

**ATCP 160.70 – MECHANICAL SCIENCE –
DEPARTMENT 24**

Judging: Friday, 9:00 a.m. – Exhibition Hall

Adult Superintendent: Owen Johnson

Mechanical Science Rules and Instructions

- a) Exhibitors and their families are responsible for reading and complying with the Junior Fair General Rules & Instructions.
- b) Fair Association is not responsible for articles lost/stolen during fair.
- c) Exhibitors are responsible for securing to the display or exhibit all loose pieces of the entry (i.e. wire, zip ties, string, or glue).
- d) All exhibitors are encouraged to be present for judging.
- e) Posters can be no larger than 14"x22", and displays can be no larger than 28"x40".
- f) Exhibitors must enter in their grade division.
- g) Work must have been made since September 1 of last year.
- h) Posters must consist of at least 50% to 75% original work.
- i) Rockets must be displayed on stands.
- j) All engines must be removed from all model rockets before entry.
- k) All fuel must be removed from engines before entry.
- l) All exhibits should include identification of grade and number of years in project.
- m) **Classes A-P - All items and pieces of exhibit must be firmly in place and secure.**
- n) Please note that due to new restrictions, posters and tri-fold displays are not eligible for WI State Fair selection. We encourage youth to consider other creative ways to exhibit what they have learned.

Premiums \$ 2.50 \$ 2.25 \$ 2.00 \$ 1.75

CLASS A – TRACTOR MAINTENANCE, Gr. 3-5

Lot **Conference Judging**

1. Exhibit: parts of a tractor
2. Exhibit: tractor safety features

3. Exhibit: how to start and stop a tractor
4. Exhibit: safety hazards when operating a tractor
5. Exhibit: role of ROPS (rollover protective structures)
6. Exhibit: commonly used hand signals with tractors
7. Exhibit: machine hazards
8. Exhibit: types of fire extinguishers and how they are used
9. Exhibit: proper clothing worn while working around tractors/machinery
10. Any other exhibit

CLASS B – TRACTOR MAINTENANCE, Gr. 6-9

Lot

15. Exhibit: general farm safety rules
16. Exhibit: PTO (power-take-off) safety
17. Exhibit: causes of tractor rollovers
18. Exhibit: how to prevent tractor rollovers
19. Exhibit: maintenance checks before operating a tractor
20. Exhibit: types of tractor fuel
21. Exhibit: recycling tractor batteries and oil
22. Exhibit of nuts, bolts, screws and other fasteners used on the farm
23. Exhibit charting the operating costs and maintenance of a typical piece of farm equipment
24. Any other exhibit

CLASS C – TRACTOR MAINTENANCE, Gr. 10 & up

Lot

Conference Judging

30. Exhibit: flowing grain hazards
31. Exhibit showing proper lawn mower safety
32. Exhibit: how to use conveyors and augers safely
33. Exhibit: cooling system safety
34. Exhibit: hydraulic system and fuel safety
35. Exhibit: tractor maintenance log
36. Exhibit: servicing oil fuel and hydraulic filters
37. Exhibit: engine air requirements
38. Exhibit: types of air filters
39. Any other exhibit

CLASS D – FARM DISPLAY

Conference Judging

45. Gr. 3-7 Model Farm – 2'x3' farm scene on plywood using model buildings, animals and equipment showing seasonal farm operations (include a description of the activity depicted in the farm scene)
46. Gr. 8 and up, Model Farm – 2'x3' farm scene on plywood using model buildings, animals and equipment showing seasonal farm operations (include a description of the activity depicted in the farm scene)

CLASS E – MODELS PROJECT, Gr. 3-7

- a) Exhibits must be the result of the exhibitor's efforts since the previous year's fair.
- b) Lots 50-54 are single items, not dioramas or scenes.
- c) All models should be securely mounted on base or platform no larger than 2'x3'.

Lot

50. Model of member's original design made from snap together components such as Legos, Erector or K'nex
51. Model made from a kit, using snap together components such as Legos, Erector or K'nex – include instructions.
52. Model made from a kit, assembled with glue, following kit instructions (no snap together components)
53. Modified or customized model made from one or more kits, assembled with glue (no snap together components)
54. Scratch built model – not a kit
55. Diorama or panorama exhibit (not model farm)
56. Poster with 5 photos of your model railroad setup
57. Any other exhibit related to models

CLASS F – MODELS PROJECT, Gr. 8 and up

- a) Exhibits must be the result of the exhibitor's efforts since the previous year's fair.
- b) Lots 60-65 are single items, not dioramas or scenes.
- c) All models should be securely mounted on base or platform no larger than 2'x3'.

