



# 2010 MICHIGAN INDUSTRIAL AND TECHNOLOGY EDUCATION SOCIETY

## STUDENT PROJECT COMPETITION RULES BOOK

ONLY MEMBERS IN GOOD STANDING AND THEIR STUDENTS MAY ENTER THIS CONTEST. TO JOIN: CONTACT THE MEMBERSHIP CHAIRMAN THROUGH THE WWW.MITES.CC WEBSITE. ENTRY FEE IS \$2.00 PER PROJECT. COST FOR ONSITE COMPETITIONS ARE LISTED WITH THE RULES FOR THOSE COMPETITONS.

### NEW IMPORTANT INFORMATION

- The MITES website will be used to relay important information to the membership. It is each member's responsibility to check it regularly to receive the most current information.
- Make sure the Membership Chairman has your email address. Important information will be sent when necessary.
- Project registration will open April 1st. The Membership Chairman will assign your ID Number for Project Registration. You will need to be current with your membership dues in order to register.
- Registration information will be posted on the MITES website. Read completely first, then follow the instructions. It takes about a minute to register a project. A Student Project Sheet is online that can be printed and given to the student to fill out and give back to the instructor to aid in registration.
- We recommend that only the instructor NOT students go online to enter projects. There are several security features built into the system, but the instructor is our first line of defense. One security feature is that the IP address and time of log in is recorded every time someone logs on.
- Registration deadlines will be posted on the MITES website by Region. There is also a Regional section on the website for local information.
- **THERE WILL BE NO LATE REGISTRATION - POSITIVELY NO EXCEPTIONS.**
- It is illegal and unethical to use another teacher's ID number to enter a project. This will result in a disqualification

### MISSION STATEMENT

To encourage and recognize fine craftsmanship in the field of Industrial Technology, and Career Technical Education.

### MITES CONVENTION 2010 Lake Superior State University Sault Ste. Marie, Michigan May 5 - 8, 2010

First through fourth place regional winners must enter no later than Noon, **May 6, 2010**.  
Pick-up will be Saturday from 12 Noon to 1:00 p.m.  
Absolutely No Exceptions Will Be Made  
**MITES, or it's representatives, assume no responsibility for projects left after checkout.**

### RULES COMMITTEE

Pete Miller	574-534-2159(h)	269-435-8920(w)
Cliff Durand	248-853-0232(h)	
Mick Serafinski	586-465-5915(h)	

### CONVENTION FLOOR COMMITTEE

Paul Driggers	231-796-8175(h)	989-775-2200(w) x7000
Chad Campau	586-749-3084(h)	586-723-2845(w)
Dave Mydlowski	313-268-1070(h)	313-274-3746(w)

### Student Eligibility

Any student in grades K through 12 enrolled in Industrial, Technology, or Career Technical education courses in any Michigan or Indiana public, private, or parochial school is eligible. 13th year students (graduates who are completing secondary Career Technical program course requirements) and mid-year graduates may participate if the project was completed in the semester prior to program completion/graduation. Post-secondary students pursuing TX, IX, or VT certification may enter a project in the FT division only.

### Project Eligibility

Competition Projects must be started no earlier than the school start date and be completed by Region Project Competition date. Projects not completed by Region Project Competition and completed in 9 calendar months may be entered in next years Region Project Competition. These projects must be entered in the grade level in which it was completed. Projects made from commercial kits, with pre-fitted, pre-assembled, or pre-machined parts are not eligible. A list of parts and labor, (ordinary hardware excluded), not completed by the student must be noted on the entry form. Project size is limited to 64 square feet of floor space. Unlock all items.

Projects such as bows, arrows, crossbows, knives, guns, letter openers, swords, and other weapons, **must be mounted** on a base board. Projects not meeting this criteria will not be accepted. Projects containing bullets, fuel, gunpowder, explosives or combustibles will not be accepted.

### Project Classification

All projects must be physically on the convention floor to be judged. Entries are separated into 13 divisions and each division is divided into smaller classifications. Each classification is further divided into grade levels to promote competition among students of similar abilities. Projects must be entered in the classifications in which most of the work was done. If a project qualifies under different classifications, a statement explaining the rational for entry into the classification must be provided. The Rules Committee reserves the right to reclassify a project.

### Number of Entries

A Student may enter only one project in one grade level per classification, but may enter as many classifications as desired.

### Delivery and Pick up

Project set-up begins Wednesday 4:00 p.m. - 7:00 p.m. and Thursday 8:00 a.m. - noon. No entry may be picked up without the required claim check. MITES or it's representatives, cannot be responsible for breakage, theft, or projects left after checkout. Pick-up on Saturday 12:00 noon to 1:00 p.m.. No exceptions.

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### Judging Criteria

- A. Craftsmanship
- B. Degree of difficulty
- C. Optional Project documentation in a 3-ring binder. Students are encouraged to supply plan sheets, photographs, descriptions, calculations, or other information used to produce the project.

### Regional Project Competition

Regional Project Competitions are under the direction of the Regional Administrative Officer (RAO). Projects must be entered within the MITES region for your school. 1st through 6th place and Honorable Mention will be awarded in each grade level at each classification. Only 1st through 4th place will be reported on the MITES website. Honorable Mention ribbons are given for all awards after 6th place. Projects winning 1st through 4th place awards at the Regional Project Competition are the only projects eligible for the State Project Competition.

### State Project Competition

1st through 10th place and Honorable Mention will be awarded in each classification. MITES will also recognize the outstanding achievements of Grand Award and Division Award winners.

### Didn't Meet Requirements

Projects will not be accepted if:

1. Doesn't fully meet the classification requirements, even though the project was inadvertently accepted at the region competition.

2. The entry form is not complete or has been altered by anyone other than a MITES official.
3. The entry was not awarded 1st through 4th place at the Region Competition or the entry form is not properly stickered.
4. Changes have been made to the project between the Region Competition and the State Competition.
5. The entry is not at the State Competition by the published time.
6. Any project the rules committee decides is unsafe to the floor workers, judges or the general public.
7. All entered projects must be complete. Any project the rules committee decides is unfinished or partly done will not be allowed on the floor. **Only finished projects will be judged.**
8. Any project removed from the exhibit area after judging or before 12:00 noon Saturday will be disqualified.

### Instructors Note:

When you register the student's entry form on the website you are stating that you understand the rules and classifications and that the project meets all the criteria for that classification. The Rules committee has the right to reclassify or disqualify a project, which does not fully meet a classification's requirements. If after judging, but before public viewing, a project is discovered that does not meet the requirements of a classification, any awards will be withdrawn. No other awards will be changed. If the discovery is made after public viewing has begun, no changes will be made. The Rules Committee's decisions are final.

## CLASSIFICATION DESCRIPTIONS GRADE LEVEL

### GRADE LEVEL

All entries are separated into 13 divisions and each division is divided into smaller classifications. Each classification is further divided into grade levels to promote competition among students of similar abilities

**Level A** is for students in vocational or C.T.E. spending more than 2 hours or more per day or 8 hours per week or through a related co-op program receiving instruction in the subjects represented by their entries.

