Cornell Cooperative Extension
Cayuga County

What is a 4-H project?

Projects are the foundation used by 4-H for helping youth develop life skills. 4-H members "learn by doing." Young people, with guidance from adults, learn useful skills and how to live with people and serve their community and country by practicing these skills in real-life situations.

You sign up for project areas that interest you when you enroll in 4-H. Then you think of what you want to learn and come up with a project that will help you meet your goals.

It's best to choose at least project at the beginning of the 4-H year and start working towards your goals. Projects can be added throughout the year if you find a new area to explore.

A 4-H Project is a series of educational experiences made up of 3 types of activities:

- **Hands-on Activities:** making, producing, practicing, observing, testing, interviewing, caring for, etc.
- **Organized Activities:** demonstrations, speeches, workshops, camps, county/regional/state events, project activities, exhibits, etc.
- **Leadership/Citizenship Activities:** Conducting, Planning, Teaching, Assisting, Informing, Organizing, etc.

How do I select a project?

Members choose projects that fit into their interests, family, community, and the way they live. A project can be whatever the member decides to make, study about, or raise. Sharing projects with parents brings 4-H into the family and the family into 4-H.

One of the most important aspects of 4-H project work is that the *4-H member* decides what they want to learn and do as they explore their project. This allows the project to be self-paced and gives children important skills in setting and working toward their goals.

The Cayuga County 4-H office has a ton of great **project resources** for you to use.

What projects can I choose from?

- Cloverbuds – an exploratory, non-competitive program for youth in K-2nd grade
- Animal Science
- Agriculture & Plant Sciences
- Expressive & Communication Arts
- Family Living
- Engineering & Technology
- Environmental Stewardship & Natural Resources
- Healthy Living
- Personal Growth, Development & Leadership
- Create Your Own Project - Self-Determined

When you are choosing a project, think about these things.

- Some projects have more than one level. For example, there are projects for members who are just beginning to learn about gardening. And there are other projects for members who have had a little experience in gardening. You will probably want to start at the beginner level. As your skills increase, you can enroll in projects at more advanced levels.

- Take projects that are recommended for your age group.

- You can do most 4-H projects on your own, working at your own speed. Some projects have county workshops or classes. Watch your county 4-H newsletter to learn more about these workshops.

- You can take animal projects even if you don't own an animal.

- Talk to your club leader or other club members if you want to find out more about a project. Other members can tell you about their experiences.

- Did you work a project at school and want to learn more about the topic?

What steps should I follow for success in my projects?

1. Select project areas that interest you. You can always log on to 4HOnline to change your project areas.

2. Come up with a project that will help you reach your learning goals. (For example, if you signed up for Child Development and you set the goal of learning how to keep children safe when you baby-sit, you might come up with a babysitting kit that could include a first aid kit and a home safety checklist.)

3. Use 4-H Project Curriculum to help you come up with project ideas and learning goals. 4-H Project Curriculum are "workbooks" that kids can do independently or with an adult mentor. They allow youth to go at their own pace and achieve hands-on learning independently. Curriculum can be **checked out** from the Cayuga County Extension Office or **purchased online**.

Project Goal Questions:

What do want to accomplish with the project?

Do you want to complete the learning experiences and have a great time?

Do you want to compete at a higher like the State Fair?

4. Begin work in your 4-H project area. Be sure to keep notes when you work on projects, including when you learned things and what you learned, what didn't go as planned, when you shared your project with someone else, etc. It is helpful to fill in the **Project Record Book** as you work. Take lots of pictures as you go!

5. Attend any project workshops that may be held in the project areas that you signed up for. Watch the website, newsletter and emails sent out from the 4-H Office for more information – it always includes details of upcoming 4-H activities that are being offered to 4-H members.

6. If you want to exhibit your project at the County Fair in July, you will need to register your projects with the Extension Office by mid-June. You will receive a registration form and more specific instructions as date gets closer.

7. Remember that you should be completing projects as a way to reach the learning goals you have set for yourself – not just making something to bring to the fair.

8. Complete your 4-H Project Records and turn them in to the 4-H Office by October 1. Be sure to follow the guidelines that you receive with your records.

9. Contact the 4-H Office for help if you get confused, stuck, or run out of ideas!

Good luck as you "learn by doing" your 4-H projects!

ANIMAL SCIENCE PROJECTS

BEEF | CATS | DAIRY CATTLE | DAIRY GOATS | DOGS | HORSE | MEAT GOATS | POULTRY | RABBIT & CAVY | SHEEP | PETS | SWINE | VETERINARY SCIENCE

BEEF

Learn about raising, caring for and managing beef cattle as you start with a bucket calf and work toward building your own herd. You'll learn about different breeds and anatomy of beef cattle; how to feed, groom and show your animal; how to judge beef cattle for market and/or breeding; how to produce high-quality beef; and how to use data and technology in an efficient beef-cattle operation.

