

**TEXAS**



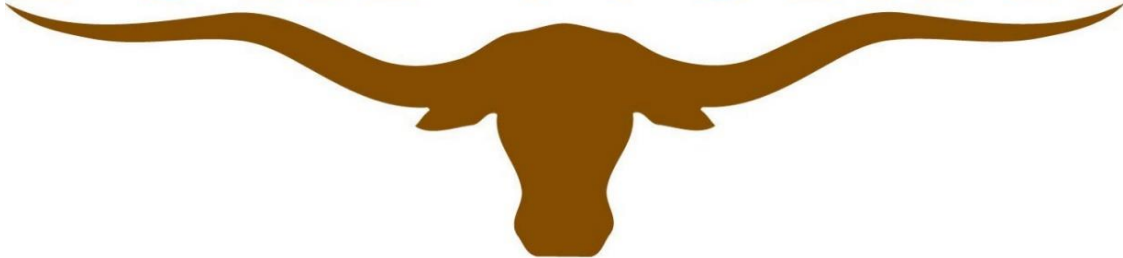
**MIDDLE SCHOOL SECTION  
CATEGORY BASED PROJECTS**

**Technology Students  
Association**

**2018-2019**

**CHANGES HAVE BEEN MADE:  
NEW CATEGORIES HAVE BEEN ADDED &  
SOME CATEGORIES HAVE BEEN MERGED/DELETED  
DO NOT USE PREVIOUS YEARS RULES BOOK!**

**FORT WORTH®**



**April 25, 26, & 27, 2019**

## Texas TSA MEMBERSHIP

School chapters must be an affiliated member with the National TSA and Texas TSA in order to participate and/or compete in the Texas TSA State Contest. Students names must be specifically listed in membership rolls with Texas TSA in order to compete at the Texas TSA State Contest. Affiliation will be completed online through <http://www.tsaweb.org/>. **Chapters be must affiliated prior to November 16, 2018 to avoid a \$100.00 late fee.** Membership application closes on February 1st each year.

**Schools that affiliate and/or upload students after the February 1st, 2019 deadline will be ineligible to receive school awards at the Texas TSA State Contest AND will incur a \$500.00 sanction by the Texas TSA Board of Directors.**

**Chapters may affiliate and compete in ONE TSA REGION only.  
Chapters may NOT affiliate and/or compete in multiple TSA Regions.**

## TEXAS TSA STATE CONTEST ENTRY FEE

After qualifying through a Texas TSA regional contest, students are eligible to participate and compete in the Texas TSA State Contest. The 2018-2019 contest will be held in Fort Worth on April 25, 26, & 27 of 2019. The entry fee is \$12.00 for each entry.

**The entry fee is \$12.00 for each entry**

Texas TSA does not refund any money for unused state entries. Texas TSA does not require a student to be present at State Contest to enter their project(s), unless they are competing in an event that requires the student to be physically present for the event. Those events include NQE Events, UTE Written tests or Graphic Solutions and most TSA Onsite Events

## HOTELS

Hotel Room Blocks: All hotel rooms will be booked through the Texas TSA hotel block. Any school booking outside of conference block will incur a **penalty of \$100/attendee** registered for that chapter. Additionally, all schools participating in on-site events, will be required to stay on-site in the hotel block. The only exception to this policy, are schools who are within a 20 mile radius of the Fort Worth Convention Center.

## Texas TSA State Conference Attendance Registration & Conference Registration Attendance Fee

All persons who attend the Texas TSA State Conference & Contest are required to register for the Conference. The Conference Registration Attendance Fee is \$15.00 per person. This includes students, teachers, administrators, drivers, parents and all guests.

Registration will open February 15, 2019 and close March 25, 2019 at 11:50 pm CST. **NO CHANGES OR REFUNDS WILL BE MADE AFTER THIS DATE.** Please do not wait until the last minute to complete your registration.

All payments – registration fees, entry fees and bus parking will be paid to Texas TSA.

All Purchase Orders and/or payments must be received by Friday, April 19, 2019. Purchase Orders may be emailed to **executive.director@texastsa.org**.

Credit Cards may be taken on-line through the Registration System.

Checks are to be made payable to Texas TSA and mailed to:

Texas TSA  
189 Candelara Drive  
Carthage, TX 75633

**NOTE: ALL forms of payments MUST include the SCHOOL NAME, not just the ISD.**

7. COPYRIGHT: All entries must be the original work of the student participant or student team. **ALL** ideas, text, images (photos, computer generated, video and/or other), and sounds from other sources must be cited, including anything that is from the public domain. References and resources are to be cited using MLA (Modern Language Association) style, the most current edition. If copyrighted material is used, proper written permission must be included. Failure to follow this procedure **WILL AUTOMATICALLY RESULT IN DISQUALIFICATION OF THE STUDENT (ALL PROJECTS)** and may potentially disqualify the entire chapter from the 2019 Texas TSA State Competition.

## UNIQUENESS OF STUDENT WORK

All student entries **MUST** be made from a single unique native file. Each project must be unique in both the final product and any associated electronic file regardless of file type. The **ONLY** exception is the use of common library parts such as the Content Center in AutoDesk

## REQUIRED MINIMUM DOCUMENTATION:

*Documentation should be attached to the back projects or least conspicuous location as possible.*

***The following is required for BOTH Level 1 & Level 2 entries:***

Documentation **MUST** be computer generated on the required form found in Part 2: Rulebook Forms of the Texas TSA Rules Book. Sketches are allowed on otherwise computer generated forms. **Documentation is required for ALL entries.** Deductions can only be applied for lack of content, quality of writing, neatness, completeness of drawings, etc. unless otherwise noted.

Documentation can be housed in clear plastic page protector or folder. No 3-Ring Binders unless specified by NQE or other rules.

