

**JUNIOR MECHANICAL SCIENCES DEPARTMENT  
DEPARTMENT – 240**

**JUNIOR MECHANICAL SCIENCES RULES**

1. Please read Junior Class rules first.
2. One exhibit per entry number.

**TRACTOR RULES**

1. No more than four entries per exhibitor.
2. Beginner, intermediate and advanced refers to years in project.

EXAMPLES OF ENTRIES: Repair or maintenance log of work performed, photo story with captions documenting repair, collection of worn or broken parts- explain defects. (Tip- zip-tie parts to a painted pegboard for a neat display.)

**DIVISION: TRACTOR - BEGINNER (1 – 2 years)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.25        | 2.00       | 1.75         | 1.50        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

**DIVISION: TRACTOR - INTERMEDIATE (3 – 5 years)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.50        | 2.25       | 2.00         | 1.75        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

**DIVISION: TRACTOR - ADVANCED (6 years +)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.75        | 2.50       | 2.25         | 2.00        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

**One Champion per Division (If Judge so desires) Ribbon Only**

**WELDING RULES**

1. No more than four entries per exhibitor. One exhibit per entry number.
2. Beginner, intermediate and advanced refers to years in project.

EXAMPLES OF ENTRIES: display of vertical, horizontal, butt, and fill welds, poster about welding safety, garden art made from welded hardware, fabricated machine or tool.

**DIVISION: WELDING - BEGINNER (1 – 2 years)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.25        | 2.00       | 1.75         | 1.50        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

**DIVISION: WELDING - INTERMEDIATE (3 – 5 years)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.50        | 2.25       | 2.00         | 1.75        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

**DIVISION: WELDING - ADVANCED (6 years +)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.75        | 2.50       | 2.25         | 2.00        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

**One Champion per Division (If Judge so desires) Ribbon Only**

### **SMALL ENGINE RULES**

1. No more than four entries per exhibitor. One exhibit per entry number.
2. Beginner, intermediate and advanced refers to years in the project.
3. Maximum display board size will be 24" x 30".

EXAMPLES OF ENTRIES: rebuilt engine, poster about lawn mower maintenance, display board showing parts of a carburetor, photo story with captions showing engine repair or maintenance, collection of worn or broken parts- explain defects (Tip- zip-tie parts to a painted piece of 24" X 30" or smaller pegboard for a neat display.)

#### **DIVISION: SMALL ENGINE - BEGINNER (1 – 2 years)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.25        | 2.00       | 1.75         | 1.50        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

#### **DIVISION: SMALL ENGINE - INTERMEDIATE (3 – 5 years)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.50        | 2.25       | 2.00         | 1.75        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

#### **DIVISION: SMALL ENGINE - ADVANCED (6 years & Over)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.75        | 2.50       | 2.25         | 2.00        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

**One Champion per Division (If Judge so desires) Ribbon Only**

### **AUTOMOBILE RULES**

1. No more than four entries per exhibitor. One exhibit per entry number.
2. Beginner, intermediate and advanced refers to years in project.
3. Maximum display board size will be 24" x 30".
4. Whole cars or large engines are allowed if the work done is visible to the fairgoers, but MUST be pre-approved by the department superintendent.
5. Contact fair office at [Chrissy@waukeshacountyfair.com](mailto:Chrissy@waukeshacountyfair.com) or phone at (262) 544-5922 one week before judging to notify Competitive Exhibits Chair.

EXAMPLES OF ENTRIES: Display about proper tire tread, Automobile maintenance checklist, Poster explaining torque, photo story with captions depicting engine overhaul.

#### **DIVISION: AUTOMOBILE - BEGINNER (1 – 2 years)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.25        | 2.00       | 1.75         | 1.50        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

#### **DIVISION: AUTOMOBILE - INTERMEDIATE (3 – 5 years)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b> | <b>White</b> | <b>Pink</b> |
|------------------|-------------|------------|--------------|-------------|
| 1. Any article   | 2.50        | 2.25       | 2.00         | 1.75        |
| 2. Any article   |             |            |              |             |
| 3. Any article   |             |            |              |             |
| 4. Any article   |             |            |              |             |

**DIVISION: AUTOMOBILE - ADVANCED (6 years +)**    **Blue**    **Red**    **White**    **Pink**  
**Class No.**

|                |             |             |             |             |
|----------------|-------------|-------------|-------------|-------------|
| 1. Any article | <b>2.75</b> | <b>2.50</b> | <b>2.25</b> | <b>2.00</b> |
| 2. Any article |             |             |             |             |
| 3. Any article |             |             |             |             |
| 4. Any article |             |             |             |             |

**One Champion per Division (If Judge so desires)**                      **Ribbon Only**

**BICYCLE RULES**

1. Limit four entries. One exhibit per entry number.
2. Beginner, intermediate, and advanced refers to years in the project.

