TEXAS

HIGH SCHOOL SECTION

CATEGORY BASED PROJECTS

Technology Students Association

STATE RULEBOOK

2016-2017

CHANGES HAVE BEEN MADE:

NEW CATEGORIES HAVE BEEN ADDED &
SOME CATEGORIES HAVE BEEN MERGED/DELETED

DO NOT USE PREVIOUS YEARS RULES BOOKS!

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 Regional and State TSA Contest. Students names must be specifically listed in membership rolls with Texas TSA in order to compete at Regional and State contest. Affiliation will be completed online through http://www.tsaweb.org/. Chapters be must affiliated prior to November 15th each year 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, 2017 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 2016-2017 contest will be held in Waco on April 6, 7, & 8 of 2017. The entry fee is $12.00 for each entry card.

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Texas TSA does not refund any money for unused state entry cards. 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.

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 2016 Texas TSA State Competition.

REQUIRED MINIMUM DOCUMENTATION:

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

Level 1 - Cover - Single Page containing a Bill of Materials and a single descriptive paragraph explaining the design, development and production of project. **NO SCHOOL LOGOS**
Documentation can be housed in clear plastic page protector or folder. No 3 Ring Binders unless specified by NQE or other rules.

Level 2 - Cover - Will be provided at contest registration.
2 page max - Description of product, instructions for its use, design process, production process, bill of
3 pages max - sketches, working drawings, pictures of production process, etc…
Documentation can be housed in clear plastic page protector or folder. No 3 Ring Binders unless specified by NQE or other rules.

WOOD CATEGORY

Items in this category involve student created projects in which students used traditional and modern woodworking tools, methods, and techniques to create projects.
Any projects in which CNC mills, lathers, computer controlled lasers, etc… were used to produce more than 50% of the major components **SHOULD NOT** be entered in this category.
Judging criteria for production will be based on the following areas: degree of difficulty, appearance, finish, and craftsmanship. NOTE: Board footage is calculated as it is displayed.

REQUIRED MINIMUM DOCUMENTATION:
Documentation is to be considered only when projects are being considered for a Best In State (BIS). Documentation should not be discounted because of method used - hand drawn/written vs. computer created/drawn.

Level 1 - Cover Page - will be provided at contest registration. Single Page containing a single descriptive paragraph explaining the design, development, and prodcution process. Bill of Materials and a single descriptive paragraph explaining the design, development, and production process. Bill of materials. **NO SCHOOL LOGOS.**

Level 2 - **Must include the following:** **NO SCHOOL LOGOS.**
-Cover Page - will be provided at contest registration.
- Step-by-Step Procedures of construction/manufacturing process
- Drawing with appropriate dimensions
- Bill of Materials

Only provide required documentation - DO NOT ADD EXTRA PAGES

MANUFACTURING - WOODS

Team Entry or Mass Produced minimum .5 to 1 board foot (2 items must be displayed, item size is calculated on one item only or appropriate photo verification)	**Individual Entry**	**Team Entry**
Wood turning Pen/Pencil Set -Manual	HP5000	N/A
Wood turning Pen or Pencil- Manual	HP5002	N/A
Wood turning Pen/Pencil Set - Machine (NON CNC)	HP5004	N/A
Wood turning Pen or Pencil- Machine (NON CNC)	HP5006	N/A
Wood turning not exceeding .25 board ft.	HP5008	N/A
Wood turnings not exceeding .5 board ft	HP5010	N/A
Wood turnings not exceeding 1 board ft	HP5012	HP5013
Wood turning not exceeding 1.5 board ft.	HP5014	HP5015
Wood turning not exceeding 2 board ft.	HP5016	HP5017
Wood turning not exceeding 4 board ft.	HP5018	HP5019
Wood turning not exceeded 6 board ft	HP5020	HP5021
Wood turning not exceeded 8 board ft	HP5022	HP5023
Wood turning not exceeding 10 board ft	HP5024	HP5025
Wood turning not exceeding 15 board ft.	HP5026	HP5027
Wood turning exceeding 15 board ft.	HP5028	HP5029
Wood entries not exceeding 0.5 board ft.	HP5030	HP5031
Wood entries not exceeding 1 board ft.	HP5032	HP5033
Wood entries not exceeding 2 board ft.	HP5034	HP5035
Wood entries not exceeding 4 board ft.	HP5036	HP5037
Wood entries not exceeding 6 board ft.	HP5038	HP5039

MANUFACTURING - WOODS (continued)

Team Entry or Mass Produced (2 items must be displayed, item size is calculated on one item only or appropriate photo verification)	**Individual Entry**	**Team Entry**
Wood entries not exceeding 8 board ft.	HP5050	HP5051
Wood entries not exceeding 10 board ft.	HP5052	HP5053
Wood entries not exceeding 15 board ft.	HP5054	HP5055
Wood entries not exceeding 20 board ft.	HP5056	HP5057
Wood entries not exceeding 25 board ft.	HP5058	HP5059
Wood entries not exceeding 30 board ft.	HP5060	HP5061
Wood entries not exceeding 35 board ft.	HP5062	HP5063
Wood entries not exceeding 40 board ft.	HP5064	HP5065
Wood entries not exceeding 50 board ft.	HP5066	HP5067
Wood entries not exceeding 60 board ft.	HP5068	HP5069
Wood entries not exceeding 70 board ft.	HP5070	HP5071
Wood entries not exceeding 80 board ft.	HP5072	HP5073
Wood entries not exceeding 90 board ft.	HP5074	HP5075
Wood entries not exceeding 100 board ft.	HP5076	HP5077
Wood entries not exceeding 120 board ft.	HP5078	HP5079
Wood entries not exceeding 140 board ft.	HP5080	HP5081
Wood entries not exceeding 150 board ft.	HP5082	HP5083
Wood entries exceeding 150 board ft.	HP5084	HP5085

DIMENSIONAL MATERIALS

The following classifications are set aside for outdoor/recreational products constructed of dimensional materials such as 2X4, 2X6, etc. Board Feet calculated on 1 unit of a production run.

	Entry	**Entry**
Less than 20 b.f.	HP5090	HP5091
20 to 30 b.f.	HP5092	HP5093
30 to 40 b.f.	HP5094	HP5095
40 to 50 b.f.	HP5096	HP5097
More than 50 b.f.	HP5098	HP5099

METALS CATEGORY

Items in this category involve student created projects in which students used metal working tools, methods, and techniques to create projects

Any projects in which CNC mills, lathes, computer controlled lasers, etc… were used to produce more than 50% of the major components **SHOULD NOT** be entered in this category.

Judging criteria for production will be based on the following areas: degree of difficulty, appearance, finish, and craftsmanship. Material used is calculated as item as displayed. **Large entries** may have to be displayed outside.

REQUIRED MINIMUM DOCUMENTATION:
Documentation is to be considered only when projects are being considered for a Best In State (BIS). Documentation should not be discounted because of method used - hand drawn/written vs. computer created/drawn.