## INTERDISCIPLINARY DISPLAY

The interdisciplinary display encompasses the application of the academic courses (science, math, history, Language Arts) through the project method of instruction. The emphasis of this category is on the student's ability to correlate the academics as they apply to the development and manufacture of a product or the construction of a product. In addition, to the documentation required by the individual units within the Technology course, further evidence is needed to specifically address the application of skills acquired in the academic courses. ***(Individual or Team)***

Classification
MP2000

## DRAFTING

Paper size not to exceed 12" x 18" (B-Size)	Classification
<b>Pages from exercise books, blueprints or other reproductions are not acceptable.</b>	<b>Individual</b>
Sketching/Free hand - May be Single or Multi-Part. May be Single View or Multi-View. Pictorial allowed. Only hand rendering allowed.	MP2001
Mechanical/Technical Drafting (pencil or ink) - May be Single or Multi-Part. May be Single View or Multi-View. Pictorial allowed. Only hand rendering allowed.	MP2002
CADD - Single View - One sheet with pictorial	MP2003
CADD - Single View - One sheet without pictorial	MP2004
CADD - Two View - One sheet with pictorial	MP2005
CADD - Two View - One sheet without pictorial	MP2006
CADD - Three View - One Sheet with pictorial	MP2007
CADD - Three View - One Sheet without pictorial	MP2008
CADD - Pictorial - One Sheet	MP2009
CADD - Working Drawing	MP2010
CADD - Architectural - Maximum four sheets (May include plot plan, floor plan, elevations, and/or door/window schedule etc.)	MP2011
CADD - Aerospace related drawings - Max 2 page	MP2012
CADD - Machine - Maximum two sheets	MP2013
CADD 3-D designs	MP2014
CADD - Presentation Drawing - Engineering	MP2015
CADD - Presentation Drawing - Architectural	MP2016

## PHOTOGRAPHY

All photos will use mounting adhesive along the top edge of photograph not to exceed 3/4-inch and be mounted on white typing paper not to exceed 8.5" by 11". **No additional matting will be allowed.** All photos will be student processed unless otherwise stated.

**Printing** - Can use either method listed below:

- Photo is developed by a professional lab, instore photo lab, or a kiosk film printer in a commercial setting. This includes self-service photo printers in Wal-Mart, CVS, Walgreens, etc...
- Photo is developed by the student in a traditional film processing lab using traditional methods and practices or digitally in the lab, classroom, or home using a printer.

## COPYRIGHT

All entries must be the original work of the student participant or student team. **ALL** ideas, text, images (photos, computer generated, video and/or other), and sounds from other sources must be cited, including anything that is from the public domain. References and resources are to be cited using MLA (Modern Language Association) style, the most current edition. If copyrighted material is used, proper written permission must be included. Failure to follow this procedure **WILL AUTOMATICALLY RESULT IN DISQUALIFICATION OF THE STUDENT (ALL PROJECTS)** and may potentially disqualify the entire chapter from the 2018 Texas TSA State Competition.

## UNIQUENESS OF STUDENT WORK

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	Classification
	<b>Individual</b>
Pin hole photograph	MP2030
Still Life - Color	MP2031
Still Life - Black and White	MP2032
Action/Motion - Black and White	MP2033
Action/Motion - Color	MP2034
Landscape - Black and White	MP2035
Landscape - Color	MP2036
Marine - Black and White	MP2037
Marine - Color	MP2038
Portraits - Black and White	MP2039
Portraits - Color	MP2040
Special Effects - Black and White OR Color: MUST include Original Photo for comparison.	MP2041
Close-up (MACRO) - Black and White	MP2042
Close-up (MACRO) - Color	MP2043
Photo essay four to six prints with captions or titles not to exceed a maximum of 36" x 36" display area. Must tell a story, process or concept.	MP2044
Photo essay - 7 or more prints with captions or titles not to exceed a maximum of 36" x 36" display area. Display or manual format.	MP2045
Slide Series - Maximum of 20 slides arranged to tell a story or explain a process. Slides must be arranged in order in a top-loading carousel.	MP2046

**DESKTOP PUBLISHING/GRAPHICS**

	<b>Classification</b>
	<b>Individual</b>
Screen Print - one color - hand cut	MP2047
Screen Print - multi-color - hand cut	MP2048
Screen Print - one color - thermal screen	MP2049
Screen Print - multi-color - thermal screen	MP2050
Screen Print - one color - photo emulsion	MP2051
Screen Print - multi-color - photo emulsion	MP2052
Computer Generated Design Transfer - one color	MP2053
Computer Generated Design Transfer - multi- color	MP2054
Computer digital transfer	MP2055
Business Cards/Name Tags, etc.	MP2056
Certificate	MP2057
Form - Single Sheet	MP2058
Product description	MP2059
Fly sheet	MP2060
Product specification sheets	MP2061
Owners/Operators manual	MP2062
Brochure 1-2 printed panels	MP2063
Brochure 3 - 4 printed panels	MP2064
Brochure 5 or more printed panels	MP2065
Thematic Portfolio - A collection of four or more <b>graphic images</b> following a central theme ( <i>Example: section pages in a yearbook, etc. - Could be created from an art program, scanned and/or original art work - Not limited to these examples</i> )	MP2074
Student original - Computer Graphics - BW	MP2075
Student original - Computer Graphics - COLOR	MP2076
Student edited - Computer Graphics - BW (must show original)	MP2077
Student edited - Computer Graphics - COLOR (must show original)	MP2078
Computer based multi media Entries with academic themes	MP2079
Computer based multi media Entries with technology themes	MP2080
Computer animation One-minute, subject: any area	MP2081
Computer animation One-minute, subject: safety	MP2082
Database Minimum of 25 entries; at least 5 fields. (Must show original input data and two data sorts)	MP2083
Spreadsheet Minimum of 5 columns and 5 rows - Must have at least 2 calculations	MP2084
A word-processing document, any subject. (8.5 x 11 inch page size, two-pages double spaced minimum); No graphics	MP2085
A word-processing document, any subject (8.5 x 11 inch page size, two-pages double spaced minimum); With graphics	MP2086
Document using word-processing, spreadsheet, and database	MP2087
Newsletter must include: Letterhead or masthead, graphics and have at least two columns	MP2088