**Level B** is for students in grades 11 and 12 who receive instruction for less than 2 hours per day in industrial education in the subjects represented by their entries.

**Level C** is for students in grades 9 and 10 who receive instruction for less than 2 hours per day in industrial education in the subjects represented by their entries.

**Level D** is for students in grades 6 through 8.

**Level E** is for students in grades K through 5. The projects in this level are not eligible for Grand Prize, Division Grand Prizes,.

### DIVISIONS

**AD-Architectural Drawing**  
**AT-Applied Technology**  
**CT-Construction Trades**  
**EL-Electrical**  
**FT-Future Teacher**  
**GA-Graphic Arts**  
**MD-Mechanical Drawing**

**MS-Machine Shop**  
**OP-Open**  
**PL-Plastics**  
**PM-Pattern Making & Molding**  
**WM-Wrought Metal**  
**WO-Wood**

### Division Group Project

Group Projects exist in each division except in the Construction Trades (CT) and the Applied Technology (AT) divisions – see note below. Group projects are those in which two or more students are involved and will be awarded by grade level categories – i.e. MD-GP B or EL-GP C. The GP designation replaces the category number as in the following example: AD-5B, if done by 2 or more students, becomes AD-GP B Grade level GP items compete against all other grade level GP items even if the others are from different categories. So, you can have something from AD-1 compete against and AD-8 if they are in the GP category for that division. List the names of all students involved on the back of the entry form. Duplicate ribbons will be given but no plaques will be awarded. No Group project is eligible for a Grand or Divisional award except in the AT Division with the exceptions noted below. The student on-site competition categories of AT-1, AT-2, FT, and CT are not eligible for Grand or Divisional awards.

**NOTE: There is no GP category in the Construction Trades (CT) or the Applied Technology (AT) divisions. In those divisions projects compete against each other regardless of how many students worked on the project.**

**Check the website [www.mites.cc](http://www.mites.cc) for the latest Region information and a listing of MITES Regional Administrative Officers.**

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## HOW TO OBTAIN RULES COMMITTEE ASSISTANCE

Regional Administrative Officers **and individual teachers** may communicate with the  
**MITES Rules Committee or Division Representatives who will follow up directly.**

### MITES DIVISION REPRESENTATIVES

#### Applied Technology

Pete Miller	(574) 534-2159(h)	(269) 435-8920(w)
Brent Hoffman	(517) 646-6361(h)	(517) 352-4781(w)
Ron Wilson	(734) 421-7525(h)	(734) 744-2665(w)

#### Architectural Drafting

Marvin Gage	(269) 467-7777(h)	(269) 337-0300(w)
Ed Domke	(269) 945-9181(h)	(269) 948-4409(w)

#### Auto Contest

Lowell Kage	(517) 821-5193(h)	
Gene Pierce	(989) 652-5714(h)	(989) 673-2144(w)

#### Construction Technology

Gary Shaffner	(989) 631-2340(w)	
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#### Electrical

Dan Gardner	(586) 752-4435(h)	(586) 752-0245(w)
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#### Future Teacher

Beth Arledge	(269) 329-0152(h)	(269) 668-3361 x.1302(w)
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#### Graphic Arts

Mick Serafinski	(586) 465-5915(h)	
John Pagels	(810) 227-0515(h)	

#### Machine Shop

Paul Driggers	(231) 796-8175(h)	(989) 775-2210(w)
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#### Mechanical Drawing

Bruce Sutton	(248) 478-0617(h)	(248) 426-4812(w)
John Mayes	(517) 543-0383(h)	(517) 543-4340(w)
Rick Ranks	(248) 651-0221(h)	(586) 759-9425(w)

#### Metric 500

Jason Youngblood	(586) 294-2127(h)	(586) 723-2563(w)
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#### Open Division

Harry Istok	(586) 286-7711(h)	(586) 797-3500(w)
Bob Crocker	(231) 271-3207(h)	
Martin Thomas	(248) 288-3653(h)	(586) 797-2500(w)

#### Pattern Making

Frank Koehle	(231) 845-7259(h)	
Greg Meyer	(517) 443-5971(h)	(313) 274-3832(w)

#### Plastics

Joe Miles	(517) 764-7277(h)	(517) 795-3810(c)
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#### Woods

Jeff Goulasarian	(313) 381-2925(h)	(313) 827-1200(w)
Matt Clay	(269) 468-4791(h)	(269) 637-0500 x1026(w)
Mike Waite	(269) 428-2513(h)	(269) 463-4221 x344(w)

#### Wrought Metal

Mark Houston	(231) 924-8872	
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## CLASSIFICATION DESCRIPTIONS

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### AD—ARCHITECTURAL DRAWING

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**Display size must be 26" X 38" or less. Models must be 30" X 36" or less including base.**

An entry consisting of more than one sheet must be fastened together and the entire set mounted on poster board, **foam board or mat board**. Single drawing entries must be mounted on poster board, **foam board or mat board**. Drawings used for tracing must be drawn by the student entering the project.

Entry forms are to appear on the front upper left hand corner. If stapled, the back of the staple **must** be taped. **No wood, glass, or metal allowed on any entries, except AD-5, AD-6, samples for AD-3, and staples used to hold drawings on the poster, foam, or mat mounting material.**

#### **AD-1 Architectural Working Drawings - Single Family and Multi-Family Residential**

Maximum of 12 sheets. Working drawings must show acceptable construction techniques and specifications dictated by building codes and ordinances. Perspectives are not to be included. Lettering with template and/or transfer letters will not be allowed except for section call-outs, view designations and title blocks.

#### **AD-2 Interior Design Board**

Limit one sheet/board per entry on one side only. The project must have original work by the student, drawn on CAD or by hand. The project should include drawings necessary to indicate the scope of the project such as floor plans, elevations, etc. Any photo copied work should be of sample items which would be purchased for the project. Samples of cloth, carpet, tile, etc. need to be securely attached to the sheet/board.

#### **AD-3 Architectural Presentation Drawings (Manual)**

Limit one sheet per entry on one side only. Projects must be original student work, rendered and not traced from enlarged photos or photo copy. Lettering with templates and/or transfer letters will not be allowed except for section callouts, view designations and title blocks. The entry should include drawings necessary to indicate the scope of the project such as floor plans, elevations, etc.

#### **AD-4 Architectural Model**

Any architectural scale model made as part of a problem in an architectural drafting class may be submitted. Models must be of a single family residence, multiple family dwelling, commercial building, industrial building or public works building. The model must be the type shown to a client by an Architect. Floor plan(s) and elevations only must accompany the model. Removable roofs are optional. Open framing construction models are eligible only in the AD-6 Open Framing, Architectural Models category.

#### **AD-5 Open Framing, Architectural Model**

Any architectural scale model depicting open framing techniques, which was made as part of a problem in an architectural drafting class to teach structures may be submitted. Models must be of a single family residence, multiple family dwelling, commercial building, industrial building or public works building. Floor plan(s) and elevations must accompany the model.

