

# Dept.24 Mechanical Projects

## Rules Governing Exhibits

Open to 4-H members enrolled in the Aerospace, Bicycles, Small Engines, Geospatial, Legos, Maintenance & Repair, Model Rocketry, Off Highway Vehicles, Robotics, Safety, Scale Models, Snowmobiling, Tractors, and Welding Projects. Also FFA, and other youth groups doing equivalent work.

All exhibits will be judged Tuesday, Entry Day, 10 a.m.- 7 p.m. Judges will break for lunch.

- All items will be judged face-to-face
- Posters should be size appropriate for display with maximum size 14"x 22" Bristol, foam core or tag board. Entry tag should be placed on the lower right hand corner and attached securely.

## Division A-E Premiums

1st - \$2.00 2nd - \$1.75 3rd - \$1.50 4th - \$1.25

### Division A -Tractor

### Class Number

Poster Explaining Tractor Safety	1
Display Board Showing Different Kinds of Nuts, Bolts, Screws, Rivets and Other Fasteners Used on Farm Machinery (properly labeled)	2
Display Panel of Damaged Parts Caused by Poor Tractor Maintenance (explanation of cause and how it could be prevented on 3"x5" card)	3
Exhibit, Display or Chart on Tractor Lubrication (might include type or lubricants, how to lubricate properly, what lubricant to use in a specific location and how often the job needs doing)	4
Chart or Poster With Information of Proper Tractor Care and Adjustments as They Relate to Good Tractor Operation (spark plugs, batteries, tires, air cleaners, carburetors, fuel injectors, etc.)	5
Display Tractor Records and Operating Costs	6
Chart Following the Transmission of Power in One Piece of Machinery (sketch out and further explain where and how the power goes to reach the job)	7
Any Other Exhibit Related to Tractor Project (include 3"x5" card explaining exhibit)	8

### Division B - Automotive

Exhibit Showing Results of Study on Use of Automobile Fuel, Include: <ul style="list-style-type: none"> <li>• Log of all miles that family or personal car traveled in two weeks with destination and purpose of all trips</li> <li>• Keep accurate account of gasoline and oil used</li> <li>• Compute total gas and oil used, miles per gallon and costs</li> <li>• Critically analyze how car could have been used more efficiently. State problems, alternative and reasons for decision made.</li> </ul>	1
Poster Indicating Types of Traffic Signs, Signals and Highway Markings Used in Wisconsin	2
Poster Emphasizing One of the Following Highway Safety Topics: <ul style="list-style-type: none"> <li>• Walking on the highway</li> <li>• Riding the school bus</li> <li>• Riding a bicycle safely</li> </ul>	3
Poster With Information on Interior Care, Exterior Care, Removing Stains, Etc.	4
Poster Emphasizing One of the Following Highway Safety Topics: <ul style="list-style-type: none"> <li>• Hand signals and their meanings</li> <li>• The meaning of different highway signs</li> <li>• What to do when you approach a stopped school bus</li> <li>• What to do when you hear a siren</li> <li>• How to parallel park</li> <li>• What you would do at an accident scene if you were involved</li> </ul>	5
Poster With Information of Proper Automotive Lubrication (might include type of lubricants, how to lubricate properly, what lubricant to use in a specific location, plus any other needed information on lubrication)	6
Poster With Information on Selection and Care of Tires	7

**Division B- Automotive**

	<b>Class Number</b>
Poster Tracing the Power Transmission of Your Car from Engine to Rear Wheels	8
Poster Tracing and Identifying the Circuit of the Generating System, the Starting System or the Lighting System	9
Poster with Information on Proper Car Care and Adjustments as They Relate to Good Car Operation (spark plugs, battery, distributor, ignition, air cleaner, carburetor, etc.)	10
Poster Emphasizing One of the Following Highway Safety Topics:	11
<ul style="list-style-type: none"> <li>• Steps to be taken for safe winter motoring</li> <li>• Precautions necessary for freeway driving</li> <li>• How to personally safety check your car</li> </ul>	
Poster With Information on Your Costs (service record, chart of seasonal servicing and tips, records on consumptions of gasoline and oil, tire service records, etc.)	12

