

# 4-H Natural Resources Annotated Project Sequences with Activities

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This summary was created to aid 4-H Leaders and Extension Educators in selecting a natural resources curriculum for their 4-H clubs. The comprehensive list below includes all activities available in each publication, and a suggested difficulty level and season in which to conduct these activities. As these are only suggestions, you should feel free to organize your projects in a way that best fits your individual club. Page 7, contains a full listing of where the publications can be ordered. To obtain a pdf of this summary: [www.dnr.cornell.edu/ext/youth/pubs.htm](http://www.dnr.cornell.edu/ext/youth/pubs.htm).

Category/Publication	Activity	Description	Difficulty <sup>†</sup>	Season*
<b>Forestry</b>				
Trees: Dead or Alive	Trees and Water	Find out how trees take up and give off water	B	S-SU
	Tree rings	See how trees grow	B	YR
	Tree roots	Learn about roots and mycorrhizae	B	S-F
	Live tree homes	Learn what types of organisms live on a tree	B	S-F
	Snags	See why trees die and what organisms live on dead trees	B	S-F
	Rotting logs	Observe types of animals and plants that live in a rotting log	B	S-F
	Forest gaps	Learn about seedling growth in forest gaps	I	S-SU
	<i>Maple Syrup</i>	Take a field trip to see maple syrup made	B	S
	<i>Gather seeds</i>	Gather seeds and learn about dispersal	B	S-F
	<i>Identify trees</i>	Identify trees in the surrounding area	B	YR
	<i>Arbor Day</i>	Plan/participate in Arbor Day activities	B	S
	<i>Forestry club</i>	Train to participate in the 4-H Forestry and Wildlife Invitational	A/T	YR
	<i>Grow Trees</i>	Grow trees from seeds or cuttings.	B	YR
Field Guides Made Easy	Making a key for identifying trees	Create a key to identify trees	B or use w/ "KYT"	S
	Using tree field guides	Learn how to use a field guide	B " "	YR
	Take a hike	Identify tree species in the wild	B " "	S-F
	Make a field guide	Create your own field guide	B " "	YR
	Make a nature trail	Create signs for a nature trail	I	YR
Know Your Trees (KYT)	Leaf collection	Collect and identify leaves from different tree species	B	
	Fruit collection	Collect and identify fruit from different tree species	B	
	Twig collection	Collect and identify twigs from different tree species	B	
Maple Syrup Production for the Beginner	Syrup production	Produce maple syrup	I	
<b>Ornithology</b>				
Field Guides Made Easy	Identifying birds	Learn characteristics to identify birds	B	YR
	Using bird field guides	Gain skill in using field guides	B	YR
	<i>Take a hike</i>	Identify bird species in the wild	I	YR
	<i>Make a field guide</i>	Create your own field guide	I	YR
Birds in Your Backyard	Cooking for birds	Make bird feed	B	W
	Bird feeders	Make a bird feeder	B	W
	Field record of birds	Keep a field record of birds	B	YR
	Project story	Write a story about your project	B	YR
	<i>Habitat improvement</i>	Plant plants that improve bird habitat	I	S