EXAMPLES OF ENTRIES: Poster about bike safety, display board labeling and explaining all parts of a bike's braking system, photo story about bike tricks (use safety equipment!)

**DIVISION: BICYCLE**

**Class No.**

|                |             |             |              |             |
|----------------|-------------|-------------|--------------|-------------|
|                | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
| 1. Any article | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |
| 2. Any article |             |             |              |             |
| 3. Any article |             |             |              |             |
| 4. Any article |             |             |              |             |

**One Champion per Division (If Judge so desires)**                      **Ribbon Only**

**SCALE MODELS AND MINIATURES RULES**

1. No more than four entries per Division. One exhibit per entry number.
2. No partially or totally pre-finished kits (except Scale Models and Miniatures classes 6 and 7).
3. All visible non-moving areas must be completely painted or finished with paint, metal foil, stain, or similar material. Finish must be applied by the member. Factory-applied finishes are not acceptable (except Scale Models and Miniatures classes 6 and 7). Clear areas such as windows, canopies, lights and view ports may be left clear.
4. The use of decals or aircraft nose art must accurately reflect the art on the original being replicated..
5. Third year and over are required to have:
  - Planes - full rigging on biplanes, tri-planes and obvious external rigging and wiring on monoplanes
  - Ships - full rigging on all ships
  - Detailing - significant detailing on all models
6. Dioramas must be no larger than 24" long by 24" wide by 24" high.
7. Models made of paper/card, etc. should be firmly attached to a foam board or cardboard base except for birds which may be displayed as if in flight. Models such as aircraft or a ship must be free standing.

**Note:**

1. Model airplanes, rockets, kites, and balloons built and judged for flight are entered in Division: County Fair Rocket Launch or Division: Aerospace Science.
2. Posters, displays, log books, etc. about aviation theory, flight experience, astronomy, space theory are entered in Division: Aerospace Science.

**DIVISION: SCALE MODELS AND MINIATURES**

**Class No.**

|                                                                            |             |             |              |             |
|----------------------------------------------------------------------------|-------------|-------------|--------------|-------------|
|                                                                            | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
| 1. Any article                                                             | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |
| 2. Any article                                                             |             |             |              |             |
| 3. Any article                                                             |             |             |              |             |
| 4. Poster, display, or photo story with captions relating to scale models. |             |             |              |             |
| 5. Pinewood Derby Car                                                      |             |             |              |             |
| 6. Snap together model kit (ex. Snap-Tite kit)                             |             |             |              |             |
| 7. 3-D metal model kit (ex. Metal Earth kit)                               |             |             |              |             |

**One Champion per Division (If Judge so desires)**    **Ribbon Only**

## MODEL RAILROAD RULES

1. No more than four entries per Division. One exhibit per entry number.
2. Individual modules must be planned and created by exhibitors.
3. Each module must be judged prior to being assembled in with other modules.
4. Exhibitors in Class #4 and #5 must pre-register with their project leaders for space on the line.
5. All items must be securely attached to the diorama.
6. All railroad dioramas must include at least 1 of the following elements:
  - a) At least two buildings
  - b) A lake, shoreline, river, stream, pond or other water feature.
  - c) A hill, mountain, tunnel, culvert or other elevated or below ground-level natural feature.
  - d) Artificial lighting or any other electrical powered item.
  - e) A quarry, factory, mining, construction site, manufacturing complex, city, town, village, fairgrounds, farm, resort, or any other scenery theme.
7. All railroad dioramas must include landscaping including grass where applicable and at least two trees.
8. Individual railroad cars/engines, etc must be shown on a length of track firmly attached to base of wood, foam board, plastic, or rigid cardboard.
9. HO Scale single Modules must be no larger than 24" long X 24" wide X 18" high. A HO Double Modules must be no larger than 24 X 48 X 18.
10. Lionel, O Gauge, S Gauge must be 30" X 30" and no taller than 30".
11. No section may weigh more than 30 lbs.
12. Cloverbuds may participate but must register in Division 217.

### **DIVISION: MODEL RAILROAD**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
|------------------|-------------|-------------|--------------|-------------|
|                  | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |

1. Any article
2. Any article
3. Any article
4. HO Scale diorama module for Iron Beaver Line
5. Lionel diorama module for Silver Fox Line.
6. Poster, display, or photo story with captions relating to model railroad.