Level 1 - Cover Page - will be provided at contest registration. Single Page containing a single descriptive paragraph explaining the design, development, and prodcution process. Bill of Materials and a single descriptive paragraph explaining the design, development, and production process. **NO SCHOOL LOGOS.**

Level 2 - **Must include the following:** **NO SCHOOL LOGOS.**
- -Cover Page - will be provided at contest registration.
- - Step-by-Step Procedures of construction/manufacturing process
- - Drawing with appropriate dimensions
- - Bill of Materials

Only provide required documentation - DO NOT ADD EXTRA PAGES

Projects housed outside should place their documentation in large plastic zip lock bag

MANUFACTURING - METALS

Team Entry or Mass Produced (2 items must be displayed, item size is calculated on one item only or appropriate photo verification)	**Individual Entry**	**Team Entry**
Entries not exceeding less than 3 lbs. - no sheet metal	HP5120	HP5121
Entries not exceeding 5 lbs. - no sheet metal	HP5122	HP5123
Entries not exceeding 10 lbs. - no sheet metal	HP5124	HP5125
Entries not exceeding 20 lbs. - no sheet metal	HP5126	HP5127
Entries not exceeding 30 lbs. - no sheet metal	HP5128	HP5129
Entries not exceeding 50 lbs. - no sheet metal	HP5130	HP5131
Entries exceeding 50 lbs. - no sheet metal **(Entrees below need not include sheet metal)**	HP5132	HP5133
Entries not exceeding 10 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5134	HP5135
Entries not exceeding 20 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5136	HP5137
Entries not exceeding 50 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5138	HP5139
Entries not exceeding 100 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5140	HP5141
Entries not exceeding 150 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5142	HP5143
Entries not exceeding 200 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5144	HP5145

MANUFACTURING - METALS (continued)

	Individual Entry	Team Entry
Entries not exceeding 250 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5146	HP5147
Entries not exceeding 300 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5148	HP5149
Entries not exceeding 350 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5150	HP5151
Entries not exceeding 400 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5152	HP5153
Entries not exceeding 500 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5154	HP5155
Entries not exceeding 800 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5156	HP5157
Entries not exceeding 1000 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5158	HP5159
Entries not exceeding 1500 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5160	HP5161
Entries not exceeding 2000 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5162	HP5163
Entries not exceeding 2500 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5164	HP5165
Entries not exceeding 3000 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5166	HP5167
Entries exceeding 3000 lbs. - combined sheet & wrought metal Major fabrication is wrought	HP5168	HP5169
Metal Sculpturing - Ferrous or nonferrous	HP5170	HP5171

SHEET METAL

Entries in which the major material is sheet metal. (.125 inches maximum thickness)
Classifications are for the total combined sheet metal area contained in the entry.

Team Entry or Mass Produced (2 items must be displayed, item size is calculated on one item only or appropriate photo verification)	Individual Entry	Team Entry
Scroll work (fastened or joined)	HP5180	HP5181
Entries not exceeding 2 sq. ft	HP5182	HP5183
Entries not exceeding 4 sq. ft	HP5184	HP5185
Entries not exceeding 6 sq. ft	HP5186	HP5187
Entries not exceeding 8 sq. ft	HP5188	HP5189
Entries not exceeding 15 sq. ft	HP5190	HP5191
Entries exceeding 15 sq. ft.	HP5192	HP5193

FORGING

Entries made from medium or high carbon tool steel. Entries may have wood, plastic or other material as part of the product. *Team - Mass Production - 2 items must be displayed, item size is calculated on one item only*

	Individual Entry	Team Entry
Scroll work (fastened or joined)	HP5200	HP5201
Entries not exceeding 2 sq. ft.	HP5202	HP5203
Entries not exceeding 4 sq. ft	HP5204	HP5205
Entries not exceeding 6 sq. ft	HP5206	HP5207
Entries not exceeding 8 sq. ft.	HP5208	HP5209
Entries not exceeding 15 sq. ft.	HP5210	HP5211
Entries exceeding 15 sq. ft.	HP5212	HP5213
1 piece forged and heat-treated	HP5214	HP5215
Forged and heat treated sets	HP5216	HP5217

FOUNDRY

Team - Mass Production - 2 items must be displayed, item size is calculated on one item only

	Individual Entry	Team Entry
Rough casting (1) part	HP5220	HP5221
Rough casting, multiple parts	HP5222	HP5223
Finished casting (1) part	HP5224	HP5225
Finished casting, multiple parts	HP5226	HP5227
Finished foundry products - not more than 4 cast parts	HP5228	HP5229
Finished foundry products - more than 4 cast parts	HP5230	HP5231
Pattern and match plates- rough casting must accompany entry	HP5232	HP5233
Disposable – 1 time use patterns, lost wax, Styrofoam, etc.		
2 oz. or less	HP5234	HP5235
8 oz. or less	HP5236	HP5237
1 lb. or less	HP5238	HP5239
More than 1 lb.	HP5240	HP5241

MACHINE METAL

Finished for all entries should be appropriate. Commercial - industrial practices should be the guides as to the degree and kind of finish to use. No plating except in the designated classifications. Entries consisting of more than 1 part must be assembled if possible. All non-student made parts should be identified as per rule 16. Standard hardware items, such as screws, bolts, washers, keys, pins, etc. that are not student made will not count as parts but must be identified. Team - Mass Production - 2 items must be displayed, item size is calculated on one item only

	Individual Entry	Team Entry
Working Production machines or devices	HP5250	HP5251
Entries containing not more than 1 student made part	HP5252	HP5253
Entries containing not more than 3 student made parts	HP5254	HP5255
Entries containing 4 or more student made parts	HP5256	HP5257
Student plated entries	HP5258	HP5259
Entries made from commercial kits or castings	HP5260	HP5261

MATERIALS CATEGORY

Items in this category involve student created projects in which students used traditional and modern tools, methods, and techniques to create projects from various materials not listed under other categories.

Any projects in which CNC mills, lathers, computer controlled lasers, etc… were used to produce more than 50% of the major components **SHOULD NOT** be entered in this category.

Judging criteria for production will be based on the following areas: degree of difficulty, appearance, finish, and craftsmanship. NOTE: Board footage is calculated as it is displayed.

REQUIRED MINIMUM DOCUMENTATION:
Documentation is to be considered only when projects are being considered for a Best In State (BIS). Documentation should not be discounted because of method used - hand drawn/written vs. computer created/drawn.