- In level 1, learn to identify breeds of beef cattle, halter break a calf, identify symptoms of sick cattle, and fit a steer.
- In level 2, learn about cattle feeds, judge beef cattle, present oral reasons, and identify livestock safety hazards.
- In level 3, calculate yield grade for cattle, evaluate beef carcasses, read, and use sire summaries, and interview people in agriculture careers.

CATS

Learn how to care for your cat's health, nutrition, and housing needs. Caring for a pet helps you develop responsibility, nurturing, and communication skills.

- In level 1, learn to care for your cat, name the parts of a cat, and groom your cat.
- In level 2, identify cat behavior, observe a cat's six senses, learn about declawing cats, understand a cat's nutritional needs, and learn the signs of illness in cats.
- In level 3, learn about genetics, practice cat showmanship, learn about cat reproduction, organize a cat quiz bowl, and learn about animal welfare issues.

DAIRY CATTLE

Learn about raising and managing dairy animals by selecting, grooming and showing a heifer calf or yearling heifer. Along the way, you'll learn about dairy cattle breeds and anatomy, judging and presenting oral reasons, animal health and welfare, and safe practices for handling milk and milk products. Members with mature cows learn about animal feeds and nutrition, milk production, and careers in the dairy industry.

- In level 1, identify the breeds of dairy cattle, identify the body parts of cows, understand the lifecycle of cows, explore milk production, and learn to fit and show cattle.
- In level 2, learn to judge dairy cows, discuss animal health issues, identify safe practices for handling milk, select dairy housing and forage, and explore dairy-related careers.
- In level 3, evaluate the body condition of dairy animals, discuss animal welfare issues, identify the estrous cycle of cattle, and learn pregnancy detection & delivery techniques.

DAIRY GOAT

The dairy goat project is great for smaller properties since goats are typically easy to train and handle. Goat milk can be consumed by the family, fed to bucket calves or fed to other market animals. You might start with one doe, raise kids and eventually create your own dairy goat herd. Throughout the project, you can learn about breeds and anatomy of dairy goats, proper care and welfare of animals, record keeping and more.

- In level 1, identify breeds of goats, learn to be a responsible goat owner, solve goat care problems, and prepare a goat for show.
- In level 2, learn goat management practices, learn about health management practices, track kid growth, exhibit goats, and judge goats.
- In level 3, organize a goat field day, develop a herd health calendar, learn about breeding systems, and evaluate a goatherd.

DOGS

Whether you have a dog or hope to own one, this project will help you learn more about your family's best friend, from basic care and grooming to advanced training commands. Learn about different dog breeds and choose the best breeds for your family. Explore dog behavior, body language and obedience training while learning about proper nutrition to keep your dog happy and healthy.

- In level 1, learn dog breeds, create a house-training plan, explore dog behavior, and learn to groom dogs.
- In level 2, learn the history of dog breeds, create a dog care budget, correct undesirable dog behaviors, and learn to show.
- In level 3, learn to assess a dog's vital signs, explore careers working with dogs, learn local dog ordinances, and learn about guide and service dogs.

HORSE

If you love horses and want to learn more. Horse ownership is not required for levels 1-3. In this project you will learn basic coat colors, breeds and horse anatomy; study horse health; participate in judging contests, quiz bowl and hippology; and give presentations.

- In level 1, learn the basics of horse behavior, practice safety around horses, learn about horses without owning a horse, and assess horse health.
- In level 2, study horse anatomy, understand horse health and nutrition, select bedding material, and practice horse judging
- In level 3, learn about breeding and genetics, learn about disease and health care, design a horse health program, and explore the financial side of showing horses.
- In level 4, practice riding skills, learn horsemanship skills, use training techniques, and explore trail riding.
- In level 5, learn advanced riding skills, learn about ethics and competition, and teach horsemanship and safety to others.

MEAT GOAT

The meat goat project involves raising and caring for live animals while learning about animal health, nutrition, breeding, selection, and marketing.

- In level 1, identify parts of a meat goat, identify goat breeds, learn about goat nutrition and health, and practice basic management skills.
- In level 2, learn about meat goat diseases, work with a veterinarian, identify goat predators, and fit and show meat goats.
- In level 3, host a judging clinic, investigate biosecurity, select breeding stock, and evaluate feed ingredients.

PETS

Whether you love fish, hamster or other pets, these projects can help you learn more about your household friends and what different pet species need to stay healthy. Identify hazards for pets around your home and learn about your pet's feeding and care. Learn the symptoms and treatment of diseases as well as taxonomic classification.

- In level 1, identify hazards for pets, design a shelter for a pet, and learn about a pet's nutritional needs.
- In level 2, Learn about a pet's digestive tract, invent and design a pet toy, and examine a pet's health.
- In level 3, Learn about pet photography, care for newborn animals, and explore careers in pet care.

POULTRY

This project is designed to help you learn about chickens and other poultry.

- In level 1, learn about poultry breeds, study the parts of a chicken egg and their function, care for chicks, and practice showmanship techniques.
- In level 2, learn how eggs are formed, learn to keep poultry healthy, select and judge broilers, and make an egg candler to examine an egg.
- In level 3, manage a small laying flock, learn to process a chicken, determine inheritance in chickens, and study poultry biotechnology.

