from: https://www.nwf.org/Wildlife/Wildlife-Conservation/Citizen-Science.aspx

4-H MISSION MANDATES

Citizenship

Youth will research and volunteer with a citizen science project to create a sense of community and place.

Healthy Living

Encourages youth to spend more time outdoors, building healthy habits to achieve optimal physical, social, and emotional well-being.

Science

Develops critical thinking and a multitude of other valuable skills.

ESSENTIAL ELEMENTS

Belonging

Participants will feel a sense of importance in that what they are able to contribute will have a value in reaching a larger scientific goal.

Independence

Researching various citizen science projects provides participants with the resources they need to become citizen scientists on their own time and the understanding that they alone can contribute.

Generosity

Youth will learn the importance of lending a helping hand to their community and respecting the natural world.

Mastery

Allows youth to practice using scientific tools to improve data collection techniques.

4-H Club Meeting 3
What Would We Do Without Wetlands?

Supplies

- Pillowcase or opaque box
- Sponge
- Small pillow
- Soap
- Eggbeater or mixer
- Small doll cradle
- Sieve or strainer
- Coffee filter
- Antacid tablets
- Oatmeal packet

INTRODUCTION

In this club we will explore nature in our own backyard. Today we will use a metamorphic approach to understand the function and importance of wetlands for our human and wild communities.

PRIOR TO THE MEETING

Prepare a Mystery Metaphor Container using an old pillowcase or opaque box that students can reach into in order to pull out the objects listed under the supplies.

What to Do:

WHAT IS A WETLAND?

"Take some low-lying land, add water, mix in lots of plants and animals, and you have a wetland!"

You may very well have a wetland habitat in your local area. Anything ranging from a small area of ground that is relatively spongy for a portion of the year, to a large area that is covered year-round by shallow water may be a wetland. Swamps, marshes, bogs, fens, and wet meadows are considered wetlands. The area around shallow ponds, lakes, rivers, and streams may harbor wetland areas.

Many of the functions of wetlands can be explored through metaphors. A metaphor is a direct comparison between two things. It gives a comparison between two things that are not alike and replaces the word with another word (not to be confused with a simile, which uses the worlds "like" or "such as" to form a comparison).

Time: 15 minutes

1. Begin by making sure participants have a clear understanding of what a wetland is. Discuss the definition, and then have them list the variety of wetlands found in your local area, city, or state.
2. Ask students to describe a particular wetland in your area. What does it look like, what type of plants and animals will they find there, how dies the air feels, how does the wetland smell, etc.
3. Next, ask the participants what they think some benefits of a wetland might be. If they do not have many answers, that is okay! This topic will be covered more in depth in the next activity. Examples may include:

    - **Fish and Wildlife Habitat:** Many animals depend on wetlands for homes and resting spots since they provide food, cover, and water. Fish, amphibians, reptiles, aquatic insects and certain animals require wetlands as a place for their young to be born and raised.
    - **Sponge Effect:** Wetlands are said to act as sponges because wetland soils can readily absorb water. This means water that flows over wetlands is slowed and absorbed, reducing flood damage downstream. Also, the absorption of surface water ensures a long-term supply of quality ground water, as well as a good supply of water in times of drought.
    - **Filter Effect:** By trapping and holding water, wetlands store nutrients (from fertilizers and other sources) and other pollutants, and filter out sediment, allowing cleaner water to flow to the body of water beyond the wetland. Vegetation, like cattails and willows, can absorb some of the pollutants that remain in the soil.
    - **Erosion Control:** Wetland vegetation reduces erosion along lakes and stream banks. The deep-binding root masses of wetland plants anchor stream banks, preventing sediment from entering the stream.
    - **Biodiversity:** Wetlands are some of the most diverse ecosystems on the planet.

Activity #2
WETLAND METAPHORS

Time: 30 minutes

1. Bring out the Mystery Metaphor Container. Explain to participants that everything in the container can be a metaphor that relates to the functions of wetlands.
2. Discuss the meaning of metaphor with the group, asking them to come up with a few examples, such as, "The snow is white as a blanket" or "The classroom was a zoo."
3. Divide the class into six different groups. Announce that when it is his or her turn, you want a representative of each group to draw an object from the container.
4. As a group, ask them to work together to come up with a relationship between their object and wetlands, building on each other's ideas.
5. After ample time for small group discussions, ask each group to report their ideas to the class.
6. Following presentations, ask the class to summarize the major roles that wetlands perform, adding any that they may have missed.