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Level 2 - **Must include the following:** **NO SCHOOL LOGOS.**
-Cover Page - will be provided at contest registration.
- Step-by-Step Procedures of construction/manufacturing process
- Drawing with appropriate dimensions
- Bill of Materials

Only provide required documentation - DO NOT ADD EXTRA PAGES

MANUFACTURING - MATERIALS

Team Entry or Mass Produced (2 items must be displayed, item size is calculated on one item only or appropriate photo verification)	**Individual Entry**	**Team Entry**
Pen/Pencil Set -Manual	HP5300	HP5301
Pen or Pencil- Manual	HP5302	N/A
Manual Turnings not exceeding 2 ounces	HP5304	N/A
Manual Turnings not exceeding 4 ounces	HP5306	N/A
Manual Turnings not exceeding 8 ounces	HP5308	N/A
Manual Turnings not exceeding 1 lbs.	HP5310	HP5311
Manual Turnings exceeding 1 lbs.	HP5312	HP5313
Machine turning less than 8 oz (NON CNC)	HP5314	HP5315
Machine turning less than 16 oz (NON CNC)	HP5316	HP5317
Machine turning more than 16 oz (NON CNC)	HP5318	HP5319
Entries not exceeding 1 ounce	HP5320	HP5321
Entries not exceeding 2 ounces	HP5322	HP5323
Entries not exceeding 5 ounces	HP5324	HP5325
Entries not exceeding 10 ounces	HP5326	HP5327
Entries not exceeding 15 ounces	HP5328	HP5329
Entries not exceeding 2 pounds	HP5330	HP5331
Entries not exceeding 5 pounds	HP5332	HP5333
Entries not exceeding 10 pounds	HP5334	HP5335
Entries not exceeding 20 pounds	HP5336	HP5337
Entries exceeding 40 pounds	HP5338	HP5339
Welding (non-metal)	HP5340	HP5341
Casting (non metal) not exceeding 2 oz.	HP5342	HP5343
Casting (non metal) not exceeding 5 oz.	HP5344	HP5345

MANUFACTURING - MATERIALS (continued)

Team Entry or Mass Produced (2 items must be displayed, item size is calculated on one item only or appropriate photo verification)	**Individual Entry**	**Team Entry**
Casting (non metal) not exceeding 10 oz.	HP5346	HP5347
Casting (non metal) not exceeding 16 oz.	HP5348	HP5349
Casting (non metal) not exceeding 2 lbs.	HP5350	HP5351
Casting (non metal) not exceeding 4 lbs.	HP5352	HP5353
Casting (non metal) exceeding 4 lbs.	HP5354	HP5355

MANUFACTURING - PLASTICS & RESINS

Team Entry or Mass Produced (2 items must be displayed, item size is calculated on one item only or appropriate photo verification)	**Individual Entry**	**Team Entry**
PVC fabrication - 10 pounds or less	HP5370	HP5371
PVC fabrication - more than 10 pounds	HP5372	HP5373
Injection molding (all)	HP5374	HP5375
Vacuum forming (all)	HP5376	HP5377
Casting (all)	HP5378	HP5379
Reinforced resins (all)	HP5380	HP5381
Non acrylic	HP5382	HP5383
Composite	HP5384	HP5385
Acrylics	HP5386	HP5387

MANUFACTURING - OTHER MATERIALS

Team Entry or Mass Produced (2 items must be displayed, item size is calculated on one item only or appropriate photo verification)	**Individual Entry**	**Team Entry**
Fabric	HP5394	HP5395
Paper	HP5396	HP5397
Glass - Flat (Ex: plate)	HP5398	HP5399
Glass - Glassware (Ex: mugs)	HP5400	HP5401
Leather	HP5402	HP5403
Combination of any of the above	HP5404	HP5405

RESTORATION

Items that were originally commercially manufactured and have been restored to their original state. A work history must accompany the entry showing the condition of the item before the restoration. All parts not reconditioned by the student must be identified.

- You must show photographic documentation, that includes before, during, and post production effort.

	Individual Entry	**Team Entry**
Restoration - furniture	HP5410	HP5411
Restoration - mechanical/machine devices	HP5412	HP5413
Restoration - electrical/appliances	HP5414	HP5415
Restoration - vehicles	HP5416	HP5417

RECYCLED MATERIALS

Items made out of a minimum of 50% recycled materials
A work history must accompany the entry showing the recycled item before construction
- You must show photographic documentation, that includes before, during, and post production effort.

Team Entry or Mass Produced (2 items must be displayed, item size is calculated on one item only or appropriate photo verification)	**Individual Entry**	**Team Entry**
Recycled - Woods	HP5430	HP5431
Recycled - Metals	HP5432	HP5433
Recycled - Electrical/electronics	HP5434	HP5435
Recycled - Other	HP5436	HP5437
Recycled - Combination of two or more recycled materials	HP5438	HP5439

CNC/CAM & PROGRAMMING CATEGORY

Items in this category involve student created projects in which students used Computer Numerical Control or Computer Aided Manufacturing devices to create projects.

Any projects in which CNC mills, lathes, computer controlled lasers, etc… were **NOT** used to produce **ALL** major components **SHOULD NOT** be entered in this category.

Judging criteria for production will be based on the following areas: degree of difficulty, appearance, finish, and craftsmanship.

PART - Refers to student manufactured pieces. Does not include purchased or pre-packed pieces, such as clock mechanisms.

REQUIRED MINIMUM DOCUMENTATION

Documentation is to be considered only when projects are being considered for a Best In State (BIS).

Level 1 - Cover Page - will be provided at contest registration. Single Page containing a single descriptive paragraph explaining the design, development, and production process. Bill of materials. **NO SCHOOL LOGOS.**

Level 2 - **Must include the following:** **NO SCHOOL LOGOS.**

-Cover Page - will be provided at contest registration.
- Step-by-Step Procedures of construction/manufacturing process
- Drawing with appropriate dimensions
- Bill of Materials

Only provide required documentation - DO NOT ADD EXTRA PAGES

UNIQUENESS OF STUDENT WORK

ALL ENTRIES MUST BE 100% STUDENT ORIGINAL WORK. NO DOWNLOADED FILES/WORK - IN FULL OR PARTIAL.

All student entries MUST be made from a single unique native file. Using a single electronic file to produce multiple contest entries is forbidden. Each project must be unique in both the final product and any associated electronic file regardless of file type.

CNC/CAM - WOOD

	Individual Entry
CNC/CAM - Mill / Router - single piece less than 5" x 5"	HP5450
CNC/CAM - Mill / Router - single piece less than 10" x 10"	HP5451
CNC/CAM - Mill / Router - single piece not exceeding 20" x 20"	HP5452
CNC/CAM - Mill / Router - single piece larger than 20"	HP5453
CNC/CAM - Mill / Router - 2 to 5 parts	HP5454
CNC/CAM - Mill / Router - 6 to 10 parts	HP5455
CNC/CAM - Mill / Router - 11 or more parts	HP5456
CNC/CAM - Lathe - Pen/Pencil	HP5460
CNC/CAM - Lathe - Pen/Pencil Set	HP5461
CNC/CAM - Lathe - single piece less than 1/2 diameter x 12" length	HP5462
CNC/CAM - Lathe - single piece less than 1" diameter x 18" length	HP5463
CNC/CAM - Lathe - single piece less than 2" diameter x 24" length	HP5464
CNC/CAM - Lathe - single piece exceeding 2" diamter	HP5465
CNC/CAM - Lathe - 2 to 5 parts	HP5466

CNC/CAM - WOOD (continued)

CNC/CAM - Lathe - 6 to 10 parts	HP5467
CNC/CAM - Lathe - 11 or more parts	HP5468
CNC/CAM - Laser Engraver - single piece less than 8" x 10"	HP5469
CNC/CAM - Laser Engraver - single piece not exceeding 16" x 20"	HP5470
CNC/CAM - Laser Engraver - single piece larger than 24"	HP5471
CNC/CAM - Laser Engraver - single piece Rotary	HP5472
CNC/CAM - Laser Engraver - 2 to 5 parts	HP5473
CNC/CAM - Laser Engraver - 6 to 10 parts	HP5474
CNC/CAM - Laser Engraver - 11 or more parts	HP5475

