



# DISCOVER



## 4-H ENTOMOLOGY CLUBS



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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).

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## 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](http://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.

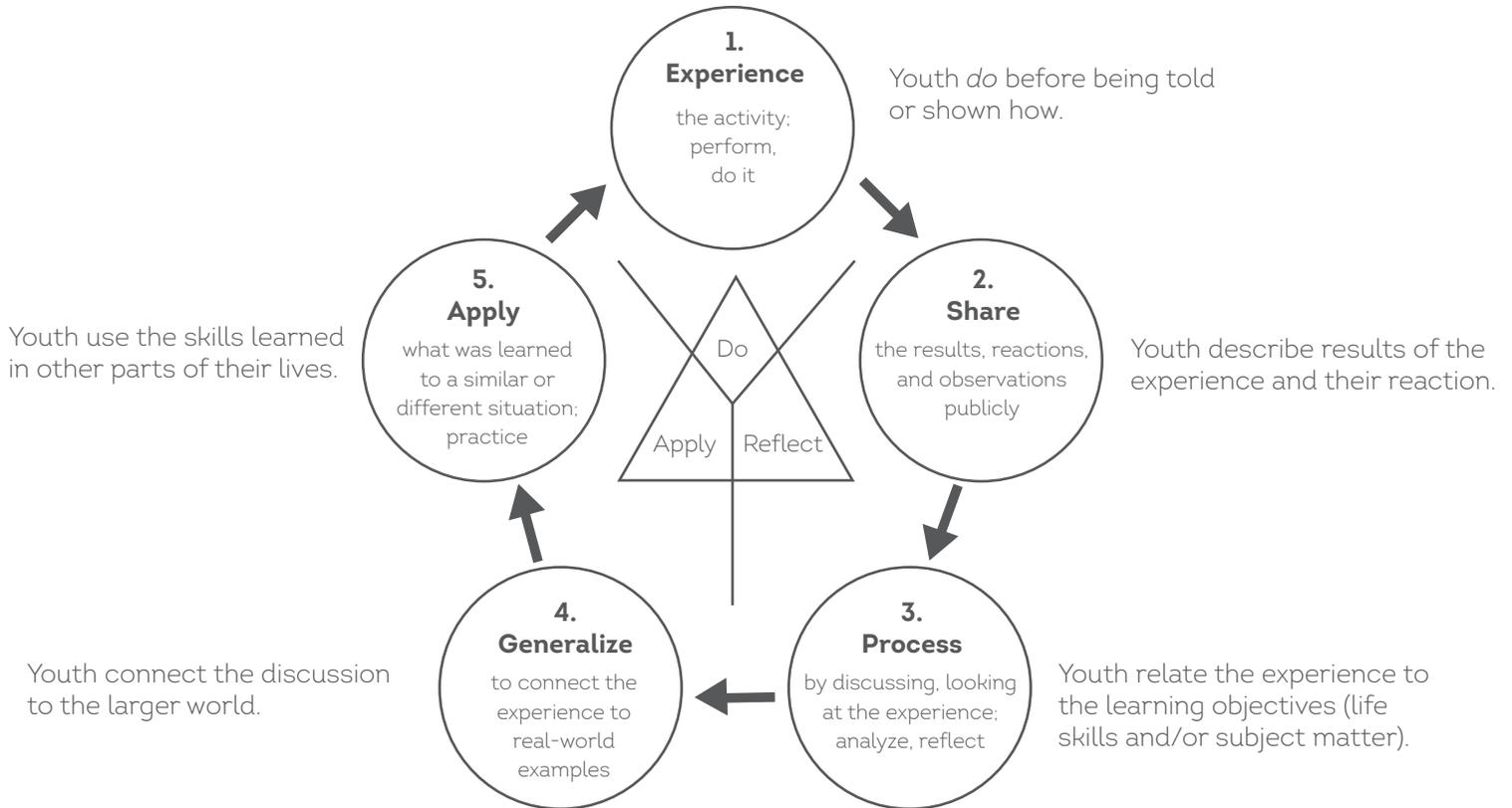
1. **Belonging:** a positive relationship with a caring adult; an inclusive and safe environment.
2. **Mastery:** engagement in learning, opportunity for mastery.
3. **Independence:** opportunity to see oneself as an active participant in the future, opportunity to make choices.
4. **Generosity:** opportunity 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](http://www.csrees.usda.gov/nea/family/res/pdfs/Mission_Mandates.pdf))

- Citizenship:** connecting youth to their community, community leaders, and their role in civic affairs. This may include: civic engagement, service, civic education, and leadership.
- 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.
- 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](http://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](http://www.Utah4-h.org)

National 4-H website: [www.4-h.org](http://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](http://utah4h.org)), the National 4-H Website ([4h.org](http://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:**

<http://tinyurl.com/lb9tnad>

# 4-H ENTOMOLOGY CLUB *Meetings*



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**DISCOVER**  
4-H ENTOMOLOGY CLUBS

## INTRODUCTION

Discover 4-H Entomology club members will explore the lives and world of bees, ants, flies, moths, butterflies, beetles, and grasshoppers and why they are important to us. Understanding the difference between insects that pollinate plants and control weeds and pests that destroy crops and spread diseases will enable youth to make critical decisions in conservation and control of insects that affect the world they live in! These six club meetings will cover what insects are and includes plenty of hands-on activities that will show youth how to make a killing jar, how to collect, how to pin and label insect specimens, how to build a display box, how to keep activity records, and build essential life skills through club activities.