	<i>Counting birds</i>	Count the number of birds seen in 1 day	B	YR
	<i>Food preferences</i>	Discuss bird food preferences	B	YR
	<i>Bird Olympics</i>	Observe birds in different teams	I	YR
	<i>Demonstration</i>	4-H members demonstrate a bird-related topic to others	I	YR
	<i>Club listing</i>	Keep club listing of all birds seen	I	YR
	<i>Wildlife Biologist</i>	Have a wildlife biologist speak to the club	A/T	YR
	<i>Information booth</i>	Create a bird information booth at the fair	A/T	SU
	<i>Species</i>	Each member learns about one bird species	A/T	YR
	<i>Bird songs</i>	Learn to identify bird songs	A/T	S
	<i>Photo collection</i>	Start a collection of bird photos	I	YR
	<i>Bird adaptations</i>	Watch a feeder to see various adaptations birds use to crack seeds	I	W or YR
	<i>Discussion</i>	Members discuss observations and successes	All levels	YR
Bluebirds in NY	Build a bluebird box	Learn how to build a box	B	W
	Mounting nest box	Find out where to place the nest box	B	W
	Monitoring nest boxes	Observe nest boxes	B	S
	Bluebird behavior	Observe bluebirds	B	S
	Are you a bluebird expert?	Complete bluebird crossword puzzle	B	YR
	Help a scientist	Find out how scientists study bluebirds	A/T	YR
<b>Wildlife</b>				
Insects All Around Us	Build a bug	Learn the body structure of insects	B	YR
	Collecting insects	How to build and use simple insect sampling equipment	B	S-F
	Insect diversity	Collecting insects in different habitats	B	S-F
	Insect observation	Learn about insect food behaviors and defensive mechanisms	B	S-F
	Insect trivia	Play insect trivia to improve knowledge of insect ID and behavior	B	YR
Wildlife Discovery	Animal tracks	Learn how to identify animals by their tracks	B	YR
	Cast a track	Make plaster impressions of tracks	B	YR
	Attract a track	Use food to attract animals	B	YR
	Owl pellets	Learn about owl food habitats	B	YR
	Who lives here?	Become familiar with plants and animals in different habitats	B	S-F
	Froggie field trip	Observe from life cycles	B	S
	What animal is that?	ID different classes of animals	B	YR
	<i>Wildlife signs</i>	List all wildlife signs the group sees	B	YR
	<i>Improve habitat</i>	Plant plants to improve wildlife habitat	I	S
	<i>Life histories</i>	Learn about life histories of animals	I	YR
	<i>Wildlife biologist</i>	Invite a wildlife biologist to speak	A/T	YR
	<i>Competition</i>	Hold a competition to collect wildlife signs	I	YR
	<i>Supplemental projects</i>	Use supplemental projects in leader's folder	I	YR
Wildlife Habitat Enhancement	Basics of wildlife habitat	Understand the elements of a suitable habitat for wildlife	A/T	S-F
	Inventorizing and planning for wildlife habitat enhancement	Understand and identify the elements that make up suitable habitat for wildlife	A/T	S
	Providing food for wildlife	Enhance food quality in a habitat	A/T	S
	Providing a cover for wildlife	Enhance cover in a wildlife habitat	A/T	S
	Improving water availability for wildlife	Enhance water supply in a wildlife habitat	A/T	S-SU

	Space: the elusive habitat element	Understand the relationship of wildlife needs for space	A/T	YR
	Checking results	Learn to identify wildlife	A/T	YR
Wildlife in Today's Landscapes	Wildlife guilds	Reinforces the concept of feeding and nesting guilds	A/T	YR
	Neighborhood survey	Discover the variety of foods, water sources and nesting sites in different habitats	A/T	YR
	Wildlife pests	Assess suitability of school or home as habitat for pest species	A/T	YR
	Rare wildlife species	Learn how a species might become endangered and how to protect it	A/T	YR
	Habitat diversity	Understand habitat and wildlife diversity	A/T	YR
	Diversity from an insect's point of view	Compare diversity of insects in different habitats	A/T	S-SU
	Recording wildlife observations in a journal	Learn how to take field notes	A/T	YR
	Interviewing people who have made habitat improvements	Conduct interviews to learn about habitat improvement	A/T	YR
	Choosing a habitat patch	Choose a site in which to improve wildlife habitat	A/T	YR
	Mapping your site	Create a vegetation map of your habitat	A/T	YR
	Wildlife needs	Select species to attract and study their habitat needs	A/T	YR
	Making the improvements	Prepare a wildlife habitat enhancement plan and implement it	A/T	YR
	Maintenance plan	Develop a maintenance plan for habitat	A/T	YR
	Local wildlife issues	Investigate a local development issue	A/T	YR
<b>Solid Waste</b>				
What about Waste?	Making paper	Recycle paper	B	YR
	Garbage gobblers	Discover organisms that aid in decomposition	B	YR
	Trash bag investigation	Learn what can be reused, recycled or composed in your garbage	B	YR
	Waste watchers	Discover how you contribute to the waste stream	B	YR
	Trash trivia game	Learn about the magnitude of the solid waste problem	B	YR
Recycling: Mining Resources From Trash	Field trips	Observe waste disposal options	I	YR
	Investigate your community	Collect data on recycling and solid waste in the local community	I	YR
	Trace your waste	Find out what's done with waste in community	I	YR
	Trash trivia game	Learn facts and figures about solid waste	I	YR
	Mix and match waste	Learn waste terminology	I	YR
	Create a landfill or compost	Observe different aspects of decomposition in mixed garbage	I	YR
	Organize a recycling project	Design a disposal set-up for garbage and recyclables	I	YR
	What is this house made of?	Observe how many resources we use in everyday life	I	YR
	Recycled water?	Build a terrarium to observe how water is recycled	I	YR
	Grow plants from trash	Observe how plants recycle themselves	I	YR
	Garbage - It's for the worms	Learn about worm composting	I	YR
Composting: Wastes to Resources	Best ever compost	Learn how to compost	I	YR
	Solving problems in your compost pile	Identify and solve problems during the composting process	I	YR
	How hot is my compost	Learn at what temperature composting is most effective	I	YR
	Discover compost animals	Build an insect trap	I	YR
	Watching wastes rot I	Learn about the role of microorganisms in decomposition	I	YR
	Watching wastes rot II	Learn about role of aeration and surface area in decomposition	I	YR

