



<b>Entries Due:</b>	July 15 <sup>th</sup>	<b>Arrival:</b>	Tuesday, 1:30 – 5:30 p.m.
		<b>Judging (Face-to-face):</b>	Tuesday, 1:30 – 6:00 p.m.
		<b>Release:</b>	Sunday, 6:00 p.m.

IN ADDITION TO THE RULES LISTED BELOW, PLEASE REFER TO ALL THE RULES AND REGULATIONS LISTED IN THE FRONT SECTION OF THIS BOOK.

**GENERAL RULES:**

1. Exhibitors must be enrolled in the Mechanical Science project or doing similar work in another youth organization in order to exhibit/show.
2. All posters must be no larger than 14" x 22" and displays must be no larger than 36" x 36".

<b>PREMIUMS FOR DIVISIONS 188-200:</b>	<b>1<sup>st</sup></b>	<b>2<sup>nd</sup></b>	<b>3<sup>rd</sup></b>	<b>4<sup>th</sup></b>
	\$2.00	\$1.75	\$1.50	\$1.25

**DIVISION 188 – AUTOMOTIVE**

**CLASS NO.**

1. Exhibit on auto safety
2. Exhibit on auto maintenance
3. Exhibit on auto mechanics
4. Exhibit relating to buying a car
5. Any other exhibit not listed above

**DIVISION 189 – SMALL ENGINES, UNIT 1**

**RULES:**

1. All projects are to be based on the four-cycle engine.

**CLASS NO.**

1. **Cause & Prevention:** Panel showing worn or faulty engine parts with a statement as to cause and prevention
2. **Engine Block:** Complete four-cycle engine block with all internal parts exposed and labeled (not a panel exhibit)
3. **Engine Service Job:** Poster illustrating steps in small engine service job
4. **Four-Cycle Engine:** Poster showing events in a four-cycle engine with brief explanation
5. **Model:** Model of a four-cycle engine
6. **Off Season Storage:** Poster showing steps in small engine service for off season storage
7. **Parts Identification:** Panel exhibit on small engine parts with identification of parts (actual parts may be used)
8. **Small Engine Parts:** Complete small engine, labeling all external parts
9. **System Diagram:** Panel exhibit showing diagram of ignition system, fuel system or lubrication system (actual parts may be used)
10. Any other exhibit not listed above

## **DIVISION 190 – SMALL ENGINES, UNIT 2**

### **RULES:**

1. All projects are to be based on the two-cycle engine.

### **CLASS NO.**

1. **Carburetor Parts/Functions**: Panel exhibit of carburetor parts with explanation of functions of parts; float type diaphragm type
2. **Disassembling**: Poster showing the steps in disassembling a small engine
3. **Event/Explanation**: Poster showing events in a two-cycle engine with a brief explanation
4. **Lawn Mower Setting**: Poster explaining how to set lawn mower height
5. **Lawn Mowers**: Poster showing different types of lawn mowers
6. **Model**: Model of a two-cycle engine
7. **Mowing Safety**: Safety poster on lawn mowing
8. **Preventative Maintenance**: Poster listing preventative maintenance measures recommended for two-cycle engines
9. **Safety**: Safety poster on chain saw use, outboard motors, motorcycles or motor bikes
10. **Types of Small Engines**: Poster illustrating different types of small engines
11. Any other exhibit not listed above

## **DIVISION 191 – SMALL ENGINES, UNIT 3**

### **CLASS NO.**

1. **Business Plan**: Small engine business plan
2. **Diagnostic Tools**: Poster or display on diagnostic tools
3. **Electrical Systems**: Display on how to disassemble and assemble an engine's electrical system
4. **Engine Base**: Display on how to disassemble and assemble an engine's base
5. **Engine Sounds**: Display on engine sounds
6. **Fuel & Air Systems**: Display on how to disassemble and assemble an engine's fuel and air system
7. **Industry Trends**: Poster or display on trends in the small engines industry
8. **Lawn Mower Maintenance**: Display on lawn mower maintenance
9. **Laws & Regulations**: Poster or display on small engine machine laws and regulations
10. **Price Comparisons**: Comparison of small engine machine prices
11. Any other exhibit not listed above