# 4-H Club Meeting 1

## What is an Insect?



### Supplies

- Copies of Handout 1 for each group
- Copies of Handout 2 for each participant
- Copies of Handout 3 for each group
- One copy of Handout 4
- Pencils and colored pencils/markers
- Modeling clay
- Other items for inventing an insect (glitter, pipe cleaners, etc.)
- Copies of Handout 5 (cut out and separate the words from the definitions for term match game)

Begin each club meeting with the Pledge of Allegiance and 4-H Pledge.

### INTRODUCTION

Insect or Bug? Almost all of our creepy crawly friends have specific duties that range from being the boss to being a worker!

### PRIOR TO THE MEETING

Review lesson, gather supplies, and print copies of handouts. Call all members and volunteers and let them know the time and location of club meeting 1 and any other information they may need before they arrive.

### ICEBREAKER

The Name Game: Arrange participants in a circle. Using an insect term, have each participant introduce themselves, for example, Ladybug Lily or Grasshopper Gregory. Once the first person has introduced his/her self, the second must name the first person by their insect and first name and then introduce their insect/first name. Each of the following participants must recite the names of each person beginning with the first down to themselves.

## Activity #1

### WHICH ONE IS AN INSECT?



### DESCRIPTION

Discuss with participants what makes an insect. Specify what makes an insect different from other arthropods: they have three body segments (head, thorax, abdomen), one pair of antennae, compound eyes, and six legs. Using Handout 4 Arthropods sheets to show different arthropods, including insects, have students try to figure out if the arthropod is an insect or not. Answers are on the bottom of Handout 4, page 10.

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## Activity #2

SCIENTIFIC INSECT TERMS  
MATCH GAME



### DESCRIPTION

Pass out prepared copies of Handout 5 to each group. Have members work together to match each Entomology term to its correct definition. Have each group share their results and explain their decisions.

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## Activity #3

INSECT DIAGRAM



### DESCRIPTION

Pass out one copy of Handout 2 to each 4-Her. Have members work in groups to try to fill out the sheets first, then have a class discussion about what each part is and what they think it does. Have youth present their diagrams and explain their decisions.



### Reflect

- What makes an insect different from other arthropods?
- Was it easy to work in a group during the term match and insect diagram activities?

### Apply

- How does learning about insects and their body parts affect your opinion of them?
- How did you resolve differences in opinion, if any, during group activities?



## 4-H MISSION MANDATES

Identify from citizenship, healthy living and/or science and explain why.

### Citizenship

Discover 4-H Entomology empowers youth by giving them knowledge that will be useful in making environmental decisions regarding insects.

### Healthy Living

Participation in 4-H clubs is beneficial to the socio-emotional well-being of youth. Life skills gained from participating in the Discover 4-H Entomology club are critical thinking, problem solving, teamwork and cooperation, and conflict resolution, to name a few.

### Science

This club meeting provides youth with activities that surround order/classification of insects and other arthropods, collaboration of groups to achieve goals, opportunities to compare and evaluate, as well as building their abilities to analyze and interpret their findings.

## ESSENTIAL ELEMENTS

Identify tips to include during the lesson and how it applies.

### Belonging

Being part of the Discover 4-H Entomology Clubs brings together youth who have similar interests in insects.

### Independence

Learning about insects and their uses prepares youth to make informed decisions that affect the environment.

### Generosity

Youth learn by the example of their adult volunteers that volunteering is valuable to our communities.

### Mastery

This introductory club will spark a continued interest in entomology among youth who participate by allowing them to collect, display, and demonstrate the knowledge they have gained in 4-H contests and county fairs.

**References:** <http://www.calacademy.org/educators/lesson-plans/invent-an-insect>



### Supplies

- Copies of Handout 1 for each group
- One copy of Handout 3
- Copy of Handout 4 from club meeting 1
- Pencils and colored pencils/markers
- Modeling clay
- Other items for inventing an insect (glitter, pipe cleaners, etc.)

### PRIOR TO THE MEETING

Review lesson, gather supplies, and print copies of handouts. Call each member/volunteer and inform them of any other information or supplies they need to bring to club meeting 2.

## Activity #1

### INVENT AN INSECT



### DESCRIPTION

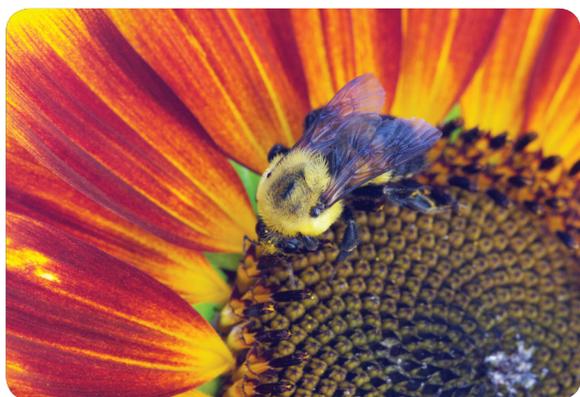
Introduce the essential question: "How can there be so many similarities among living things, yet so many different species of plants and animals?" Discuss and define the term "adaptation." Using the arthropods in Handout 4 as examples, have students try to point out adaptations they see on their bodies or behaviors they know the animals have.

