

The **4-H Youth Experiences in Science** (YES!) Project provides high-quality children's science education projects for after-school settings. These easily adaptable activities make science fun and exciting. Each activity guide includes the time required for the activity, suggested grouping of participants, materials needed, preparation information, activity directions, and discussion directions. An Activity Booklet, designed for parents and children to use at home to continue the science fun, follows each guide.

All YES Units cover Science Literacy for **Audience:** Youth ages 5-8

YES2 - Snail Trails: The Adventures of Helix Aspersa (2000)

YES3 - Magic Bubbles (2000)

YES5 - Kitchen Science (2000)

YES6 - Wonderful Worms (2000)

Rabbits: From the Animal's Point of View (Modules 1 through 5) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

This curriculum introduces youth to rabbits, their behavior, nutritional and housing needs, and appropriate care through hands-on, inquiry-based activities that follow the experiential learning cycle.

Junk Drawer Robotics – California State Standards

5th grade: Investigation and Experimentation 6a, 6b, 6c, 6e, 6f, 6g, 6h, 6i

6th grade: Investigation and Experimentation 7b, 7c, 7d, 7e

7th grade: Physical Principles in Living Systems 6I

Investigation and Experimentation 7a, 7b, 7c, 7d, 7e

8th grade: Density and Buoyancy 8c, 8d

Investigation and Experimentation 9a, 9b

Veterinary Science (Modules 1 through 11) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning. Modules include: 1. Behaving like Animals, 2. Fur, Feathers, Skin and Scales, 3. The Eyes Have it, 4. You've Got to Have Heart, 5. Dem Bones, Dem Bones, 6. Food in, Waste Out, 7. Is your Bird Feeling Blue?, 8. Is your Dog Feeling Down?, 9. Is Your Goat Feeling Green?, 10. Is Your Horse Healthy?, 11. Is Your Snake Sick?

4-H Filmmaking Studio (2009)

Topic Area: Technology | **Audience:** Youth grades 8-12

The 4-H Filmmaking Studio and Workshop will assist you with making your own film. Take your time and view each module. Practice with your camera, tell your story, and upload your film to share with others. This workshop was developed by 4-H in collaboration with Montana State University and TerraPod.

4-H SET Activity Guide (2009)

Topic Area: Science Literacy | **Audience:** Youth ages 5-19

4-H science, engineering and technology (SET) activities can enhance your club or project meetings! This guide provides fast and fun science and engineering activities prepared to be SET-Ready. The activities allow youth to have hands-on experiences with a variety of science and engineering topics.

Rabbits: From the Animal's Point of View (Modules 1 through 5) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

Wild rabbits are found on every continent except Antarctica. Domesticated rabbits come in many breeds that vary in shape, size, and color. But what does it mean to be a rabbit? This curriculum introduces youth to rabbits, their behavior, nutritional and housing needs, and appropriate care through hands-on, inquiry-based activities that follow the experiential learning cycle.

Rabbits: From the Animal's Point of View (Modules 1: What Does It Mean to Be a Rabbit?) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

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Rabbits: From the Animal's Point of View (Modules 2: Rabbit Housing: Designing a Rabbit Habitat) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

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Rabbits: From the Animal's Point of View (Modules 3: Rabbit Nutrition: What You Need to Know) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

Wild rabbits are found on every continent except Antarctica. Domesticated rabbits come in many breeds that vary in shape, size, and color. But what does it mean to be a rabbit? This curriculum introduces youth to rabbits, their behavior, nutritional and housing needs, and appropriate care through hands-on, inquiry-based activities that follow the experiential learning cycle.

Rabbits: From the Animal's Point of View (Modules 4: Rabbit Disease: What You Need to Know) (2009) Topic Area: **Animal Science** | Audience: **Youth grades 3-6**

Wild rabbits are found on every continent except Antarctica. Domesticated rabbits come in many breeds that vary in shape, size, and color. But what does it mean to be a rabbit? This curriculum introduces youth to rabbits, their behavior, nutritional and housing needs, and appropriate care through hands-on, inquiry-based activities that follow the experiential learning cycle.