	Growing plants with compost	Learn what effects adding compost to soil has on the growth of plants	I	S-SU
Composting in the Classroom	Two-can bioreactors	Construct a bioreactor	A/T	YR
	Soda bottle bioreactors	Construct a soda bottle bioreactor	A/T	YR
	Worm bins	Learn vermicomposting	A/T	YR
	Measuring compost moisture	Learn to measure and calculate the amount of moisture in compost	A/T	YR
	Calculations for thermophilic composting	Compute the best combination of compost ingredients	A/T	YR
	Observing compost microorganisms	Learn about the microbial communities in compost	A/T	YR
	Culturing bacteria	Learn to culture bacteria	A/T	YR
	Culturing actinomycetes	Learn to culture actinomycetes	A/T	YR
	Culturing fungi	Learn to culture fungi	A/T	YR
	Measuring microbial activity	Measure the level of metabolic activity of microbes in a compost sample	A/T	YR
	Pick and sort	Collect microorganisms in a compost pile	A/T	YR
	Berlese funnel	Concentrate into a vial small organisms that are not easily collected through picking	A/T	YR
	Wet extraction	Collect small organisms that live in aqueous films surrounding compost particles	A/T	YR
	Compost stability	Determine if organic matter is thoroughly decomposed based odor development	A/T	YR
	Self-heating test	Determine if organic matter is thoroughly decomposed based on heat production	A/T	YR
	Respiration test	Determine if organic matter is thoroughly decomposed based on CO <sub>2</sub> production	A/T	YR
	Phytotoxicity bioassay	Determine whether compost contains substances that inhibit seed germination	A/T	YR
	Porosity	To measure the volume of pore space in a compost or soil sample	A/T	YR
	Water holding capacity	To determine the ability of a soil or compost to retain moisture against drainage	A/T	YR
	Organic matter content	Determine the organic and mineral fractions of a compost or soil sample	A/T	YR
	Buffering capacity	Determine whether adding compost to soil increases the soil's capacity to resist pH change.	A/T	YR
	Plant Growth experiments	Determine the effect of compost on plant germination and growth	A/T	YR
<b>Fish and Aquatic Resources</b>				
Let's Go Fishing	Tying an improved clinch knot	Develop basic knot tying skills	B	YR
	Introduction to spin-casting	Learn how to cast	B	YR
	Tying the blood knot	Learn to tie a knot	B	YR
	Casting practice and game	Compete to practice casting	B	YR
	Bait field trip	Learn to collect, store and use bait	B	S-F
	Fishing trip	Learn to catch and identify fish	B	S-F
	Fishing for food	Learn to catch, handle, clean and cook fish	B	S-F
Let's Go Ice Fishing	Ice fishing trip	Learn about ice fishing and safety	I	W
	Ice fishing derby	Run an ice fishing derby	I	W
Basic Fly Tying	Basic tying techniques	Learn basic tying techniques	I	YR
	Streamer and bucktail flied	Make streamer and bucktail flies	I	YR
	Bivisible and hackle flies	Make bivisible and hackle flies	I	YR
	Wet flies	Learn to tie wet flies	I	YR
	Winged dry flies	Learn to tie dry flies	I	YR
	Nymphs	Learn to tie nymphs	I	YR
	Hair wing and hair body dry flies	Make hair wing and hair body dry flies	I	YR
	Bass and panfish bugs	Learn to tie bass and panfish bugs	I	YR
Exploring Freshwater Fisheries	Using a dichotomous key to identify fishes	Learn to use a dichotomous key and identify fish	I	S-F

