DEPARTMENT 24-MECHANICAL SCIENCES

Superintendent Franklin Cook

Tractors, Small Engines, Bicycle Safety, Aerospace, Lego Type Blocks & K'Nex, Models, Robotics, and Geospace

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Judging Fair Monday, 1:30pm to 6:30pm; Premiums 1st , $3.00; 2nd $2.75; 3rd, $2.50; 4th, $2.25

Rules & Requirements:

Scratch Built, Custom Built, Kit-Bashed using Lego type blocks or similar or K'Nex exhibits (no kits)

- Scratch built is an exhibit made by exhibitor's original design, or buying or making individual parts and building a scale model or from a second market kit missing pieces/instructions.
- Scratch built - Custom built - starting with a kit or a model and completely changing or modifying its appearance.
- Scratch built - Kit-bashed - taking two or more kits and combing them into one scale model.
- Exhibitors are encouraged to display all exhibits during fair week, exhibitors may use display cases sized to their display for security.
- Exhibit must be in box or pan to enable moving, it should be proportional to the project for ease in handling and displaying.
- **Exhibitor should provide a 3" x 5" card describing the exhibit.**

Posters

- All posters should be 14"x22" and ready to hang.
- Entry tags must be placed on the lower right-hand corner of the poster.

Kit Built Exhibits

- Kit built is an exhibit made by kit instructions.
- Kit built exhibits must include the model instructions for judging.
- Exhibitors are judged on the ability to follow the instructions that were provided with the kit.
- Exhibitors are encouraged to display all exhibits during fair week, exhibitors may use display cases sized to their display for security.
- Project must be in box or pan to enable moving, it should be proportional to the project for ease in handling and displaying.

Maintenance or Repairs

- Exhibitors are limited to two (2) entries in the Maintenance and Repairs class.
- All exhibits must have a statement attached as to the work done and method used.

Welding

- All entries must have a statement describing the application used. Example tig, oxyacetylene, mig wire, or arc welding.

Robotics and Scale Models

- All robotics and scale models that are built using a kit must include the instructions for the kit used.
- Exhibit must be in box or pan to enable moving, it should be proportional to the project for ease in handling and displaying.
- All motorized entries must include a 3" x 5" card stating how to operate the item.

Dioramas

- The largest scale to be used is 1:12 scale (1" equals 1 foot)
- First year modelers can build a Snap-Tite Kit
- **Dioramas will be limited in size to 4' x 4'**
- **Exhibitor is limited to no more than 2 entries in Dioramas Class**
- Exhibit must be able to be moved.
- **Exhibitor should provide a description no smaller than on a 3" x 5" card describing the exhibit,**
- **Including:**
  - Diorama Title
  - Difficulties in building
  - Any help in building
  - Amount of time to build
  - Specify any modifications or customized pieces and whether they were purchased or customized by exhibitor
  - Explain the activity in your diorama
  - Manufacturer if kit, type of paint used, finishing procedures,
- **Definitions: A. Scratch built - buying or making individual parts and building a scale model B. Custom built - starting with a kit or a model and completely changing or modifying its appearance C. Kit - bashed - taking two or more kits and combining them into one scale model**

Motorized items must include batteries and a support box with manual No

Before you bring your exhibit to the fair.

***Posters must be ready to hang with entry tag on lower right-hand corner of poster.**

***Exhibit 3" x 5" card attached to scratch built, custom built or kit-bashed**

CLASS 1 – TRACTOR MAINTENANCE

1	Poster explaining tractor or machinery safety.	2	Display board showing different kinds of nuts, bolts, screws, rivets, and other fasteners used on farm machinery, properly labeled.
3	Periodic lubrication and maintenance chart.	4	Display panel of damaged parts caused by poor tractor maintenance, collected by member, with explanation of cause and how it could be prevented
5	Exhibit Display or chart on tractor lubrication. Display might include type of lubricants, how to lubricate properly, and what lubricant to use in a specific location & how often needs done.	6	Chart or poster with information on proper tractor care and adjustments as they relate to good tractor operation.
7	Display tractor records and operating costs	8	Any other exhibit not listed above

CLASS 2 – AUTOMOTIVE **Mechanical Science**

9	Automotive safety poster (11” x 14”) and ready to hang	10	Automotive safety poster (11” x 14”) and ready to hang
11	Display of six (6) or more worn automotive parts properly identified (statement must be attached for each part indicating how it might have lasted longer if properly cared for	12	Exhibit on some system of the care such as electrical, cooling transmission, etc Exhibit must be diagramed, pictorial report or mechanical display
13	Any other exhibit not listed above		