1. Divide members into small groups. Provide each group with a Handout 3: Insect Habitat Card and craft supplies. Each member will need a copy of Handout 1: Invent an Insect worksheet.
2. Present the rules of the activity:
  - Invented insects must be suited for the habitat described on your group's Insect Habitat Card and must eat at least one of the food sources listed.
  - Invented insects should be grounded in reality (insects can't make jet packs to fly around) and have the same body parts as real insects.
  - Have fun and be creative!
  - Don't forget to give your insect a name.

### Additional Adaptations

To make the activity more challenging, assign an additional required adaptation.

- Looks like an animal other than an insect (mimicry)
  - Is active only at night (nocturnal)
  - Blends in with an environment (camouflage)
  - Must be able to eat specific things (crushing mouthparts for seeds)
  - Must be able to avoid certain predator characteristics (strong back legs for jumping)
  - Must be able to move or stay put (fleas move from host to host)
3. Have groups present their insect and state what habitat they were given. Have youth share at least one adaptation they gave their insect and explain why.



## Reflect

- How were the insects everyone created similar and different?
- Did any two have similar adaptations? Did any two have similar habitats, but different adaptations?

## Apply

- How can there be so many similarities among living things, yet so many different species of plants and animals?
- How do the similarities and differences among insects help them in their habitats?



## 4-H MISSION MANDATES

### Citizenship

Understanding similarities and differences among insects and their habitats increases environmental stewardship.

### Healthy Living

Participation in 4-H clubs is beneficial to the socio-emotional well-being of youth. Life skills gained from participating in the Discover 4-H Entomology club are critical thinking, problem solving, teamwork and cooperation, and conflict resolution, to name a few.

### Science

This club meeting provides youth with activities that surround order/classification of insects and other arthropods, collaboration of groups to achieve goals, opportunities to compare and evaluate as well as building their abilities to analyze and interpret their findings.

## ESSENTIAL ELEMENTS

### Belonging

Being part of the Discover 4-H Entomology Clubs brings youth together who have similar interests in insects.

### Independence

Learning about insects and their uses prepares youth to make informed decisions that affect the environment.

### Generosity

Youth learn by the example of their adult volunteers that volunteering is valuable to our communities.

### Mastery

This introductory club will spark a continued interest in entomology among youth who participate by allowing them to collect, display, and demonstrate the knowledge they have gained in 4-H contests and county fairs.

**References:** <http://www.calacademy.org/educators/lesson-plans/invent-an-insect>

# 4-H *Club Meeting 3*

## Tools for Collecting Insects



### Supplies

- Computer/laptop/tablet
- Internet service
- 2 wide-mouth pint, quart, or similar containers with tight-fitting lids
- Sawdust or plaster of Paris
- Masking/duct tape
- Large bottle of ethyl acetate (nail polish remover)
- Blotter or cardboard (cut to fit in each container)
- Forceps/tweezers
- Cotton
- Water
- Insulation-type Styrofoam
- Cigar, pizza, or other boxes
- Pins

### PRIOR TO THE MEETING

Review lesson and gather supplies. Youth may be able to provide items they will need for the activities. Call members/volunteers and inform them of any other information or supplies they need to bring to club meeting 3.

## Activity #1

### MAKING A KILLING JAR



### DESCRIPTION

Place a 1-2 inch layer of absorbent material in the bottom of the jar. Pour in ethyl acetate and allow it to soak in. Pour so there is little, if any, extra liquid (when using plaster of Paris, do not allow any excess ethyl acetate). Try not to breathe in the fumes. Place the blotter or cardboard over the absorbent material (if using plaster of Paris, this layer is not necessary). Seal the jar lid tightly. Wrap the lower half of the jar with duct or masking tape to prolong the potency of the killing jar by protecting it from sunlight. When it takes noticeably longer to kill specimens in your killing jar, re-charge the jar by adding more ethyl acetate. It is best to pin insects soon after they die and while they are still relaxed to minimize breaking any body parts. If this is not possible, you can soften insects in a relaxing jar.

## Activity #2

MAKING A RELAXING JAR



### DESCRIPTION

It is best to pin insects soon after they die and while they are still relaxed to minimize breaking any body parts. If this is not possible, you can soften insects in a relaxing jar. A relaxing jar, like a killing jar, should have a wide mouth (to easily place and remove specimens) and a tight fitting lid. Place an absorbent layer (such as sand, cotton, cloth, sponge) in the bottom of the jar. Saturate the material with water and add a little ethyl acetate to inhibit fungus development. Place a protective layer (such as cork, cardboard) over the absorbent material. Place insects that need to be softened on the top layer for several days until they are relaxed.

## Activity #3

MAKING A SPREADING BOARD



### DESCRIPTION

Have youth research Do It Yourself (DIY) insect spreading boards on the internet, and then using the resources available, plan and design their insect spreading board.



### Reflect

- Why is it best to pin insects soon after they die?
- Why is it important to understand the purpose of and practice using your insect collecting tools before you begin?