	Photographic collection of fishes	Observe fish diversity in the local area	I	S-F
	Scientific collection and preservation of fishes	Learn to make a scientific fish collection	I	S-F
	Japanese fish printing	Observe the physical details of a fish	I	S-F
	Plaster casts of fish	Study the physical details of a fish	I	W
	Observing fishes	Learn about fish adaptations and form and function	I	W
Pond and Stream Safari	Aquatic safari	Use aquatic sampling techniques	I	S-F
	Making an aquatic insect collection	Sample, preserve and identify insects	I	S-F
	Presto, Change-o	Become mature with immature and mature forms of aquatic insects	I	S-F
	Create a critter	See insect adaptations to habitat	I	YR
	The Waterwatcher's worry	Learn simple biomonitoring, explore insect adaptations	I	S-F
	Word jumble	Unscramble words with the help of clues	I	YR
	Weaving the web	Build a food web of aquatic organisms	I	YR
Aquatic Plants - Another World	Three major forms of aquatic plants	Identify emergent, floating and submergent plants	I	S-F
	Common aquatic plants	Familiarize yourself with common aquatic plants	I	S-F
	Plant and animal interactions	Explore relationships between plants and animals	I	S-F
	Characterizing a plant community	Identify plants, explore relationships between plants and their environment	I	S-F
	Aquatic plants and people	Learn how aquatic plants can influence the use of a body of water	I	S-F
	Plants as problem indicators	Investigate how pollutants can affect plant growth	A/T	S-F
	Mechanical control techniques	Study the effects of mechanical control alternatives on plant growth	A/T	S-F
	<i>Making and using a plant press</i>	Build a plant press	B	S-F
<b>Water</b>				
Water Worlds	Measuring water temperature	Observe temperature differences in different parts of a body of water	B	S-F
	Measuring water depth	Observe water-depth differences	B	S-F
	Measuring current speed	Measure water current speed	B	S-F
	Measuring turbidity	Make and use a secchi disk	B	S-F
	Observing plants and animals	Build and use an observation window	B	S-F
	Collecting plants and animals	Build and use basic sampling equipment	B	S-F
	<i>Aquarium</i>	Make an aquarium for plants and animals	B	S-F
	<i>Photography</i>	Photograph a local water world each season	B	S-F
	<i>Visit water treatment plant</i>	Visit a local water treatment plant	B	YR
	<i>Water world list</i>	Create a list of all water worlds in your area	B	YR
	<i>Identify aquatic insects</i>	Learn to identify aquatic insects	B	S-F
	<i>Make a shell collection</i>	Make a shell collection and identify the collected animals	B	YR
	<i>Visit a reservoir</i>	Visit a reservoir or dam	B	YR
	<i>Find signs of riparian life</i>	Count how many animals you see along a river bank or beach	B	YR
	<i>Water uses</i>	Members list daily water uses	B	YR
	<i>Life list</i>	Create a list of all aquatic plants and animals that members see	I	YR
	<i>Nocturnal life</i>	Observe a water environment at night	I	YR
	<i>Marine biologist</i>	Invite a water resources professional to speak to the group	I	YR
	<i>Human-made ponds</i>	Compare human-made water environments with natural ones	I	YR
	<i>Fishing trip</i>	Go on a fishing trip	I	YR
Water Wise	Water content of food	Calculate the water content of food	I	YR
	How water use	Monitor the amount of water you use daily	I	YR
	Water down the drain	Observe a leaky faucet	I	YR