RABBIT & CAVY

The Rabbit & Cavy project is a great way to get involved no matter where you live. You'll learn the basics of care and proper nutrition. You can even show your rabbits or guinea pigs.

- In level 1, learn to care for a rabbit or cavies, groom and show, and build a nest box.
- In level 2, select and judge rabbits and cavies for exhibit and learn about housing and care.
- In level 3, study genetics and breeding, design a rabbitry, and promote rabbit products.

SHEEP

The program will help you learn to select, manage, produce, and market sheep.

- In level 1, learn the parts and uses of sheep, determine the age of sheep by their teeth, care for sheep, and show sheep.
- In level 2, explore sheep diseases, determine lamb yield grades, learn to ear tag and vaccinate, and deliver a lamb.
- In level 3, prepare an operation budget, prepare a marketing plan, and design the ideal sheep herd.

SWINE

Learn about the nutrition needs of pigs, ethical care of pigs, preparation for showing, making good financial decisions, and judging.

- In level 1, study swine breeds, feed and care for pigs, complete an income and expense budget, and identify pork by-products.
- In level 2, learn to select quality pork, learn to keep swine healthy, design a swine operation, and explore the swine industry.
- In level 3, study swine genetics, practice baby pig management, design a farrowing facility, and learn to prevent swine diseases.

VETERINARY SCIENCE

- Learn about different animal species, explain roles animals have in society, learn about body systems and organs, and study animal behaviors.
- Complete an animal health record, learn about animal diseases and how they spread, learn about animal parasites and their controls, and learn about veterinary careers.
- Study animal reproduction, preventative medicine, genetics, and veterinary careers.

CAREER & LEADERSHIP DEVELOPMENT

CAREER READINESS | FINANCIAL FUTURE | LEADERSHIP

BUILD YOUR FUTURE

4-H prepares youth to make decisions about their career and college paths. Build skills that help you succeed in LIFE.

This project is for 4-H members who are preparing for their first paid jobs. Activities cover everything from making a good first impression to managing money, including applying, getting references, creating a resume, and interviewing. Even social media posts can affect one's job prospects!

Explore potential careers while you create your own business plan and career portfolio. Career opportunities in agriculture are everywhere, including in places you may not know about. Explore your interests and talents to find your best fit in the working world outside of traditional production farming. There is a rewarding ag career for you!

FINANCIAL FUTURE

Responsible financial management is an important factor in successful families. Learn to determine differences between needs and wants, develop a savings plan for a specific goal, practice comparison shopping, learn to manage a checking account, recognize target advertising, identify consumer rights, and learn the value of employment.

In level 1, study real-life financial scenarios, study future careers, set SMART goals, and create spending plans.

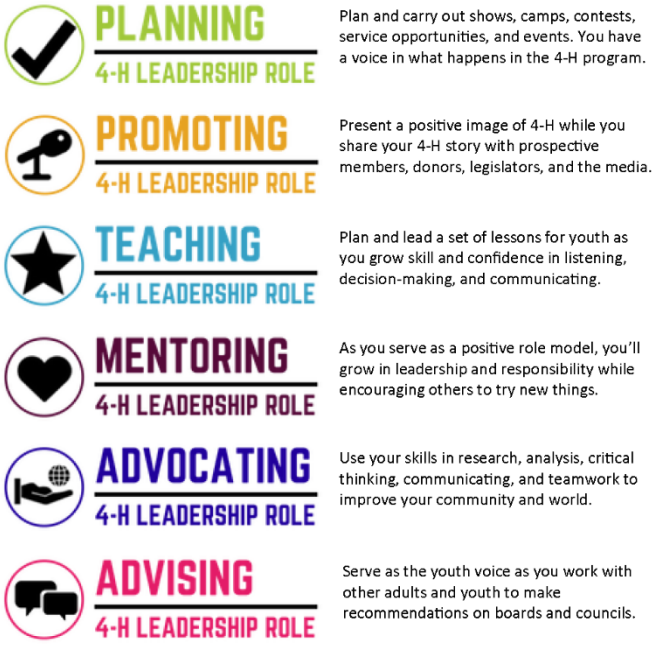
In level 2, learn to manage financial records, choose payment methods, and manage credit.

LEADERSHIP

Leaders build relationships, serve as a good role model, and help others. Leaders influence and support others in a positive manner for a shared goal. Leaders aren't just elected. Learning about yourself and how you work with others is a key part of developing leadership skills.

- In level 1, learn about the seven skill areas: understanding self, communicating, getting along with others, learning, making decisions, managing, and working in groups.
- In level 2, develop a positive self-image, use technology to communicate, explore different ways of learning, practice making good decisions, and manage your resources.
- In level 3, explore leadership styles, work with local media to showcase your club activities, and investigate community resources.

SIX WAYS YOU CAN LEAD



CIVIC ENGAGEMENT

CIVIC ENGAGEMENT | COMMUNITY SERVICE | FAMILY HERITAGE | INTERCULTURAL | DIVERSITY

CIVIC ENGAGEMENT

4-H empowers young people to be actively engaged in their communities and world. Youth learn about civic affairs, build decision-making skills, and develop a sense of understanding and confidence in relating and connecting to other people. These life skills help grow 4-H youth into true leaders.