## **DIVISION 192 – BICYCLING, UNITS 1 AND 2**

### **CLASS NO.**

1. **Care & Maintenance**: Poster or display on bicycle care and maintenance
2. **Parts**: Poster or display related to the parts of the bicycle
3. **Safety**: Poster or display on bicycle safety
4. **Trips**: Poster or display related to bicycle trips
5. **Types & Features**: Poster or display on the different types of bicycles and/or features
6. Any other exhibit not listed above

## **DIVISION 193 – AEROSPACE**

### **CLASS NO.**

#### **Unit 1, Model Airplanes**

1. **Basic Parts:** Poster or display on basic parts of an airplane
2. **Model:** Small model of homemade airplane (no kits) no larger than one foot in any direction

#### **Unit 2, Model Rocketry**

6. **Basic Parts:** Poster or Display on Basic Parts for Rockets
7. **Homemade Rocket**

#### **Unit 3, Flying**

11. **Air Safety:** Poster or display on air safety
12. **History of Flight:** Poster or display on history of flight
13. **Homemade Kite**
14. **Kite from a Kit**

## **DIVISION 194 – SNOWMOBILE PROJECT**

### **CLASS NO.**

1. **Clothing:** Poster or display on snowmobile clothing
2. **Internal Parts:** Poster or display on the internal parts of a snowmobile

## **DIVISION 195 – SELF-DETERMINED MECHANICAL SCIENCE**

### **CLASS NO.**

1. **Home:** Repaired, refinished, or constructed article for use in the home
2. **Outdoors:** Repaired, refinished, or constructed article for use out of doors

## **DIVISION 196 – TRACTORS/FARM EQUIPMENT**

### **CLASS NO.**

1. **Proper Maintenance:** Detailed poster or display showing proper maintenance procedures of at least 2 types of farm equipment
2. **Safety Procedures:** Detailed poster or display showing safety procedures to be observed while using at least 2 types of farm equipment
3. Any other exhibit not listed above

## **DIVISION 197 – MODELS** (\*\*\*)Legos or K'nex may not be used for Lot No.'s listed below unless specified. (\*\*\*)

### **CLASS NO.**

1. **Boat/Ship**
2. **Building Structure**
3. **Car**
4. **Drawing of an Object to Scale**
5. **Farm Scene Module** (limit size to 3 ft. x 3 ft.)  
Legos may be used, but only up to 50% of the display
6. **Motorcycle**
7. **Railroad Car/Locomotive**
8. **Tank/Military Vehicle**
9. **Truck**
10. **Any other item from Construction Blocks**  
(i.e. Legos, K'nex, Lincoln Logs, etc.)
11. **Any other Module Scene** (Limit: 3 ft. x 3 ft.) –  
Legos may be used, but only up to 50% of the display
12. Any other Scale Model

3. **Plastic Kit:** Airplane made from a kit, plastic
4. **Wood Kit:** Airplane made from a kit, wood
5. Any other exhibit not listed above
8. **Multi-Stage Rocket**
9. **Single Stage Rocket**
10. Any other exhibit not listed above
15. **Principles of Flight:** Poster on the principles of flight
16. **Propulsion:** Poster or display on aircraft propulsion
17. **Structure & Instruments:** Poster or display on structure and instruments
18. Any other exhibit not listed above

3. **Maintenance:** Poster or display on snowmobile maintenance
4. **Safety:** Poster or display on snowmobile safety
5. Any other exhibit not listed above

3. **Sport/Recreation:** Repaired, refinished, or constructed article for sport or recreational purposes
4. **Workshop:** Repaired, refinished, or constructed article for use in the workshop
5. Any other exhibit not listed above

