Are You Into It?

Are you fascinated by how living systems work and the chemistry in the world around us? It is all about biological and chemical sciences in this project. Whether you want to learn about life and the chemistry of your world in agriculture, medicine, biotechnology, genetics, crime scene investigation, or engineering, you can discover the secrets through this project.

- Develop an interest, knowledge, and skills related to biological and chemical sciences
- Develop problem solving and logical reasoning skills
- Improve communication and teamwork skills by working the way scientists and engineers do – in teams
- Develop responsible attitudes about science and how science relates to our everyday world and people’s lives
- Gain experience in problem solving and decision making using science process skills

Here’s what you can do all year!

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**Starting Out Basic / Level 1**
- Discover what chemistry and biology are all about, from plant and animal science to medical to chemical engineering
- Learn how to control parasites in your animal
- Learn about biosecurity systems in the U.S.
- Discover how chemistry is used to solve crimes

**Learning More Intermediate / Level 2**
- Have fun with chemistry and biology! Do experiments, learn about safely, discover the cool things technologies make possible.
- Learn about diseases and environmental controls
- Learn about garden fertilizer and nutrients plants need to grow

**Expanding Horizons Advanced / Level 3**
- Design your own experiment and enter your results in science and technology fairs
- Learn about DNA and genetics
- Learn about breeding and reproduction techniques

Step It Up!

Pass it on! Now that you know how, share it with others. Here are ideas to get you started.

**Communication**
- Enter a science & technology fair
- Create an exhibit for your county fair or do an educational presentation

**Citizenship**
- Present information about hand washing and germs to a local daycare class
- Organize an event to using activities from the Forensic Biotechnology Guide (see More Resources) to teach to teach younger children how biology and chemistry are used in crime scene investigation.

**Leadership**
- Organize a field trip to a local lab, business, or industry to learn how science, engineering, and technology inform what they do
- Attend 4-H youth conference

Learn more at www.extension.iastate.edu/4h/projects/biological-chemical-sciences or contact your county ISU Extension Office.
Take Biological & Chemical Sciences further!

Here are other opportunities to explore the biological & chemical sciences:

- Contact your County Extension Office for local workshops, activities, camps, and events on biological and chemical sciences (http://www.extension.iastate.edu/4h/contactus/countystaff.htm)
- Check out the Iowa 4-H Center for camps focused on biological and chemical sciences (http://www.extension.iastate.edu/4h/center)
- Are you in high school? Attend Iowa 4-H Youth Conference and participate in workshops, motivational speakers and a community service project, bringing ideas back to your community (http://www.extension.iastate.edu/4h/StateConference/)
- Is it fair time? Consider taking an exhibit, a piece of your project learning to the fair for judging and to show off your learning. It might get selected to go to the Iowa State Fair. (http://www.extension.iastate.edu/4h/statefair)
- Enter your science experiment or engineering design in the a local science fair or the State Science + Technology Fair of Iowa (http://www.sciencefairofiowa.org/)
- Interested in a college education in the area of biological or chemical sciences? Schedule a visit with Iowa State University to explore those majors. (www.iastate.edu)

Resources

4-H Resources

- National 4-H Agriscience activities http://www.4-h.org/resource-library/curriculum/agriscience/
- National 4-H biotechnology activities http://www.4-h.org/resource-library/curriculum/agriscience/biotechnology-activities/
- Contact your local Extension Office to find out if biology or chemistry related educational kits, workshops, or activities are available http://www.extension.iastate.edu/content/countystaff

More Resources

- 4-H National Youth Science Day Experiment Archives: 4-H2O, Biofuel Blast, Helpful Hydrogels http://www.4-h.org/4-h-national-youth-science-day/past-experiments-archives/
- ISU Biotechnology Outreach Education Center http://www.biotech.iastate.edu/publications/BOEC/
- Biotechnology Resources for 4-H http://www2.ca.uky.edu/brei/Teach/4-H/Info/Resources.htm

Record Keeping

Find all your record keeping tools at: http://www.extension.iastate.edu/4h/page/record-keeping

- 4-H Yearly Summary (4H 0096)
- Basic 4-H Project Record (4H 0096A)
- Experienced 4-H Project Record (4H 0096B)
- Advanced 4-H Project Record (4H 0096C)
- Recordkeeping Self-Evaluation (4H 98, PDF)

Exhibit Ideas

- Make a poster on how DNA fingerprinting works
- Create a display about a research experiment you conducted and entered in a science fair
- Make a display about potentially toxic interactions between chemicals found in common household cleaners
- Create a body-parts chart for a livestock animal, pet, or human
- Create a working exhibit based on one of the National Youth Science Day Experiments (see More Resources)