- In level 1, learn more about yourself, your family, and your friends.
- In level 2, find out about your community and learn how to be a good neighbor.
- In level 3, organize a tour of a local village, city hall, or courthouse; learn how government functions; and learn about police, fire protection, health, sanitation, safety, and tourism in your community.

COMMUNITY SERVICE

4-H members are four times more likely than their peers to serve their community.

- In level 1, plan and carry out a service project by researching a need in your community and serving that need.
- In level 2, plan and conduct a service project, conduct a walk-about to observe needs and assets in your community, and survey community members about needs and identify solutions to those needs.

FAMILY HERITAGE

Uncover the rich history of your family in this genealogy project.

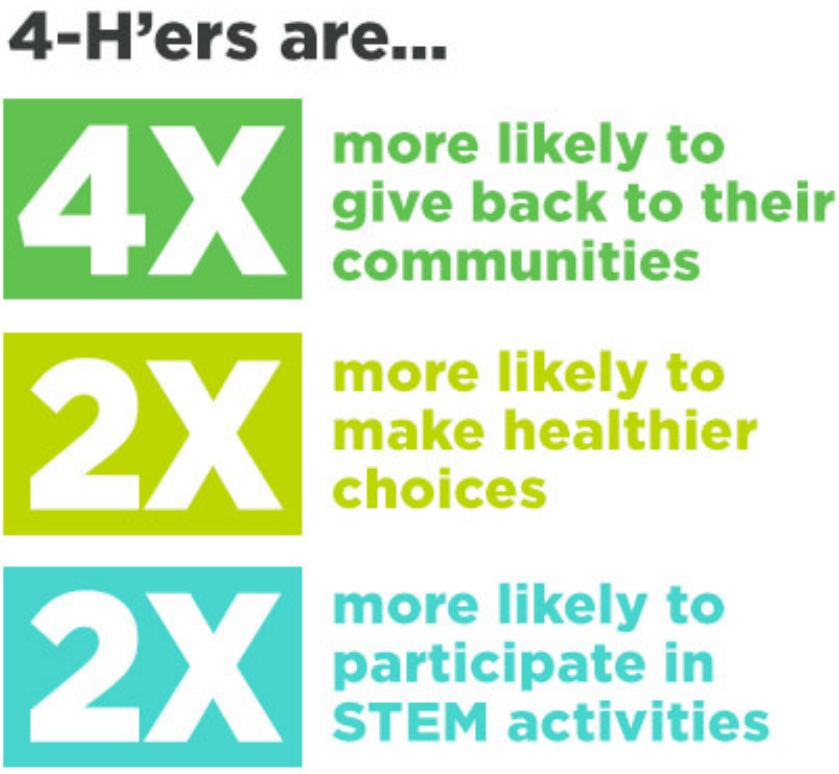
Discover your family history as you go on a treasure hunt for information. The records you create will last a lifetime.

PASSPORT TO THE WORLD

We're part of a big world. Explore new cultures from anywhere you choose, even different cultures right here in the United States

Youth will study a country's government, agriculture, housing, and industry while exploring cultures through food, clothing, music, and crafts.

Members will gain self-awareness, explore beliefs and views of others, develop skills for engaging others who are different from themselves, and become inspired to continue their journey of cultural awareness.



CREATIVE ARTS

COMMUNICATIONS | CREATIVE WRITING | JOURNALISM | PUBLIC SPEAKING | PHOTOGRAPHY | THEATER ARTS | VIDEOGRAPHY | VISUAL ARTS

COMMUNICATIONS

Effective communication drives all aspects of day-to-day life. You'll learn how we communicate, learn different modes of communications, and strengthen your own communication skills. Learn active listening, conflict resolution, social media, and digital storytelling, among other skills

- In level 1, learn about active learning, communication preferences, aggressive communication, visual aids, making introductions, and letter writing
- In level 2, learn about conflict resolution, communicating in social media, understanding cultural differences, writing press releases and speeches, and working in communication careers.
- In level 3, learn about electronic communication, evaluate advertisements, write resumes and cover letters, and become a digital storyteller.

CREATIVE WRITING

Find the writer in you! Find inspiration for writing, develop a theme, create a plot using SWBS, and develop main characters.

JOURNALISM

Learn the different types of news, explore careers in journalism, gather news and write different kinds of news stories, and compare the difference between opinion pieces, photojournalism, and news stories.

PUBLIC SPEAKING

Youth learn to speak with confidence. The introductory manual is intended for youth with little or no public speaking experience. More advanced speakers may wish to download the advanced guides.

PHOTOGRAPHY

From learning about camera equipment to capturing great images and sharing what you have learned with others, you are bound to love photography!