**Division C- Small Engines**

<b>Class Numbers</b>	<b>Class Numbers</b>
Panel Exhibit of Small Engine Parts (With identification of parts, not to exceed 24"x48")	1
Poster Illustrating Steps in a Small Engine Service Job	2
Poster Showing Correct Steps in Preparing a Small Engine for Off-season Storage	3
Small Engine Safety Poster	4
Panel Exhibit Showing Diagram of Ignition System or Fuel System or Lubrication System (actual parts may be used)	5
Panel Showing Worn or Faulty Engine Parts With a Statement as to Cause and Prevention	6
Poster Showing the Events in a Four-cycle Engine (include brief explanation)	7
Poster Showing Events in a Two-Cycle Engine (include brief explanation)	8
Panel Exhibit of Carburetor Parts (explanation and function of parts, float type of diaphragm type)	9
Poster Listing Preventive Maintenance Measures Recommended for Two-cycle Engines	10
Safety Poster in Chain Saw Use, Outboard Motors, Motorcycles or Motorbikes	11

**Division D – Welding****Arc Welding**

<b>Class Numbers</b>	<b>Class Numbers</b>
Useful Article for Use in Farm or Home Workshop	1
Article for Use Out-of-Doors	2
Article for Use in Storage	3
Repaired Article	4
Any Other Article	5

**MIG Welding**

<b>Class Numbers</b>	<b>Class Numbers</b>
Useful Article for Use in Farm or Home Workshop	6
Article for Use Out-of-Doors	7
Article for Use in Storage	8
Repaired Article	9
Any Other Article	10

**Oxy-acetylene Welding**

<b>Class Numbers</b>	<b>Class Numbers</b>
Useful Article for Use in Farm or Home Workshop	11 Article
for Use Out-of-Doors	12
Article for Use in Storage	13
Repaired Article	14
Any Other Article	15

<b>Division E - Metalworking/Metal Crafts</b>		<b>Class Number</b>		<b>Class Number</b>
Poster Showing Different Kinds of Blacksmithing Equipment and Tools	1	Article for Use Outdoors or in the Workshop (doorknockers, tools, etc.)		4
Poster Explaining the Rules for Safety while Blacksmithing	2	Article of Creative Design Using Metals and Other Materials (at least 75% metals)		5
Article for Use in the Home (trivets, candleholders, etc.)	3	Any Other Article		6

<b>Sheet Metal Fabrication</b>		<b>Class Number</b>		<b>Class Number</b>
Poster Showing Different Kinds of Metalworking Equipment and Tools with Sheet Metals	7	Article for Use Outdoors or in the Workshop (wind chimes, etc.)		11
Poster or Display Showing Different Types of Most Commonly Used Sheet Metals and Their Qualities and Characteristics	8	Article of Creative Design Made of One or More Sheet Metals (jewelry, etc.)		12
Poster Showing Safety Rules When Working With Sheet Metals	9	Article of Creative Design Made of Sheet Metals and Other Materials (75% sheet metals)		13
Article for Use in the Home (candleholder, lanterns, etc.)	10	Any Other Article		14

<b>Division F - Bicycle</b>		<b>Class Number</b>		<b>Class Number</b>
Poster Showing the Different Parts of a Bicycle	1	Study Project on Types of Bicycles, Past and Present (may be booklet or miniature models)		4
Poster Showing or Telling of Maintenance Needed for Keeping Bike in Good Operating Condition or of Adjustments	2	Select One Bicycle Part, Mount the Part and Explain its Purpose, Care, Etc.		5
Poster Stating Rules for Safe Bicycling	3			