**DIGITAL VIDEO**

<b>USB Drive ONLY or Printouts - MP4 or QuickTime format ONLY</b>	<b>Classification</b>	
	<b>Individual</b>	
Still Capture - Black & White – 1 Frame Capture from Video	MP2089	
Still Capture - Color– 1 Frame Capture from Video	MP2090	
Still Capture - edited paint - (must show original) - Black & White – 1 Frame Capture from video	MP2091	
Still Capture - edited paint - (must show original) - Color– 1 Frame Capture from video	MP2092	
Video Capture – B/W – Multiple Frame Video Clip	MP2093	
Video Capture- Color– Multiple Frame Video Clip	MP2094	
Video Capture – Black & White- (must show original) – Multiple Frame Video Clip	MP2095	
Video capture - Color - (must show original) – Multiple Frame Video Clip	MP2096	
Static or working model of a telecommunication device or system	MP2097	

**ROBOTICS**

<b>USB Drive or Printouts - no other formats accepted</b>	<b>Classification</b>	
	<b>Individual</b>	
Programming to 25 lines (moves) of program maximum. Minimum documentation must include hard copies of codes and 3 to 6 photographs or video (maximum of 5 minutes) of robot in action, or printouts.	MP2098	
Programming 26 to 50 lines (moves) of program maximum. Minimum documentation must include hard copies of codes and 3 to 6 photographs or video (maximum of 5 minutes) of robot in action or printouts.	MP2099	
Robot display: must include the robot (may or may not be in working condition), engineering notebook from the contest, photos and/or DVD of the robot in action at actual event.	MP2100	
<b>Remote Operated Vehicle Display (Underwater Robotic R.O.V.)</b>	<b>Middle School</b>	
	<b>Entries Per Region</b> 3	MP3200

**COMPUTER-NUMERIC-CONTROL (CNC) MODELING/PROGRAMMING**

The intent of this area to demonstrate the programming and design aspects ONLY, not actual production, which can be entered under the other classifications. Do NOT bring produced part.

	<b>Classification</b>	
	<b>Individual</b>	<b>Team</b>
CNC Lathe program -must include drawing and CNC code printout - Single Part	MP2101	MP2102
CNC Lathe program -must include drawing and CNC code printout - Multiple Parts	MP2103	MP2104
CNC Mill program- must include drawing and CNC code printout - Single Part	MP2105	MP2106
CNC Mill program- must include drawing and CNC code printout - Multiple Parts	MP2107	MP2108



**COMPUTER-NUMERIC-CONTROL MANUFACTURING (CNC/CAM)****UNIQUENESS OF STUDENT WORK**

ALL ENTRIES MUST BE 100% STUDENT ORIGINAL WORK.

**NO****DOWNLOADED FILES (STL or OTHERS)/WORK - IN FULL OR PARTIAL.****NO DOWNLOADED .STL FILES**

CNC/CAM - 3D Printer/Rapid Prototype - Single Part:	Engineering	MP2109
CNC/CAM - 3D Printer/Rapid Prototype - 2 to 5 Parts:	Engineering	MP2110
CNC/CAM - 3D Printer/Rapid Prototype - 6 to 10 Parts:	Engineering	MP2111
CNC/CAM - 3D Printer/Rapid Prototype - 11 or More Parts:	Engineering	MP2112

**NO DOWNLOADED .STL FILES**

CNC/CAM - 3D Printer/Rapid Prototype - Single Part:	Architecture	MP2113
CNC/CAM - 3D Printer/Rapid Prototype - 2 to 5 Parts:	Architecture	MP2114
CNC/CAM - 3D Printer/Rapid Prototype - 6 to 10 Parts:	Architecture	MP2115
CNC/CAM - 3D Printer/Rapid Prototype - 11 or More Parts:	Architecture	MP2116

**NO DOWNLOADED .STL FILES**

CNC/CAM - 3D Printer/Rapid Prototype - Single Part:	Bio-Medical	MP2117
CNC/CAM - 3D Printer/Rapid Prototype - 2 to 5 Parts:	Bio-Medical	MP2118
CNC/CAM - 3D Printer/Rapid Prototype - 6 to 10 Parts:	Bio-Medical	MP2119
CNC/CAM - 3D Printer/Rapid Prototype - 11 or More Parts:	Bio-Medical	MP2120

**NO DOWNLOADED .STL FILES**

CNC/CAM - 3D Printer/Rapid Prototype - Single Part:	Artistic/Other	MP2121
CNC/CAM - 3D Printer/Rapid Prototype - 2 to 5 Parts:	Artistic/Other	MP2122
CNC/CAM - 3D Printer/Rapid Prototype - 6 to 10 Parts:	Artistic/Other	MP2123
CNC/CAM - 3D Printer/Rapid Prototype - 11 or More Parts:	Artistic/Other	MP2124

**Use of graphics and logos under the Fair Use Laws is permissible, but MUST be documented.**

CNC/CAM - Laser Engraver - single piece less than 8" x 10"	MP2125
CNC/CAM - Laser Engraver - single piece not exceeding 16" x 20"	MP2126
CNC/CAM - Laser Engraver - single piece larger than 24"	MP2127
CNC/CAM - Laser Engraver - single piece Rotary	MP2128
CNC/CAM - Laser Engraver - 2 to 5 parts	MP2129
CNC/CAM - Laser Engraver - 6 to 10 parts	MP2130
CNC/CAM - Laser Engraver - 11 or more parts	MP2131

**INTERFACE**

<b>To control lights, motors, switches, or to receive input from switches, sensors, etc.</b>	<b>Classification</b>
<b>Provide Instructions how to operate in Documentation</b>	<b>Individual</b>
Output interface	MP2132
Input controlled interface	MP2133

**ENERGY**

Student produced displays or working models that demonstrate extraction or processing of Energy.