- In level 1, practice techniques for taking quality photographs. Learn about lighting, interesting backgrounds, and photo composition
- In level 2, learn about shutter speed and f-stops, use special effects in photos, compose photos using the "rule of thirds," and take photos from different angles.
- In level 3, experiment with wide angle and telephoto lenses, create different lens filters, use a light meter, and use exposure to create a mood and tell a story.

THEATRE ARTS

Theatre Arts opens the world of theatre to youth with activities in communication, improvisation, pantomime, script writing, cultural and historical influences, stage design, and costume design.

- In level 1, express yourself through movement, voice, speech, and characterization. Create and present a play, or do improvisation, pantomime, monologs, or clowning.

- In level 2, design costumes and stage sets, create sound effects, apply makeup for a character, and experiment with lighting.

VIDEOGRAPHY

The video project exposes youth to filmmaking, digital storytelling, and videography through workshop modules that assist youth with making their own films.

VISUAL ARTS

Do you want to express yourself, be creative, or make an impression? will get to work with paint, chalk, metal, wood, food, scrapbooking, paper, computers, and much more.

Chalk, Carbon & Pigment

Demonstrate and master techniques using acrylics, oil, watercolors, pencil, or chalk. Create dry point etching or make a wood block stamp.

Clay

Creativity is the key when working with clay. Learn to mold, shape, and see an idea become reality before your eyes.

Computer Generated Art

In this project, your computer is the medium you use to create art. Computer generated art refers to any form of digital imagery or graphic art that is produced with the aid of a computer.

Fiber

Explore different fiber arts as you learn to use natural materials and apply principles of design in a variety of finished products. Explore the urban art using duct tape. Duct tape is a fibrous material, so duct tape creations are part of the fiber project.

Food Decorating

Practice simple decorating techniques as you decorate cookies, cupcakes, and cakes. As you advance, expand to working with stacked or tiered cakes

Glass & Plastic

You may think of glass as being a medium; however, glass comes in many forms, some more robust than others. Members can create stained glass art using the copper foil method or use heat to reshape existing glass.

Heritage Arts

Heritage arts are traditional crafts learned from another person or from a pattern. Some examples include cross-stitch, knitting, crocheting, needlepoint, embroidery, macramé, basket making, candles, pysanki, leather, handmade dolls, costumes, felting, quilting, or making candles.

Leather

Artistic work using leather comes in many forms. To some, it is creating delicate leather jewelry pieces, while others may work with heavy leather, carving and tooling a saddle.

Metal

Metal art includes any original item made of metal such as sculpture, tin punch, engraved metal, and jewelry. Items for industrial use, such as tools or shop items, are not considered part of this Visual Arts project. Metal items created using laser cutting programs/devices are part of the Computer-Generated Art project.

Nature

Take a walk outside and you will see artistic elements at every turn. Nature provides the medium for art in this project. Learn to make original item made of natural material such as wreaths, cornhusk dolls, etc.

Paper

Members explore multiple design elements of paper art, including origami and card making. Paper art associated with creation of a scrapbook aligns with the Scrapbooking project. All other paper arts align with the Paper project.

Quilting

Quilting is an art form that has been a part of American culture for centuries. Those enrolling in this project should already have some sewing experience. You'll learn basic quilting and piecing techniques; selecting appropriate fabrics; quilting equipment; options for finishing quilts, tie quilts, bindings, and machine quilting; and exploring the unique patterns and history associated with the art of quilting.

Scrapbooking

Scrapbooking preserves happy memories of important days. Beginning members will learn to create a layout and use simple embellishments. Advanced users learn to use die cuts, stamps, fiber, wire, and buttons to personalize your pages.

3-Dimensional Mixed Media

Creating free-standing art allows your products to be seen from all sides. The piece includes at least three different medium, with no one medium making up more than 40 percent of the item.

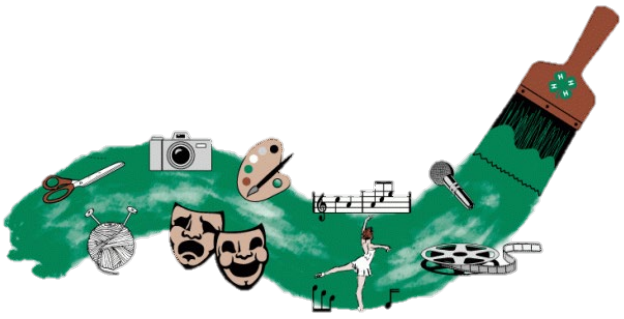
Wood

Wood carving, sculptures, collages, and wood burning are a few of items included in this project. The focus of this project is art.

Clothing & Textiles

There are two areas of clothing projects: construction and shopping. Learn how Science, Technology, Engineering, Art, and Math (STEAM) are needed to create textile products.

- In level 1, learn about sewing notions, sewing machines, color, body types, fabrics, and basic sewing skills.
- In level 2, learn how to fit patterns; sew with different fabrics; test fabrics; sew darts and curves; make buttonholes; and insert zippers, interfacing, and pockets.
- In level 3, learn to sew with sergers, use pressing tools, care for fabric, insert a lining, sew with specialty fabrics, and practice advanced techniques.
- Shopping activities include creating your own style, determining lines and color that flatter your shape, taking a clothing inventory, recycling garments into new items, and caring for clothes.