#### **AD-6 CAD Architectural Working Drawing-Single Family Residential**

Maximum of 12 sheets. Working drawings must show acceptable construction techniques and specifications dictated by building codes and ordinances. All drawings must be plotted or printer plotted on a drawing media to scale. No photo realistic drawings or **color** allowed.

#### **AD-7 CAD Architectural Working Drawing-Multi-Family Residential**

Maximum of 12 sheets. Working drawings must show acceptable construction techniques and specifications dictated by building codes and ordinances. The structure must have two or more independent units (duplex, apartment building, etc.)

All drawings must be plotted or printer plotted on a drawing media to scale. No photo realistic drawings or color allowed.

#### **AD-8 CAD Architectural Working Drawing - Commercial Building**

Maximum of 12 sheets. Working drawings must show acceptable construction techniques and specifications dictated by building codes and ordinances. All drawings must be plotted or printer plotted on a drawing media to scale. No photo realistic drawings or **color** allowed.

#### **AD-9 CAD Architectural Presentation Rendering Manual**

Limit one sheet per entry on one side only. The entry may include drawings necessary to indicate the scope of the project such as floor plans, elevations, etc. All drawings must be completely done by CAD except manual (hand) rendering.

#### **AD-10 CAD Architectural Presentation Rendering - Software**

Limit one sheet per entry on one side only. The entry may include drawings necessary to indicate the scope of the project such as floor plans, elevations, etc. All drawings must be completely done by CAD and shaded/rendered by using only hatching materials **attached by the student**. **All drawings must be 2D and no photo-realistic attached materials allowed.**

#### **AD-11 Architectural CAD Photo-Realistic/CAD Rendered Presentation**

Limit one sheet per entry on one side only. Any interior/exterior view **or views** that are done in CAD, has color or attached materials and is displayed as a photo-realistic/CAD rendered presentation.

#### **AD-12 Topographical Mapping Drawings (Manual or CAD)**

Maximum of 4 sheets. Drawings to include the representation of a portion of the Earth's surface. The project might include: natural features, man-made objects, elevations contours of land, subdivisions plats, utilities, and cross sections to illustrate the total scope of the project. All drawings must be to scale.

## AT-APPLIED TECHNOLOGY

Projects entered in this area are to be student original solutions to the problems stated. **All entries must be on display at the respective Regional Fairs where entry fees are collected and state qualifying stickers will be put on entry forms. Regional judging is at the discretion of each regional.** Limits on number of entries per teacher are listed in the individual category descriptions. All areas are eligible for Grand and Divisional Awards except AT-1 and AT-2. If number of student entries per teacher limits are not listed you may enter any amount.

NOTE: There is no GP category in the Applied Technology(AT) divisions. In these divisions projects compete against each other regardless of how many students worked on the project.

### AT-1 Biotechnology Activity Handicapped Device

#### PROBLEM:

The student is to design and construct a device that will allow a person with a specific handicap to be able to perform a normal everyday activity in a more efficient manner.

#### LIMITATIONS:

- (1) No copying of existing devices allowed.
- (2) Students may make changes in existing devices.
- (3) A working model of the device must be included.
- (4) A set of written instructions on how the device is used, must be included. The opening paragraph of these instructions will state what the specific handicap is and what daily activity the device will benefit.

#### CRITERIA FOR JUDGING:

Judging will be based on quality of instructions and the working model.

### AT-2 Mass Production

Manufacturing of a multi-part product. Any material is acceptable. Material that can be used include: wood, metal, plastic, leather, etc. All production must have a notebook (three ring binder) and one product with:

- (1) Photo display of jigs and tooling. Display must be smaller than 2 pieces of 22" x 28" poster board or not to exceed 9 square feet.
- (2) Routing operations sheet for each part.
- (3) Check sheet with all the dimensions of the part (for each operation).
- (4) Photograph of 20 or more finished products.
- (5) Prints or sketches of each part and an assembly print/sketch of the product on A or B size paper.

All forms can be produced by the teacher EXCEPT flow charts and prints/sketches. If CNC or computer is used, list equipment, software etc.

### AT-3 Inventions

This project must be an original invention by the student. The invention may be a new product or process for doing something useful and needed. Entrants should show the developmental work and problem solving that went into the creation of the invention. A model of the invention must be included. Judging will be based on creativity and originality. Any project that violates the intent of this category will be given an Honorable Mention.

### AT-4 MITES Dragsters

- (1) The MITES Dragster Race is planned to bring the best five entries of each instructor in each level to compete for state honors.
- (2) The competition levels will be A,B,C,D, and E.
- (3) Only one entry per student. All entries must have a dimensional drawing. Drawing must not exceed 11" x 17".
- (4) Follow rules on the MITES website.
- (5) Instructors please make sure the car is balanced when the Co2 cartridge is in.
- (6) Not eligible for Division or Grand awards because of the large traveling trophy.
- (7) Project number must be on project, drawing, and any instructions.

### AT-5 Mousetrap Mechanics

#### PROBLEM:

The student will design and construct a vehicle that will travel 20 feet as fast as possible, as straight as possible, and stop as close to the 20 foot line as it can.

- (1) The only power source for energy shall be a standard Victor mousetrap.
- (2) Each vehicle must carry all of its parts for the duration of the race.
- (3) There can be no guides or tracks used to aid the vehicle.
- (4) Follow rules on the MITES website.
- (5) No items can be used to make the spring more powerful.
- (6) Standard items may be purchased and used in construction.
- (7) All distance and time measurements will be made from the front center of the vehicle body.
- (8) A set of step by step instructions on how the vehicle is to be set up and released MUST be included to have the vehicle run at the competition.
- (9) Project number must be on project, drawing, and any instructions.

#### CRITERIA FOR JUDGING:

The vehicle will be judged by the total time for one run on the track. One second will be added to the total time for every quarter inch the vehicle ends up away from the center line and the finish line.

### AT-6 Bridge Construction

THE PROBLEM: The student is to design and construct the lightest possible bridge to hold 10 pounds. The bridge must be built according to the specifications.

#### SPECIFICATIONS:

- (1) The bridge must span a minimum of 10 inches.
- (2) The bridge must be open down the center so that a 2" x 2" x 2" block can slide through the center from end to end. This block will support the weight and may be positioned in locations listed under #3.
- (3) The road bed and top of the bridge must be open to allow a 3/8 inch load bearing rod to pass through the road bed at the center of the bridge (measured end to end) and 2 inches either side of the center. Testing may occur at any one of these three positions.
- (4) Only balsa wood, 1/8" x 1/4" in cross section, or smaller, and glue may be used in construction of the structure. No other materials may be in the final project.
- (5) A drawing must be submitted with the structure.
- (6) If one or more structural members or glue joints break the bridge will be determined not to have held the 10 pounds.

CRITERIA FOR JUDGING: The lightest bridge to hold the 10 pounds wins. In case of a tie, the quality of the drawing will be considered.

### AT-7 Technical Writing

PROBLEM: The student will write a technical paper on any technical subject or activity that was done in a technology class. This can be a research paper or a report on an activity done in class. Evaluation criteria are similar to those used to evaluate the state writing proficiency tests.