Rabbits: From the Animal's Point of View (Modules 5: Rabbit Care and Responsibility) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

Wild rabbits are found on every continent except Antarctica. Domesticated rabbits come in many breeds that vary in shape, size, and color. But what does it mean to be a rabbit? This curriculum introduces youth to rabbits, their behavior, nutritional and housing needs, and appropriate care through hands-on, inquiry-based activities that follow the experiential learning cycle.

SERIES - It Came From Planted Earth (2006)

Topic Area: Plant Science | **Audience:** Youth grades 4 - 6

"It Came From Planted Earth" provides activities using the scientific process and discussions to gain a better understanding of agriculture. It has been extensively pilot-tested as a useful tool in helping elementary students to begin to gain knowledge about agriculture and its application in the real world.

Each session provides hands on activities for youth to explore agriculture from the beginning seeds to the foods we eat to the importance of water and soil to production. Further exploration is given about current issues in agriculture from biotechnology to integrated pest management to urban-rural interface.

The session outline provides an overall purpose and background material. Then, each activity states an objective, materials that will be needed, getting ready, suggested grouping, action steps and sciencing questions. Youth are encouraged to further explore their world with hands-on experiments and community action.

SERIES - Nature's Partners: Pollinator Protection (2007)

Topic Area: Environmental Education | **Audience:** Youth grades 4-6

The Nature's Partners curriculum is just one step toward increasing the public's awareness and sense of responsibility that are essential to a successful conservation program for pollinators. This introductory curriculum focuses on two of the many pollinators as a means for teaching basic concepts about the process and importance of pollination. **Bees** were chosen due to their primary importance among pollinators and **butterflies** were chosen because of the interesting and distinctive stages of their life cycle and their intrinsic appeal.

SERIES - Pond Mapping (2005)

Topic Area: Environmental Education | **Audience:** Teens lead activities with youth grades 3-6

The activities in Pond Mapping are designed to be led by teens with youth as participants that are interested in exploring and learning more about their natural environment. Working together, teens and youth learn to make and use simple surveying equipment to map the bottom contours of a small body of water. Participants exercise their presentation skills by creating a product of their own design to share their research findings with local community groups.

SERIES - Ridges to Rivers: Watershed Explorations Elementary (1999)

Topic Area: Environmental Education | **Audience:** Youth grades 4 - 6

Hands-on activities designed to teach young people about watershed concepts. Each curriculum features activities that develop an awareness of land as a watershed and encourage exploration of erosion, surface water pollution, movement and contamination of groundwater, and what kids can do to help. **Elementary:** For ages 9-11. Hands-on activities on erosion, making soil, life underground, aquifer in a cup, and creek bugs!

SERIES - Ridges to Rivers: Watershed Explorations High School (1999)

Topic Area: Environmental Education | **Audience:** Youth grades 10 - 12

Hands-on activities designed to teach young people about watershed concepts. Each curriculum features activities that develop an awareness of land as a watershed and encourage exploration of erosion, surface water pollution, movement and contamination of groundwater, and what kids can do to help. **High School:** A guide to developing an independent science project around watershed water quality issues. Ideas for investigating surface water creek chemistry, creek habitat, groundwater, and sustainable land use

SERIES - Ridges to Rivers: Watershed Explorations Junior High (1999)

Topic Area: Environmental Education | **Audience:** Youth grades 7 - 9

Hands-on activities designed to teach young people about watershed concepts. Each curriculum features activities that develop an awareness of land as a watershed and encourage exploration of erosion, surface water pollution, movement and contamination of groundwater, and what kids can do to help. **Junior High:** For ages 12-15. Hands-on activities on erosion, topographic maps, groundwater models, and creek creatures!

SERIES - Ridges to Rivers: Watershed Explorations Model Construction Manual (1999)

Topic Area: Environmental Education | **Audience:** Youth grades 4 - 12

Hands-on activities designed to teach young people about watershed concepts. Each curriculum features activities that develop an awareness of land as a watershed and encourage exploration of erosion, surface water pollution, movement and contamination of groundwater, and what kids can do to help. **Watershed Model Construction Manual:** Learn how to build large, scale-model, concrete relief maps of your own local watershed that you can jump around on! Use them to teach about local geography and water pollution. Kids love them ... and kids build them!