ENVIRONMENTAL SCIENCES

ENTOMOLOGY | FORESTRY | GEOLOGY | ENVIRONMENT | NATURAL RESOURCES | OUTDOOR LIVING | SPORTFSISHING | WILDLIFE |

ENTOMOLOGY

Nearly three-fourths of all animals are insects or their relatives. There are nearly one million species of insects, and they impact our lives daily. They compete with us for food, they can carry diseases, and they impact our renewable resources affecting our economy. Insects are major benefactors too, controlling other insect pests, pollinating a wide variety of crops, and recycling organic matter.

Entomology

- In level 1, you may build a compound eye to see how an insect sees, identify insects, use a pitfall trap to collect insects, and observe insect habits.
- In level 2, you may make an insect collection tool kit, make insect traps and baits, create a spreading board, and investigate invasive species.
- In level 3, use the scientific method to investigate insects, create a dichotomous key, measure insect diversity, and experiment with meal worms.

Beekeeping

- In level 1, learn basic beekeeping facts, such as species of bees and the honey they produce, types of plants that attract bees, and equipment used by beekeepers.
- In level 2, learn to manage a colony of bees and care for their beehive. Learn basic beekeeping operations which produce extracted, chunk, or cut comb honey.
- This project is for youth who are experienced and knowledgeable in the basic care of a beehive. In level 3, learn to manage honeybee colonies, increase the number of colonies by splitting colonies, care for queens, troubleshoot risks to colonies, and use bees in pollination

FORESTY

Learn about trees, forests, forest ecology, and human reliance on forests. Discover forest resources near home and around the world.

- In Level 1, learn to identify types of forests, trees, and forest products; learn to tell the age of trees; learn about transpiration; and learn to classify types of trees.
- In Level 2, learn how trees absorb water and nutrients, learn the parts of a leaf, decode a tree's rings, and identify tree diseases.
- In Level 3, learn to use a tree key, identify trees by their bark, explore fruits from flowering trees, and identify how different cultures use forests.

GEOLOGY

In this project, learn the difference between rocks and minerals, identify fossils, describe, and identify rocks, understand stages of the rock cycle, and use the scientific method to solve problems.

EXPLORING THE ENVIRONMENT

- In level 1, explore natural and manmade environments, learn how we affect the environment, and solve environmental problems.
- In level 2, learn how to be good stewards at home, school, and community; investigate greenhouse effect on living organisms; reduce and manage waste at home; and calculate your ecological footprint.

NATURAL RESOURCES

- In level 1, classify animals as domestic or wildlife, build a miniature ecosystem, build an indoor wildlife habitat, and do a splash erosion experiment.
- In level 2, make a compost column, develop habitat improvement plan, interview a water quality expert, and conduct a soil percolation test.
- In level 3, conduct a nature hike, design a landscape using trees, make a video on a natural resource topic, and interview someone with a natural resources career.

OUTDOOR ADVENTURES

- level 1, pack a backpack and take a day hike, choose clothes for hikes, assemble a first aid kit, learn about "leave no trace" ethics, and identify hazardous weather situations.
- In level 2, learn to purify water, tie rope knots, plan a menu, select a camp stove, and select a camp site.
- In level 3, pack a backpack and tent, plan food supplies, use a map and compass, develop an emergency procedure, and adopt "Leave No Trace" principles.

SPORT FISHING

- In level 1, tie fish knots, make a lure, organize a fishing tackle box, identify types of fish in your area, and identify fish parts.
- In level 2, practice casting, learn state fishing regulations, learn what attracts fish, and make your own fishing tackle.
- In level 3, clean your fishing reel, make artificial lures, refurbish old equipment, and build a kick net.

WILDLIFE

- In level 1, identify species of wildlife, match wildlife to their habitats, and observe behavior.
- In level 2, identify wildlife population changes, identify animals by their body parts, and learn about migration.
- In level 3, consider the implications of wildlife on farmers, teachers, and legislators while you consider a wildlife-related career and advance education.

FOOD SYSTEMS

CROPS | HORTICULTURE | PLANTS & SOILS

CROPS

Take a trip anywhere across New York and you'll see thousands of acres of corn, soybeans, and small grains. This project prepares you for what it takes to feed the world. Test germination rates, study seed selection and seasonal pests, and identify plant diseases and weeds.

Corn

Learn to test corn germination, study growing degree-days, experiment with soil tilth, manage pests, calculate drying time, cross-pollinate plants, and determine harvest losses.

Small Grains

Learn to select seed varieties, understand stages of plant development, germinate seeds, recognize and manage pests, determine pesticide risks, take soil samples, study costs and prices, and recognize disease.

Soybeans

Learn to select and germinate seeds, experiment with planting depth, study disease-resistant factors, explore careers related to crops and soils, and identify pests and diseases.

HORTICULTURE

Horticulture is the science of growing living things, such as fruits, flowers, vegetables, and ornamental plants. There are two divisions: Flowers and Vegetables.