**One Champion per Division (If Judge so desires)**

**Ribbon Only**

## LEGO RULES

1. No more than three entries per exhibitor. One exhibit per entry number.
2. Only Lego or Duplo blocks may be used. A model constructed of Construx, Erector, or similar toys will be disqualified.
3. Exhibit must be mounted to a sturdy base.

### **DIVISION: LEGO - JUNIOR (13 years & younger)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
|------------------|-------------|-------------|--------------|-------------|
|                  | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |

1. Building or Tower Themed
2. Automobile Themed
3. Airplane, Jet, or Rocket Themed
4. Wisconsin Themed
5. Waukesha County Fair Themed
6. Original/Free Build

### **DIVISION: LEGO - SENIOR (14 years & older)**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
|------------------|-------------|-------------|--------------|-------------|
|                  | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |

1. Building or Tower Themed
2. Automobile Themed
3. Airplane, Jet, or Rocket Themed
4. Wisconsin Themed
5. Waukesha County Fair Themed
6. Original/Free Build

## COUNTY FAIR ROCKET LAUNCH RULES

1. **One rocket and one aircraft per exhibitor will be judged at 4-H Rocket Launch, all other launched rockets and flown aircraft must be entered in Division: Aerospace Science for judging.**
2. In the event of bad weather on the day of the Rocket Launch, 4-H Rocket Launch may be flown independently and will be judged under Division: Aerospace Science.
3. All entries are judged on the knowledge, flight, operation, and overall appearance of the rocket. Appearance is judged on the basis of structure, paint and finish. Appearance counts for 33%, Knowledge is 33%, and Operation is 33% of the final award given.
4. All entries must meet appropriate safety codes of NAR (National Association of Rocketry) and the AMA (Academy of Model Aeronautics).
5. All participants in Rocket Launch will be required to demonstrate knowledge of safe operation before launch of model rockets.
6. Rockets containing a payload may only contain a USDA large uncooked egg. No living creatures may be launched.
7. **Scratch Built or Kit Built:**
  - a. Cloverbuds and Juniors (age 13 and younger) may only build rockets from kits.
  - b. Senior youth (14 years and older,) may build rockets from scratch or kits.
8. **Engine type/size:**
  - a. Exhibitors who **have not** flown in two county Rocket Launches within the past three years, (regardless of age,) **must** use a single stage rocket with ballistic, streamer or parachute recovery.
  - b. Exhibitors who **have flown** in two County Fair Rocket Launches within the last three years may use any rocket built from a **kit** with engine **limited to E or smaller**, as listed in instructions in the kit.
  - c. Exhibitors entered in Class #6, **and** having flown in four fair launches within last five years, may fly any scratch built or kit built rocket, **with engine limited to E or smaller** as listed in instructions.
9. Scratch built models must meet NAR safety specifications for scratch built rockets. Entrant must present a logbook with all design drawings and calculations at the time of a swing test **prior to fair Launch**, at a time agreed upon between the entrant and one of the rocket launch coordinates.
10. Entrant will not be penalized for loss of a rocket or aircraft during County event flight.
11. Flying model rockets and aircraft will be sent home with the entrant after rocket launch/aircraft flight for cleanup and repair, with the exception of lost or damaged beyond repair rockets/aircraft. Members whose rocket/ aircraft was lost or severely damaged may bring a substitute to the fair for display.
12. Launched rockets **must be** displayed at fair.
13. **Any** rocket engines, fuel, batteries, and other power sources except rubber bands, **must be removed** before models are brought for display at fair.
14. The rocket or aircraft flown in Division: County Fair Rocket Launch, cannot be used for any other fair entry.
15. One 4-H member in Junior and Senior Classes of Launched Rockets may be selected to represent Waukesha County 4-H at the State 4-H Rocket Launch (**if held**, and could be the following year).
16. Cloverbuds may participate but must register in Division 217.

### **DIVISION: COUNTY FAIR ROCKET LAUNCH**

| <b>Class No.</b> | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
|------------------|-------------|-------------|--------------|-------------|
|                  | <b>2.00</b> | <b>1.75</b> | <b>1.50</b>  | <b>1.25</b> |