#### LIMITATIONS:

- (1) Only four entries are allowed from each teacher in each classification level.
- (2) Use MLA format
- (3) Maximum of five (5) pages.
- (4) The last paragraph must be an original conclusion or observation by the student.

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### AT-8 Automotive Technology

State competition only. There will be no regional contest. The contest will consist of a hands-on practical exam lasting approximately 4 hours, requiring the students to test, diagnose, repair and/or identify specific automotive components.

**Check MITES website for date, place and registration information.**

Each school may enter two students in this contest.

In order for the student to be eligible for the State contest:

- (1) He/she must be able to obtain release time from school and secure transportation to and from the conference to compete.
- (2) The student's instructor must be a current member of the MITES and attend the conference on Friday to assist in judging the contest.
- (3) The student must have his/her parent or guardian complete a "Parent Consent Form" and return it to their instructor before the state contest.
- (4) The student must have safety glasses.
- (5) All students must be registered for this contest at the same time as Regional registrations are due for other contests. Contact your RAO for this information.
- (6) The student must be enrolled in a secondary level Automotive Technology/Mechanics program.
- (7) Student must be registered online.

### AT-9 Automotive Quick Service Contest

State competition only. There will be no regional contest. This contest is for first year Automotive Technology/Mechanics students only. The contest will focus on basic skills generally covered in the first year of automotive education programs. The following items may be covered in this contest:

- (A) General automotive knowledge multiple choice test
- (B) Safety Inspection
- (C) Oil Change and Lubrication Services
- (D) Tire Service, Balance and Rotation
- (E) Basic Cooling System Services

This contest will be held on Friday at or near the site of the State MITES conference.

Each school may enter two students in this contest.

In order for the student to be eligible for the State contest:

- (1) He/she must be enrolled in an Automotive Technology/Mechanics program.
- (2) He/she must be in the first year of the training program.
- (3) The student's instructor must be a current member of MITES and attend the conference on Friday to assist with the judging.
- (4) The student must have safety glasses.
- (5) Students must register for this contest at the same time as the Regional registrations are due for other contest. Contact your RAO for this information.
- (7) Student must be registered online.

## CT-CONSTRUCTION TRADES

### CT-1 Team Build

- This on-site building contest will be held only at the state conference and consists of students building a pre-determined project from a blue print. THERE IS NO REGIONAL CONTEST unless there are two teams in the same region that want to participate (it is up to the teachers in that Region to determine the state qualifying team). There is room for 14 teams at the state competition. This contest is for any high school construction program wanting to place a team of three students currently enrolled in a construction trades program. All students must have MiOSHA approved dress, no shorts or sleeveless shirts. Hard hats, boots and safety glasses are required to be worn during the contest. All students are responsible for providing their own equipment and tools, no others tools will be allowed.

- All teams MUST be registered on line under CT-1. This MUST be done before your Region's entry deadline.

- Cost for this event is \$75 per team. There is no individual student cost on top of this.

- The instructor must be a member in good standing with MITES. Each team must be registered online, have the appropriate paperwork filled out completely and turned in on time in order to compete. Checks with the correct fees made out to MITES must be given to the CT Division Representative at the competition before the contest begins.

### Individual Tools

1. Framing hammer
2. Finish hammer
3. Tool belt
4. Utility knife
5. 2 pencils
6. Framing square
7. Speed square
8. Tape measure
9. Hand saw
10. Chalk line
11. Cats claw
12. 2 Framing buttons

### Team Tools

1. Power miter saw & stand
2. Circular saw w/break
3. Replacement blade for saw
4. 25' GFCI extension cord
5. 50' extension cord
6. Push broom & dust mop
7. 5/8" Spade bit
8. Router and flush trim bit
9. Router wrenches
10. Replacement flush trim bit
11. 3/8" drill motor
12. 4 Clamps (any kind)
13. Cordless drill
14. Cord splitter
15. 4' level
16. 2' level
17. 2-6'ladders
18. First aid kit
19. 2 Saw horses

A tool safety inspection will be conducted on Thursday night.

To qualify, each team's teacher must have the following post marked to the construction coordinator by April 17.

1. The teacher's name and school (Cover Page)
2. The three student's names and school
3. Each student's MITES Release Forms A & B
4. A copy of each student's insurance card front and back
5. Each student's "Permission to Medically Treat" form.

Post marked by April 17, 2010 to:

**Gary Shaffner - Coordinator**  
**2809 Datmouth**  
**Midland, MI 48642**

**gary.shaffner@bcreek.k12.mi.us**  
**(989) 631-2340 Work**

All information must be filled in completely to qualify. Any part of the form not turned in or completed correctly will be disqualified and will not be able to compete.

## EL-ELECTRICAL

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Projects/circuits made from commercial assembly kits (Chaney, Velleman, Graymark etc.) are not eligible in any fashion – **even if a student etches the circuit board for a kit, IT IS NOT ELIGIBLE.** Electrical projects must not utilize pre-etched or manufactured circuit boards that are manufactured by anyone other than the student completing the project. If a student etches a circuit board for their project, they must etch the current school year onto the circuit board, or it will be disqualified. Projects cannot be sealed so that the judges can't look at the circuit board (top and bottom side), wiring or the primary electrical content of the project. Perf-boards and prototype circuit boards, which are purchased to wire a circuit together, are OK. Point to point wiring and wire-wrapping are accepted methods for entering electrical projects. Breadboard analog, digital or microprocessor based projects will be accepted in EL-5. **Projects in EL-5 are not eligible for the Grand Award.** See specifications below. Neatness and organization will count in the judging of all projects whether they are breadboard or prototype.

All projects must be complete and in operating condition to enable the judges to test their operation. If the project cannot be tested by the judges for any reason, it will be disqualified. **\*\*All of the written documentation for each project must be submitted in an 8 1/2" x 11" standard folder\*\*.** Clearly written operating instructions, schematic diagram(s), electrical parts list, and the name and function of each project **must** accompany each entry (EL-1 has an exception to this rule). Microprocessor/Micro-controller based projects must also include a print out of the program code utilized in the project. Projects must be made electrically safe to operate. Any unsafe condition could result in the disqualification of a project.

### EL-1 Basic Electrical Devices/Wiring

Any project which is predominately composed of basic electrical devices or wiring. This would include lights, switches, relays, motors, electromagnets, speakers, etc. The only required documentation in this area is clearly written operating instructions, and the name of the project.

### EL-2 Analog Electronics

Any project predominately analog in nature. This would include transistors, SCR's, op-amps, amplifiers, radios, lasers, power supplies, photocells, any project based on an analog IC, etc. Clearly written operating instructions, schematic diagram(s), electrical parts list, and the name and function of each project must accompany each entry.

### EL-3 Digital Electronics

Any project predominately digital in nature. This would include digital IC circuits, logic devices, displays, fiber optics, digital clocks, logic probes, any project based on a digital IC, etc. Clearly written operating instructions, schematic diagram(s), electrical parts list, and the name and function of each project must accompany each entry.