CNC/CAM - OTHER MATERIAL

	Individual Entry
CNC/CAM - Mill / Router - single piece less than 5" x 5"	HP5476
CNC/CAM - Mill / Router - single piece less than 10" x 10"	HP5477
CNC/CAM - Mill / Router - single piece not exceeding 20" x 20"	HP5478
CNC/CAM - Mill / Router - single piece larger than 20"	HP5479
CNC/CAM - Mill / Router - 2 to 5 parts	HP5480
CNC/CAM - Mill / Router - 6 to 10 parts	HP5481
CNC/CAM - Mill / Router - 11 or more parts	HP5482
CNC/CAM - Lathe - Pen/Pencil	HP5483
CNC/CAM - Lathe - Pen/Pencil Set	HP5484
CNC/CAM - Lathe - single piece less than 1/2 diameter x 12" length	HP5485
CNC/CAM - Lathe -single piece less than 1" diameter x 18" length	HP5486
CNC/CAM - Lathe - single piece less than 2" diameter x 24" length	HP5487
CNC/CAM - Lathe - single piece exceeding 2" diamter	HP5488
CNC/CAM - Lathe - 2 to 5 parts	HP5489
CNC/CAM - Lathe - 6 to 10 parts	HP5490
CNC/CAM - Lathe - 11 or more parts	HP5491
CNC/CAM - Laser Engraver - single piece less than 8" x 10"	HP5492
CNC/CAM - Laser Engraver - single piece not exceeding 16" x 20"	HP5493
CNC/CAM - Laser Engraver - single piece larger than 24"	HP5494
CNC/CAM - Laser Engraver - single piece Rotary	HP5495
CNC/CAM - Laser Engraver - 2 to 5 parts	HP5496
CNC/CAM - Laser Engraver - 6 to 10 parts	HP5497
CNC/CAM - Laser Engraver - 11 or more parts	HP5498
CNC/CAM - Plasma Cutter - single piece less than 12" x 12"	HP5499
CNC/CAM - Plasma Cutter- single piece not exceeding 24" x 24"	HP5500
CNC/CAM - Plasma Cutter- single piece not exceeding 36" x 36"	HP5501
CNC/CAM - Plasma Cutter- single piece larger than 36" x 36"	HP5502
CNC/CAM - Plasma Cutter - single piece Rotary	HP5503
CNC/CAM - Plasma Cutter - 2 to 5 parts	HP5504
CNC/CAM - Plasma Cutter- 6 to 10 parts	HP5505
CNC/CAM - Plasma Cutter - 11 or more parts	HP5506
Robotic Welding	HP5507
CNC/CAM Embroidery Single Design	HP5508
CNC/CAM Embroidery Multiple Design	HP5509
CNC/CAM Vinyl Cutter - Single Color - less than 3.5 x 18"	HP5510
CNC/CAM Vinyl Cutter - Multi Color - less than 3.5 x 18"	HP5511
CNC/CAM Vinyl Cutter - Single Color - 8 x 10"	HP5512

CNC/CAM - OTHER MATERIAL (continued)	
CNC/CAM Vinyl Cutter - Multi Color - 8 x 10"	HP5513
CNC/CAM Vinyl Cutter - Single Color - Large Format	HP5514
CNC/CAM Vinyl Cutter - Multi Color - Large format	HP5515

Flexible Manufacturing Systems – Multiple machine – multi tasks – single part, hard copy of the programs must accompany entry on USB drive	HP5516
Flexible Manufacturing Systems – Multiple machine – multi tasks – multiple parts, hard copy of the programs must accompany entry on USB drive	HP5517
Flexible Manufacturing Systems - Multiple machine Multi-task-video *Demonstration* - 5 minute Maximum…	HP5518
Computer Integrated Manufacturing - Multiple machine Multiple task-video *Demonstration* - 5 minute maximum	HP5519

UNIQUENESS OF STUDENT WORK

ALL ENTRIES MUST BE 100% STUDENT ORIGINAL WORK. NO DOWNLOADED FILES/WORK - IN FULL OR PARTIAL.

ALL work must be 100% student original produced. ALL copyright rules and regulations apply. No downloaded files of any format - in part or in whole - may be used to create any part or parts of any 3D Print/Rapid Prototype.		**Individual Entry**
CNC/CAM - 3D Printer/Rapid Prototype - Single Part:	Engineering	HP5520
CNC/CAM - 3D Printer/Rapid Prototype - 2 to 5 Parts:	Engineering	HP5521
CNC/CAM - 3D Printer/Rapid Prototype - 6 to 10 Parts:	Engineering	HP5522
CNC/CAM - 3D Printer/Rapid Prototype - 11 or More Parts:	Engineering	HP5523

CNC/CAM - 3D Printer/Rapid Prototype - Single Part:	Architecture	HP5524
CNC/CAM - 3D Printer/Rapid Prototype - 2 to 5 Parts:	Architecture	HP5525
CNC/CAM - 3D Printer/Rapid Prototype - 6 to 10 Parts:	Architecture	HP5526
CNC/CAM - 3D Printer/Rapid Prototype - 11 or More Parts:	Architecture	HP5527

CNC/CAM - 3D Printer/Rapid Prototype - Single Part:	Bio-Medical	HP5528
CNC/CAM - 3D Printer/Rapid Prototype - 2 to 5 Parts:	Bio-Medical	HP5529
CNC/CAM - 3D Printer/Rapid Prototype - 6 to 10 Parts:	Bio-Medical	HP5530
CNC/CAM - 3D Printer/Rapid Prototype - 11 or More Parts:	Bio-Medical	HP5531

CNC/CAM - 3D Printer/Rapid Prototype - Single Part:	Artistic/Other	HP5532
CNC/CAM - 3D Printer/Rapid Prototype - 2 to 5 Parts:	Artistic/Other	HP5533
CNC/CAM - 3D Printer/Rapid Prototype - 6 to 10 Parts:	Artistic/Other	HP5534
CNC/CAM - 3D Printer/Rapid Prototype - 11 or More Parts:	Artistic/Other	HP5535

COMMUNICATION/PRINT MEDIA CATEGORY

Items in this category involve student created projects in which students used traditional and modem methods, equipment, and processes to create Communication projects.

SCREEN PRINTS: Entries must include 3 copies in order to judge consistent registration and quality, along with content, composition and overall visual effect. Maximum size not to exceed 11 x 17 inches.

GI-24 – **Binding Terms**

Bound – Example, spiral bound, glued and tape, GBC Machine
Saddle Stitch – Stapled in the fold.

Mounting boards may be used not to exceed 8-1/2" x 11" unless otherwise noted.

Entries that depict sex, drugs, tobacco, gangs, violence, or cults will not be permitted. This does not preclude posters, "etc." that may bring awareness of these and other issues as deemed appropriate by TEA, State Board of Education, and local school policy.