### Apply

- How does collecting insects help us learn about them?
- How does the absorbent material and the nail polish remover work together in your killing and relaxing jars?
- How does the sun affect the ability of the nail polish remover? How does the masking/duct tape prolong the effectiveness of the nail polish remover?



## 4-H MISSION MANDATES

### Citizenship

Understanding similarities and differences among insects and their habitats increases environmental stewardship.

### Healthy Living

Participation in 4-H clubs is beneficial to the socio-emotional well-being of youth. Life skills gained from participating in the Discover 4-H Entomology club are critical thinking, problem solving, teamwork and cooperation, and conflict resolution, to name a few.

### Science

This club meeting provides youth with activities that surround order/classification of insects and other arthropods, collaboration of groups to achieve goals, opportunities to compare and evaluate as well as building their abilities to analyze and interpret their findings.

## ESSENTIAL ELEMENTS

### Belonging

Being part of the Discover 4-H Entomology Clubs brings youth together who have similar interests in insects.

### Independence

Learning about insects and their uses prepares youth to make informed decisions that affect the environment.

### Generosity

Youth learn by the example of their adult volunteers that volunteering is valuable to our communities.

### Mastery

This introductory club will spark a continued interest in entomology among youth who participate by allowing them to collect, display, and demonstrate the knowledge they have gained in 4-H contests and county fairs.

#### References:

<http://www.extension.umn.edu/youth/mn4-H/projects/environment/entomology/collecting-and-preserving-insects/>

[https://extension.entm.purdue.edu/401Book/default.php?page=spreading\\_board](https://extension.entm.purdue.edu/401Book/default.php?page=spreading_board)

# 4-H Club Meeting 4 Tools for Collecting Insects



## Supplies

- Mesh produce bags or tulle (about 22x32)
- 8-inch plastic embroidery hoops
- Wire hanger
- Scissors
- Two 1/2-inch wooden dowels or broom handles, plunger handles, etc.
- Extra-large spool of soft wire or duct tape
- 1 old pillow case or 20x30-inch pieces of muslin
- Needle and heavy thread
- Drill and various sizes of drill bits
- Extension cord

## PRIOR TO THE MEETING

Review lesson and gather supplies. Youth may be able to provide items they will need for the activities. Call each member/volunteer and inform them of any other information or supplies they need to bring to club meeting 4.

## Activity #1 BUILDING AN AERIAL NET

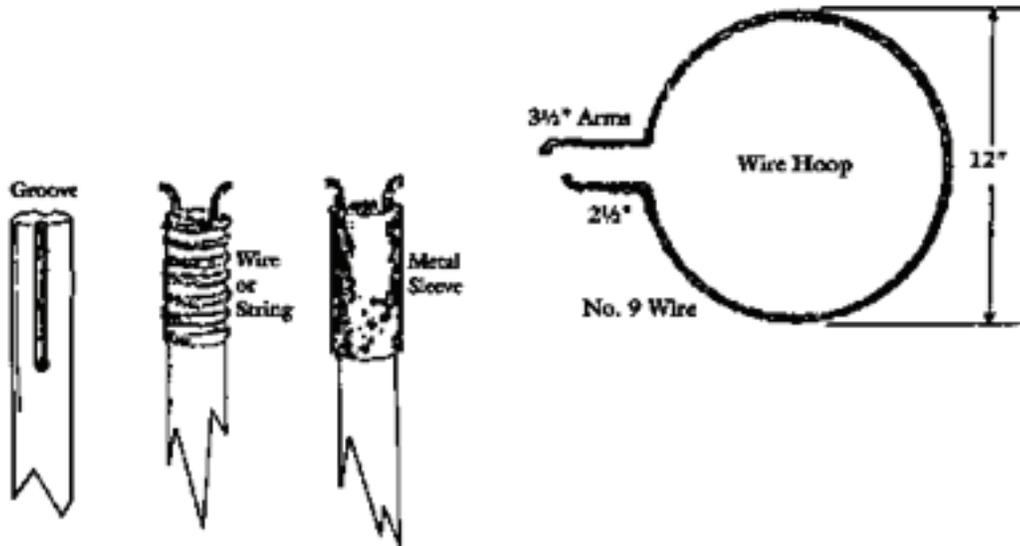
### DESCRIPTION

You can buy insect nets from a biological supply company or from a hobby shop. There are two basic kinds of nets – aerial nets and sweep nets. The lighter bag on an aerial net is designed to capture insects in flight or at rest. The heavier bag on a sweep net is designed to collect insects in tall grass, shrubs, or water by sweeping or beating through plants and water.

1. Loosen the screw on the embroidery hoop, and remove the center ring.
2. Wrap the mesh produce bag around the center ring, then slide it back in the outer ring and re-fasten the screw.
3. Trim away any excess mesh fabric.
4. Wrap colored wire around the end of a wooden dowel, then use the wire to attach the dowel to the embroidery hoop to make a handle.

## DESCRIPTION

1. Bend heavy wire into a circle (about 12 inches) to form a hoop. Bend arms 2 1/2 inches and 3 1/2 inches for fitting in net handle.