### EL-4 Microprocessor/Micro-controller Electronics

Any project that uses a microprocessor/micro-controller base. This would include all computer-interfaced projects, PIC based projects or other micro-controller based projects. Robot kits of any type are not allowed. FIRST robotic contest projects are not eligible in this category. Microprocessor/Micro-controller based projects must include a print out of the program code utilized in the project along with clearly written operating instructions, schematic diagram(s), electrical parts list, and the name and function of the project. All programming must be done by the student completing the project – preprogrammed micro-controllers are not eligible.

### EL-5 Breadboard Electronics

Any project that is built on a breadboard. All entries in this category must follow these rules: The breadboard area itself cannot exceed 100 square inches; circuits must be battery driven; circuits must be neatly wired, with components and point-to-point connections laid flat against the breadboard. Clearly written operating instructions, schematic diagram(s), electrical parts list, and the name and function of each project must accompany each entry. If the breadboard project is microprocessor based, it must include a print out of the program code utilized in the project along with the rest of the required documentation listed in the general requirements. Batteries must be supplied by the entrant.

## **FT-FUTURE TEACHER**

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The FT(Future Teacher) division is for Post-Secondary students pursuing a TX, IX, or VT certification at a Michigan or Indiana college or university.

### **FT-1**

The student will create an instructional display to be used in an Industrial Technology, Technology Education, or Vocational class. The display must include a written explanation of the purpose and student objectives or outcomes. Size of the display is limited to 16 sq.ft of table or floor space. The display can demonstrate how something works, i.e. a project, prototype, concept, student activity, etc. which is taught in a class.

### **FT-2**

A media presentation to be used in an industrial technology, technology education, or vocational class. The presentation is limited to 15 minutes in length and can include slides, power point, video, visual displays, or other media to cover the topic of the presentation. The project must be demonstrated at the State Competition before judges. Student must provide all equipment to make the presentation at the State Competition.

Must include a written explanation of the objective and student outcomes and indicate how the presentation relates to the Michigan Benchmarks and Standards for Industrial Technology, Technology Education, Vocational Classes, or Career and Technical Education Classes. It may include written instructions, student handouts, evaluation materials, etc.

The presentation can show how something works, i.e. a project, prototype, concept, student activity, etc. which is taught in an industrial technology, technology education, or vocational class.

Students will need to pre-register with the FT Division Representative to schedule times for presentations and to possibly coordinate equipment needed for the presentation. See page 2 in the Rules Sheet for the listing of Division Representatives.

## GA—GRAPHIC ARTS

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The entry must not exceed **ONE side of single 22" X 28" poster board**. More than one specimen on the same related project may be mounted within the size limitation but will be submitted as one entry. No frames, plastic covers or glass allowed. Do not laminate project. The judges must have access to the project. Remember to supply ALL the information that is required for each category. **Entry forms must be affixed to the front upper left hand corner**. Dye sublimation or heat transfer products (Example: mouse pads, mugs, t-shirts) are not included in any of the Graphic Arts Categories. If you have any questions please call the GA Division representatives.

### Electronic Publishing

The entries in this classification are to be produced through electronic publishing methods. **The design must come from the student, this is NOT a cut and paste contest. Electronic Publishing does NOT include CAD.** Examples of electronically produced items include but are not limited to: stationary, flyers, brochures, advertisements, newsletters, packaging, etc. Judging will be based on quality of design, degree of difficulty and production techniques.

**The following information must be specified on the face of the entry:**

1. List all **Graphic Arts** software and versions used to create the project such as: Photoshop, Illustrator, InDesign, PageMaker, Quark and Coral Draw.
2. A brief description of the techniques used to produce the entry.
3. List all elements **not** produced by the student. Example: Clip art, photos, artwork etc.
4. List the make and model of hardware used. Example: computer, printer, scanner, etc.

### GA-1 Electronic Publishing - Single Color

This category is for single color printing.

### GA-2 Electronic Publishing - Spot Color

This category is for trapping and spot color printing. The ink colors to be used for printing **must be listed** with the required information. **Maximum three colors of ink.**

### GA-3 Electronic Publishing - Process 4 Color

This category is for CMYK process color printing. Depending on the job specs, additional colors may be used and must be listed with the required information.

### Offset Printing

The entries in this classification are to be produced by offset printing. Judging will be based on quality of printing, degree of difficulty, quality of design and production techniques. **The following information must be specified on the face of the entry:**

1. Brief description of techniques used to produce the entry. Specify if traditional flats and plates or direct to plate method was used.
2. List all elements **not** produced by the student. Example: Clip art, photos, artwork, etc.
3. Number of press passes.
4. Type, weight and size of press sheet.

5. Type and color of ink(s).
6. Number of copies printed.
7. Make and model of offset press or presses used.

### GA-4 Offset Printing - Single Color

This category is for a single color of ink.

### GA-5 Offset Printing - Spot Color

This category is for trapping and spot color offset printing. The ink colors to be used for printing must be listed with the required information.

### GA-6 Offset Printing - Process 4 Color

This category is for CMYK process color printing. Depending on the job specs, additional colors and varnishes may be used and must be listed with the required information. **Progressive Color Press Proofs must be part of this entry. Access to both sides of the sheets is necessary for judging.**

### Screen Printing

The entries in this classification are to be produced directly on the substrate by screen printing. Judging will be based on quality of printing, degree of

difficulty, quality of design and production techniques. **The following information must be specified on the face of the entry:**

1. A brief description of technique used to produce the project.
2. List all elements **not** produced by student. Example: clip art, artwork, etc.
3. Source of design
4. Type and colors of inks
5. Number of passes
6. Kind of stencil, mesh and screen fabric
7. Number printed

### GA-7 Screen Printing - Paper Products

The entries must have been printed on a paper product such as: paper, card stock, poster board, etc.

### GA-8 Screen Printing -Textiles

Entries must have been printed on a textile product such as: pellaon, strike-off cloth, t-shirt, jacket, hat, towel, etc. **For safety reasons absolutely no straight pins allowed.**

### GA Group Project

Maximum size of display for a Group Project will be 36"x 48". Only ONE side of the board may be used. An example of this is the commercial display boards that are sold in office supply stores. They are self standing and tri-fold. These display boards stand 36" tall and have three panels 12" x 24" x 12" wide. Appropriate information must accompany this project for judging.

## MD-MECHANICAL DRAWING

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All display sizes must not exceed 26" x38". All entries must be mounted on a single sheet of poster board or mat board. No frame or glass allowed in any category. All drawings should conform to current ANSI and ISO standards. **(Entry forms are to appear on the front upper left corner. All staples must be taped on the backside).**

### MD-1 Detail Mechanical Drawing

This classification includes a single detail drawing of a manufactured part. Working assembly drawings consisting of more than one part or parts held together will not be acceptable. No pictorials are to be on the drawing. Lettering with templates and/or transfer letters will not be allowed except for section call-outs, view designations and title blocks. LIMITED TO ONE SHEET.

### MD-2 Detail and Assembly Drawing

A complete set of details and an assembly drawing. No pictorials are to be on the drawing. Lettering with templates and/or transfer letters will not be allowed except for section call-out, view designations and title blocks. LIMITED TO SIX SHEETS.