REQUIRED MINIMUM DOCUMENTATION:

Documentation is to be considered only when projects are being considered for a Best In State (BIS). Documentation should not be discounted because of method used - hand drawn/written vs. computer created/drawn.

Level 1 - Cover page - will be provided at contest registration. Single Page containing a single descriptive paragraph explaining the design and production of project.

Level 2 - Cover - will be provided at contest registration.

2 pages max - Description of product, design process, description of software/hardware used, production process…

Only provide required documenation - DO NOT ADD EXTRA PAGES

DESKTOP PUBLISHING

	Individual Entry
Business Cards/Name Tags/Invitation - *Must include 4 design options*	HP6000
Certificate	HP6001
Flyer, newspaper ad - Single Sheet	HP6002
Form - Single Sheet	HP6003
Calendar – Single Sheet	HP6004
Calendar – Multiple Sheet	HP6005
Resume - One page, front only	HP6006
Form Single Sheet	HP6007
CD Packaging – must include CD case and labeling	HP6008
2-4 printed panels (Maximum paper size is 8.5 x 11)	HP6009
5 or more printed panels (Maximum paper size is 8.5 x 11) *May include: invitations, greeting cards, menus, programs, travel, marketing,*	HP6011
Thematic Portfolio - A collection of four or more graphic images following a central theme (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)	HP6012
Desktop publishing - thematic portfolio display to promote a Business *Must include letterhead, business card, and form*	HP6013

DESKTOP PUBLISHING (continued)

	Individual Entry
Booklet - Multiple page document (Instructional manual, memory book, course description, student handbook, etc.) Must be bound on edge	HP6014
Pamphlet - Multiple page document – maximum size 8.5 x 11 Folded in half and saddle stitched (stapled) Refer to GI-24)	HP6015
Newsletter - Must Include Flag (heading with title, date, etc.) Single Sheet - Front Only - Maximum sheet size 8.5 x 11 inches	HP6017
Newsletter - Must Include Flag Single Sheet Front and Back Maximum sheet size 8.5 x 11 inches	HP6018
Newspaper - Must Include Flag – Multiple sheets - Maximum Sheet Size 11 X 17 inches (could be four 8.5 x 11 inches taped together to form camera-ready flats)	HP6019
Magazine Layout Student produced magazine of 5-10 pages, must have a common theme. For example fashion, cars, sports, ect. Must be submitted on 8.5x11 pages, bound for sale. All photos and stories must be original work of the student.	HP6020
Product Label – Ex. Soup label	HP6021
Product Packaging –Ex. Cereal box	HP6022
Database	HP6023
Spreadsheet	HP6024
Computer Image Transfer- one color (fabric, mug, etc…)	HP6025
Computer Image Transfer-multi color (fabric, mug, etc…)	HP6026
Other desktop communication not mentioned above	HP6027

PRINT COMMUNICATION

Print communication entries must include a minimum of three copies in order to judge consistent registration and quality along with content, composition and overall effect. Maximum finished size is 11 x 17 inches.

	Individual Entry
Screen print communication - one color on paper, fabric, or container Should advertise a product, place or upcoming event	HP6030
Screen print communication - multicolor on paper, fabric, or container Should advertise a product, place or upcoming event	HP6031

TECHNICAL REPORT

Using Word Processing software create a technical report – include a cover sheet, body of report, and bibliography. Citations and bibliography can be in either MLA or APA format.	Individual Entry
Aerospace related	HP6040
Architectural related	HP6041
Biotech - emerging technology	HP6042
Communication Technology - Engineering	HP6043
Communication Technology - Scientific	HP6044
Computer Aided Design	HP6045
Computer Aided Manufacturing	HP6046
Computer Digital Transfer Technology (example: Digital Music)	HP6047
Energy Technology - Engineering	HP6048
Energy Technology - Scientific	HP6049
Alternate Energy	HP6050

TECHNICAL REPORT (continued)

Using Word Processing software create a technical report – include a cover sheet, body of report, and bibliography. Citations and bibliography can be in either MLA or APA format.	**Individual Entry**
Engineering - Applied research. Example:: improve an existing machine or material	HP6051
Illustrate the difference 2 or more types of structures	HP6052
Machine Design	HP6053
Meteorology	HP6054
Production Technology - Engineering	HP6055
Robotics - emerging technology	HP6056
Satellite communication	HP6057
Science - Research using given scientific parameters and formulas to obtain conclusions. For example: determining the speed of an object based on time and distance.	HP6058
Statistical processing	HP6059
Web Page Design	HP6060
Technical Report – Create a report integrating two or more of the processes Word processing, database and/or spreadsheet	HP6061
A combination of any of the above Technologies - Engineering	HP6062
A combination of any of the above Technologies - Science	HP6063
Other field or area not listed	HP6064

MULTIMEDIA & ANIMATION CATEGORY

Items in this category involve student created projects in which students used Multimedia & Animation Technology to create 2D and 3D projects. Multimedia includes video, audio, graphics, and animation.

MULTIMEDIA: Entries must include two or more communications methods. A story board and brief description of the two or more communications methods used must be included.

USB Drive ONLY. This includes a wide variety of small pluggable USB memory storage devices such as thumbrives or flash drives. Please ensure that they work on both PC and Macs. Care should be taken to ensure the safety of these devices due to their portable nature. USB Drive must be read by current version of Internet Explorer or .flc, .avi, and .mov formats. USB Drive must be in RESEALABLE clear plastic bag (Zip Lock Type). USB Drive is required and MUST BE AUTO-PLAY.

Video Editing/Sound Editing - must supply original footage/audio and finished copy.

Entries that depict sex, drugs, tobacco, gangs, violence, or cults will not be permitted. This does not preclude posters, "etc." that may bring awareness of these and other issues as deemed appropriate by TEA, State Board of Education, and local school policy.

Documentation is to be considered only when projects are being considered for a Best In State (BIS). Documentation should not be discounted because of method used - hand drawn/written vs. computer created/drawn.

Level 1 - Cover Page - will be provided at contest registration. Single Page containing a Bill of Materials and a single descriptive paragraph explaining the design, development and production of project. **NO SCHOOL LOGOS.**

Level 2 - Cover - will be provided at contest registration.
2 pages max - Description of product, design process, description of software/hardware used, production process… **NO SCHOOL LOGOS.**

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

Only provide required documentatiopn - DO NOT ADD EXTRA PAGES

COMPUTER GENERATED PRESENTATION

USB Drive format

Presentation must include a minimum of 2 of the following media: static images, audio, or video. A story board and brief description of the methods used must be included.	**Individual Entry**
Presentation – 1 to 15 slides	HP6100
Presentation – 16 to 25 slides	HP6101
Presentation – 26 or more slides	HP6102

SOUND EDITING

USB Drive format

Video Editing/Sound Editing - must supply original footage/audio and finished copy	**Individual Entry**
Audio CD/USB —30 seconds	HP6103
Audio CD/USB —60 seconds	HP6104
Audio Editing – must supply original & finished copy - 15 Sec. Max	HP6105
Audio Editing – must supply original & finished copy - 30 Sec. Max	HP6106
Audio Editing – must supply original & finished copy - 60 Sec. Max	HP6107
Audio Editing – must supply original & finished copy - 3 Minutes Max	HP6108