## **DIVISION 198 – GEOSPATIAL**

### **CLASS NO.**

1. **4H Meting Locations**: Map made of Brown County 4-H Club meeting locations
2. **Careers**: Poster or display illustrating careers that use GPS and GIS technology
3. **Compass v. GPS**: Poster or display explaining the difference between a compass and GPS
4. **Elements & Symbols**: Poster or display explaining elements and symbols found on maps
5. **Geographical Terms**: Poster or display explaining geographical terms
6. **Geographical Tools**: Poster or display of different types of geographical tools
7. **GIS**: Poster or display explaining GIS and how it is used
8. **GPS/GIS Integration**: Poster or display explaining how GPS integrates with GIS
9. **GPS/GIS Technology Map**: Map made using GPS and GIS technology
10. **GPS**: Poster or display explaining what GPS is
11. **Map Route**: Map made showing a route from my home to the UW-Extension Office or Brown County Fairgrounds
12. **Navigation with Compass**: Poster or display explaining how to use a compass for navigation
13. **Recreational Activities**: Poster or display illustrating recreational activities that use GPS
14. **Types & Uses**: Poster or display showing different types of maps and their uses
15. **Using a GPS**: Poster or display explaining how to use GPS
16. **Using Geographical Tools**: Poster or display illustrating how different geographical tools are used
17. Any other exhibit not listed above

**DIVISION 199 – ROBOTICS**: \*\*\*Robots will not be on display during the fair. **The youth should bring a picture or pictures of them working on the project which will be displayed at the Fair\*\*\***

### **CLASS NO.**

#### **Poster or Display:**

1. **Basic LEGO robot** that I designed and built
2. Poster or display illustrating the **difference of machines, computers and robots**
3. Poster or display illustrating **different types of robots and their uses**
4. Poster or display illustrating a **good and bad example of a flowchart and how it relates to programming**
5. Poster or display illustrating the **features of the NXT intelligent brick**
6. Poster or display illustrating at least **3 types of sensors used with robots and their purpose**
7. Poster or display that illustrates how **to troubleshoot a program problem**
8. Poster or display that illustrates an **experiment conducted by a robot I built and programmed**

**Programming:** **Youth should bring a copy of the program for the judge to see.**

9. Program designed to make robot **go forward, reverse, and stop**
10. Program designed to make robot **go forward 1 second, turn left 3 rotations, and stop**
11. Program designed to make robot **turn left 3 different ways**
12. Program designed to make robot **stop, using touch sensor**
13. Program designed to make robot **follow a curved line using a light sensor**
14. Program designed to make robot **go forward indefinitely and stop, using a sound sensor**
15. Program designed to make robot **avoid an obstacle, using an ultrasonic sensor**
16. Program designed to make robot **navigate a maze, race track, or obstacle course**
17. Any other exhibit not listed above

## **DIVISION 200 - POWER OF THE WIND**

### **CLASS NO.**

1. **Beaufort Scale**: Exhibit illustrating the Beaufort Scale
2. **Engineering Design**: Exhibit illustrating the engineering design process
3. **History of Windmills**: Exhibit illustrating the history of windmills
4. **Information about Wind Turbines**: Exhibit illustrating specific information about wind turbines in your county
5. **Location of Wind Turbines**: Exhibit illustrating where wind turbines are located in the county, state, country, or world
6. **Low & High Solidarity Turbines**: Exhibit comparing a low solidity and a high solidity turbine
7. **Measuring Wind Speed**: Exhibit illustrating various ways to measure wind speed
8. **Motors & Generators**: Exhibit illustrating how motors and generators work
9. **Pinwheels**: Exhibit of 3 different pinwheels that you designed, built, and tested. Include written test results
10. **Turbine**: Exhibit of a turbine that you designed, built, and tested. Include written test results
11. **Wind in Art & Literature**: Poster or display showing examples of wind in art and literature
12. **Wind Powered Boat**: Exhibit of a wind powered boat that you designed, built, and tested. Include written test results
13. **Wind Resources**: Exhibit showing wind resources in the United States including wind power density and wind speeds
14. **Wind-Powered Device**: Exhibit of a wind powered device that you designed, built, and tested. Include written test results
15. **Wind-Powered Sculpture**: Exhibit of a wind powered sculpture that you designed, built, and tested. Include written test results
16. **Wind-Powered Turbine**: Exhibit of a wind powered turbine that creates electricity that you built and tested. Include written test results of how much energy was produced
17. Any other exhibit not listed above

## **Division 478- Legos**

### **One entry per class**

1. Lego vehicle (car, tractor, airplane, etc) from a kit or free standing
2. Lego display mounted on a base. (landscape, village, scene, etc. Max base size 24" x 24"
3. Free Standing Lego creation, No size limit.
4. Lego display from a kit
5. Any other building material ( Not Legos) suchas K'Nex, Magnetix, Erector, or Gear.