### MD-3 Product Development

Any part or parts, 3mm thick or less, such as surface development drawing of sheet metal or cam development or ASBE drawing that may have a practical application or be a descriptive geometry problem. No pictorials are to be on the drawing and all drawing must be dimensioned. Lettering with templates and/or transfer letters will not be allowed except for section call-outs, view designations and title blocks. LIMITED TO ONE SHEET.

### MD-4 Pictorial Illustration Drawing

A pictorial drawing of a single part which may involve shading and rendering techniques. No assembly drawings or parts held together will be allowed. No orthographic views or dimensions will be allowed. LIMITED TO ONE SHEET. Judging shall be on the total scope of the project.

### MD-5 Pictorial Information Exploded Assembly Drawing

Pictorial exploded assembly drawings that are dimensioned and/or use callout notes are in this category. No orthographic views or shading of any kind will be allowed. LIMITED TO ONE SHEET. Judging shall be on the total scope of the project.

### MD-6 Pictorial Illustration Exploded Assembly Drawing

Pictorial exploded assembly drawings, which may involve shading or rendering techniques. No orthographic views or dimensions will be allowed. LIMITED TO ONE SHEET. Judging shall be on the total scope of the project.

### MD-7 Pictorial Illustration Assembled Drawing

Pictorial assembly drawings, which may involve shading or rendering techniques. No orthographic views or dimensions will be allowed. LIMITED TO ONE SHEET. Judging shall be on the total scope of the project.

### MD-8 CAD Detail Mechanical Drawing

This classification includes a single drawing of a manufactured part. Working assembly drawings consisting of more than one part, or parts held together will not be acceptable. No pictorials are to be on drawing. LIMITED TO ONE SHEET. Black Line Drawings Only. No shading or rendering allowed. All drawings must be plotted to a scale.

### MD-9 CAD Detail and Assembly Drawing

A complete set of details and an assembly drawing. No pictorials are to be on the drawing. LIMITED TO SIX SHEETS. Black Line Drawings Only. No shading, rendering or color fills allowed. All drawings must be plotted to a scale.

### MD-10 CAD Product Development

Any part or parts, 3mm thick or less, such as surface development drawing of sheet metal or cam development or ASBE drawing that may

have a practical application or be a descriptive geometry problem. No pictorials are to be on the drawing and all drawings must be dimensioned. Black Line Drawings Only. No shading, rendering or color fills allowed. All drawings must be plotted to a scale. LIMITED TO ONE SHEET.

### MD-11 CAD Pictorial Drawing

A pictorial drawing of a single part. No assembly drawings or parts held together will be allowed. No orthographic views or dimensions will be allowed. LIMITED TO ONE SHEET. No shading, rendering or color fills allowed. AutoCAD ISO lines do not constitute a rendering technique. More than one view acceptable.

### MD-12 CAD Exploded Information Pictorial Assembly Drawing

Includes exploded pictorial drawings if they are done as an ISO drawing. Rounds and fillets can be used to show an entire radius edge. If done as an Iso Drawing, Rounds and Fillets can be used to show an entire radius edge. Dimensions and or callouts required. No orthographic views. LIMITED TO ONE SHEET. No shading, rendering or color fills allowed. AutoCAD ISO lines do not constitute a rendering technique.

### MD-13 CAD Exploded Pictorial Assembly Drawing

Includes exploded pictorial drawings if they are done as an ISO drawing. Rounds and fillets can be used to show an entire radius edge. No orthographic views or dimensions will be allowed. LIMITED TO ONE SHEET. No shading, rendering or color fills allowed. No call-outs, dimensions, material specification will be allowed on project. AutoCAD ISO lines do not constitute a rendering technique.

### MD-14 CAD Pictorial Assembly Drawing

Pictorial assembly drawing. No orthographic views or dimensions will be allowed. LIMITED TO ONE SHEET. No shading, rendering or color fills allowed. AutoCAD ISO lines do not constitute a rendering technique. No call-outs, dimensions, material specification will be allowed on project. More than one view acceptable.

### MD-15 CAD Photo-Realistic Rendering

Any CAD drawing drawn by the student that is a rendered image that has colors or attached materials and is displayed as a photo-realistic presentation with shadows on any media. **Backgrounds are acceptable. An orthographic drawing (3 views, with all of the hidden lines of each part or parts) must be attached to the back of the entry.** LIMITED TO ONE SIDE. Judging shall be on the total scope of the project.

### MD-16 CAD Detail Drawing with a Pictorial

This classification includes a single drawing of a manufactured part. Working assembly drawings consisting of one or more parts will not be accepted. A pictorial drawing and dimensioned orthographic views must be included on the layout. LIMITED TO ONE SIDE.

### MD-17 CAD Presentation Package

This classification will include all of the following items: A photo realistic rendering on a white background with no shadows on the background, a pictorial exploded with dimensions and or callouts, and a selection of orthographic views with dimensions. **ONLY ONE RENDERED OR PHOTO-REALISTIC DRAWING ALLOWED.** LIMITED TO SIX SHEETS. Judging shall be on total scope of the project.

### MD-18 CAD Rendering - Manual

A drawing done in CAD and rendered by hand (manually) using ruled, freehand, stippled, or any hatching materials in the software can be used. Color fills not allowed. LIMITED TO ONE SHEET. Judging shall be on the total scope of the project.

### MD-19 CAD Promotional Product Imagery

Any CAD drawing drawn by the student that is a rendered image that has colors or attached materials. The drawing can have shadows but must be displayed on a white background. **An orthographic drawing (3 views, with all of the hidden lines) must be attached to the back of the entry.** LIMITED TO ONE SIDE.

## **MS-MACHINE SHOP**

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Projects in this division are those that are produced in a machine shop. Any part in the MS division may include parts that have been produced using Computer-Aided-Machining (CAM) or Computer-Numerical-Control (CNC) equipment. If CAM or CNC is used it must be listed on the entry form.

### **MS-1 Machine Crafts**

This area includes ferrous, non-ferrous metals or combinations of both machined metal projects. Candlestick holders, lamps, gavels, etc. (no models, meat tenderizers, clocks.).

### **MS-2 Single Machined Hand Tools**

This area includes one ferrous, non ferrous metal or a combination of both that is held in the hands when used and has no moveable parts. Examples: hammer, screwdriver, punch, machined chisel, hacksaw, plumb bobs, etc.

### **MS-3 Simple Machined Parts (single) Hand Tool**

This area includes simple assembled units that have moveable parts and are held in the hands when used. Example: slide hammer, slide punch, hammer with interchangeable heads, hammer and punch, screwdriver with changeable blades, screw jack or screw slide, etc.

### **MS-4 Hand Tool Sets and Combinations**

This area includes any sets of hand tools or combination of hand tools as described in MS-2 or MS-3. Example: set of punches, two or more slide hammers, etc.

### **MS-5 Single Machined Tool (Precision Tool)**

This area includes ferrous or combination ferrous and non-ferrous metal and has no moveable parts in its normal use. Example: V-block without clamp, angle plate, sine bar, matched pair or parallels, matched pair of 1-2-3 blocks, faceplate, fly cutter, etc.