VIDEO EDITING

USB Drive format

Video Editing/Sound Editing - must supply original footage/audio and finished copy	**Individual Entry**
Video Commercial – 15 Seconds precisely	HP6109
Video Commercial – 30 Seconds precisely	HP6110
Video Commercial – 60 Seconds precisely	HP6111
Video Presentation – 30 seconds precisely	HP6112
Video Presentation – 60 seconds precisely	HP6113
Video Presentation – 120 seconds precisely	HP6114
Video Promotional/Instructional/Demonstration – 3 minutes maximum	HP6115
Video Album (Example: memories on video) – 5 minutes maximum	HP6116
Video Editing Musical Original Music - Maximum one song	HP6117
Video Newscast – No commercially processed program 3 minute maximum	HP6118
Video Animation *(3-5 minutes)*	HP6119
Graphic Video –(Example: Logo created in PhotoShop for video)	HP6120
Marketing Video – (Example: Non-Profit organization video such as say no to drugs)	HP6121
Video Editing – must supply original & finished copy	HP6122
Video Editing Chromakey Screen - Original and After (Maximum 60 seconds.)	HP6123
Video Editing Musical – Max One Song.	HP6124
Music Video Lip Sync – (Example: MTV, CMT Video)	HP6125
Music Video Original Student – (1 Song Length Max)	HP6126
Historical aspect of your community, mini encyclopedia (must include sound, text, animation, and or digital video)	HP6127
Video Highlights - Video Footage Only	HP6128

COMPUTER IMAGING

USB Drive format ***Must cite source for Clip Art***

	Individual Entry
Computer Generated Graphic Art - Single page - Color	HP6129
Computer Generated Graphic Art - Single page – Black & White	HP6130
Computer generated graphic art - Multiple page - color	HP6131
Computer generated graphic art - Multiple page - black & white	HP6132
Computer generated original 3-D Sci-Fi Image	HP6133
Computer generated original 3-D Transportation	HP6134
Computer generated original 3-D Not mentioned above	HP6135
Computer Generated Original Drawing or Painting- B/W- Paint program	HP6136
Computer Generated Original Drawing or Painting- Color- Paint program	HP6137
Computer Scanned Object(s). – (Example: Montage)	HP6138
Computer Manipulated Scanned Image – *Scanned image(s) which have been computer manipulated. Must include original image(s)*	HP6139
Computer Manipulated Digital Image – *Digital image(s) which have been computer manipulated. Must include original image(s)*	HP6140
Desktop Wallpaper	HP6141

2D ANIMATION

USB Drive format	**Individual Entry**
2D Animation with sound and or lip sync- 30 sec. max	HP6145
2D Animation – Ex. animated gif's – 30 sec. max.	HP6146
2D Animation without sound. - 30 sec. max	HP6147
2D Animation. (3 minute maximum)	HP6148
Open 2D Animation. – 5 min. max	HP6149
2D Animation (15 seconds – MUST BE PRECISELY 15 SEC)	HP6150
2D Animation (30 seconds – MUST BE PRECISELY 30 SEC)	HP6151
2D Animation (60 seconds – MUST BE PRECISELY 60 SEC)	HP6152
2D Animated Commercial – 15 Seconds precisely	HP6153
2D Animated Commercial – 30 Seconds precisely	HP6154
2D Animated Commercial – 60 Seconds precisely	HP6155
Generate a Morphing image	HP6156

3D ANIMATION

USB Drive format	**Individual Entry**
3D Introduction EXAMPLE: spinning logo	HP6160
Sci-fi Animation– 60 Sec. Max.	HP6161
Time Lapse Animation – 60 Sec. Max	HP6162
Open 3D animation (3 minute maximum)	HP6163
3D Animation (15 seconds – MUST BE PRECISELY 15 SEC)	HP6164
3D Animation (30 seconds – MUST BE PRECISELY 30 SEC)	HP6165
3D Animation (60 seconds – MUST BE PRECISELY 60 SEC)	HP6166
3D Animated Commercial – 15 Seconds precisely	HP6167
3D Animated Commercial – 30 Seconds precisely	HP6168
3D Animated Commercial – 60 Seconds precisely	HP6169
Human or Animal 3D animation – 60 Sec. Max	HP6170

WEBPAGE DESIGNS

USB Drive format	**Individual Entry**
Individual Related WebPages	HP6180
School Related WebPages	HP6181
Commercial Related WebPages	HP6182

OTHER

USB Drive format	**Individual Entry**
Video Game Design - 2D	HP6183
Video Game Design -3D	HP6184
Computer assisted tutorial to teach a subject or software	HP6185
Computer Based Training – Develop an interactive training module	HP6186
Use a programming language to make a text based interactive program	HP6187
Use a programming language to make a graphic based interactive program	HP6188

PHOTOGRAPHY CATEGORY

Items in this category involve projects in which students set-up, shoot, and develop their own photographs for presentation to a specified or general audience.

PHOTOGRAPHS: Photos must be taken by the student unless otherwise noted. Maximum printed size for a single photographic entry is 8.5 x 11 inches and for multiple photo classifications the size limit is 22 x 28 inches. Each class will be one photograph unless specified.

MOUNTED ENTRIES: Entries cannot be framed except by folded tape or suitable matting material around the perimeter. The complete assembly/mounting material, taped edges, drawings, photos, backing and cover cannot exceed 8-1/2" x 11" for single photographic entry or 22" x 28" for multiple photo classifications. Maximum thickness for single sheet is .125 inches.

Printing - Photo is developed by the student in a traditional film processing lab using traditional methods and practices, **OR** digitally in the lab, classroom, at home, etc.. **OR** in a professional lab, pghoto store, or commercial setting**.**

Level 1 - Cover Page - will be provided at contest registration. Single Page containing a single descriptive paragraph explaining the design, development and production of project. **NO SCHOOL LOGOS.**

Level 2 - Cover - will be provided at contest registration.
2 pages max - Description of product, design process, description of software/hardware used, production process, list of materials used, etc… **NO SCHOOL LOGOS.**

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

Only provide required documentation - DO NOT ADD EXTRA PAGES

UNIQUENESS OF STUDENT WORK

ALL ENTRIES MUST BE 100% STUDENT ORIGINAL WORK. NO DOWNLOADED FILES/WORK - IN FULL OR PARTIAL.
All student entries MUST be made from a single unique native file. Using a single electronic file to produce multiple contest entries is forbidden. Each project must be unique in both the final product and any associated electronic file regardless of file type.