YES -Youth Experiences in Science (All Modules) (2000)

Topic Area: Science Literacy | **Audience:** Youth ages 5-8

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YES1 -Teen Recruitment and Training Guide (2000)

Topic Area: Science Literacy | **Audience:** Youth ages 5-8

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YES2 - Snail Trails: The Adventures of Helix Aspersa (2000)

Topic Area: Science Literacy | **Audience:** Youth ages 5-8

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YES3 - Magic Bubbles (2000)

Topic Area: Science Literacy | **Audience:** Youth ages 5-8

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YES4 - The Collection Connection (2000)

Topic Area: Science Literacy | **Audience:** Youth ages 5-8

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YES5 - Kitchen Science (2000)

Topic Area: Science Literacy | **Audience:** Youth ages 5-8

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YES6 - Wonderful Worms (2000) **Topic Area:** Science Literacy | **Audience:** Youth ages 5-8

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YES7 - Wee-cyclo-saur-us (2000)

Topic Area: Science Literacy | **Audience:** Youth ages 5-8

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YES8 - CLUE: Children Looking Undercover for Energy (2000)

Topic Area: Science Literacy | **Audience:** Youth ages 5-8

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Youth Development through Veterinary Science (Module 1: Behaving Like Animals) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 10: Is Your Horse Healthy?) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 11: Is Your Snake Sick?) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 2: Fur, Feathres, Skin and Scales) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 3: The Eyes Have It!) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 4: You've Got To Have Heart) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 5: Dem Bones, Dem Bones) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 6: Food In, Waste Out) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 7: Is Your Bird Feeling Blue?) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 8: Is Your Dog Feeling Down?) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Youth Development through Veterinary Science (Module 9: Is Your Goat Feeling Green?) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

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Youth Development through Veterinary Science (Modules 1 through 11) (2009)

Topic Area: Animal Science | **Audience:** Youth grades 3-6

The Youth Development through Veterinary Science Series is a 4-H Youth Development curriculum that introduces youth, grades 3-6, to many aspects of veterinary science through experiential and inquiry-based learning.

Modules include: 1. Behaving like Animals, 2. Fur, Feathers, Skin and Scales, 3. The Eyes Have it, 4. You've Got to Have Heart, 5. Dem Bones, Dem Bones, 6. Food in, Waste Out, 7. Is your Bird Feeling Blue?, 8. Is your Dog Feeling Down?, 9. Is Your Goat Feeling Green?, 10. Is Your Horse Healthy?, 11. Is Your Snake Sick?

Also SERIES-Earthquakes in the ANR catalog, or the National 4-H Power of the Wind.

TechXcite: Discover Engineering developed at Duke University's Pratt School of Engineering. This curriculum is being developed as part of a National Science Foundation sponsored program and will be utilized in 4-H supported after-school programs across the country.
<http://techxcite.pratt.duke.edu/curriculum/index.php>

Kits are designed for **Middle School** Students and include Instructors Guide, Youth Handouts & Materials Tub

"Your TV Remote" – Youth construct a sound breadboard to connect a music player directly to a speaker. They build a circuit to amplify the sound and then an infrared receiver to test it with a TV remote. The final activity combines all the work to see music transmitted wirelessly. (5 Activity sessions – 45 minutes in length each)

"Bionic Arm" – Youth explore tasks that need an arm; then build a hydraulic & pneumatic system using oral syringes and plastic tubing to move a prosthetic arm. Next they build a circuit with a simple buzzer to use as a touch sensor for their prosthetic arm. (4 activities varying in length from 30 to 60 minutes each)

"Rainwater Harvesting" – Youth explore the magic of surface tension and capillary action and learn where it is found in nature. Then they design and build a roof to collect rainwater and a water filter and test how effective it is in filtering water samples. (4 Activity sessions varying from 45 to 90 minutes each)

"Cooking with the Sun: Solar Oven" – Youth explore factors affecting the amount of heat absorbed or reflected by objects. They locate the sun using solar angle and solar azimuth. They learn about insulation and build a device to determine if a material is a good insulator. Lastly they build a solar oven and cook food in it. (4 Activity sessions varying in length from 20 – 90 minutes)

"Racing with the Sun: Solar Car" - Youth are introduced to ways in which solar panels may be used to generate electricity through the design of a solar car. In this module, kids explore how solar panels generate electricity in different lights by measuring the maximum voltage they can create. Then, they apply this knowledge in building and optimizing a small solar car. (3 activities varying in length from 45 to 90 minutes each)