OBJECT	METAPHORIC FUNCTION
Sponge	Absorbs excess water caused by runoff; retains moisture for a time, even if standing water dries up.
Small pillow	Resting place for migratory birds.
Egg beater or mixer	Mixes nutrients and oxygen into water.
Small doll cradle	Provides a nursery that shelters, protects, and feeds young wildlife.
Sieve or strainer	Strains silt, debris, etc., from water
Coffee filter	Filters small impurities from water
Antacid tablets	Neutralizes toxic substances
Oatmeal packet	Provides nutrient-rich foods for wildlife.
Soap	Helps cleanse the environment, as wetlands do.

Activity #3
VISIT A WETLAND (OPTIONAL)

If you are fortunate enough to have a wetland area close by with a pond or stream, it's definitely worth a visit! The following link provides curriculum and other resources for wetland versus stream macroinvertebrates to indicate water quality:

Wetland versus Stream Macroinvertebrates -
http://extension.usu.edu/files/publications/publication/NR_WQ_2004-1e.pdf

Reflect

- What was the most surprising function of a wetland you learned today? What do you think is the most important function wetlands serve?
- Why do you think humans convert wetlands to other uses? What might that conversion or development do to plants and animals, as well as the ecosystem as a whole?
- Do you have your own ideas and attitudes about changing wetlands? Why or why not?

Apply

- How is our own well-being tied into healthy wetland ecosystems?
- How does a wetland's condition depend on each of us?
- What can we do to protect wetlands?

4-H MISSION MANDATES

Citizenship

Youth will learn about, and potentially explore a wetland habitat in their neighborhood, allowing them to be engaged and be well-informed about their natural surroundings and gain an understanding of their place within it.

Healthy Living

Youth will develop an understanding of the importance of protecting wetlands to help ensure a clean water source for living things, including themselves.

Science

Youth will develop critical thinking and a multitude of other valuable skills.

ESSENTIAL ELEMENTS

Belonging

Participants will share their ideas with a team to determine the benefits of wetlands.

Independence

Learning about the importance of wetland ecosystems will provide youth with the knowledge and motivation to protect these important ecosystems.

Generosity

Youth will learn the importance of respecting the natural world.

Mastery

youth will use metaphors to creatively express the functions of wetlands.

References:

National Wildlife Federation. Ranger Rick. Retrieved from https://www.nwf.org/Kids/Ranger-Rick/Animals/Mixture-of-Species/What-Is-A-Wetland.aspx

PWN. Wetland Metaphors. Retrieve from https://migration.pwnet.org/pdf/Wetland_Metaphors.pdf

USU Extension. Wetland vs Stream Macroinvertebrates. Retrieved from http://extension.usu.edu/files/publications/publication/NR_WQ_2004-1e.pdf

4-H Club Meeting 4
Build a Better Watershed

Supplies

- Map of watershed in which you live
- Aluminum cake pans (one per group)
- Florist foam; small blocks or round balls (an alternative option would be to use newspaper and masking tape to create mountain formations)
- Foil
- Bucket
- Craft glue
- Scissors
- Sponges
- Towels
- Small plastic figurines (e.g., farm animals, model houses, barns, industrial buildings)
- Permanent markers
- Spray bottles filled with water
- Chocolate pudding mix or hot cocoa mix
- Lime gelatin mix
- Orange gelatin mix
- Grass or straw (real or artificial)
- Moss (real or artificial)
- Modeling clay or Playdough

INTRODUCTION

In this club we will explore nature in our own backyard. Today we will build our own watershed models and learn about the importance of maintaining a healthy ecosystem.

PRIOR TO THE MEETING

Gather supplies for club members to build their own watershed models. If possible, print out a diagram of the watershed in which you live for students to take a look at and discuss.

The video link below is a good overview of watersheds. The video includes footage of an instructor using a watershed model to teach students about watersheds, helping to answer these discussion points: 1) What is a watershed? 2) How do humans impact watersheds? 3) Why are wetlands important for watersheds? and 4) What can people do to protect their watershed?

Video link: https://www.youtube.com/watch?v=LJ63xGJY4pM

Nonpoint source pollution is pollution that does not have an easily pinpointed source (e.g. a pipe, channel, tunnel, etc.). Nonpoint source pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters. (www.epa.com)

WHAT IS A WATERSHED?