### **MS-6 Simple Moving Parts Single (Precision Tool)**

This area includes simple assembled units that have moveable parts and fit in an 8" square box. Examples: precision vise, planer gage, V-block and clamp, sine plate, sine bar with ground gage block, etc.

### **MS-7 Precision Tool Sets and Combinations**

This area includes any sets or combinations of precision tools as described in MS-5 and MS-6. Examples: set of parallels, sine bar and precision vise, angle blocks, set of V-blocks and clamps, etc. Tool sets may include a hammer.

### **MS-8 Mating Moving Parts**

This includes assemblies that move or produce movement through the use of gears, lead screws, slides and/or levers. May include cast parts. Examples: vise, rotary table, cross slide table, arbor press, compound sine plate, dies, mold, vise larger than 4", etc. Handle or key must be included.

### **MS-9 Games**

Examples: games-puzzles, mind teasers, chess set, cribbage boards, cue stick, darts, checkers, yo-yo, tick tac toe.

### **MS-10 Sporting Goods**

May include multiple parts. Examples: fly reel, paint ball barrel, bow sight, stabilizer, camp tool, spear, arrow strengthener, hand held clay bird thrower.

### **MS-11 Machine Models**

Entries in this division will include models machined from metal. The model may be a car, boat, airplane, train, cannon, etc. Example: a model you can see all around (three dimensional).

### **MS-12 CNC 2D**

Entries in this division will include a model machined from metal. or plasma cut. Any project using CAD or CAM to design and cut the part in metal will be entered here. List hardware, software, and a short statement of the process used. The model may be a sign, picture, plaque, personal license plate. Two (2) dimensional.

### **MS-13 Engines**

Any gas, steam or hot air driven engine with moving parts (working) will be entered here. All others will be entered in models.

## **OP-OPEN**

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This project is limited to 64 sq. ft. (longest length X longest width) of usable floor space in its normal operating position.

### **OP-1 Transportation Vehicles**

Any vehicle capable of carrying a person or cargo and constructed in an Industrial Technology course. Examples: boat, canoe, mini-bike, go-cart, automobile, dune buggy, dragster, trailer. GASOLINE MUST BE REMOVED. Projects in this category must be complete and in operating condition.

### **OP-2 Glass Work**

Any project made of one or more materials with the major portion of the work involved being glass. Example: Etched or sandblasted mirror or engraved, sculptured or stained glass. (No commercial patterns).

### **OP-3 Instructional Aid**

This division will include any project developed by the student which is specifically designed to be used by a teacher in providing instruction on a particular topic. Must include a typewritten explanation of how a teacher would use this aid.

### **OP-4 Safety Poster**

**Contest Purpose** - the purpose of the Safety Poster Contest is to inform and familiarize students with effective and efficient safety slogans and rules which can be applied or established in their own school system.

Any size 8½ X 11 to 22" X 28".

Entry form will be on the front upper left hand corner.

Poster will be judged on the following: eye appeal, content, originality, organization and neatness.

Must be computer generated.

### **OP-5 Upholstery**

Upholstered furniture of any kind, where the major portion of the project is upholstery. Judging will be on upholstering only

### **OP-6 Flexible Lamination**

Any project which includes flexible movement as part of its normal operation. Judging will be done on lamination only. Example: crossbow, bow, skis & sleds. No strings on bows or crossbows. **Any project in this category that could be considered or used as a weapon must be securely affixed to a backboard or base plate for display.**

### **OP-7 Student/Industry Product or Project Development**

A product or project planned and designed by students but produced by industry. Documentation showing student input and development will be included.

### **OP-8 Rapid Prototyping Models**

Any Rapid Prototyping Models must be entered here. These are models made from a CAD drawing and completed as a solid 3-D model by a FDM machine. May be a single or multiple part entry.

## **PM-PATTERNMAKING AND MOLDING**

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### **PM-1 Patternmaking**

Any pattern to be used in preparing a mold or casting metal can be entered here. An entry in Pattern Making which consists of more than one piece should have each piece marked to show that the pieces belong to one entry. A ROUGH CASTING MUST ACCOMPANY THE PATTERN and/or be entered in PM-2 or PM-4. If an investment (lost) pattern is used mounted photos must be provided. No CNC or computer made patterns. Student must make all parts of the pattern.

### **PM-2 Molding**

Any project cast of metal must be CLEAN but NOT filled, painted, polished, machined, sandblasted, wire brushed, filed or assembled. All gates, spurs and risers MUST be left on a casting entry. Examples: wall plaque, engine part, etc.

### **PM-3 Finished Casting - Using commercial or pattern not made by student.**

Casting must be cleaned, filed, polished or finished. It must be machined and ready for assembly. Pattern must accompany the casting or be entered in PM -1. Project may be mounted to a display board.

### **PM-4 Finished Casting CNC - Using pattern made by student on Computer Controlled Equipment.**

Pattern must accompany the casting. If an investment (lost) pattern is used, mounted photos must be provided. Casting must be cleaned, filed, polished or finished. It must be machined and ready for assembly. Project may be mounted to a display board.

### **PM-5 Finished Casting - Using pattern made by student on computer controlled equipment. Pattern must accompany the casting or be entered in PM-6**

Pattern must accompany the casting. Casting must be cleaned, filed, polished or finished. It must be machined and ready for assembly. Project may be mounted to a display board.

### **PM-6 Cast Model**

Entries in this division will include a model cast from metal. The model may be a car, boat, airplane, train, cannon, chess set, etc. A model you can see all around (three dimensional).

### **PM-7 Die Casting**

Any project cast from metal using a metal or plaster die are to be entered in this category. The dies may be commercially produced or student created and MUST be stated as one or the other. Statement must be attached to casting. If student developed die is used; at least one die is to accompany the project. Examples: chess set, screw driver, etc.

### **PM-8 The Total Project - For the Student Who Has Done It All**

For the student who has done it all. When the student has made his own pattern, proven it works with a rough casting, and has the finished project. All three can be entered here as one entry. Individual category rules will apply for the pattern, PM-1 or PM-8, rough casting, PM-2 and finished, PM-3, PM-4 or PM-5. Student must make all parts of the pattern.

## **PL-PLASTICS**

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### **PL-1 Casting**

Any plastic project involving a casting, pattern and/or mold in conjunction with the casting. Examples: paper weight, book ends, pen holder, jewelry, etc.

### **PL-2 Fabrication**

Any project in which plastic is the predominant material which has been joined together by lamination, joinery, and/or mechanical fasteners. Examples: lamp, game, toy, shelves, etc.

### **PL-3 Carving**

This area includes projects that have been carved, sculpted, or turned using hand tools and/or power equipment. Examples: flowers, animals, pens, etc.

### **PL-4 Forming**

Any project in plastic where the predominant material is plastic that has been formed by thermoforming, and/or expansion molding/forming. Examples: lamp, utensils, tray, bowl, etc.

### **PL-5 Miscellaneous Plastic**

This classification will include any project not covered by other classifications. Examples: plastic laminates, solid surface, vinyl products,

dispersion molding, compression molding, extrusion, injection molding, tracer, duplication, and fiberglass. (Any fiberglass vehicles must be entered in OD-1).