Provide specific instruction on how to operate for judges.

	<b>Classification</b>
	<b>Individual</b>
Mechanical	MP2134
Heat	MP2135
Electrical	MP2136
Nuclear	MP2137
Light	MP2138
Alternative Energy	MP2139

## POWER

Student produced displays or working models that demonstrate the man-made or natural power sources being used. Provide Instructions how to operate in Documentation.

	Classification	
	Individual	
Mechanical	MP2140	
Heat	MP2141	
Electrical	MP2142	
Chemical	MP2143	
Nuclear	MP2144	
Light	MP2145	
Hydraulic	MP2146	
Pneumatics	MP2147	

## TRANSPORTATION

Student produced displays or working models that demonstrate the man-made or natural power sources being used. Provide Instructions how to operate in Documentation.

	Classification	
	Individual	
Land	MP2148	
Sea	MP2149	
Air	MP2150	
Space	MP2151	
Stationary (Conveyers)	MP2152	
Transportation System / Industries – land/water/air/space. Static display or model.	MP2153	

## APPLICATION OF ENERGY, POWER, AND TRANSPORTATION

**Maximum display size: 3 ft wide X 18 inches deep X 4 ft high unless otherwise specified in rules.**

	Classification	
	Individual	Team
Power Systems - Utilization of pneumatic, hydraulic, and/or mechanical power. <i>Static Display or Working Model</i>	MP2154	MP2155
Electrical Energy Devices Non-Kit	MP2156	MP2157
Electrical Energy Devices Kit	MP2158	MP2159
Electrical Power Systems - Principles, utilization, and impact. <i>Static Display or Working Model</i>	MP2160	MP2161
Electronic devices that use semiconductors in its operation ( <i>Non-kit</i> )	MP2162	MP2163
Electronic devices that use semiconductors in its operation ( <i>Commercial Kits</i> )	MP2164	MP2165
Electronic/Audio Communication Systems - ( <i>Example laser, fiber optics, radio, etc.</i> ) <i>Static Display or Working Model. Provide Instructions how to operate in Documentation.</i>	MP2166	MP2167
Internal and External Combustion Engines - Research of principles, utilization, and environmental impact. ( <i>Static display or working model. Example: engine cut-a-way</i> )	MP2168	MP2169
Transportation Systems/Industries - Land/water/air/space <i>Static Display or Working Model</i>	MP2170	MP2171
Internal and External Combustion Engines - Operation and Maintenance. ( <i>Running</i> ) 5 h.p. maximum size. Minimum documentation will consist of a work history statement signed by the students instructor verifying the task in the work history was performed and the engine is in proper operating condition. <b>Student must operate engine.</b> Engine must be mounted on a suitable frame or engine stand not exceeding 36" x 36" <b>Note: A fire extinguisher must be supplied and be on hand during live engine testing.</b> P.T.O. end of crank shaft must be bare - <b>nothing attached.</b>	MP2172	MP2173
Static or working model of a Telecommunication Device or system.	MP2174	MP2175

## WOOD - INDIVIDUAL ENTRY (Individual Student ONLY)

One (1) Board Foot (bf) is defined as a piece of wood 12" X 12" X 1" in size = 144 cubic inches of wood.

All Board Feet calculations are "AS DISPLAYED". Calculate the total volume of wood in the project based upon cubic inches and divide by 144 to get Board Feet in the project.

**CNC code printout must accompany CNC entry**

	Turning CNC	Turning Machine Tools	CNC	Machine Tools	Portable Power Tools
Less than .25 board feet	MP2176	MP2177	MP2178	MP2179	MP2180
Less than .5 board feet	MP2181	MP2182	MP2183	MP2184	MP2185
Less than .75 board feet	MP2186	MP2187	MP2188	MP2189	MP2190
Less than 1 board feet	MP2191	MP2192	MP2193	MP2194	MP2195
Less than 1.5 board feet	MP2196	MP2197	MP2198	MP2199	MP2200
Less than 2 board feet	MP2201	MP2202	MP2203	MP2204	MP2205
Less than 2.5 board feet	MP2206	MP2207	MP2208	MP2209	MP2210
Less than 3 board feet	N/A	MP2211	MP2212	MP2213	MP2214
Less than 3.5 board feet	N/A	MP2215	MP2216	MP2217	MP2218
Less than 4 board feet	N/A	MP2219	MP2220	MP2221	MP2222
Less than 5 board feet	N/A	MP2223	MP2224	MP2225	MP2226
Less than 6 board feet	N/A	MP2227	MP2228	MP2229	MP2230
Less than 8 board feet	N/A	MP2231	MP2232	MP2233	MP2234
Less than 10 board feet	N/A	MP2235	MP2236	MP2237	MP2238
Less than 15 board feet	N/A	MP2239	N/A	MP2240	N/A
Less than 20 board feet	N/A	MP2241	N/A	MP2242	N/A
Less than 25 board feet	N/A	MP2243	N/A	MP2244	N/A
Less than 30 board feet	N/A	MP2245	N/A	MP2246	N/A
Less than 35 board feet	N/A	MP2247	N/A	MP2248	N/A
Less than 40 board feet	N/A	MP2249	N/A	MP2250	N/A
Less than 50 board feet	N/A	MP2251	N/A	MP2252	N/A
Less than 60 board feet	N/A	MP2253	N/A	MP2254	N/A
More than 60 board feet	N/A	MP2255	N/A	MP2256	N/A

## WOOD - TEAM ENTRY

**Definition of team product:** Two or more students worked on project.

All Board Feet calculations are "AS DISPLAYED".

