

Project Number & Name	Skill Level*	Project Completion Requirements See each project book for complete details.	County Requirements	State Fair Requirements See the 4-H State Fair Guidebook for complete details for non-livestock projects
501 <i>Rockets Away! (2-liter Bottle Rockets)</i>	B	All 3 interest areas At least 2 organized project activities At least 2 leadership/citizenship activities Build and launch a 2-liter bottle rocket Project review	JUDGING: Bring completed project book and a rocket that you have built. Do not include the motor or fuel. Be prepared to discuss construction of the model, recorded launch trails and what you learned from the project. FAIR: Exhibit rocket	STEM Day ohio4h.org/nonlivestockguidebook
502 <i>Science Fun with Flight</i>	B, ages 9-14	All 7 interest areas At least 2 learning experiences At least 2 leadership/citizenship activities Build a glider or flyer, or a plastic model airplane or jet Project review	JUDGING: Bring completed project book and a glider or flyer that has been built for the project. Be prepared to answer questions about the project. FAIR: Exhibit the glider or flyer	STEM Day ohio4h.org/nonlivestockguidebook
503 <i>Rockets Away (Solid-Fuel Model Rockets)</i>	B	All 3 interest areas At least 2 organized project activities At least 2 leadership/citizenship activities Build and launch a solid-fuel model rocket from a kit Project review	JUDGING: Bring completed project book and a rocket that you have built. Do not include the motor or fuel. Be prepared to discuss construction of the model, recorded launch trails and what you learned from the project. FAIR: Exhibit rocket	STEM Day ohio4h.org/nonlivestockguidebook
503M <i>Solid-Fuel Rocketry Master</i>	A	One major solid-fuel rocketry project At least 2 learning experiences At least 2 citizenship activities Project records including interview, budget, and photos Judging activity	JUDGING: Bring completed project book, model rocket and an educational display exhibiting information learned and/or skills gained. Be prepared to answer questions about the project. FAIR: Educational display	STEM Day ohio4h.org/nonlivestockguidebook
549 <i>Young Engineers in Space: Missions in Microgravity</i>	I	All 9 activities At least 2 organized activities At least 2 leadership/citizenship activities Project summary and project review	JUDGING: Bring completed project book and an educational display or poster exhibiting information learned and/or skills gained. Be prepared to answer questions about the project. FAIR: Educational display or poster	STEM Day ohio4h.org/nonlivestockguidebook

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All-Terrain Vehicles (ATV)				
555 ATV Safety	X	Safety pledge All 9 activities Practice pages Practice and riding record At least 2 learning experiences At least 2 leadership/citizenship activities	JUDGING: Complete project interview. Bring your project book and an educational display of something learned through the project. Be prepared to answer questions about the project. FAIR: Educational display	STEM Day ohio4h.org/nonlivestockguidebook
Bicycles				
517 Bicycling for Fun, Level 1	B	At least 7 activities per year Complete the Bicycling For Fun Achievement Program on second year Complete Project Goals, Before and After, and Project Highlights sections <i>(The same book can be used for up to 2 years.)</i>	JUDGING: Be prepared to discuss your knowledge gained in the learning experience. DO NOT BRING YOUR BIKE for Judging. Bring poster or educational exhibit teaching about an activity from project. FAIR: Educational display or poster	STEM Day ohio4h.org/nonlivestockguidebook
Biology				
489 Microscope Mysteries	I	All 8 activities At least 2 learning experiences At least 2 leadership/citizenship activities Project review Requires purchase of a Foldscope	JUDGING: Bring completed project book and an educational display or poster exhibiting information learned and/or skills gained. Be prepared to answer questions about the project. FAIR: Educational display or poster	STEM Day ohio4h.org/nonlivestockguidebook

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Chemistry				
493 <i>Science Fun with Kitchen Chemistry</i>	B	All 11 experiments At least 2 learning experiences At least 2 leadership/citizenship activities Project review	<p>JUDGING: Bring completed project book along with an educational display or poster exhibiting information learned and/or skills gained. Be prepared to answer questions about the project. *Private Proton Challenges are optional.*</p> <p>FAIR: Educational display or poster</p>	<p>STEM Day ohio4h.org/nonlivestockguidebook</p>
Electricity				
527 <i>Paper Circuits</i>	B	Complete all 10 activities in Parts 1, 2, and 3	<p>JUDGING: Bring completed book and records. Bring your project exhibit that represents your level of understanding and ability within the project. The project exhibit must be derived from one of the activities, experiments or plans contained in the project book. Be prepared to answer questions about the project book as well as how your item works. Be prepared to demonstrate your item.</p> <p>FAIR: Exhibit the item brought to judging.</p>	<p>STEM Day ohio4h.org/nonlivestockguidebook</p>

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528 Smart Circuits	I	Complete all 9 activities in Parts 1, 2, 3, and 4	<p>JUDGING: Bring completed book and records. Bring your project exhibit that represents your level of understanding and ability within the project. The project exhibit must be derived from one of the activities, experiments or plans contained in the project book. Be prepared to answer questions about the project as well as how your item works. Be prepared to demonstrate your item.</p> <p>FAIR: Exhibit the item brought to judging.</p>	STEM Day ohio4h.org/nonlivestockguidebook
531 Science Fun with Electricity	B	<p>All interest areas Experiments and journals for each interest area At least 2 project activities At least 2 leadership/citizenship activities Project summary</p>	<p>JUDGING: Bring completed book and records. Bring your project exhibit that represents your level of understanding and ability within the project. The project exhibit must be derived from one of the activities, experiments or plans contained in the project book. Answer questions about your project experiences, including general 4-H knowledge, project book knowledge and activities, and electricity project exhibit.</p> <p>FAIR: Exhibit the item brought to judging</p>	STEM Day ohio4h.org/nonlivestockguidebook