### **PL-6 Plastic Model**

Entries in this division will include a model made of plastic. The model may be a car, boat, airplane, train, cannon, etc. A model that you can see all around (three dimensional).

### **PL-7 Plastic - Using Computer Controlled Equipment (student design data input i.e. G code etc., no scanner input)**

Any project using CAD or CAM to design and cut the part in plastic will be entered here. List hardware, software, printout of G code or machine operating code and short statement of the process used.

### **PL-8 The Total Project - For the Student Who Has Done It All**

For the student who has done it all. When the student has made his own pattern, proven it works with a rough casting, and has the finished project. All three can be entered here as one entry. Individual category rules will apply. Student must make all parts of the pattern.

## WO-WOOD

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**Project is limited to 64 sq. ft. (longest length X longest width) of usable floor space in its normal operation position. Unlock all locks.**

Architectural models should be entered in the Architectural Drawing Division. Upholstered projects should be entered in OD-5. Bed sideboards must not exceed a length of 12". Exception: waterbed.

### WO-1 General Woodworking

Projects whose intent is to sit on a table or hang on a wall are acceptable in this category and may have a lid or drawer. Examples: wall mirrors and coat racks, wall shelves, etc.

### WO-2 Sporting Goods and Games

Examples: games-puzzle, mind teaser, chess set, cribbage board, cue stick, baseball bat, darts, checkers, yo-yo, tick tac toe, skate board, snowshoes, fishing net, etc. May include multiple parts.

### WO-3 Boxes

A box designed to be set or displayed on a table. This is not furniture casework. Examples: jewelry box, small display box, etc.

### WO-4 Wood Clocks (Table or Wall)

Wood clocks that sit on a table or hang on a wall must be entered in this area. Example: mantle, table, wall, etc.

### WO-5 Sculpture and Carving

This area includes projects which have been carved or sculpted using hand tools and/or power equipment. Examples: Statue, sign, decoy, animal, rocking horse, etc. Includes Intaglio.

### WO-6 Wood Models

Entries in this division will include a model made of wood. Model may be a car, boat, train, airplane, canoe, etc. A model you can see all around (three dimensional).

### WO-7 Wood Turning (Between Centers)

Any project on which the major portion if the work involves turning between centers. Multiple pieces may be glued before turning but is not required. A project with more than one piece turned, which gives the appearance of a continuous piece. Example: lamp with base, body and top separately turned, etc.

### WO-8 Face Turnings

Any project that is turned on a lathe using a faceplate. Example: bowls, coasters, round jewelry boxes, etc.

### WO-9 Furniture (26" & under)

A single piece of free-standing furniture classified as a table, chair, bench, stool or stand must be entered in this division. May include a drawer. Height is determined as measured from the floor.

### WO-10 Furniture (over 26")

A single piece of furniture that hangs on a wall. It may be open faced or include the construction of doors, lids, or drawers. Examples: spice rack, display cabinet, bookcase, curio cabinet, etc.

### WO-11 Wall Case Work

A single piece of furniture that hangs on a wall. It may be open faced or include the construction of doors, lids, or drawers. Examples: spice rack, display cabinet, bookcase, curio cabinet, etc.

### WO-12 Case Work (30" & under)

A single piece of free-standing furniture that may be open faced or include the construction of doors, lids, or drawers. Examples: hutch, desk, chest, bookcase, blanket chest, trunk, etc. **Height is determined as measured from the floor.**

### WO-13 Case Work (30" to 60")

A single piece of free-standing furniture that may be open faced or include the construction of doors, lids, or drawers. Examples: hutch, desk, chest, bookcase, blanket chest, trunk, etc. **Height is determined as measured from the floor.**

### WO-14 Case Work (over 60")

A single piece of free-standing furniture that may be open faced or include the construction of doors, lids, or drawers. Examples: hutch, desk, chest, bookcase, etc. **Height is determined as measured from the floor.**

### WO-15 Wood Clocks (Floor)

Wood clocks that sit on the floor must be entered in this area. Example: grandfather, etc. Pendulum movements and weights in floor clocks are not permitted except small battery powered units.

### WO-16 Woods - Using Computer Controlled Equipment (student design data input only, ie: G code etc., no scanner input)

Any project using CAD or CAM to design and cut the part in wood will be entered here. List hardware, software and a short statement of the process used. **No Scanner data allowed.**

### WO-17 Outdoor Furniture and Accessories

Any wood project produced to be used outdoors. The project may have a door or drawer, a lid or movable, non-movable parts. Examples: Loungechairs, benches, picnic tables, storage cabinets, planters and swings.

## **WM-WROUGHT METAL**

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Project is limited to 64 sq. ft. of usable floor space. Bed sideboards not to exceed a length of 12". All small items such as knives, belt buckles, and letter openers must be mounted and securely fastened to a panel or a board. All CNC plasma cutting goes to MS-13.

### **WM-1 Non-Ferrous Metal**

Any project made of aluminum, copper, silver, brass, pewter or a combination of metals listed. The materials may be in the form of sheet, rod, tube, or bar. Manipulative processes on materials may include hammering, etching, raising, stamping, spinning, welding, or any combination of these processes. **Jewelry or small items must be securely mounted to a panel or board at least ½" X 6" X 8".**

### **WM-2 General Iron-Cold - Under 26 inches**

Any project in which the major material used for construction is band, round, or other shapes of steel that are **developed by means of no heat.** can be fastened by any means. These projects will hang from the ceiling or hang on the wall, sit on the table, or a small single piece project that sits on the floor. Items in this area are used primarily inside. Example: magazine rack, small plant stand, shelf brackets, flower pot holder, etc.

### **WM-3 General Iron - 26 inches or taller**

Any project in which the major material used for construction is band, round, or other shapes of steel. These projects are larger in nature than WM-2 and are found mainly in a workshop or outside. Examples: Table, chair, jackstands, engine stand, stove, log splitter, etc. Processes may include welding, forging, bending, twisting, etc. (Note: Tile, glass or other suitable material may be used for tops of tables, etc.)

### **WM-4 General Iron - Hot**

Any project in which the major material used for construction is band, round, or other shapes of iron or steel and developed by means of heat such as forged tools. Examples: chisel, letter opener, center punch, wrecking bar, and out door grill tools.

### **WM-5 Sheet Metal (under 30")**

Any project which incorporates one or more of the following developments: angular, cylindrical, radial line, or transitional. Examples: pail, bucket, lamp, watering can, tool box, small heating stove, etc.

### **WM-6 Sheet Metal (30" or taller)**

Any project which incorporates one or more of the following developments: angular, cylindrical, radial line, or transitional, and which measure over 30" in height. Examples: storage unit, tool cart, large tool box, shelving, etc.

### **WM-7 Wrought Metal Models**

Entries in this division will include models made of wrought metal. A model you can see all around (three dimensional) fits here. Examples: car, boat, airplane, train, cannon, etc.

### **WM-8 The Total Project – For the Student Who Has Done It All**

This is any project beyond the scope of the projects in the other WM categories. Can include multiple parts/pieces, machine shop processes, blueprints, etc.

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