A watershed is an area of land that drains water, sediment, and pollutants into a common body of water. For example, the Chesapeake Bay watershed is thousands of square miles of land and waterways that all eventually drain into the Chesapeake Bay. A watershed can also be a very small area that drains into a local pond or stream.

Pollution on land in the watershed eventually ends up in the water. Fertilizer, pesticide, and manure run-off from farms and yards can put potentially harmful chemicals and pathogens into rivers and lakes. Incorrect disposal of household and industrial chemicals can lead to deadly chemicals in waterways. Excess sediment from construction sites can wash into streams, smothering fish eggs and the bottom-dwelling bugs fish eat.

A common form of pollution in watersheds is nonpoint source pollution, caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters. (www.epa.com)

Healthy watersheds and clean water are important to protect the rivers, streams, and lakes we use for drinking water, recreation, and fishing.

Activity #1
BUILD A WATERSHED MODEL

Time: 30 minutes

Adapted from: http://www.iwla.org/docs/default-source/how-to/how_to_build-a-model-watershed.pdf?sfvrsn=8

This hands-on activity will give students a visual of what a watershed is and how it works. By creating their own watershed models, students will be able to understand pollution sources and how they affect our watersheds. They will also devise ways in which to prevent or reduce the amount of polluted run-off that ends up in our waterways.

After reviewing the discussion points from the video and looking at a map of your local watershed, divide the students into groups of three to four to design and create a model of their own watershed.

Instruct each group to include the following in their model:

1. **Develop land:** Create a watershed landscape inside a cake pan. Use florist foam (or balled-up newspaper and masking tape) to represent two tall mountains on the outer/top edges of the pan. Use clay or Playdough to create a river that should run between the mountains and down to a lake (also made of clay) at the opposite end of the pan. Make a shallow depression for your clay lake to hold water.

2. **Cover Ground:** Cover the entire landscape with a large piece of aluminum foil. Start from the middle and gently press the foil into the hills, valleys, and waterways. Fold the foil over the edge of the pan to help hold everything in place. You may need multiple sheets of foil.

3. **Run a River Through:** With a permanent marker, draw the outline of the river running through the middle of the mountains into6+ the lake at the bottom.

4. **Build:** Put in land-use areas by placing model homes, barns, factories, and animals around the watershed, from the hills to the lakeside. You may need craft glue to hold these in place. Draw roads, fields, and other landscapes to represent your own community.

Activity #2
DEMONSTRATE ENVIRONMENTAL ISSUES TO WATERSHEDS

Time: 30 minutes

1. **Demonstrate** some of the environmental issues that happen in your watershed. Here are some examples:
   - Sprinkle hot chocolate near your farm animals to represent manure, and near construction sites to show exposed dirt.
   - Sprinkle lime gelatin mix near houses to represent lawn-care chemicals.
   - Sprinkle orange gelatin mix on farm fields to represent agricultural chemicals (pesticides and fertilizers).
   - Fill your lake/reservoir at the bottom of the cake pan with clean water (this represents the waterbody that is at the lowest point in your watershed).
   - Make it rain! Use a water-filled spray bottle to start a rain shower in the mountains. The chocolate, lime, and orange mixes will color the water to show how water pollution can wash down through the watershed, ending with very dirty water in the lake that demonstrates a high level of pollution.

2. **Discuss:** What happened to the manure, pesticides, fertilizers, etc., when it rained? (The same phenomenon would happen in the spring with snow-melt.) As the precipitation, in the form of run-off, moves through the watershed, it carries away natural and human-made pollutants, depositing them into lakes, rivers, wetlands, coastal waters, and ground waters. These nonpoint pollution sources can include excess fertilizers, herbicides, insecticides, oil, grease, toxic chemicals, sediment, pet and livestock waste, sewage, and other pollutants

3. **Remediate:** Dump the water from each of the watershed models into a bucket and rinse off any remaining residue, then dry each watershed model as thoroughly as possible. Again, tell students to sprinkle chocolate, lime, and orange mixes in the same spots - this time (before it "rains") using smaller amounts of each mix to show more careful use of chemicals. Next students should take additional steps to prevent water pollution before the next rainfall using the following materials:

    - Sponges to represent wetland habitat.
    - Grasses or straw to represent natural plant materials found in forests, wetlands, and other wild habitats.
    - Moss to represent lawns found in parks and residential areas.
    - Clay to represent barriers.