2. Bore holes in the net handle for arm hooks. If you want a smooth fit, groove handle as shown.
3. Thread the wire hoop through the hem of the bag, and insert the wire arms into the handle. Slip the metal sleeve over the net handle to hold the wire arms in place. You can also attach the hoop arms to the net handle by wrapping them with soft wire, heavy string, or duct tape.
4. To make the net bag, fold material to 10 x 30 inches. Cut the material from the bottom folded corner diagonally up and across to a point 10 inches below the top unfolded corner. After you have finished cutting, the net bag will be in two roughly triangular pieces.
5. Stitch the two halves of the net together making the seam about 1/2 inch from the cut edge; leave 10 inches free on one side at the top where the net hoop will be inserted. Turn the cut edges inside and stitch the seam down flat (flat-felled seam).
6. To make a loop for the wire hoop, fold the top edge down 5 inches. Then turn the folded edge down 2 1/2 inches and stitch the hem. If you need to reinforce the hem, make only one fold and cover the fold with a strip of muslin 5 x 10 inches. Then fold again and stitch. The muslin will protect the netting around the wire hoop.
7. If you use an old pillow case to make a net bag, you won't be able to "see through" your net; however, it will not snag. The hem of the pillowcase is a ready-made loop for the wire hoop. Just cut a small slit on either side of the pillowcase seam, and then feed the wire through them.



## Reflect

- What is the aerial net used for? What is the sweep net used for?
- What was the most difficult step in building your nets? How did you overcome any building difficulties?

## Apply

- How does the aerial net work to collect insects?
- How does the sweep net work to collect insects?



## 4-H MISSION MANDATES

### Citizenship

Understanding similarities and differences among insects and their habitats increases environmental stewardship.

### Healthy Living

Participation in 4-H clubs is beneficial to the socio-emotional well-being of youth. Life skills gained from participating in the Discover 4-H Entomology club are critical thinking, problem solving, teamwork and cooperation, and conflict resolution, to name a few.

### Science

This club meeting provides youth with activities that surround order/classification of insects and other arthropods, collaboration of groups to achieve goals, opportunities to compare and evaluate as well as building their abilities to analyze and interpret their findings.

## ESSENTIAL ELEMENTS

### Belonging

Being part of the Discover 4-H Entomology Clubs brings youth together who have similar interests in insects.

### Independence

Learning about insects and their uses prepares youth to make informed decisions that affect the environment.

### Generosity

Youth learn by the example of their adult volunteers that volunteering is valuable to our communities.

### Mastery

This introductory club will spark a continued interest in entomology among youth who participate by allowing them to collect, display, and demonstrate the knowledge they have gained in 4-H contests and county fairs.

#### References:

<http://www.extension.umn.edu/youth/mn4-H/projects/environment/entomology/collecting-and-preserving-insects/>

<http://www.sheknows.com/parenting/articles/1003593/bug-hunt-crafts-for-kids-diy-bug-net>

<https://www.uky.edu/Ag/Entomology/ythfacts/4h/unit1/collnet.htm>

# 4-H Club Meeting 5

## We're Going on an Insect Hunt!



### Supplies

- A clear plastic tub or jam jar with air holes
- Tweezers
- Identification guide (available from libraries)
- Aerial and sweep net
- Killing jar
- Nail polish remover
- Small pocket size notebooks
- Pencils
- Hand sanitizer

### PRIOR TO THE MEETING

Review lesson and gather supplies. Instruct youth to bring their aerial and sweep nets as well as their kill jars. Call members/volunteers and inform them to dress appropriately for an outdoor club meeting and any other information or supplies they need for club meeting 5.

## Activity #1

### INSECT HUNTING



### DESCRIPTION

1. Know where to look! Backyard bugs can usually be found under things like potted plants, rocks, or other heavy items. If you're on the trail, look for bugs in flowers and trees or near water.
2. Search for signs of bugs, too. Finding bugs is thrilling, but so are signs of bugs or bug homes. Spider webs and vacated cocoons are good examples. Youth are also enthralled with dead bugs, so don't be too quick to discourage curiosity in whatever form it comes.
3. Take your time. Bugs are easy to miss if you're walking too fast. Most are small and many have the gift of camouflage, making them tough to spot at first glance. Take it slow and let your eyes roam the area for anything that moves. You might even want to pick one place and hang out there for a while.
4. Try to stay quiet. How is staying quiet possible with youth? Surprisingly kids are willing to listen and be still when looking for bugs and other wild critters. Once they have spotted one even the youngest members seem to know instinctively to be still and enjoy the discovery.
5. Set a specific amount of time and have youth spread out and collect as many creepy crawlies as they can find using their nets and depositing the bugs into their killing jars.
6. Butterflies will need to be removed from the killing jar and placed on a spreading block using strips of paper held down with pins to keep the wings flat (do not put pin through the wings).
7. Have youth use the insect identification guide to attempt to identify their insects. Instruct them to number and take notes about the insects they have collected such as where they were found, the temperature, weather conditions and any information found in the guide.
8. Allow for discussion time in which youth can share what insects they found and whether they were "good" bugs or "bad" bugs – to make the connection with garden pests and helpers. Consult a field guide to learn more about your finds.



## Reflect

- What types of insects did you find? Where did you find them?
- Did you find any that did not classify as insects? Were you able to identify them?

