



## CALIFORNIA 4-H PROJECT SHEET SERIES

# 4-H Astronomy Project



The night sky holds endless learning opportunities for youth and adults. Since our earliest days on Earth, humans have observed the movements of the Sun, Moon, stars, and other celestial bodies that lie beyond the bounds of Earth's atmosphere.

These observations and subsequent inquiries have led to many advancements in science and the betterment of civilization by helping us understand the world around us. In fact, many explanations of natural phenomena began with astronomical observations. Likewise, many technological advances have come about as a direct result of our drive to explore outer space. In this project, members will learn

- the rich history behind this scientific field
- the role and power of observation in science learning
- how to explore the solar system and Earth's place within it

### STARTING OUT, BEGINNER

- Research the early astronomers. Create a timeline of their activities and discoveries. Share with members of your project.
- Learn about our solar system and the planets in it.
- Draw or build a model of the solar system.
- Learn how telescopes work. What are the differences between a refracting telescope and a reflecting telescope? How are they the same?
- Go online to find a star chart for your area or create your own. Learn how to use it.

### LEARNING MORE, INTERMEDIATE

- Read about the mythology of the constellations. Share your favorite constellation and its mythology with the members of your project.
- Learn about the phases of the Moon. Observe the lunar cycle for a month and create a Moon journal to record your observations. What patterns do you observe?
- Attend a star party or visit a nearby planetarium or observatory during each of the seasons and observe the similarities and differences.

### EXPLORING DEPTH, ADVANCED

- Learn how a radio telescope works. Build your own radio telescope with other members of your project.
- Learn how the stars and constellations are used for navigation. Complete an orienteering course using the sky to guide you.
- Explore the NASA Technology Transfer (T2) Program. Research the history of technologies that are the result of space exploration. Give a presentation on your favorite technology and how it has impacted everyday life.

*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)

- Build your own Galilean telescope.
- Partner with a robotics project to build a Mars rover.
- Discover the many uses that NASA has for Pi and how that relates to astronomy.

### Healthy Living

- Learn about the diet and exercise of astronauts while they are in outer space.
- Explore how scientists are working to grow vegetables and other plants in space.
- Discover how astronauts manage their thoughts and behaviors to help address sleeplessness.

### Civic Engagement

- Learn about light pollution and the efforts of the International Dark-Sky Association.
- Explore the Outer Space Treaty and how it governs our nation's activities in space.
- Discover what the U.S. and other nations are doing to minimize and clean up orbital debris.

### Leadership

- Serve as a junior or teen leader in your 4-H Astronomy Project.
- Organize a star party and invite other 4-H members or members of the community.
- Deliver a presentation on an astronomy-related topic of your choice.

### College and Career Readiness

- Research the types of careers available in the astronomy field and share your findings.
- Visit with a professional astronomer to learn more about their work and career path.
- Meet with a school counselor to learn about the coursework needed for a career in astronomy.

## 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

- Astronomy: It's Out of This World  
<https://ecommons.cornell.edu/handle/1813/3487>
- Discover 4-H Astronomy Clubs  
[https://usu.co1.qualtrics.com/CP/File.php?F=F\\_3BN3EeTHjACS7Gd](https://usu.co1.qualtrics.com/CP/File.php?F=F_3BN3EeTHjACS7Gd)
- Astronomy  
[www.gov.pe.ca/photos/original/4h\\_astronomyAG.pdf](http://www.gov.pe.ca/photos/original/4h_astronomyAG.pdf)  
[www.gov.pe.ca/photos/original/4h\\_astronomyRG.pdf](http://www.gov.pe.ca/photos/original/4h_astronomyRG.pdf)

## 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

- NASA SpacePlace, <https://spaceplace.nasa.gov/>
- The Astronomical League, [www.astroleague.org/](http://www.astroleague.org/)
- International Dark-Sky Association, [www.darksky.org/](http://www.darksky.org/)
- Hubble Space Telescope, <https://hubblesite.org/>
- Astronomy Picture of the Day, <https://apod.nasa.gov/apod/>
- Google Mars, [www.google.com/mars/](http://www.google.com/mars/)
- International Space Station, [www.nasa.gov/mission\\_pages/station/main/index.html](http://www.nasa.gov/mission_pages/station/main/index.html)
- Space.com, [www.space.com](http://www.space.com)

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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>



Marianne Bird

### 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](mailto:anrcatalog@ucanr.edu).

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Publication 8700

ISBN-13: 978-1-62711-177-5

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This publication has been anonymously peer reviewed for technical accuracy by University of California scientists and other qualified professionals. This review process was managed by UC ANR Associate Editor for Human and Community-Youth Development Dorina Espinoza.

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