Floriculture

- In level 1, learn to plant a cutting garden; grow flowers from seeds, bulbs, and transplants; identify plant parts; and create floral design
- In level 2, learn to plant and grow a theme garden, care for houseplants, experiment with growing mediums, and dry flowers.
- In level 3, learn to design a garden planter, grow plants from cuttings, make floral designs, make wearable flowers, and experiment with drying methods.
- In level 4, learn to design all-season gardens, plan a floral business, force bulb flowers, create a bridal bouquet, and explore career and community service opportunities.

Vegetable Gardening

- In level 1, learn to plan and plant a garden, grow plants from roots, make a rain gauge, and harvest vegetables.
- In level 2, learn to start seeds indoors, understand how plants respond to light, grow new plants from plant parts, and make a worm box.
- In level 3, learn to test and improve soil, extend growing seasons, cross pollinate flowers, dry herbs, and pickle vegetables.
- In level 4, learn to double crop, learn about plant genetics, practice integrated pest management, and start a plant business

PLANT & SOIL SCIENCE

It's more than just dirt. Soil gives us life and food. Find out about soil, insects, and how they affect the crops we grow and the food we eat.

Cover Crops

Investigate new planting processes, explore genetic modification, and develop new products to learn how cover crops can benefit agriculture and the environment.

Plants & Soils

In level 1, Collect soil and discover what animal life is present, learn how plants prevent soil erosion, conduct soil tests, and compare how soil types affect growth.

In level 2, Identify stage of plant life cycles, recognize plant parts, experiment with seed germination methods, and propagate plants.

In level 3, Learn how plants compete for air, water, light, and nutrients; demonstrate the importance of soil nutrients; learn how plants adapt to different light levels; and understand seeds and planting depths.

HEALTHY LIVING & NUTRITION

CHILD DEVELOPMENT | FOOD NUTRITION | FOOD SCIENCE | PRESERVATION | HEALTH

CHILD DEVELOPMENT

Learn about careers in the child development field while you learn best practices for caring and working with children.

Understand how kids grow while you learn safe ways to care for children. Explore topics like safety, health, nutrition, and making age-appropriate choices to engage youth.

FOOD & NUTRITION

4-H offers learning opportunities and resources that help kids make healthy food choices and develop their food purchasing and preparation skills.

Cooking

- In level 1, learn the basics of cooking, conduct food science experiments, prepare classic 4-H recipes, and practice food and kitchen safety.
- In level 2, learn to prevent foodborne illness, conduct food science experiments, prepare recipes from each food group, and use equipment to prepare food.
- In level 3, learn to prepare food for a party, make yeast breads and rolls, bake shortened cakes, and prepare food on a grill.
- In level 4, learn to prepare ethnic foods, bake flatbreads and ethnic breads, make candy, bake pastries and pies, bake foam cakes, use dry– and moist-heating cooking methods, cook with herbs and spices, and prepare celebration meals.

Food Science

- In level 1, explore the secrets of baking, experiment with leavening agents, and experiment with gluten.
- In level 2, explore protein chemistry, learn how eggs are used in food, learn how to make milk into cheese, and experiment with protein foods.
- In level 3, explore the mysteries of fruits and vegetables, prepare attractive food presentations, and experiment with taste and texture.
- In level 4, explore a career as a food scientist, create new foods, and experiment with crystallization.

Sports Nutrition

Eating well and exercising daily are keys to a healthy life. Whether you are competing or not, learn to balance the calories you eat with the calories you burn and understand the importance of hydration.

Food Preservation

Preserving your own garden produce can help extend your family's food budget while guaranteeing your food is healthy and safe. You can choose from several preservation methods: canning fruits and vegetables; making jams, jellies, and preserves; freezing fruit and vegetables; drying fruits; and making pickles.

HEALTH

Being healthy and keeping fit are what this project area is all about. 4-H offers learning opportunities and resources that help you make healthy choices, create plans for fitness, and increase knowledge of personal safety.

- In level 1, practice first aid skills, learn to help someone who is choking, make a first aid kit, and interview medical professionals.
- In level 2, identify personal areas of strength, teach others about personal hygiene, and plan physical activities.
- In level 3, design a personal fitness plan, create a fitness file, and manage your personal fitness.

STEM: SCIENCE, TECHNOLOGY, ENGINEERING, MATH

AEROSPACE | BICYCLE | CLOTHING | COMPUTER SCIENCE | ELECTRICITY | ROBOTICS SMALL ENGINES | MAKER | ESPORTS | UAV | TRACTOR | WELDING | WOODWORKING

AEROSPACE

Whether you're flying kites, hot air balloons, airplanes, or rockets, it's all about moving through air and space.

- In level 1, build and launch a rocket, build and fly a model plane, learn about types of aircraft, and make a paper helicopter.
- In level 2, experiment with various gliders, make a fighter kite, learn about remote-control flights, and build and launch a balloon rocket.
- In level 3, construct an altitude tracker, explore pilot certification, plan a flight route, and build a box kite.