## Apply

- According to the guide which of these insects are useful? Which of these insects are pests?
- What habitat were your insects from?
- Was the habitat indicative of the insects you found?



## 4-H MISSION MANDATES

### Citizenship

Understanding similarities and differences among insects and their habitats increases environmental stewardship.

### Healthy Living

Participation in 4-H clubs is beneficial to the socio-emotional well-being of youth. Life skills gained from participating in the Discover 4-H Entomology club are critical thinking, problem solving, teamwork and cooperation, and conflict resolution, to name a few.

### Science

This club meeting provides youth with activities that surround order/classification of insects and other arthropods, collaboration of groups to achieve goals, opportunities to compare and evaluate as well as building their abilities to analyze and interpret their findings.

## ESSENTIAL ELEMENTS

### Belonging

Being part of the Discover 4-H Entomology Clubs brings youth together who have similar interests in insects.

### Independence

Learning about insects and their uses prepares youth to make informed decisions that affect the environment.

### Generosity

Youth learn by the example of their adult volunteers that volunteering is valuable to our communities.

### Mastery

This introductory club will spark a continued interest in entomology among youth who participate by allowing them to collect, display, and demonstrate the knowledge they have gained in 4-H contests and county fairs.

#### References:

<http://goexplorenature.com/2011/03/go-bug-hunting-with-kids.html>

# 4-H *Club Meeting 6* Putting Your Collection Together



## Supplies

- Computers/laptops
- Internet access
- Cigar boxes, pizza boxes, shoeboxes, etc.
- Styrofoam
- Cardboard
- Ceiling tiles
- Hot glue gun and glue
- Insect pins
- Insect labeling paper strips
- Very fine point ink pens
- Scissors
- Box knives

### PRIOR TO THE MEETING

Review lesson and gather supplies. Youth may be able to provide items they will need for the activities. Call members/volunteers and inform them of any other information or supplies they need to bring to club meeting 6.

## Activity #1

### ASSEMBLING THE COLLECTION BOX



#### DESCRIPTION

Have youth work together in teams to research do-it-yourself insect collection boxes. Instruct youth to draw a design of their insect collection box and, using the supplies on hand, note which materials they will use.

## Activity #2

### DISPLAYING THE INSECTS



#### DESCRIPTION

Specimens within an order are neatly grouped above the order label. Pinned specimens face toward the top of the box. Pointed specimens face to the viewer's right, but their labels are parallel to the labels of the pinned specimens. Although no specific size of the order label is mandated, most attractive labels are approximately 2 inches long and 5/16 inch wide. H6 A series of these labels has been supplied to cut and use in the collection. Pin them directly to the floor of the box, and arrange all specimens representing that order in neat rows in a rectangular area above the label. (Always arrange the insects across the length of the box.)



## DISPLAYING THE INSECTS CONTINUED

For youth who plan to enter their collections in to their 4-H County Exhibit Hall, the following are basic requirements:

### BEGINNER

Box of insects containing between 10-24 different adult insects, grouped in at least two named orders.

### ADVANCED

Boxes of insects containing over 25 different adult insects, grouped in at least three named orders.



### Reflect

- A well thought-out collection box is essential to protecting and displaying your insect collection. What problems or design issues did you encounter while selecting and building your box?
- What was nice about working in a group? What was hard about working in a group?

### Apply

- Why Study Insects?

Insects are the most abundant animals on earth. More than one million different types of insects have been identified. They live in just about every situation or habitat on earth. Insects have lived on earth for more than 300 million years. As you will see, insects are just about everywhere! If you take the time to observe them carefully, you will find them very interesting.

No matter where you live or what you do, you will be able to find insects. They can live in just about any situation or climate. Nearly everybody will have some type of problem with insects at some time in their life. Some insects eat our crops or food in storage; others can bite or sting us, our livestock, or our pets. A few insects spread diseases. Some eat our clothing and other household furnishings, and some even eat the wood in our homes. Certain insects are helpful to us by producing products we can use (for example, honey), by pollinating our crops, or by attacking pest insects.

Congress is in the process of approving the monarch butterfly as our national insect. The monarch butterfly was chosen because it is a native insect, it has a wide distribution throughout most of the United States, and it is large and showy. Several states also have chosen a state insect. Can you name an insect that might be a good representative for the state you live in? Why do you think it is appropriate?

Entomologists are people who make careers of studying insects or of protecting us and our crops and other goods from insects. Because there is no end to finding new kinds of insects and learning more facts about them, many people collect and study insects as a hobby. You can become a young entomologist by working to achieve the objectives of this unit.

Encourage youth to enter their collections in to their 4-H County Exhibit Hall by following their State 4-H Fairbook rules. The following are basic requirements from the Utah 4-H State Fairbook:

### BEGINNER

Box of insects containing between 10-24 different adult insects, grouped in at least two named orders.

### ADVANCED

Boxes of insects containing over 25 different adult insects, grouped in at least three named orders.