**CNC code printout must accompany CNC entry**

	Turning CNC	Turning Machine Tools	CNC	Machine Tools	Portable Power Tools
Less than .25 board feet	MP2257	MP2258	MP2259	MP2260	MP2261
Less than .5 board feet	MP2262	MP2263	MP2264	MP2265	MP2266
Less than .75 board feet	MP2267	MP2268	MP2269	MP2270	MP2271
Less than 1 board feet	MP2272	MP2273	MP2274	MP2275	MP2276
Less than 1.5 board feet	MP2277	MP2278	MP2279	MP2280	MP2281
Less than 2 board feet	MP2282	MP2283	MP2284	MP2285	MP2286
Less than 2.5 board feet	MP2287	MP2288	MP2289	MP2290	MP2291
Less than 3 board feet	N/A	MP2292	MP2293	MP2294	MP2295
Less than 3.5 board feet	N/A	MP2296	MP2297	MP2298	MP2299
Less than 4 board feet	N/A	MP2300	MP2301	MP2302	MP2303
Less than 5 board feet	N/A	MP2304	MP2305	MP2306	MP2307
Less than 6 board feet	N/A	MP2308	MP2309	MP2310	MP2311
Less than 8 board feet	N/A	MP2312	MP2313	MP2314	MP2315
Less than 10 board feet	N/A	MP2316	MP2317	MP2318	MP2319
Less than 15 board feet	N/A	MP2320	N/A	MP2321	N/A
Less than 20 board feet	N/A	MP2322	N/A	MP2323	N/A
Less than 25 board feet	N/A	MP2324	N/A	MP2325	N/A
Less than 30 board feet	N/A	MP2326	N/A	MP2327	N/A
Less than 35 board feet	N/A	MP2328	N/A	MP2329	N/A

**WOOD-TEAM ENTRY (continued)**

All Board Feet calculations are "AS DISPLAYED". CNC code printout must accompany CNC entry	Turning CNC	Turning Machine Tools	CNC	Machine Tools	Portable Power Tools
Less than 40 board feet	N/A	MP2330	N/A	MP2331	N/A
Less than 50 board feet	N/A	MP2332	N/A	MP2333	N/A
Less than 60 board feet	N/A	MP2334	N/A	MP2335	N/A
More than 60 board feet	N/A	MP2336	N/A	MP2337	N/A

**METAL/ACRYLIC – INDIVIDUAL**

CNC code printout must accompany CNC entry Area Calculations are required in documentation	Acrylic CNC	Acrylic Machine Tools	Acrylic Hand or Portable Power Tools	Sheet Metal	Metal CNC	Metal Machine Tools	Metal Hand or Portable Power Tools
Less than 0.5 square feet	MP2345	MP2346	MP2347	MP2348	MP2349	MP2350	MP2351
Less than 0.75 square feet	MP2352	MP2353	MP2354	MP2355	MP2356	MP2357	MP2358
Less than 1 square foot	MP2359	MP2360	MP2361	MP2362	MP2363	MP2364	MP2365
Less than 2 square feet	MP2366	MP2367	MP2368	MP2369	MP2370	MP2371	MP2372
Less than 6 square feet	MP2373	MP2374	MP2375	MP2376	MP2377	MP2378	MP2379
Less than 10 square feet	MP2380	MP2381	MP2382	MP2383	MP2384	MP2385	MP2386
Less than 12 square feet	MP2387	MP2388	MP2389	MP2390	MP2391	MP2392	MP2393
More than 12 square feet	MP2394	MP2395	MP2396	MP2397	MP2398	MP2399	MP2400
Less than 1 ounce	MP2401	MP2402	MP2403	MP2404	MP2405	MP2406	MP2407
Less than 2 ounces	MP2408	MP2409	MP2410	MP2411	MP2412	MP2413	MP2414
Less than 4 ounces	MP2415	MP2416	MP2417	MP2418	MP2419	MP2420	MP2421
Less than 6 ounces	MP2422	MP2423	MP2424	MP2425	MP2426	MP2427	MP2428
Less than 8 ounces	MP2429	MP2430	MP2431	MP2432	MP2433	MP2434	MP2435
Less than 12 ounces	MP2436	MP2437	MP2438	MP2439	MP2440	MP2441	MP2442
Less than 1 pound	MP2443	MP2444	MP2445	MP2446	MP2447	MP2448	MP2449
Less than 3 pounds	MP2450	MP2451	MP2452	MP2453	MP2454	MP2455	MP2456
Less than 5 pounds	MP2457	MP2458	MP2459	MP2460	MP2461	MP2462	MP2463
Less than 10 pounds	MP2464	MP2465	MP2466	MP2467	MP2468	MP2469	MP2470
Less than 20 pounds	MP2471	MP2472	MP2473	MP2474	MP2475	MP2476	MP2477
Less than 30 pounds	MP2478	MP2479	MP2480	MP2481	MP2482	MP2483	MP2484
Less than 50 pounds	MP2485	MP2486	MP2487	MP2488	MP2489	MP2490	MP2491
Less than 75 pounds	MP2492	MP2493	MP2494	MP2495	MP2496	MP2497	MP2498
Less than 100 pounds	MP2499	MP2500	MP2501	MP2502	MP2503	MP2504	MP2505
More than 100 pounds	MP2506	MP2507	MP2508	MP2509	MP2510	MP2511	MP2512
Less than 250 pounds	MP2513	MP2514	MP2515	MP2516	MP2517	MP2518	MP2519
Less than 400 pounds	MP2520	MP2521	MP2522	MP2523	MP2524	MP2525	MP2526
Less than 600 pounds	MP2527	MP2528	MP2529	MP2530	MP2531	MP2532	MP2533
Less than 800 pounds	MP2534	MP2535	MP2536	MP2537	MP2538	MP2539	MP2540
Less than 1000 pounds	MP2541	MP2542	MP2543	MP2544	MP2545	MP2546	MP2547
Less than 1500 pounds	MP2548	MP2549	MP2550	MP2551	MP2552	MP2553	MP2554
More than 1500 pounds	MP2555	MP2556	MP2557	MP2558	MP2559	MP2560	MP2561