4. Rain again! Use the spray bottle to create a second rainfall. The water that ends up in the lake should be much less colorful, because students took multiple steps to keep pollutants out of runoff.

Tips to Build a Better Watershed:

- Students can cover chocolate mix near construction sites with straw to prevent rain from washing away exposed soil.
- Students can build clay barriers around the areas of manure, which will hold runoff water until it can be cleaned.
- Cut small pieces of moss and glue them down between the river and the orange and lime mixes on the farm. The moss pieces represent contour plantings and grass buffer strips, which help filter pesticides and fertilizers from agricultural run-off. Also, moss can be placed along the banks of the river to repre sent a buffer of stream-side trees and shrubs to slow runoff and trap pollutants.
- Cut small pieces of sponge to place near pollution areas in low spots where water may gather. This will represent wetlands which filter runoff by trapping and breaking down pollutants.

Reflect

- What happened after you remediated your watershed? Did your streams and lakes appear cleaner? Why? Where did the pollution/ toxins go?

Apply

- How do wetlands, permeable surfaces, natural areas, barriers, etc. improve the health of a watershed? What would the water quality in your watershed be like without these things?

4-H MISSION MANDATES

Citizenship

Youth will learn about and build their own watershed models, allowing them to be engaged and well-informed about their natural surroundings and gain an understanding of their place within it.

Healthy Living

Youth will develop an understanding of the importance of protecting watersheds to help ensure a clean water source for living things, including themselves.

Science

Youth will gain strategies, skills, and resources for successful watershed management.

ESSENTIAL ELEMENTS

Belonging

Exploring the natural world together and eventually sharing their findings, thoughts, and ideas with each other will help youth create a connection with their peers and their surroundings.

Independence

Learning about watersheds will provide youth with the knowledge and motivation to protect these important ecosystems.

Generosity

Youth will learn the importance of respecting the natural world.

Mastery

Youth will use metaphors to creatively express the functions of watersheds.

References:

Izaak Walton League of America. How to Build a Watershed Model. Retrieved from http://www.iwla.org/docs/default-source/how-to/how_to_build-a-model-IZAAK WALTON LEAGUE OF AMERICAwatershed.pdf?sfvrsn=8

[WaterMattersTV]. (2012, September 12). Watersheds. [Video File]. Retrieved from https://www.youtube.com/watch?v=LJ63xGJY4pM

4-H Club Meeting 5
Wild(life) in a Hometown Ecosystem

Supplies

- Nature journals
- Pens/pencils
- Magnifying glasses and/or hand-lenses
- Device to take photos (e.g. camera, cell phone, or tablet)
- Butcher paper
- Scissors
- Construction or drawing paper
- Markers
- Push pins
- Yarn
- Glue
- Resource materials and/or access to Internet

INTRODUCTION

In this club we will explore nature in our own backyard. Today we will look at a particular ecosystem in our area to discover how non-living elements such as soil, sunlight and water, as well as living elements (plants, animals, fungi, and other organisms) are connected to each other. Once students explore their chosen ecosystem, they will create a mural of the ecosystem that shows the interconnection of the organisms found there.

What to Do:

WHAT IS AN ECOSYSTEM?

In an ecosystem, living (biotic) and non-living (abiotic) elements constantly interact. For example, most plants depend on soil for water and nutrients, and they need sunlight to manufacture food. Some plants also depend on animals to pollinate their flowers, disperse their seeds, and fertilize the soil in which they live. Animals, in turn, depend on food and shelter. Some animals may also depend on other animals for food and protection. This relationship can be demonstrated through a food web.

WHAT IS A FOOD WEB?

A food web consists of all the food chains in a single ecosystem. Each living thing in an ecosystem is part of multiple food chains. Each food chain is one possible path that energy and nutrients may take as they move through the ecosystem. All of the interconnected and overlapping food chains in an ecosystem make up a food web.

Activity #1
ECOSYSTEM OBSERVATIONS

Time: 20 minutes

Adapted from the Project Learning Tree K-8 activities, "Web of Life" and "Are Vacant Lots Vacant?"

1. Choose a forest, wetland, field, meadow, pond, or other ecosystem that is within walking distance. If you have none of the above nearby, a yard or even a vacant lot will suffice.