## 4-H MISSION MANDATES

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## ESSENTIAL ELEMENTS

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### Mastery

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#### References:

[http://extension.entm.purdue.edu/401Book/default.php?page=how\\_to\\_display](http://extension.entm.purdue.edu/401Book/default.php?page=how_to_display)

<http://utah4h.org/hm/events-registration/utah-state-fair/>

<https://www.uky.edu/Ag/Entomology/ythfacts/4h/unit1/why.htm>



My Name: \_\_\_\_\_ Date: \_\_\_\_\_

1) My insect's habitat: \_\_\_\_\_

2) My insect's food source: \_\_\_\_\_

3) How it finds and eats its food: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

4) How my insect moves: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

5) What eats my insect: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

6) How my insect escapes predators: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_



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### What Makes an Insect an Insect?

Use the terms below to label the parts of the insect.

- |                          |                           |
|--------------------------|---------------------------|
| <b>All insects have:</b> | <b>Most insects have:</b> |
| Head                     | Wings                     |
| Thorax                   |                           |
| Abdomen                  |                           |
| Antennae (2)             |                           |
| Legs (6)                 |                           |

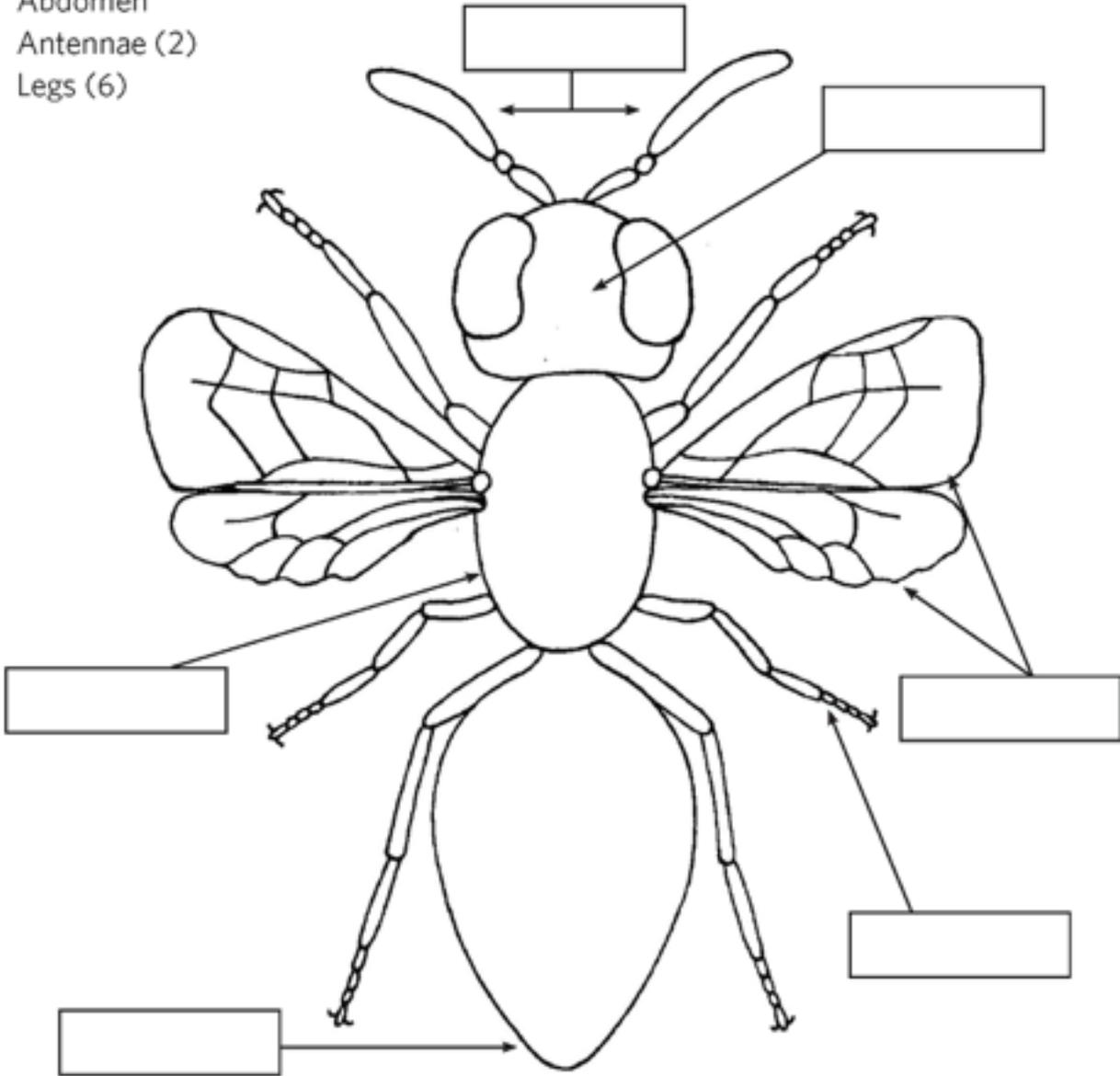


Image: Creepy Crawly Roadshow, UK



Draw your insect below. Be sure to label its body parts.

