



CALIFORNIA 4-H PROJECT SHEET SERIES



4-H Climatology and Climate Science Project



Marianne Bird

Climatology, an Earth science, is the scientific study of long-term average weather and atmospheric conditions. The prevailing weather conditions in specific geographic regions change over years, decades, centuries, and eras, affecting the plants, animals, and other life in the region.

Climate change is an increasingly important topic to study and understand because even small increases in temperature can have big impacts on the planet. In this project, members will learn

- to explore the difference between weather and climate
- to measure average temperature, wind, rainfall, and humidity over time
- to analyze daily weather patterns
- how weather patterns influence plants, animals, humans, and the environment
- how climate is influenced by interactions between sunlight, the ocean, the atmosphere, ice, landforms, and living things
- how the ocean exerts a major influence on climate by absorbing energy from the Sun, releasing it over time, and globally redistributing it through ocean currents
- how human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in climate change
- methods to mitigate climate change or adapt to it

STARTING OUT, BEGINNER

- Measure daily weather, including high and low temperature, wind speed and direction, inches of rainfall, and humidity.
- Talk to a meteorologist and see how they predict weather. Discuss the difference between weather and climate.
- Learn about the forces that affect climate such as sunlight, the ocean, atmosphere, land, and living things.
- Compare the climate in various regions of the Earth.
- Learn about the concepts and terms used in geology, including era and eon.

LEARNING MORE, INTERMEDIATE

- Discuss types of severe weather in your region (e.g., tsunamis, floods, coastal erosion) and how to reduce their impacts.
- Conduct investigations to understand how water absorbs energy.
- Learn about greenhouse gases, where they originate, and how they increase global temperature.
- Plan a [service-learning project](#) to reduce your impacts on land, water, and air.

EXPLORING DEPTH, ADVANCED

- Learn about the factors contributing to historical and current climate change.
- Find and analyze geoscience data to make a forecast of the current rate of regional climate change.
- Interview a climate scientist about their career.
- Plan a service-learning project to mitigate or adapt to climate change.

The activities above are ideas to inspire further project development. This is not a complete list.

Light your spark | Flex your brain | Reach your goals



Expand Your Experiences!

Science, Technology, Engineering, and Mathematics (STEM)

- Facilitate the National Youth Science Day 4-H2O activity with younger youth.
- Determine your carbon footprint and find ways to reduce it.
- Download historical weather data and create graphs of averages over time.

Healthy Living

- Learn about how climate change influences human health and disease.
- Find and share ways for people to reduce their carbon footprint and increase their physical activity at the same time.

Civic Engagement

- Plan a [service-learning project](#) to mitigate carbon emissions.
- Create a survey to assess how other youth feel about climate issues; report out to your club.
- Learn more about renewable energy and advocate for its use.

Leadership

- Become a junior or teen leader.
- Prepare a presentation on climate change and present it to a community group.
- Be a role model in the 5 R's: refusing, reducing, reusing, recycling, and rotting/composting.

College and Career Readiness

- Visit a local college and talk to a climatologist about their research.
- Research colleges and universities to find one that has the majors, minors, and programs to help you become a climatologist.

CONNECTIONS AND EVENTS

Presentation Days — Share what you've learned with others through a presentation.

Field Days — At these events, 4-H members may participate in a variety of contests related to their project area. Contact your county 4-H office to determine additional opportunities, such as a county resource fair.

CURRICULUM

- National 4-H Weather and Climate Science <https://shop4-h.org/products/weather-and-climate-science-level-3>
- Weather and Climate Science Facilitator Guide <https://shop4-h.org/products/weather-and-climate-science-facilitators-guide>
- Maine 4-H Climate Change Toolkit <https://extension.umaine.edu/4h/stem-toolkits/climate-project/>
- 4-H Weather and Climate Youth Learning Lab www.montana.edu/communitydevelopment/youth-climate-education.html

4-H RECORD BOOK

4-H Record Books give members an opportunity to record events and reflect on their experiences. For each project, members document their experiences, learning, and development.

4-H Record Books also teach members record management skills and encourage them to set goals and develop a plan to meet those goals.

RESOURCES

- Climate Change in California Cooperative Extension, <https://ucanr.edu/sites/CalClimateChange/>
- Science & Climate, UC Davis, <https://climatechange.ucdavis.edu/>
- Climate Lab, University of California, www.universityofcalifornia.edu/climate-lab
- Climate Kids, NASA, <https://climatekids.nasa.gov/weather-climate/>
- 4-H Weather and Climate Variability Toolkit, <http://agroclimate.org/wp-content/uploads/2017/04/WeatherAndClimateVariabilityToolkit.pdf>
- Climate Education Resource Collection, NOAA, www.noaa.gov/education/resource-collections/climate-education-resources

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4-H Thriving Model

4-H programs done well help youth thrive. No matter what project or activities are offered, the project leader should help ensure youth engagement with a focus on these three contexts:

FACILITATE YOUTH SPARKS

A spark is something youth are passionate about; it really fires them up and gives them joy and energy. Youth use their spark to make the world a better place.

Sparks create action, provide fuel for growth in knowledge and skills. Sparks grow a young person's networks.

Help youth find how this project may bring them joy, purpose, and direction.

To learn more: <https://tinyurl.com/y2lwct7u>

PROGRAM QUALITY MATTERS

Research shows that youth programs must be done well if they are to make a positive difference in the lives of youth.

Quality programs ensure:

- Physical and psychological safety.
- Appropriate structure.
- Supportive relationships.
- Opportunities to belong.
- Positive social norms.
- Support for mattering.
- Opportunities for skill building.
- Integration of family, school, and community.

To learn more: <https://tinyurl.com/yxg27m3j>

FOSTERING DEVELOPMENTAL RELATIONSHIPS

Caring, supportive adults are clearly connected to positive youth development.

Across the childhood years, youth need different things from adults as they learn, grow, and self-regulate. What should remain constant from all adult volunteers and staff:

- Expressing care through listening, warmth, and dependability.
- Challenging growth by expecting youth to do their best.
- Providing support.
- Sharing power.
- Expanding possibilities.

To learn more: <https://tinyurl.com/y6434ntw>

For Further Information

For more UC ANR publications and products, visit our online catalog at <https://anrcatalog.ucanr.edu/>, call 1-800-994-8849, or write anrcatalog@ucanr.edu.

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Marianne Bird

Author of 4-H Climatology and Climate Science Project Sheet

Steven M. Worker

California 4-H Project Sheet Technical Editors

Nathaniel W. Caeton, 4-H Youth Development Advisor, UC Cooperative Extension, Shasta, Tehama, and Trinity Counties; Steven Worker, 4-H Youth Development Advisor, UC Cooperative Extension, Marin, Napa, and Sonoma Counties.

California 4-H Project Sheet Series Authors

Nathaniel W. Caeton, 4-H Youth Development Advisor, UC Cooperative Extension, Shasta, Tehama, and Trinity Counties; Gemma Miner, 4-H Academic Coordinator for Volunteer Management, UC Cooperative Extension, State 4-H Office; Steven Worker, 4-H Youth Development Advisor, UC Cooperative Extension, Marin, Napa, and Sonoma Counties.

California 4-H Project Sheet Design Team (2011)

Mandi Bottoms; Patricia English; Sharon K. Junge; Gemma Miner; Steven M. Worker.