2. Have the participants identify the type of ecosystem it is, and then explore the area. Ask participants to write down in their nature journals all of the non-living elements within the ecosystem (e.g., air, sunlight, water, wind, etc.), and all of the living elements that they see (e.g. plants: trees, wildflowers, algae, etc.; animals: birds, insects, chipmunks, etc.). If no wildlife seems to be present, participants should be encouraged to look and listen for clues (e.g., spider webs, animal tracks, bird sounds, etc.) to determine what wildlife might be living there.

Activity #2
ECOSYSTEM MURAL

Time: 20 minutes

Back at the meeting space:

1. As a group, make a list of all the non-living and living elements found in the chosen ecosystem. If names of plant and tree species are not known, that's okay. For our purposes here, plants can be listed as "grass," "shrub," "tree," "wildflower," etc. Include items on your list that you know are in the area that you explored, but you didn't necessarily see.

2. Divide students into groups. Each group is responsible for drawing one to three representations on construction paper (or cutting out magazine images) in each of the following areas:

- Insects
- Plants
- Small mammals
- Birds
- Non-living elements
- Microscopic organisms (e.g., bacteria, fungi, algae)
- Medium/large mammals
- Amphibians
- Reptiles

3. Once representations of some of the organisms and non-living elements found in your ecosystem are made, they can be glued to the butcher paper mural and labeled. The type of ecosystem explored should be written on top.

Time: 10 minutes

1. Ask participants to place a push pin next to each plant and animal represented on the mural. Then use yarn to connect each animal to other animals and plants with which it directly or indirectly interacts (e.g. "eats", "is eaten by," or "depends on for food and/or shelter").

2. With yarn, connect the abiotic factors (non-living elements) to those plants and animals on which the non-living elements have an impact.

Reflect

- What would happen if one element of the ecosystem were missing? Demonstrate this by removing a push pin. What would happen to the other organisms?
- What important elements are not included in the web?

Apply

- What can you do to ensure that an element is not removed from an ecosystem? Are there changes that you can make in your day-to- day life that affect plants and animals in your local area?
- Think about what your own personal food web looks like. Where do you get your food and water? What about shelter or other resources? Do humans have their own unique food web they've created? How might your food web look different from someone who lives in another state or country?

4-H MISSION MANDATES

Citizenship

Youth will create a food web, allowing them to be engaged and well-informed about their natural surroundings and gain an understanding of their place within it.

Healthy Living

Youth will develop an understanding of food webs and how an imbalance could affect the health of an ecosystem, including their own.

Science

Youth will develop critical thinking in terms of ecosystem relationships and food webs.

ESSENTIAL ELEMENTS

Belonging

Exploring the natural world together and eventually sharing their findings, thoughts, and ideas with each other will help youth create a connection with their peers and their surroundings.

Independence

Learning about food chains will provide youth with the knowledge and motivation to protect these important ecosystems.

Generosity

Youth will learn the importance of respecting the natural world.

Mastery

Youth will create their own food web to better understand relationships between ecosystem elements.

References:

Project Learning Tree. Environmental Education Pre K-8 Activity Guide. Retrieved from http://ucanr.edu/sites/PLT_UCCE/files/201188.pdf

4-H Club Meeting 6

Sprucing Up Your Space with Native Plants

Supplies

- Nature journals
- Pens/pencils
- Toilet paper rolls (6-10 per participant)
- Scissors
- Potting soil
- Spoons
- Native plant seeds (a variety of flowers and herbs)
- Sharpies
- Clean rotisserie chicken containers with lids (one for each participant)
- A few spray bottles filled with water

INTRODUCTION

In this club we will explore nature in our own backyard. Today we will explore pollinator habitats and create miniature greenhouses for growing native plants.

PRIOR TO THE MEETING

Ensure this is done during late spring so there will be pollinators to observe and the plants can eventually be planted after the final frost.

What to Do:

Few things add beauty and color to a backyard, schoolyard, or community garden the way native flowers do. Growing native plants provides beauty as well as important habitats for wildlife species – especially pollinators.

WHAT IS POLLINATION AND WHO ARE THE POLLINATORS?

Pollination occurs when pollen is moved within flowers or carried from flower to flower by pollinating animals such as birds, bees, bats, butterflies, moths, beetles, or other animals, or by the wind.

WHAT DOES POLLINATION DO?

The transfer of pollen in and between flowers of the same species leads to fertilization, and successful seed and fruit production for plants. Pollination ensures that a plant will produce full-bodied fruit and a full set of viable seeds.

WHY DOES POLLINATION MATTER TO US?