SINGLE PHOTO ENTRIES

	Individual Entries Only	
	B/W	**Color**
Action/Motion. Animal, *One photograph.*	HP6200	MP6201
Action/Motion. Sport, One *photograph.*	HP6202	MP6203
Aerial. *One photograph taken from any aerial perspective.*	HP6204	MP6205
Animal Life. *One photograph.*	HP6206	MP6207
Architecture. *One photograph.*	HP6208	MP6209
Close- Up (Macro) *One photograph.*	HP6210	MP6211
Fashion photography. *One photograph of a group or individual.*	HP6212	MP6213
Journalist Photo - Documentary - one photograph.	HP6214	MP6215
Landscape. *One photograph.*	HP6216	MP6217
Marine. *One underwater photograph.*	HP6218	MP6219
Pinhole Photo - One photograph.	HP6220	NA

SINGLE PHOTO ENTRIES (continued)

	Individual Entries Only	
	B/W	**Color**
Portrait photography. *One photograph of a group or individual.*	HP6222	MP6223
Product photography. One photograph of a single product to be used in sales & advertising	HP6224	HP6225
Still Life. *One photograph*	HP6226	MP6227
Other Photo not listed above (Not special effects)	HP6228	MP6229

SPECIAL EFFECT PHOTO ENTRIES

The following entries require 2 photos to be submitted. The first photo is the original unaltered photo. The second photo will be the final product that has been edited. Each photo must be 8.5 x 11 inches or smaller.

- Entries in these classification can NOT be mounted. NO MOUNTING

- Small label on back of 2nd photo must explain effect(s)/process(es) used and can be handwritten

	Individual Entries Only	
	B/W	**Color**
Special Effects. *One photograph.* - single effect/process	HP6240	HP6241
Special Effects. *One photograph.* - multiple effects/processes	HP6242	HP6243

MULTIPLE PHOTO ENTRIES

Photos must be taken by the student unless otherwise noted. Maximum printed size for multiple photo classifications the size limit is 22 x 28 inches. Multiple photos may be mounted or printed as a single sheet up to 22 x 28 inches.

	Individual Entries Only	
	B/W	**Color**
Journalistic photo essay. *Six to twelve photographs mounted to tell a newsworthy story. Titles and brief captions may be used.*	HP6250	HP6251
Special Effects. *Three or more photographs.*	HP6252	HP6253
Technical process photo-essay. *Six to twelve photographs mounted to explain how to do something. Titles and brief captions may be used.*	HP6254	HP6255
Travel photo-essay. *Three to six photographs mounted to share the atmosphere and feel of a place while traveling* .	HP6256	HP6257
Montage - Multiple Photo - BW, Color, or Mix	HP6258	HP6259

DRAFTING/CAD CATEGORY

Items in this category involve student created projects in which students created projects using traditional drafting or modern computer aided design standards practices, and methods. This category will be divided into two sections: Engineering and Architecture

***MAXIMUM** sheet size in this category is 24 x 36 inches. No limit on number of sheets.*

The most current version of the **American National Standard Institute** (ANSI) Standards of symbols and conventions will be the standard for judging.

DC: 1-1 PRECISION DIMENSIONS: Entries should include such dimensioning practices as: datum line, tolerances, limits, geometric symbols, reference dimensions and BASIC dimensions, but not limited to these examples.

DC: 1-2 DEVELOPMENT AND INTERSECTIONS: Each entry must be accompanied with a model. The suggested material is stiff paper fastened with tape or glue. The model may be painted to appear as metal as desired. The model must be attached to the drawing.

DC: 1-3 FILLETS AND ROUNDS: May be represented only by curved or straight lines on any drawing for clarity.

DC: 1-4 AEROSPACE: Aerospace is defined as anything for an aeronautical purpose or application. This may include actual aircraft or spacecraft, aircraft/spacecraft parts or projects (flight or non-flight) for NASA H.U.N.C.H. (**H**igh Schools **U**nited with **N**ASA to **C**reate **H**ardware).

FREE HAND LETTERING: Is to be used except for CADD and INK drawings. All pencil drawings must have free hand lettering except for preprinted title block.

WORKING DRAWINGS: shall consist of the following: Multi-view drawings with dimensions necessary for manufacture, and other views such as: isometric, sections, exploded views, assembly views, charts, and notes are acceptable.

Pictorials (exploded) can be used as needed for clarity.

Working drawings may include exploded assemblies/ pictorials/ rendering to describe the various elements of the working drawings. The pictorials/ exploded assemblies may be rendered/ shown.

MULTIPLE SHEETS: Drawing sets should be fastened together along the left edge.

PICTORIAL: Pictorial drawings do not have to be dimensioned.

RENDERING: Rendering or shading permitted for pictorials and presentations unless otherwise noted.

Pictorials on working drawings can beshaded and/or rendered.

TITLE BLOCK: Title blocks **may** contain **ONLY** the following information: STUDENT NAME, UNIQUE STUDENT ID NUMBER, AND CLASSIFICATION NUMBER. NO SCHOOL LOGOS ALLOWED.

STUDENT CREATED LOGOS THAT ARE NOT ASSOCIATED WITH A SCHOOL MASCOT/LOGO ARE ALLOWED

ALL drawings except Presentation Drawings MUST *be plain printed. Presentation Drawings may be laminated or mounted, as long as the outside dimension of the matting or lmaination does not exceed the drawing size by more than 1/2 " on any edge. Blank or Mylar cover sheets are allowed on Presentation Drawings.*

The bold face word CADD means CADD ONLY. ALL WORK MUST BE DONE IN CADD
NOTE: ALL MANUAL DRAWINGS CAN BE EITHER PENCIL OR INK.

UNIQUENESS OF STUDENT WORK

ALL ENTRIES MUST BE 100% STUDENT ORIGINAL WORK. NO DOWNLOADED FILES/WORK - IN FULL OR PARTIAL. All student entries MUST be made from a single unique native file. Using a single electronic file to produce multiple contest entries is forbidden. Each project must be unique in both the final product and any associated electronic file regardless of file type.

REQUIRED DOCUMENTATION: ALL LEVELS (Unless noted otherwise)

All documentation should be attached to the BACK of drawings.

Single Page ONLY - Description of product, design process, description of software/hardware used, production process, list of materials used, etc…Documentation should be placed in a clear sheet protector.

ENGINEERING DESIGN

For the Engineering Section this category: symbols, lettering, and standards should be used as appropriate. Common industrial practices and time savers may be used. Shading, rendering and coloring may be used in presentation drawings and pictorials on working drawings.

	Individual Entry	Team Entry
Sketching/Free hand - May be Single or Multi-Part. May be Single View or Multi-View. Pictorial allowed. Only hand rendering allowed.	HP7000	NA
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.	HP7002	NA
Working drawing of single part includes pictorial **CADD**	HP7004	NA
Working drawing of single part (Refer to **DC-1:1**) **CADD**	HP7006	NA
Development and intersection drawing **CADD** (Refer to **DC-1:2**)	HP7008	NA
Working drawing of jigs and fixtures **CADD**	HP7010	NA
Working drawing of gears, cams, lever, etc. **CADD**	HP7012	NA
Working drawing: Pipe fabrication (Fluid transportation) **CADD**	HP7014	NA
Working drawing of a transportation device **CADD**	HP7016	NA
Mechanical/Technical Drafting (pencil or ink) - Working Drawing - May be Single or Multi-Part: Pictorial allowed. Only hand rendering allowed.	HP7018	NA
Working drawings of multiple machine or mechanical 2 - 5 parts **CADD**	HP7020	HP7021
Working drawings of multiple machine or mechanical 6 -12 parts **CADD**	HP7022	HP7023
Working drawings of multiple machine or mechanical 13 or more parts **CADD**	HP7024	HP7025
Working drawing: Electrical/electronic (Note: NO BUILDING ELECTRICAL WIRING PLAN EXAMPLE: electronic device with a schematic wiring diagram but not limited to this example.)	HP7026	HP7027
Working drawing: Electrical/electronic (Note: NO BUILDING ELECTRICAL WIRING PLAN EXAMPLE: electronic device with a schematic wiring diagram but, not limited to this example). **CADD**	HP7028	N/A
Mechanical/Technical Drafting (pencil or ink) - Pictorial - May be Single or Multi-Part: Only hand rendering allowed.	HP7030	NA
Pictorial Drawing Single Part – no rendering (Refer to **DC-1:3) CADD**	HP7032	N/A
Pictorial Drawing of multiple machine or mechanical 2 - 5 parts **CADD**– no rendering (Refer to **DC-1:3)**	HP7034	HP7035
Pictorial Drawing of multiple machine or mechanical 6 - 12 parts **CADD** – no rendering (Refer to **DC-1:3)**	HP7036	HP7037