Lot

Conference Judging

60. Model of member's original design made from snap together components such as Legos, Erector or K'nex
61. Model made from a kit, using snap together components such as Legos, Erector or K'nex – include instructions.
62. Model made from a kit, assembled with glue, following kit instructions
63. Modified or customized model made from one or more kits, assembled with glue (no snap together components)
64. Scratch built model – not a kit
65. Acton model featuring lights, sounds, motors, or substantial moving parts
66. Diorama or panorama exhibit (not model farm)
67. Poster with 5 photos of your model railroad setup
68. Photo story on the construction of a scale model
69. Any other exhibit related to models

CLASS G – SMALL ENGINES, Gr. 3-7

Premiums \$ 2.00 \$ 1.75 \$ 1.50 \$ 1.25

Lot

Conference Judging

75. Rebuilt engine or machine part for 2 or 4 cycle engine
76. Any exhibit showing a two-cycle or four-cycle engine
77. Exhibit showing correct steps in preparing a small engine
78. Exhibit illustrating steps in a small engine service job
79. Any other exhibit related to engines

CLASS H – SMALL ENGINES, Gr. 8 and up

Premiums \$ 2.50 \$ 2.25 \$ 2.00 \$ 1.75

Lot

85. Rebuilt engine or machine part for 2 or 4 cycle engine
86. Any exhibit showing a two-cycle or four-cycle engine
87. Exhibit showing correct steps in preparing a small engine for off season storage
88. Exhibit illustrating steps in a small engine service job
89. Any other exhibit related to engines

CLASS I - BICYCLE

Premiums \$ 2.00 \$ 1.75 \$ 1.50 \$ 1.25

Lot

Conference Judging

95. Rebuilt or refinished bicycle
96. Any exhibit about bicycle parts
97. Any exhibit about bicycle safety, rules of the road
98. Exhibit on bicycle maintenance
99. Any other exhibit related to bicycles



CLASS J – AEROSPACE, Gr. 3-5

Premiums \$ 2.00 \$ 1.75 \$ 1.50 \$ 1.25

Lot

105. Small model of homemade airplane or rocket (not a kit)
106. Small model of homemade airplane or rocket (kit)
107. Exhibit of parts of an aircraft or rocket
108. Exhibit of how weather affects flying
109. Exhibit on any other related phase of the project
110. Launched rocket – including a card describing the results of the rocket flight (rocket not exhibited at a previous fair)

CLASS K – AEROSPACE, Gr. 6-8

Lot **Conference Judging**

115. Model rocket built by member – not kit – include explanation of finishing involved, launching system, tracking system, and any flight results
116. Model rocket built by member – from kit – include explanation of finishing involved, launching system, tracking system, and any flight results
117. Model airplane built by member – from a kit
118. Exhibit of rocket parts and their function
119. Exhibit matching parts and functions of remote control
120. Exhibit on any other related phase of the project
121. Launched rocket – including a card describing the results of the rocket flight (rocket not exhibited at a previous fair)

CLASS L – AEROSPACE, Gr. 9 and up

Lot

125. Model rocket built by member – not a kit – include explanation of finishing involved, launching system, tracking system, and any flight results
126. Model rocket built by member – from a kit – include explanation of finishing involved, launching system, tracking system, and any flight results
127. Model airplane built by member – from a kit
128. Exhibit of flat-style box kite (see page 20 of State 4-H Curriculum)
129. Exhibit explaining aircraft navigation
130. Exhibit on any other related phase of the project
131. Launched rocket – including a card describing the results of the rocket flight (rocket not exhibited at a previous fair)
132. Drone built by member – include explanation of operation system, registration process and any flight results.

CLASS M – GEOSPATIAL, Gr. 3-7

- | Lot | Conference Judging |
|------|--|
| 140. | Any exhibit related to maps/map-making |
| 141. | Any exhibit related to GPS/geocaching |

CLASS N – GEOSPATIAL, Gr. 8 and up

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|------|--|
| 150. | Any exhibit related to maps/map-making |
| 151. | Any exhibit related to GPS/geocaching |



CLASS O – ROBOTICS, Gr. 3-7

- | Lot | Conference Judging |
|------|--|
| 170. | Basic LEGO tankbot that I designed and built |
| 171. | Exhibit: differences among machines, computers, and robots |
| 172. | Exhibit: parts of an RCX (robot's brain) |
| 173. | Program: tankbot goes forward for 4 seconds |
| 174. | Program: tankbot turns left 3 different ways |
| 175. | Program: tankbot navigates a maze |
| 176. | Program: tankbot travels around square race track |
| 177. | Program: tankbot stops, using a touch sensor |
| 178. | Program: tankbot follows a path |
| 179. | Any other exhibit |

CLASS P – ROBOTICS, Gr. 8 and up

- | Lot | Conference Judging |
|------|---|
| 185. | Robot that I designed and built |
| 186. | Program: robot goes forward and backward |
| 187. | Program: robot determines distance, using rotational sensor |
| 188. | Program: robot controls turns, using rotational sensor |
| 189. | Exhibit: types of gears |
| 190. | Compound gear train |
| 191. | Program: robot goes forward then backward, using containers (variables) |
| 192. | Robotic gripper that I built |
| 193. | Program: robot grips soda can and returns to starting point |
| 194. | Any other exhibit |