Worldwide, roughly 1,000 plants grown for food, beverages, fibers, spices, and medicines need to be pollinated by animals in order to produce the goods on which we depend.

ARE POLLINATORS IN TROUBLE?

Worldwide there is disturbing evidence that pollinating animals have suffered from loss of habitat, chemical misuse, introduced and invasive plant and animal species, and diseases and parasites.

WHAT IS A NATIVE PLANT?

A native plant is one that occurs naturally in a particular region, ecosystem, or habitat without direct or indirect human intervention.

WHAT IS A GREENHOUSE?

Greenhouses are used extensively by botanists, commercial plant growers, and dedicated gardeners. Particularly in cool climates, greenhouses are useful for growing and propagating plants because they allow sunlight to enter and prevent heat from escaping. The transparent covering of the greenhouse allows visible light to enter unhindered, where it warms the interior as it is absorbed by the material within. The transparent covering also prevents the heat from leaving by reflecting the energy back into the interior and preventing outside winds from carrying it away.

For more information, visit pollinator.org

Activity #1
POLLINATORS AND THEIR HABITAT

Time: 30 minutes

Bring participants outdoors to an area frequented by pollinators. A garden, patch of clover, flowering shrub or tree, etc., are all good places to observe pollination taking place. Begin by discussing the questions listed below. Ask them to record the definitions they come up with as a group in their natural journals. After they have a clear understanding, allow them to explore the area to observe pollinators, recording any observations in their nature journals. Possible journal prompts are:

- What are some pollinators native to the area?
- Are they solitary or social? Where do they make their nests?
- Where can they most likely be found?
- What is the geography and vegetation like?
- What are the native plants they prefer?
- Are different plants necessary at various stages of the life cycle of native bees and butterflies?
- What are the sources of water and shelter?
- Are there threats to native pollinators and managed bees and their habitat?

Time: 20 minutes

1. **Create seed boxes** to keep each type of native plant separate. Each participant will want to create 6-10 seed boxes. Use scissors to cut the toilet paper rolls in half. Next, cut four slits around each half toilet paper roll, about one-third from the bottom. Use these slits as a guide to fold the bottom of each toilet paper tube together, similar to how you would close a box.

2. **Plant native seeds** of choice. Use a spoon to fill your "boxes" two-thirds of the way full with a light potting soil. Pack the soil down with your spoon or thumbs. Add your choice of native seed to each "box", planting to the proper depth indicated on the packaging they come in. If they do not come with planting instructions, research the specific seed online. Label each box with the name of the native flower or herb planted.

   Hint: You will want to add two or three seeds to each seed box to ensure that at least one seed will sprout. Once these seeds sprout, you will want to pull the other seedlings so that you have only one sprout in each box.

3. **Assemble the greenhouse** by placing planted boxes in a clean rotisserie chicken container. Give them a good watering with the spray bottle, completely soaking the toilet paper rolls to keep them moist the entire time the seeds are growing. Secure the lid to create a greenhouse effect.

4. **Plant care** will need to take place at home over the next few weeks. Make sure the participants know the following plant care tips:
   a. Greenhouses should be kept in a bright, sunny spot.
   b. Lid should stay secure until the seeds sprout to ensure moisture stays contained. Only water if the toilet paper rolls appear dry.
   c. Once the seeds reach the top of the lid, the lid should be removed to allow air circulation. At this point the toilet paper seed pots can be removed from the rotisserie chicken container and placed directly in the ground. Make sure this is done after the last frost. The toilet paper rolls will naturally biodegrade and roots will be able to break through.

Reflect

- What type of pollinators might the native plants in your greenhouse attract?
- What else can you do in your greenhouse to make it more appealing to pollinators?

Apply

- What can you do to promote and protect pollinators?
    - Plant for pollinators by cultivating native plants, especially those that provide nectar and larval food for pollinators
    - Support pollinators by installing houses for bats and native bees or supply salt or mineral licks for butterflies and water for wildlife
    - Reduce pesticide use
    - Substitute flower beds for lawns
    - Volunteer for pollinator-friendly organizations and garden groups
    - Experience time outdoors and work with plants and animals
    - Buy locally produced or organic food
    - Reduce your impact - walk, cycle, use public transit, carpool, telecommute
    - Reduce your consumption – reduce, recycle, reuse
- Is there a need to raise public awareness of pollinators in the community? If so, what are some ways to educate people in the community about the importance of pollinators and the need to provide a pollinator-friendly environment?