CLASS 3 – SMALL ENGINES

15	Panel exhibit of small engine parts with identification of parts	16	Small engine safety poster 11” x 14”) and ready to hang
17	Poster describing how to properly dispose of discarded oil (11” x 14”) and ready to hang	18	Panel exhibit showing diagram of: Ignition system OR Fuel System OR Lubrication system (actual parts may be used)
19	Panel showing worn or faulty engine parts with a statement as to cause and prevention.	20	Any other poster relating to small engines.
21	Any other display relating to small engines		

CLASS 4 – BICYCLE SAFETY

35	Poster showing six (6) or more road signs (11” x 14”) and ready to hang	36	Poster relating to your project. (11” x 14”) and ready to hang
37	A display relating to your project	38	Poster on types of bicycles
39	Display of broken bicycle parts with explanations	40	Chart diagramming parts of a bicycle. (11” x 14”) and ready to hang
41	Any other exhibit not listed above.		

CLASS 5 – AEROSPACE – MODEL ROCKETRY

42	A straw rocket (beginners only)	43	Gnome rocket (beginners only)
44	Map made for use by a pilot	45	Parts of an airplane displayed and labeled
46	Flight Simulator	47	Feather wing glider
48	Controllable glider	49	Model Rocket made by exhibitor
50	Exhibit or rocket built by member (indicate if kit was used, not made to fly.	51	Exhibit or rocket built by member (indicate if kit was used , made to fly. Explain on 3”x 5” card the finishing involved, launching system and tracing from one or more flights.
52	Poster of basic parts of a rocket with their functions. (11” x 14”) and ready to hang	53	Any other exhibit relating to model rocketry
54	Experiment in the Aerospace Project	55	Model glider from kit
56	Plastic airplane kit		

CLASS 5 – SCALE MODELS (OTHER THAN LEGOS OR K’NEX)

55	Model railroad item	56	Model truck
57	Model car	58	Model ship or boat
59	Model motorcycle	60	Model military item
61	Any other type of model	62	Model airplane (made to fly or not to fly)
63	Agricultural item		

CLASS 6 – MAINTENANCE OR REPAIRS

64	Repaired, refinished or constructed article for use in the workshop.
65	Repaired, refinished or constructed article for sport or recreational purpose
66	Repaired, refinished or constructed article for use in the home.
67	Repaired, refinished or constructed article for use out-of-doors.
68	Repaired, refinished or constructed article for use in another project.

CLASS 7 – WELDING **Mechanical Science**

69	Poster showing the different types of welding (11” x 14”) and ready to hang,

70	Poster showing the different equipment used for welding. (11” x 14”) and ready to hang
71	Repaired item, by exhibitor
72	A display of 3 welds. T-joint, butt weld and lap weld, using oxyacetylene, arc and wire welder. Joints may be no more than 3” long. Maximum display 16” x24”
73	Manufactured item made by exhibitor
74	Any other welding exhibit

CLASS 8 – LEGOS AND LEGO TYPE BLOCKS, & K’NEX

Scratch built, Custom Built, Kit-Bashed (remember to include 3” x 5” card description)

100	Lego or Lego type blocks – Animal or person
101	Lego or Lego type blocks – Building
102	Lego or Lego type blocks – Ground transportation vehicle (car, truck, bus, etc)
103	Lego or Lego type blocks -Article made with moveable parts
104	Lego or Lego type blocks – Any other article
105	Lego or Lego type blocks – Bionicle Scratch
106	Lego or Lego type blocks – Diorama, no larger than 30” x 16”
107	Lego or Lego type blocks – Aquatic item
108	Lego or Lego type blocks – Aircraft item.
109	Lego or Lego type blocks - Reused item or item purchased without manual
110	Lego or Lego type blocks – Any other display made from Legos

Kit Built – INCLUDE INSTRUCTIONS

111	Lego or Lego type blocks – Animal or person
112	Lego or Lego type blocks – Building
113	Lego or Lego type blocks – Ground transportation vehicle (car, truck, bus, etc)
114	Lego or Lego type blocks -Article made with moveable parts
115	Lego or Lego type blocks – Any other article
116	Lego or Lego type blocks – Bionicle Scratch
117	Lego or Lego type blocks – Diorama, no larger than 30” x 16”
118	Lego or Lego type blocks – Aquatic item
119	Lego or Lego type blocks – Aircraft item.
120	Lego or Lego type blocks - Reused item or item purchased without manual
121	Lego or Lego type blocks – Any other display made from Legos

