Muzzle loading is one of the disciplines of the 4-H Shooting Sports program, which covers the fundamentals of shooting and basic firearm safety, while developing self-motivation, self-discipline, and personal responsibility. Learning about muzzle loading offers an opportunity to access the history and technological advances of firearms. From the earliest matchlock and wheellock pistols to today’s in-line rifles, muzzleloaders have seen a long evolution, spanning several centuries.

Although the invention of smokeless powder and self-contained cartridges has rendered them obsolete, muzzleloaders are still embraced by a devoted following of antique firearm collectors, historical reenactors, and even modern hunters. In this project, members will learn

- shooting proficiency
- proper handling of muzzle-loading firearms
- the difference between black powder and smokeless powder
- how to promote the highest standard of safety

**STARTING OUT, BEGINNER**

- Learn and discuss the fundamental rules for safe gun handling.
- Discuss range safety and range etiquette. Learn the rules and policies of the range where your project meets and follow them.
- Discuss the types of personal protective equipment used in shooting and demonstrate proper use of them.
- Learn the types of muzzle-loading firearms and identify their parts.

**LEARNING MORE, INTERMEDIATE**

- Participate in live fire shooting exercises, practicing good form and demonstrating proper safety practices.
- Set a long-term shooting proficiency goal, and several short-term goals to help you reach it.
- Keep a shooting diary to track your progress, and note any thoughts or observations on your shooting experiences.

**EXPLORING DEPTH, ADVANCED**

- Attend a Black Powder Rendezvous with your project. Speak with a reenactor about life on the frontier and the use of muzzle-loading firearms.
- Plan and organize a black powder competition with your project. Invite other shooting sports projects to attend.
- Complete a state 4-H Shooting Sports workshop.

*The activities above are ideas to inspire further project development. This is not a complete list.*
Expand Your Experiences!

**Science, Technology, Engineering, and Mathematics (STEM)**
- Learn how gravity, drag, and wind affect the trajectory of a projectile and how you compensate.
- Explore the science of chemical reactions, and what occurs when you fire a muzzleloader.
- Conduct your own experiment to find out which types of bullets are most accurate.

**Healthy Living**
- Learn how to minimize exposure to lead while engaged in shooting sports.
- Discover the health benefits connected to hunting and eating wild game.
- Explain and demonstrate appropriate methods of securing and storing firearms and ammunition.

**Civic Engagement**
- Learn about the connection between sportsmanship and citizenship. Practice them both.
- Conduct a service-learning project to clean up a shooting range on public land.
- Discover a hunting conservation organization and go to one of their meetings.

**Leadership**
- Serve as a junior or teen leader in your 4-H Muzzle Loading Project.
- Learn about the 4-H California Shooting Sports Advisory Committee and apply to become a member.
- Apply to the National 4-H Shooting Sports Ambassador Program.

**College and Career Readiness**
- Learn about the college scholarship opportunities offered by shooting sports foundations.
- Explore careers associated with shooting sports, including those outside the firearms industry.
- Discover colleges and universities that offer collegiate shooting sports programs.

---

**CONNECTIONS AND EVENTS**

**State and National Shooting Sports Competitions** — Put your knowledge and shooting expertise to the test at these organized shoots.

**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.

**CURRICULUM**
- Discipline-specific manuals are available in California to adult 4-H volunteers who complete a state 4-H Shooting Sports workshop.

**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**
- National 4-H Shooting Sports, [https://4-hshootingsports.org/](https://4-hshootingsports.org/)
- California 4-H Shooting Sports, [http://4h.ucanr.edu/Projects/STEM/SET_Projects/ShootingSports/](http://4h.ucanr.edu/Projects/STEM/SET_Projects/ShootingSports/)
- Youth Shooting Sports Alliance, [www.youthshootingsa.com/](www.youthshootingsa.com/)
- National Muzzle Loading Rifle Association, [https://nmlra.membershipsoftware.org/](https://nmlra.membershipsoftware.org/)
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](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](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](https://tinyurl.com/y6434ntw)

For Further Information

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

©2021 The Regents of the University of California. This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit [https://creativecommons.org/licenses/by-nc-nd/4.0/](https://creativecommons.org/licenses/by-nc-nd/4.0/) or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

Publication 8704


It is the policy of the University of California (UC) and the UC Division of Agriculture and Natural Resources not to engage in discrimination against or harassment of any person in any of its programs or activities. (Complete nondiscrimination policy statement can be found at [https://ucanr.edu/sites/anrstaff/files/215244.pdf](https://ucanr.edu/sites/anrstaff/files/215244.pdf).)

Inquiries regarding ANR’s nondiscrimination policies may be directed to UCANR, Affirmative Action Compliance and Title IX Officer, University of California Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750-1343, titleixdiscrimination@ucanr.edu.

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.

Author of 4-H Muzzle Loading Project Sheet

Nathaniel W. Caeton

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, Marin, Napa, and Sonoma Counties; Steven Worker, 4-H Youth Development Advisor, 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.