4-H MISSION MANDATES

Citizenship

Youth will explore the pollinator habitats in their own neighborhood, allowing them to be engaged and well-informed about their natural surroundings and gain an understanding of how they affect the health of their ecosystem.

Healthy Living

Youth will gain an understanding of the importance of pollinators to our health.

Science

Youth will develop an understanding of pollinators and their relationship with the ecosystem.

ESSENTIAL ELEMENTS

Belonging

Exploring the natural world together and eventually sharing their findings, thoughts, and ideas with each other will help to create a connection with their peers and their surroundings.

Independence

Learning about the importance of native plants and pollinators will provide youth with the knowledge and motivation to protect these species.

Generosity

Youth will learn the importance of respecting the natural world.

Mastery

Participants will gain an understanding of greenhouse science, pollinators, and native plants and through hands-on experiences.

References:

Pollinator Partnership. What are pollinators? Retrieved from http://pollinator.org/pollination

The "Greenhouse Effect." What is a Greenhouse? Retrieved from http://www.ucar.edu/learn/1_3_2_12t.htm

More to Discover

Congratulations on completing your Discover 4-H club meetings! Continue with additional curriculum in your current project area, or discover other 4-H project areas. Check out the following links for additional 4-H curriculum.

1. www.discover4h.org
2. http://www.4-h.org/resource-library/curriculum/
3. http://utah4h.org/curriculum/

Become a 4-H Member or Volunteer

To **register** your Utah club or individuals in your club visit and contact your County Extension Office

http://utah4h.org/about/

http://utah4h.org/join/index

For help registering in 4-H online visit:

http://utah4h.org/staffresources/4honlinehelp

Non-Utah residents, please contact your local 4-H office:

http://www.4-h.org/get-involved/find-4-h-clubs-camps-programs/

Stay Connected

Visit Your County Extension Office

Stay connected with 4-H activities and news through your county Extension office. Ask about volunteer opportunities, and don't forget to register for your county newsletter. Find contact information for counties in Utah here:

https://extension.usu.edu/locations

Enjoy the Fair!

Enter your project or create a new project for the county fair. Learn about your county fair and fair judging here:

http://utah4h.org/events/index

Participate in Local or State 4-H Activities, Programs, Contests or Camps

For Utah state events and programs visit:

http://utah4h.org/events/index

http://utah4h.org/projects/

For local Utah 4-H events and programs, visit your county Extension office.

https://extension.usu.edu/locations

Non-Utah residents, please contact your local 4-H office.

http://www.4-h.org/get-involved/find-4-h-clubs-camps-programs/

Discover *Service*

Become a 4-H Volunteer!

http://www.youtube.com/watch?v=UBemO5VSyK0

http://www.youtube.com/watch?v=U8n4o9gHvAA

To become a 4-H volunteer in Utah, visit us at:

http://utah4h.org/htm/about-4-h/newto4h/

Serve Together as a 4-H Club or as an Individual 4-H Member

Use your skills, passions, and 4-H to better your community and world. You are needed! Look for opportunities to help in your area or participate in service programs that reach places throughout the world (religious groups, Red Cross, etc.).

Hold a Club Service Project

USU Collegiate 4-H Club hosted "The Gift of Giving" as a club activity. Club members assembled Christmas stockings filled with needed items for CAPSA (Community Abuse Prevention Services Agency).

http://tinyurl.com/lu5n2nc

Donate 4-H Projects

Look for hospitals, nursing homes, or other nonprofit organizations that will benefit from 4-H projects. Such projects include making quilts for CAPSA or Primary Children's Hospital, or making beanies for newborns. During Utah 4-H State Contests, 40 "smile bags" were sewn and donated to Operation Smile.

Partner with Local Businesses

92,000 pounds of processed lamb, beef, and pork were donated to the Utah Food Bank in 2013 by multiple companies.

http://tinyurl.com/pu7lxyw

Donate Money

Clubs or individuals can donate money gained from a 4-H project to a worthy cause. A nine-year-old 4-H member from Davis County donated her project money to help a three-year-old battle cancer.

http://tinyurl.com/mqtfwxo

Give Us Your *Feedback*

Help us improve Discover 4-H curriculum. We would love feedback or suggestions on this guide.
Please go to the following link to take a short survey: Click here to give your feedback
Or go to: https://goo.gl/iTfiJV