Name of my insect: \_\_\_\_\_

Habitat: \_\_\_\_\_

Special adaptations: \_\_\_\_\_



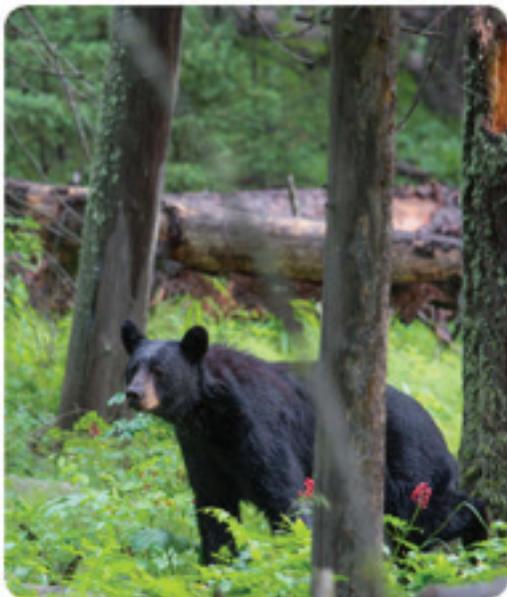
©Daniel Prano

### Habitat

windy beaches

### Food Sources

nectar from flowers, other arthropods, dead plants, dead animals



©Yellowstone NPS

### Habitat

on or in another animal

### Food Sources

blood, other arthropods, dung, decaying matter



©GustOhevenor

### Habitat

dark caves

### Food Sources

soil, dung, other arthropods, worms and grubs, decaying matter



©Jire Dollar

### Habitat

dry deserts

### Food Sources

leaves, nectar from flowers, dead plants, dead animals, other arthropods



©monkeypuzzle

### Habitat

fallen tree log

### Food Sources

wood, worms and grubs, dead animals, other arthropods



©Daniel Piraino

### Habitat

fruit tree

### Food Sources

leaves, fruit, other arthropods, nectar, dead plants, dead animals



©James E. Pettis

### Habitat

forest floor leaf litter

### Food Sources

decaying plants, soil, worms, grubs,  
other arthropods



©Martin LaBar

### Habitat

cold mountains

### Food Sources

dead animals or plants, nectar and  
pollen from flowers, dung



© iStockphoto

### Habitat

fresh water pond

### Food Sources

leaves, other arthropods, soil, dead plants, dead animals, dung



© iStockphoto

### Habitat

under rocks

### Food Sources

dung, worms and grubs, soil, decaying matter

1.



2.





3.



4.





5.



6.





7.



8.





9.





1. Centipede – not an insect
2. Butterfly – insect
3. Scorpion – not an insect
4. Bee or wasp – insect
5. Millipede – not an insect
6. Grasshopper – insect
7. Isopod (aka: Roly Poly or Pillbug) – not an insect
8. Ladybug – insect
9. Spider – not an insect

<b>Abdomen</b>	The last of an insect's three main body parts.
<b>Adaptation</b>	Any structure or behavior of an organism that improves its chances for survival.
<b>Antenna/Antennae</b>	The thin feelers on the head of an animal like a crayfish, isopod, or insect. Antennae are used to sense the environment.
<b>Arthropods</b>	A group of animals with exoskeletons, jointed legs and segmented bodies, including insects, spiders, ticks, scorpions, centipedes, crabs, and shrimp.
<b>Entomologist</b>	A scientist who studies insects.
<b>Exoskeleton</b>	A hard, protective covering found in all arthropods, which provides structure like a skeleton, but is on the outside.
<b>Habitat</b>	The place or type of place where a plant or animal naturally or normally lives and grows.
<b>Head</b>	The first of an insect's three main body parts.
<b>Insects</b>	A group of arthropods that is characterized by having a three-part segmented body, six legs, and two antennae, including beetles, ants, and bees.
<b>Larva/Larvae</b>	The wormlike early stage in the life cycle of an insect
<b>Metamorphosis</b>	The change of an insect (or other animal) from one form into another as it develops into an adult. Butterflies are a well-known example.
<b>Thorax</b>	The middle of an insect's three body parts. An insect's legs and wings are always attached to the thorax.

1st label information (mandatory and under insect)	+ County State Location Date Collector	+ 2 Examples:	Cadle Co. UT N 41, 73788 E-111 rd 8 June 2008 Bryon Hinton	Cache Co. UT 400 E 2200 N.N. Logan 15 June 2008 Katherine E. Coats		Please contact your 4-H County Extension Agent with questions about collecting or pinning insects!
2nd label information (optional and under insect)	+ Collection method and plant source	+ 2 Examples:	Sweep net In alfalfa	By hand in turfgrass	Use 1st label to group insects by Order	<b>Coleoptera</b>
3rd label information (optional and under insect)	+ Scientific name, be as specific as possible	+ 2 Examples:	Coleoptera: Coccinellidae	Lepidoptera: Noctuidae		<b>Neuroptera</b>
						<b>Lepidoptera</b>
						<b>Orthoptera</b>
						<b>Diptera</b>
						<b>Hemiptera</b>
						<b>Hymenoptera</b>
						<b>Isoptera</b>
						<b>Mecoptera</b>
						<b>Ephemeroptera</b>
						<b>Dermoptera</b>
						<b>Odonata</b>
						<b>Trichoptera</b>
						<b>Phthiraptera</b>
						<b>Psocoptera</b>
						<b>Thysanoptera</b>
						<b>Collembola</b>
						<b>Protura</b>
						<b>Anoplura</b>



## 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](http://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/join/becomevolunteer>

### 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.

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Please go to the following link to take a short survey:

[Click here to give your feedback](#)