#### **Flying Launched Model Rocket**

1. Junior (age 13 and younger)
2. Senior (age 14 and older)

#### **Flying Remote Control Model Aircraft**

3. Junior (age 13 yrs. and under)
4. Senior (age 14 yrs. and older)

## AEROSPACE SCIENCE RULES

1. No more than four entries per exhibitor. One exhibit per entry number.
2. Aerospace Science articles deal with the science of flight.
3. Entries may include actual flown rockets or aircraft, with flight history, or posters, displays, and photos.
4. **None of the articles in this class have been flown or launched at the County Fair Rocket Launch.**
5. Rockets or aircraft models are judged on flight history, operation knowledge, and sound aerospace construction of the model.
6. All entries must meet appropriate safety codes of NAR, (National Association of Rocketry), and of the AMA, (Academy of Model Aeronautics).
7. Rocket engines, fuel, batteries and other power sources, except rubber bands, **must be removed** before models are brought for judging and display.
8. Rockets or aircraft **have been flown** this current year, but **not** at County Fair Rocket Launch.
9. All flown model entries must include: Details of the flight information, including date, time, location, conditions of the flight, flight history, and at least one picture of flight. This must be provided on an 8 ½" X 11" sheet of cardstock weight.
10. Additional notes and photographs of the flight may be included.
11. The actual model flown must be presented to the judge, put on display at the fair and cannot be used for any other entry.

12. Drones built from kits or parts may be shown as an aerospace model.
13. Remote controls for drones should be brought to judging, with working batteries. Remotes will need to be brought home after judging, the drones will remain on display.
14. Purchased drones may only be used in the Division: Drones Course.

**DIVISION: AEROSPACE SCIENCE**

|                  |             |             |              |             |
|------------------|-------------|-------------|--------------|-------------|
| <b>Class No.</b> | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
|                  | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |

1. Independently flown model Rocket (Rockets flown at Rocket Launch excluded)
2. Independently flown Remote Controlled (RC) Aircraft
3. Poster explaining some principle of aerospace
4. Poster explaining a real life experience of aerospace
5. Poster, display or photo story of aerospace science
6. Photos taken during flight of Rocket, RC Aircraft or Drone. (Rockets flown at Rocket Launch excluded).

**One Champion per Division (If Judge so desires) Ribbon Only**

**DRONES COURSE RULES**

1. No more than two entries per exhibitor. One exhibit per entry number.
2. Waukesha County Fair drones course judging will be held indoors. Date and location each year TBD.
3. All entries must meet adapted safety codes of the AMA (Academy of Model Aeronautics).
4. All participants in Drones course judging must demonstrate knowledge of safe operation before course flight will be allowed.
5. All entries are judged on the flight, timing, and operation of the drone.
6. The agility course will be a timed race around obstacles such as flags, hoops, and tunnels.
7. The target course will be a timed race with the object of landing accurately on a series of targets.
8. Faults will deduct from overall time. Faults will be assigned for going off the course.
9. Cloverbuds may participate but must register in Division 217.

**DIVISION: COUNTY FAIR DRONES COURSE**

|                  |             |             |              |             |
|------------------|-------------|-------------|--------------|-------------|
| <b>Class No.</b> | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
|                  | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |

Drones Agility Course

1. Junior (13 years old and younger)
2. Senior (14 years old and older)

Drones Target Course

3. Junior (13 years old and younger)
4. Senior (14 years old and older)

One Champion per Division (If Judge so desires)

Ribbon Only

**RC CAR RULES**

1. No more than three entries per exhibitor per Division. One exhibit per entry number.
2. Remote controls should be brought to judging, with working batteries. Remotes will be brought home after judging, the car will remain on display.

**DIVISION: RC CARS**

|                  |             |             |              |             |
|------------------|-------------|-------------|--------------|-------------|
| <b>Class No.</b> | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
| 1. Any Entry     | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |

2. Any Entry
3. Any Entry
4. Poster, display, or photo story with captions about RC Cars.

**One Champion per Division (If Judge so desires)**

**Ribbon Only**

## ROBOTICS RULES

1. All judging will take place during Mechanical Sciences judging.
2. Presentations must include a written statement, a 14" x 22" poster, or a tri-fold display explaining some aspect of the exhibitor's participation.
3. Robot Performance must include a photograph and written description of the exhibitor's participation in a Robotics competition displayed on a 14" x 22" poster board or tri-fold board.

### **DIVISION: ROBOTICS**

| <b>Class No.</b>                                    | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
|-----------------------------------------------------|-------------|-------------|--------------|-------------|
|                                                     | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |
| 1. Project presentation                             |             |             |              |             |
| 2. Individual Robot performance during FIRST season |             |             |              |             |

| <b>Class No.</b>                              | <b>Blue</b> | <b>Red</b>  | <b>White</b> | <b>Pink</b> |
|-----------------------------------------------|-------------|-------------|--------------|-------------|
|                                               | <b>2.25</b> | <b>2.00</b> | <b>1.75</b>  | <b>1.50</b> |
| 3. Team Project presentation                  |             |             |              |             |
| 4. Team Robot performance during FIRST season |             |             |              |             |