	Water dissolves many things	Observe which substances dissolve more easily in water	I	YR
	Water absorbs heat	Observe how water temperature increases	I	YR
	Water molecules stick together	Make a model of a water molecule	I	YR
	The water cycle	Learn about the water cycle	I	YR
	Water world fill-in	Learn water cycle terminology	I	YR
	Water word search	Complete a water word search	I	YR
	Making a terrarium	Build a terrarium	I	YR
	Making a water cycle	Demonstrate the water cycle	I	YR
	Stream field trip	Measure some properties of the aquatic environment	I	S-F
	Adaptations of aquatic organisms	Design a new aquatic organism	I	YR
	Life in a drop of water	Observe sediment and water drops for organisms	I	S-F
	Groundwater model	Build a groundwater model	I	YR
	Soil as a filter	Show how soil acts as a filter	I	YR
	Oral histories of water quality	Interview residents about water quality	I	YR
	The pH scale	Measure pH of some common products	I	YR
	Acid rain	Check for acid rain in your region	I	YR
	Soil as a buffer	Test the buffering capacity of different	I	YR
	Visit a wastewater treatment plant	Follow the path of water as it moves through the plant	I	YR
	How a settling tank works	Learn how a settling tank works	I	YR
	Safe disposal of house-hold hazardous wastes	Learn about household hazardous wastes	I	YR
	Visit a drinking water purification plant	Learn about the functioning of a drinking water purification plant	I	YR
	Water supply essay	Write an essay about your water supply	I	YR
	Water cycle/water supply	Make a mural showing the place of you water supply in the water cycle	I	YR
	Water clean-up	Learn to filter water	I	YR
	Class newsletter	Write a water quality awareness newsletter	I	YR
	Letter writing campaign	Write letters to local officials expressing concern over water quality issues	I	YR

<sup>†</sup>**Difficulty Level:** B = Beginner, I = Intermediate, T = Teen (15-18), A = Advanced

<sup>\*</sup>**Suggested Season:** YR = Year round, S = Spring, SU = Summer, F = Fall, W = Winter

Italicized text above refers to supplemental activities

## Publications included in 4-H summary

Publication	Available From	Number	Price – does not include S&H (prices may not be up to date)
<b>Forestry</b>			
Trees: Dead or Alive	DNR Extension Publications	147L22	6.25
Field Guides Made Easy	DNR Extension Publications – online		
Know Your Trees (KYT)	DNR Extension Publications	147J85	3.95
Maple Syrup Production for the Beginner	DNR Extension Publications	None	1.00
<b>Ornithology</b>			
Field Guides Made Easy	DNR Extension Publications – online		
Birds in Your Backyard	DNR Extension Publications – online		
Bluebirds in NY	DNR Extension Publications	None	2.50
<b>Wildlife</b>			
Insects All Around Us	DNR Extension Publications	147L23	10.50
Wildlife Discovery	DNR Extension Publications	147L519	9.75 Members guide: 2.00
Wildlife Habitat Enhancement	DNR Extension Publications – online	147L516	3.00
Wildlife in Today's Landscapes	DNR Extension Publications	147L520	14.00
<b>Solid Waste</b>			
What about Waste?	DNR Extension Publications – online		
Recycling: Mining Resources From Trash	Cornell University Press, PO Box 6525, Ithaca, NY 14851 1-800-666-2211 or 607-277-2211, orderbook@cupserv.org	43094	8.95
Composting: Wastes to Resources	DNR Extension Publications – online	174CWRF	8.50
Composting in the Classroom	DNR Extension Publications – online To purchase: Kendall-Hunt 1-800-228-0810		
<b>Fish and Aquatic Resources</b>			
Let's Go Fishing	DNR Extension Publications	147L56	3.00
Let's Go Ice Fishing	DNR Extension Publications	147L515	2.75
Basic Fly Tying	DNR Extension Publications – online		
Exploring Freshwater Fisheries	DNR Extension Publications	147L57	3.00
Pond and Stream Safari	DNR Extension Publications	147L24	15.75
<b>Water</b>			
Water Worlds	DNR Extension Publications	147L518	6.50 Member's guide: 2.00
Water Wise	DNR Extension Publications	147WW	8.95
<b>Videos</b>			
Set of 7 videos includes: Leader's Orientation, Field Guides Made Easy, Trees: Dead or Alive, Birds in Your Backyard,	Instructional Materials Service, 420 Kennedy Hall, Cornell University, Ithaca, NY 14853 607-255-9252		\$185 guides included \$150 without guides + S&H
It's Gotten Rotten	DNR Extension Publications – online To purchase: Bullfrog Films 1-800-543-3764		

Unless otherwise noted all publications are available from:

**DNR Extension Publications**, 108 Fernow Hall, Ithaca, NY 14853. phone: 607-254-6556, fax: 607-255-2815, e-mail: cce-nat-res@cornell.edu, www.CornellDNRStore.com  
DNR Extension Publications – online: [www.dnr.cornell.edu/ext/youth/pubs.htm](http://www.dnr.cornell.edu/ext/youth/pubs.htm)