**METAL/ACRYLIC – TEAM**

	<b>Acrylic CNC</b>	<b>Acrylic Machine Tools</b>	<b>Hand or Portable Power Tools</b>	<b>Sheet Metal</b>	<b>Metal CNC</b>	<b>Metal Machine Tools</b>	<b>Hand or Portable Power Tools</b>
Less than 0.25 square feet	MP2585	MP2586	MP2587	MP2588	MP2589	MP2590	MP2591
Less than 0.5 square feet	MP2592	MP2593	MP2594	MP2595	MP2596	MP2597	MP2598
Less than 0.75 square feet	MP2600	MP2601	MP2602	MP2603	MP2604	MP2605	MP2606
Less than 1 square foot	MP2607	MP2608	MP2609	MP2610	MP2611	MP2612	MP2613
Less than 2 square feet	MP2614	MP2615	MP2616	MP2617	MP2618	MP2619	MP2620
Less than 4 square feet	MP2621	MP2622	MP2623	MP2624	MP2625	MP2626	MP2627
Less than 6 square feet	MP2628	MP2629	MP2630	MP2631	MP2632	MP2633	MP2634
Less than 8 square feet	MP2635	MP2636	MP2637	MP2638	MP2639	MP2640	MP2641
Less than 10 square feet	MP2642	MP2643	MP2644	MP2645	MP2646	MP2647	MP2648
Less than 12 square feet	MP2649	MP2650	MP2651	MP2652	MP2653	MP2654	MP2655
More than 12 square feet	MP2656	MP2657	MP2658	MP2659	MP2660	MP2661	MP2662
Less than 1 ounce	MP2663	MP2664	MP2665	MP2666	MP2667	MP2668	MP2669
Less than 2 ounces	MP2670	MP2671	MP2672	MP2673	MP2674	MP2675	MP2676
Less than 4 ounces	MP2677	MP2678	MP2679	MP2680	MP2681	MP2682	MP2683
Less than 6 ounces	MP2684	MP2685	MP2686	MP2687	MP2688	MP2689	MP2690
Less than 8 ounces	MP2691	MP2692	MP2693	MP2694	MP2695	MP2696	MP2697
Less than 12 ounces	MP2698	MP2699	MP2700	MP2701	MP2702	MP2703	MP2704
Less than 1 pound	MP2705	MP2706	MP2707	MP2708	MP2709	MP2710	MP2711
Less than 3 pounds	MP2712	MP2713	MP2714	MP2715	MP2716	MP2717	MP2718
Less than 5 pounds	MP2719	MP2720	MP2721	MP2722	MP2723	MP2724	MP2725
Less than 15 pounds	MP3719	MP3720	MP3721	MP3722	MP3723	MP3724	MP3725
Less than 25 pounds	MP2726	MP2727	MP2728	MP2729	MP2730	MP2731	MP2732
Less than 50 pounds	MP2733	MP2734	MP2735	MP2736	MP2737	MP2738	MP2739
Less than 75 pounds	MP2740	MP2741	MP2742	MP2743	MP2744	MP2745	MP2746
Less than 100 pounds	MP2747	MP2748	MP2749	MP2750	MP2751	MP2752	MP2753
Less than 200 pounds	MP2754	MP2755	MP2756	MP2757	MP2758	MP2759	MP2760
Less than 400 pounds	MP2761	MP2762	MP2763	MP2764	MP2765	MP2766	MP2767
Less than 600 pounds	MP2768	MP2769	MP2770	MP2771	MP2772	MP2773	MP2774
Less than 800 pounds	MP2775	MP2776	MP2777	MP2778	MP2779	MP2780	MP2781
Less than 1000 pounds	MP2782	MP2783	MP2784	MP2785	MP2786	MP2787	MP2788
Less than 1500 pounds	MP2789	MP2790	MP2791	MP2792	MP2793	MP2794	MP2795
More than 1500 pounds	MP2796	MP2797	MP2798	MP2799	MP2800	MP2801	MP2802

## MASS PRODUCTION ENTRY - INDIVIDUAL

One (1) Board Foot (bf) is defined as a piece of wood 12" X 12" X 1" in size = 144 cubic inches of wood.

All Board Feet calculations are "AS DISPLAYED". Calculate the total volume of wood in the project based upon cubic inches and divide by 144 to get Board Feet in the project.

**Definition of mass production project:** Board foot calculated on single product only to get correct amount of board foot for correct classification.

**This category requires the entry of 2 samples.**

	Wood Turning CNC	Wood Turning Machine Tools	Wood CNC	Wood Machine Tools	Wood Hand or Portable Power Tools
Less than .25 board feet	MP2803	MP2804	MP2805	MP2806	MP2807
Less than .5 board feet	MP2808	MP2809	MP2810	MP2811	MP2812
Less than .75 board feet	MP2813	MP2814	MP2815	MP2816	MP2817
Less than 1 board feet	MP2818	MP2819	MP2820	MP2821	MP2822
Less than 2 board feet	MP2823	MP2824	MP2825	MP2826	MP2827
Less than 4 board feet	MP2828	MP2829	MP2830	MP2831	MP2832
Less than 6 board feet	MP2833	MP2834	MP2835	MP2836	MP2837
Less than 8 board feet	MP2838	MP2839	MP2840	MP2841	MP2842
Less than 10 board feet	MP2843	MP2844	MP2845	MP2846	MP2847
Less than 15 board feet	MP2848	MP2849	MP2850	MP2851	MP2852
Less than 20 board feet	MP2853	MP2854	MP2855	MP2856	MP2857

### Plastic

	Classification
	Individual
Less than .25 sq. feet	MP2858
Less than .5 sq. feet	MP2859
Less than .75 sq. feet	MP2860
Less than 1 sq. feet	MP2861
Less than 2 sq. feet	MP2862