BICYCLES

Ride for transportation, exercise, or competition! Learn the essentials for getting started safely.

- In level 1, learn to identify bike parts; check tires, brakes, and chains; understand traffic signs; and select safety equipment.
- In level 2, learn to fix a flat tire, do maintenance on a bike chain, shift gears efficiently, and perform safety maneuvers.

COMPUTER SCIENCE

Learn the fundamental principles of computer programming while you explore and create.

Visual-Based Programming

Discover the basic elements of programming within the Google CS First and other VPL environments. Learn fundamental concepts about sequence, iteration, conditionals, variables, modularization, and interfacing with external hardware.

Text-Based Programming

Discover the basic elements of programming within text-based programming languages such as Java, Python, and C. In this project, build on fundamental concepts such as, sequence, iteration, conditionals, variables, modularization, machine coding, SQL, HTML, and other text-based programming languages.

ELECTRICITY

Look around you and no matter which direction you turn, you will see electricity at work! It might be a clock on the wall, your computer showing a video, or the microwave preparing your dinner.

- In level 1, learn to make a flashlight, switch, and simple circuit; find out about magnetism and make a compass; and build an electromagnet, galvanometer, or motor.
- In level 2, learn about Ohm's law; use a volt-ohm meter; and build a parallel or series circuit, a 3-way switch, or a burglar alarm.
- In level 3, assemble an electric tool kit, measure electric usage of appliances, replace electrical switches, and determine electrical loads.
- In level 4, learn about electronics, diodes, transistors, LEDs, photocells, resistors, and capacitors. You can also build an amplifier.

ROBOTICS

Robots do surgery, build cars, and assist us with our complex modern lives. This project is all about these amazing machines and learning to build and program your own robots to solve issues you face.

- In level 1, use LEGO® EV3 technology to learn what a robot is, how to build one, and how to program it.
- In level 2, use LEGO® EV3 technology to learn new robot configurations and programming challenges.
- In level 3, learn to program robots using free range open-source hardware and software. Learn how to build and program a robot, understand difference of closed and open-source design, and configure robots.

Junk Drawer Robotics

- In level 1, build robots from everyday items without using computers. Explore robot arms, pneumatics, arm designs, and three-dimensional space.
- In level 2, build robots from everyday items without using computers. Explore robots that move with legs and wheels and move underwater.
- In level 3, build robots from everyday items without using computers. Explore sensors, analog, and digital systems

SMALL ENGINES

Youth who love figuring out how things work will enjoy the 4-H Small Engines projects. Get hands-on experiences that will help you understand how machines, such as lawn mowers and model airplanes, operate and how to keep them running.

- In level 1, identify parts of an engine, identify different oil grades, experiment on engine systems, and learn to safely start a small engine.
- In level 2, distinguish between engine types, use engine specialty tools, make carburetor adjustments, and prepare a lawn mower for storage.
- In level 3, learn to identify engine problems by sound; take engines apart and reassemble; remove, sharpen, and replace a mower blade; and research a career related to small engines.

TECHNOLOGIES

4-H is taking emerging technologies by storm. We've added projects which will spark the imagination of builders, makers, and tinkerers of all ages.

Maker

Learn about the Maker Movement and develop skills in 3D design, electronics, and other rapid prototyping techniques that will aid you in making gadgets and devices from scratch.

E-Sports

Learn about the exciting field of competitive electronic sports, also known as esports, in this cutting-edge project area. Learn about the PC and console gaming industries, the software and hardware involved, as well as the fields of competitive and professional gaming. Be a part of the pilot group that helps take esports to the next level, and usher in a new era of 4-H projects.

Drones

Learn how UAV/UAS/Drones work, fundamental aerospace principles, commercial uses of drones, FAA regulations, and basic UAV operation

TRACTORS

Tractors are an essential part of agriculture. Learn about safety, maintenance, parts of the tractor, fuels, engines, hydraulics, and electrical systems.

- In level 1, learn the parts of a tractor tractor maintenance, and how to avoid machine hazards.
- In level 2, learn farm and tractor safety, different fuels, and engine cooling systems.
- In level 3, learn how to safely connec PTO and hydraulics, increase your knowledge of farm safety, and learn about different oil systems.
- In level 4, learn the mechanics and maintenance of an engine, learn safety with chemicals, and advance your skill in operational systems and equipment.

WELDING

Welding can bring personal satisfaction as you create items which make your life better. Industrial items created should be entered in the Welding exhibit class. Artistic items created should be entered in the Visual Arts Metal project.

The welding project is for youth in grades 7 and higher. Learn about welding equipment, electrodes, and basic arc welding processes.

WOODWORKING

The woodworking project teaches the full scope of constructing a wood piece from design to completion. Start with a piece of wood and end up with a handcrafted item.

- In level 1, learn the basics of woodworking, use a hammer and hand tools, apply glue, and select wood finishes.
- In level 2, learn wood species, select wood types, use a combination square, cut on an angle, and sand.
- In level 3, learn about hinges, clamps, joints, stains, angles, and T-bevels.

4-H STEM Challenge