K’Nex Scratch Built -INCLUDE INSTRUCTIONS

122	K’Nex– Animal or person
123	K’Nex – Building
124	K’Nex – Ground transportation vehicle (car, truck, bus, etc)
125	K’Nex -Article made with moveable parts
126	K’Nex – Any other article
127	K’Nex – Bionicle Scratch
128	K’Nex – Diorama, no larger than 30” x 16”
129	K’Nex – Aquatic item
130	K’Nex – Aircraft item.
131	K’Nex - Reused item or item purchased without manual
132	K’Nex – Any other display made from K’Nex

K’Nex Kit Built **Mechanical Science**

133	K’Nex– Animal or person
134	K’Nex – Building
135	K’Nex – Ground transportation vehicle (car, truck, bus, etc)

136	K'Nex -Article made with moveable parts
137	K'Nex – Any other article
138	K'Nex – Bionicle Scratch
139	K'Nex – Diorama, no larger than 30" x 16"
140	K'Nex – Aquatic item
141	K'Nex – Aircraft item.
142	K'Nex - Reused item or item purchased without manual

CLASS 7 – DIORAMAS AND SCALE MODELS

Scratch built, custom built or kit-bashed (combining 2 or more kits into one model)

Include a 3" x 5" card describing the exhibit.

143	Diorama Military items, scratch built or kit bashed (combining tanks, trucks personal vehicles, cannons.
144	Diorama Aquatic items, scratch built, custom built, kit bashed. Ships, submarines, boats, etc.
145	Diorama Highway transportation items, scratch built, custom built or kit bashed. Semis, trucks, car, motorcycles etc.
146	Diorama Railroad Items, scratch built, custom built, kit bashed. Engines, railcars, equipment.
147	Diorama Agricultural items, scratch built, custom built, kit bashed. Tractors, equipment.
148	Diorama Non-Military Aircraft scratch built, custom built, kit bashed.
149	Diorama Miniature dwelling (s) (doll houses, etc) and/or furnishings, scratch built, custom built or kit bashed.
150	Diorama Scale Model – reused item or item purchased without manual
151	Diorama of Miniature dwelling (s) or room.
152	Diorama of a farm scene

Kit Built - <u>INCLUDE INSTRUCTIONS, include a 3" x 5" card describing the exhibit.</u>

153	Diorama Military items, kit built (combining tanks, trucks personal vehicles, cannons.
154	Diorama Aquatic items, kit built Ships, submarines, boats, etc.
155	Diorama Highway transportation items, kit built. Semis, trucks, car, motorcycles etc.
156	Diorama Railroad Items, kit built. Engines, railcars, equipment.
157	Diorama Agricultural items, kit built. Tractors, equipment.
158	Diorama Non-Military Aircraft kit built.
159	Diorama Miniature dwelling (s) (doll houses, etc) and/or furnishings, kit built.
160	Diorama of a farm scene kit built

<u>CLASS 8 – ROBOTICS EXPLORER</u> (3" x 5" card describing)

120	Basic Lego tank bot you designed and built (3" x 5" card describing)
121	Drivable robot designed and built by exhibitor (3" x 5" card describing)
122	Drivable robot drives forward & backwards with remote. (3" x 5" card describing)
123	Drivable robot drives forward & backwards autonomously. (3" x 5" card describing)
124	Drivable robot that navigates a maze (3" x 5" card describing)
125	Robot (drivable or stationary) that uses sensors to operate (touch, light, potentiometer, etc.
126	Stationary robot machine that completes a task (elevator, vending machine, conveyer, etc.
127	Robot Exhibit made at school, 4-H event, FFA event or other youth organization
128	Any other exhibit related to robotics

<u>CLASS 9 – GEOSPATIAL EXHIBITS</u>

120	Poster on types of geographical tool, (11" x 14") and ready to hang	121	Poster on uses of geographical tools. (11" x 14") and ready to hang
122	Any other display that relates to geospatial project		

<u>CLASS 10- SELF DETERMINED MECHANICAL SCIENCE EXHIBIT</u>

130	Any display relating to Mechanical Science	131	Poster relating to Mechanical Science (11" x 14") and ready to hang