### Metal

	Classification
	Individual
Less than 3 oz	MP2863
Less than 6 oz	MP2864
Less than 12 oz	MP2865
Less than 1 lb.	MP2866
Less than 2 lb.	MP2867
Less than 3 lb.	MP2868
Less than 5 lb.	MP2869

**MANUFACTURING - TURNING – KIT - INDIVIDUAL**

	<b>Other</b>	<b>Bone</b>	<b>Acrylic</b>	<b>Wood</b>	<b>Metal</b>
Pen or Pencil-CNC	MP2870	MP2871	MP2872	MP2873	MP2874
Pen or Pencil - Manual	MP2875	MP2876	MP2877	MP2878	MP2879
Pen/Pencil Set-CNC	MP2880	MP2881	MP2882	MP2883	MP2884
Pen/Pencil-Set-Manual	MP2885	MP2886	MP2887	MP2888	MP2889
Letter Opener-CNC	MP2890	MP2891	MP2892	MP2893	MP2894
Letter Opener-Manual	MP2895	MP2896	MP2897	MP2898	MP2899
Magnifier-CNC	MP2900	MP2901	MP2902	MP2903	MP2904
Magnifier-Manual	MP2905	MP2906	MP2907	MP2908	MP2909
Light or Pull Fan-CNC	MP2910	MP2911	MP2912	MP2913	MP2914
Light or Pull Fan-Manual	MP2915	MP2916	MP2917	MP2918	MP2919
Key Chain-CNC	MP2920	MP2921	MP2922	MP2923	MP2924
Key Chain-Manual	MP2925	MP2926	MP2927	MP2928	MP2929
Other-CNC	MP2930	MP2931	MP2932	MP2933	MP2934
Other-Manual	MP2935	MP2936	MP2937	MP2938	MP2939

**MANUFACTURING - PLASTICS & RESINS**

	<b>Classification</b>
	<b>Individual</b>
PVC fabrication - 10 pounds or less	MP2940
PVC fabrication - more than 10 pounds	MP2941
Injection molding (all)	MP2942
Vacuum forming (all)	MP2943
Casting (all)	MP2944
Reinforced resins (all)	MP2945
Non acrylic	MP2946
Composite	MP2947

**MANUFACTURING - OTHER MATERIALS**

	<b>Individual</b>	<b>Team Single Product</b>	<b>Mass Production</b>
Fabric	MP2948	MP2949	MP2950
Paper	MP2951	MP2952	MP2953
Glass - Flat (Ex: plate)	MP2954	MP2955	MP2956
Glass - Glassware (Ex: mugs)	MP2957	MP2958	MP2959
Leather	MP2960	MP2961	MP2962
Combination of any of the above	MP2963	MP2964	MP2965

**CASTING MATERIALS**

	<b>Sand Mold Rough</b>	<b>Sand Mold Finished</b>	<b>Commercial Mold Rough</b>	<b>Commercial Mold Finished</b>
1 oz	MP2966	MP2967	MP2968	MP2969
3 oz	MP2970	MP2971	MP2972	MP2973
6 oz	MP2974	MP2975	MP2976	MP2977
8 oz	MP2978	MP2979	MP2980	MP2981
12 oz	MP2982	MP2983	MP2984	MP2985
16 oz	MP2986	MP2987	MP2988	MP2989
16 oz plus	MP2990	MP2991	MP2992	MP2993
Pattern Match Plate	MP2994	MP2995	MP2996	MP2997
Disposable	MP2998	MP2999	MP3000	MP3001

## PRECIOUS METALS (Note: See Rule 9 pg. 14)

	<b>Student Made Mold</b>	<b>Commercial Mold</b>
Lost wax casting - Purchased Pattern with stones	MP3002	MP3003
Lost wax casting - Purchased Pattern without stones	MP3004	MP3005

## RECYCLED MATERIALS

These products must be constructed from 50% recycled materials. Products must be classified by the primary construction material

	<b>Combination</b>	<b>Other</b>	<b>Glass</b>	<b>Plastic</b>	<b>Metals</b>	<b>Wood</b>
.5 lb.	MP3006	MP3007	MP3008	MP3009	MP3010	MP3011
1.0 lb.	MP3012	MP3013	MP3014	MP3015	MP3016	MP3017
1.5 lb.	MP3018	MP3019	MP3020	MP3021	MP3022	MP3023
2.0 lb.	MP3024	MP3025	MP3026	MP3027	MP3028	MP3029
3.0 lb.	MP3030	MP3031	MP3032	MP3033	MP3034	MP3035
5.0 lb.	MP3036	MP3037	MP3038	MP3039	MP3040	MP3041
7.0 lb.	MP3042	MP3043	MP3044	MP3045	MP3046	MP3047
10.0lb.	MP3048	MP3049	MP3050	MP3051	MP3052	MP3053
10.0 lb. Plus	MP3054	MP3055	MP3056	MP3057	MP3058	MP3059

## COMBINATION MATERIALS

**Maximum display size: 3 ft. wide X 18 inches deep X 4 ft high.**

	<b>Classification</b>
	<b>Individual</b>
A combination of materials, tools and processes to produce a product	MP3060
Static display or working model that demonstrates the use of a combination of energy, power, and/or transportation. Student or representative should be present only if the device or system needs special instructions to be operated.	MP3061
Static display or working model that incorporates the uses of Communication, Energy/Power/Transportation, Manufacturing, Construction and/or Biotech Technology. Evidence documenting the use of the above technologies must accompany the completed product.	MP3062



## CONSTRUCTION TECHNOLOGY - Individual/Team

Construction is defined as the technique, skills, and standards used in the construction of a shelter, containment, support, or complex. Students will be demonstrating the application of their knowledge of construction when they enter their project in competition.

### PAST

All entries must include historical documentation of the feature that the construction represents.