## **Division G - Aerospace Divisions**

<b>Model Airplanes</b>	<b>Grades 3-5</b>	<b>Class Numbers Grade 6-8</b>	<b>Grade 9-13</b>
Small Model of Homemade Airplane, No Kit, Not Made to Fly (Balsa wood, paper, cardboard, etc.)	1	2	3
Small Model of Homemade Airplane, No Kit, Made to Fly (Balsa wood, paper, cardboard, etc.)	4	5	6
Small Model of Airplane, From Kit, Not Made to Fly	7	8	9
Small Model of Airplane, From Kit, Made to Fly	10	11	12
Educational Poster on Basic Parts of Airplane	13	14	15

<b>Model Rocketry</b>	<b>Grades 3-5</b>	<b>Grade 6-8</b>	<b>Grade 9-13</b>
Single Stage Rocket, Balsa Wood Fins (3 or 4 fin model)	16	17	18
Single Stage Rocket, Any Material for Fins (3 or 4 fin model)	19	20	21
Multi-stage Rocket (2 or 3 stage)	22	23	24
Exotic Design Rocket (not a kit)	25	26	27
Educational Poster on Basic Parts of a Rocket	28	29	30
Previously Launched Rocket (attach card giving information on direction of flight and number of times rocket was launched)	31	32	33
Single Stage Rocket, Any Material for Fins, Made at Summer Club Program (3 or 4 fin model, ribbon only)	34	35	36

## Division G – Aerospace Divisions Flying

	Grade3-5	Class Numbers Grade6-8	Grade9-13
Exhibit on History of Flight	36	37	38
Exhibit on Principles of Flight	39	40	41
Exhibit on Aircraft Propulsion	42	43	44
Exhibit on Structure and Instruments	45	46	47
Exhibit on Navigation and Weather	48	49	50
Exhibit on Air Safety	51	52	53

## Division H - Models

	Grade3-5	Class Number Grade6-8	Grade9-13
Trains	1	2	3
Trucks	4	5	6
Cars (includes CO2 cars and mousetrap cars)	7	8	9
Ships and Boats	10	11	12
Motorcycles	13	14	15
Submarines	16	17	18
Tanks	19	20	21
Lego Model, May be attached to Lego board	22	23	24
Any Other Model (except rockets and airplanes, may include Legos)	25	26	27
Project Made at 4-H County-wide Program	28	29	30
Diorama Using Any Type of Model	31	32	33

## Division I- Snowmobiles

	Class Number		Class Number
Snowmobile Safety Poster	1	Picture Sequence Story, Illustrating One of the	4
Panel Exhibit of Snowmobile Parts (identify parts)	2	Following: Trail maintenance and development,	
Panel Exhibit of Faulty Parts	3	Trail ride activity, Maintenance of own snowmobile,	
		Any other snowmobile project or activity	
		(use photographs, mounted on tag board)	
		Emergency Snowmobiler's Safety Kit	5
		Emergency Snowmobiler's	6
		Maintenance Kit	

## Division J-Robotics

	Grades3-5	Grades6-8	Grades9-13
Poster: showing activities & involvement in the Robotics project from current year	1	2	3
Scrapbook including pictures and story related to Robotics project	4	5	6
Any type of robot made during current enrollment year with a note card attached explaining how robot was designed and built. (Be prepared to demonstrate robot's capabilities during judging.)	7	8	9
Poster: difference among machines, computers, and robots	10	11	12
Any other robotics related project	13	14	15

## Division K–Geospatial

	Grades3-5	Grades6-8	Grades9-13
Poster types and uses of geographical tools	1	2	
Display of types and uses of maps	3	4	
Poster of coordinate-grid reference system	5	6	
Map with selected route	7	8	9
Display showing differences between population and road maps		10	11
Poster on the differences between geographic and geospatial data		12	13
Poster: why some G2 data is hard to collect		14	15
Display using G2 data (types of data about my community; how to solve a community problem; my community map with several data layers)		16	17