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Energy				
550 <i>Young Engineers in Solar Energy</i>	I	All 9 activities and Talking It Over questions At least 2 learning experiences At least 2 leadership/citizenship activities Project review	JUDGING: Bring completed project book and one item you made from one of the interest areas. Be prepared to answer questions about the project as well as how your item works. Be prepared to demonstrate your item. FAIR: Educational display or item brought to judging.	STEM Day ohio4h.org/nonlivestockguidebook
Food Science				
490 <i>Science Fun with Dairy Foods: The Case of the Missing Milk</i>	B	All 6 activities At least 2 learning experiences At least 2 leadership/citizenship activities Project review	JUDGING: Bring completed project book; be prepared to discuss the experiments completed. Bring poster or educational exhibit teaching about an activity from project. (This is required for state fair) FAIR: Exhibit the item brought to judging.	STEM Day ohio4h.org/nonlivestockguidebook
Knots				
540 <i>Not Just Knots</i>	X	All 17 activities (including a capstone project) and Talking It Over questions At least 2 learning experiences At least 2 leadership/citizenship activities Project review	JUDGING: Bring completed project book and display board with ten or more knots, splices, hitches, etc. Be prepared to discuss information learned in project book FAIR: Educational display	STEM Day ohio4h.org/nonlivestockguidebook

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Physics				
500 <i>Science Fun with Physics</i>	B	All 12 experiments At least 2 learning experiences At least 2 leadership/citizenship activities Project Review	JUDGING: Bring completed project book and records documenting activities, experiences and experiments. Create and bring an educational display on a topic of your choice from the project. Be prepared to answer questions about the project. FAIR: Educational display	STEM Day ohio4h.org/nonlivestockguidebook
Robotics				
509 <i>Robotics Essentials</i>	I	All 10 activities (including construction of a LEGO® Spike™ Prime or VEX robot) and Talking It Over questions At least 2 learning experiences At least 2 leadership/citizenship activities Project review	JUDGING: Bring completed project book. Be prepared to answer questions about the project. Members are required to bring their own test surface to demonstrate their robot's completion of a task of their choosing (in less than 10 minutes) along with a printout of the program. FAIR: Educational display	STEM Day – Completed project book, display and interview. Contestants are required to bring their own test surface to demonstrate their robot's completion of a task of their choosing (in less than 10 minutes) along with a printout of the program. ohio4h.org/nonlivestockguidebook
512M <i>Robotics Master</i>	A	One major robotics project At least 2 learning experiences At least 2 citizenship activities Project records including interview, budget, and photos Judging activity	JUDGING: Bring completed project book. Bring Robot you designed and built per project guidelines on page 2 of project book. Members are required to bring their own test surface to demonstrate their robot's completion of a task of their choosing along with a printout of the program. Be prepared to answer questions about the project. FAIR: Educational display	STEM Day - Completed project book, display, interview, and tasks. Contestants are required to bring their own test surface to demonstrate their robot's completion of a task of their choosing along with a printout of the program. ohio4h.org/nonlivestockguidebook

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Small Engines and Lawn Care				
541 <i>Crank It Up, Level 1</i>	B	At least 7 activities each year in either main activities sections or Race Ahead sections Planning Guide <i>(The same book can be used for up to 3 years.)</i>	JUDGING: Bring completed project book and an educational display on a topic from the project experience. Be prepared to answer questions about the project. FAIR: Educational display	STEM Day ohio4h.org/nonlivestockguidebook
542 <i>Warm It Up, Level 2</i>	I	At least 7 activities each year in either main activities sections or Race Ahead sections Planning Guide <i>(The same book can be used for up to 3 years.)</i>	JUDGING: Bring completed project book and an educational display on a topic from the project experience. Be prepared to answer questions about the project. FAIR: Educational display	STEM Day ohio4h.org/nonlivestockguidebook
543 <i>Tune It Up, Level 3</i>	A	At least 7 activities each year in either main activities sections or Race Ahead sections Planning Guide <i>(The same book can be used for up to 3 years.)</i>	JUDGING: Bring completed project book and an educational display on a topic from the project experience. Be prepared to answer questions about the project. FAIR: Educational display	STEM Day ohio4h.org/nonlivestockguidebook
544 <i>Ready, Set...Mow!</i>	A	All 13 activities and Talking It Over questions At least 2 learning experiences At least 2 leadership/citizenship activities Project review	JUDGING: Bring completed project book and an educational display on a topic from the project experience. Be prepared to answer questions about the project. FAIR: Educational display	STEM Day ohio4h.org/nonlivestockguidebook

Project skill level indicates the project's intended audience. **B** = Beginning level—for members with little or no experience in a project area, or 8 to 10 year olds; **I** = Intermediate level, for members with some experience in a project area, or 11 to 13 year olds; **A** = Advanced level—for experienced members in a project area, or 14 or older; and **X** = All levels—for all skill and age levels. Exceptions to these age guidelines are noted.