	Classification	
	Individual	Team
Early buildings (houses, churches, theaters, etc.)	MP3063	MP3064
Early roads, bridges, or waterways	MP3065	MP3066
A display depicting construction technology or material used in the past	MP3067	MP3068

### PRESENT

**(NOTE: When entering models, you must have available original drawing or copy of plans used.)**

	Classification	
	Individual	Team
Model of a constructed residential shelter	MP3069	MP3070
A partial model of a constructed residential shelter which shows detail. Max. size 4 feet by 4 feet by 8 ft. high	MP3071	MP3072
A partial structure to show construction techniques. (Example: wall section, plumbing, electrical application, etc.) Max. size 4 feet by 4 feet by 8 ft. high	MP3073	MP3074

### STRUCTURE USING CONSTRUCTION PROCESSES - Without Utilities

	Classification	
	Individual	Team
Less than 5 sq. ft. of floor space	MP3075	MP3076
More than 5 sq. ft. of floor space	MP3077	MP3078

### STRUCTURE USING CONSTRUCTION PROCESSES - Without Utilities (Continued)

	Classification	
	Individual	Team
A display depicting the technologies or materials that are currently used in construction	MP3079	MP3080
Model of a constructed containment	MP3081	MP3082
Structural engineering research, design, and evaluation of civil construction projects. (Example: highways, bridges, airports, dams, etc.) Static display or model	MP3083	MP3084
Model of a constructed support	MP3085	MP3086
Model of an Aerospace structure	MP3087	MP3088

### FUTURE

	Classification	
	Individual	Team
Master plan development (must include residential, commercial, industrial, and civil construction projects). Example: <i>Sim City</i> computer program. Display area not to exceed 36 x 36 inches	MP3089	MP3090
Model of a mass-transit system	MP3091	MP3092
Other	MP3093	MP3094

## CONSTRUCTION TECHNOLOGY - Individual/Team (Continued)

### DIMENSIONAL MATERIALS

Dimensional Materials are sold/described based upon "nominal" measurements. After being milled and dried for sales, the lumber described is no longer the nominal measurement. Example: A 2X4 is actually 1.5" X 3.5".

Use traditional/standard nominal measurements when calculating board feet.

**The following classifications are set aside for outdoor/recreational products constructed from dimensional materials such as 2x4, 2x6, etc.**

	Classification	
	Individual	Team
Less than 5 b.f	MP3095	MP3096
5 to 10 b.f	MP3097	MP3098
10 to 20 b.f.	MP3099	MP3100
20 to 30 b.f.	MP3101	MP3102
30 to 40 b.f.	MP3103	MP3104
40 to 50 b.f.	MP3105	MP3106
More than 50 b.f.	MP3107	MP3108

### RESTORATIONS - Team/Individual

Restoration: Projects that have been restored to the original condition. Items were originally commercially manufactured. A work history must accompany the entry stating the condition in which the entry was found, parts not reconditioned by the student and other pertinent information as per Rule 9 of the Texas Competition Rules on Page 14 . Engines and motors are not included in this classification.

	Classification	
	Individual	Team
Restoration - furniture	MP3109	MP3110
Restoration - mechanical/machine devices	MP3111	MP3112
Restoration - electrical/appliances	MP3113	MP3114
Restoration - vehicles (All batteries MUST be disconnected while on display)	MP3115	MP3116

### COMMERCIAL MODEL KITS

Theory and Processes as related to Technology Education

Must include manufacturer's assembly instructions.

	Classification	
	Individual	
Construction	MP3117	
Energy	MP3118	
Power	MP3119	
Electricity/Electronics	MP3120	
Land Transportation	MP3121	
Air Transportation	MP3122	
Space Transportation	MP3123	
Water Transportation	MP3124	

### INTEGRATED TECHNOLOGIES PRODUCT PRODUCTION-INDIVIDUAL

**Maximum display size: 3 ft. wide X 18 inches deep X 4 ft high.**

	Classification	
	Individual	
Develop and produce a product that incorporates the uses of Communication, Energy/Power/Transportation, Manufacturing, Construction and/or Biotech Technology. Evidence documenting the use of the above technologies must accompany the completed product.	MP3125	

## BIOTECHNOLOGY

*Students must show evidence of the use of the universal system model. Minimum documentation must contain the following; sketches, description of problem, process and outcomes.*

**Maximum display size: 3 ft. wide X 18 inches deep X 4 ft high.**

	Classification
	Individual
Design biotechnology tools to meet human, physical, and biological needs.	MP3126
Interdisciplinary studies in biotechnology research	MP3127

## SCHOOL DISPLAY

Entries may be for exhibit only and awards may or may not be earned as determined by contest judges. Student must tell the contest coordinator if the entry is "For Judging" or "For Display Only" prior to judging. A team must have produced a product or solved a technological problem. Individual projects are not entered in these classifications. The contest director may refuse entry of a school display due to safety or space availability. School Displays must be approved by the contest director, **two weeks prior to state contest.**

**Maximum display size: 3 ft. wide X 18 inches deep X 4 ft high.**

	Entries Per Region	Classification
		Individual
<b>Activities in more than two curriculum areas</b>	15	MP3128
<b>Communication Technology</b>	15	MP3129
<b>Power/Energy/Transpiration</b>	15	MP3130
<b>Manufacturing/Construction</b>	15	MP3131
<b>Bio-Tech</b>	15	MP3132

## SAFETY POSTER

**Maximum size: 3 ft. wide X 18 inches deep X 4 ft high.**

	Entries Per Region	Classification
		Individual
<b>SAFETY POSTER:</b> a poster to illustrate safety principles in the classroom environment or in the workplace. Poster Size: 22 x 28 inches only. Safety posters may be computer generated / printed.	3	MP3133

## CLUB T-SHIRT

	Entries Per Region	Classification
		Individual
<b>CLUB T-SHIRT:</b> A display of one (1) T-shirt designed & produced for club members to wear. No copyrighted materials/designs/partial designs, images, pictures, or photographs allowed.	3	MP3134

*Use of TSA & School Logos allowed.*