ENGINEERING DESIGN (continued)

	Individual Entry	Team Entry
Pictorial Drawing of multiple machine or mechanical 13 or more parts **CADD** – no rendering (Refer to **DC-1:3)**	HP7038	HP7039
Mechanical/Technical Drafting (pencil or ink) - Presentation - May be Single or Multi-Part: Only hand rendering allowed - no airbrush.	HP7040	NA
Presentation drawing of a transportation device. **CADD**	HP7042	HP7043
Presentation drawing of single part **CADD.**	HP7044	HP7045
Presentation drawing of multiple part **CADD.** 2 to 5 parts	HP7046	HP7047
Presentation drawing of multiple part **CADD.** 6 - 12 parts	HP7048	HP7049
Presentation drawing of multiple part **CADD.** 13 or more parts	HP7050	HP7051
Working Drawings for a Reverse Engineered Project -- Single Part Mechanical Drafting or CADD - Documentation must include picture of original object as well as original notes containing measurements obtained using calipers, micrometers,etc..	HP7052	NA
Working Drawings for a Reverse Engineered Project -- Multiple Parts Mechanical Drafting or CADD - Documentation must include picture of original object as well as original notes containing measurements obtained using calipers, micrometers,etc..	HP7054	HP7055
Aerospace Drawing: Mechanical Drafting or CADD - See DC1-4	HP7056	HP7057
Presentation Drawings of Space Structure: Mechanical Drafting or CADD	HP7058	HP7059
Pictorial Drawings of Space Structure - Mechanical Drafting or CADD	HP7060	HP7061
Working Drawings of Space Structure - Mechanical Drafting or CADD	HP7062	HP7063
Computer generated original 3-D Engineering	HP7064	NA
Animated Mechanical movement - 60 Sec. Max	HP7065	NA
Animated Transportation Device – 60 Sec. Max	HP7066	NA
Engineering Presentation Animation : Multiple part animation (Note: This category is reserved for students working with 3-D applications, Advanced Modeling and some of the Animation software - Max 5 min. USB Drive Format only	HP7067	NA
Multimedia Presentation of a single machine part. (3-D drawing digital presentation)	HP7068	NA

ARCHITECTURAL DESIGN

For the Architectural Graphics portion of this section: American Institute of Architects or the Architectural Graphic Standards should be used as needed. Common industrial practices and timesavers may be used. Shading, rendering and coloring may be used.

NOTE: ALL MANUAL DRAWINGS CAN BE EITHER PENCIL OR INK.

ALL FINISH (RENDERING) IS PENCIL UNLESS NOTED. No limit to number of sheets.	**Individual Entry**	**Team Entry**
Sketch drawing - Any Architectural subject - Shading Allowed - pencil (black & white)	7100	NA
Presentation Sketch drawing - Any Architectural subject - Shading Allowed - (color)	7101	NA
Tiny House: A tiny house is defined as a structure on a trailer that includes living area, kitchen, sleeping area and a full bath. Max trailer size is 8'X24' - bumper pull or gooseneck. Max overall height 13'6". Must draw both structure and trailer.	HP7102	HP7103
Working drawings of Residential home under 2000 sq. ft HVAC	HP7104	HP7105
Working drawings of Residential home under 2000 sq. ft HVAC **CADD**	HP7106	HP7107
Working drawings of Residential home over 2000 sq. ft HVAC	HP7108	HP7109
Working drawings of Residential home over 2000 sq. ft HVAC **CADD**	HP7110	HP7111
Working drawings of Residential Multistory single family home under 2000 sq. ft HVAC	HP7112	HP7113
Working drawings of Residential Multistory single family home under 2000 sq. ft HVAC **CADD**	HP7114	HP7115
Working drawings of Residential Multistory single family home over 2000 sq. ft HVAC	HP7116	HP7117
Working drawings of Residential Multistory single family home over 2000 sq. ft HVAC **CADD**	HP7118	HP7119
Working drawings of Apartment, Condo, Townhouse, Duplex, etc.	HP7120	HP7121
Working drawings of Apartment, Condo, Townhouse, Duplex, etc. **CADD**	HP7122	HP7123
Recreational facility (sheets as needed)	HP7124	HP7125
Recreational facility (sheets as needed) **CADD**	HP7126	HP7127
Commercial or public structure (sheets as needed)	HP7128	HP7129
Commercial or public structure (sheets as needed) **CADD**	HP7130	HP7131
Working drawing of electrical system Architectural (Ex: Phone System, Audio System, Fire Alarm, and/or Security System. NOT Electrical Floor Plan) **CADD**	HP7132	NA
Remodeling drawings (number sheets as needed)	HP7134	NA
Remodeling drawings (number sheets as needed) **CADD**	HP7136	NA
Construction detailing (All types of typical details that are used in the construction of a building - 1 sheet)	HP7138	NA
Construction detailing (All types of typical details that are used in the construction of a building - 1 sheet) **CADD**	HP7140	NA
Civil construction: (EXAMPLE: Tunnel, dam, bridge, or transportation systems, etc. sheets as needed)	HP7142	HP7143
Civil construction: (EXAMPLE: Tunnel, dam, bridge, or transportation systems, etc. sheets as needed) **CADD**	HP7144	HP7145
Topographic/Surveying drawings (number of sheets as required)	HP7146	HP7147
Topographic/Surveying drawings (number of sheets as required) **CADD**	HP7148	HP7149
Architectural Landscape Plan (Number of sheets as needed) Should include underground sprinkler plan.	HP7150	HP7151
Architectural Landscape Plan (Number of sheets as needed) **CADD** Should include underground sprinkler plan..	HP7152	HP7153
Presentation drawing (1 sheet) Residential (rendered in any way **except Airbrush or computer**)	HP7154	NA
Presentation drawing (1 sheet) Residential (rendering method **computer** only)	HP7156	NA

ARCHITECTURAL DESIGN (continued)		
Presentation drawing (1 sheet) Commercial/Public (rendered in any way except Airbrush or computer)	HP7158	NA
Presentation drawing (1 sheet) Commercial/Public (rendering method **computer** only)	HP7160	NA
Presentation drawing (1 sheet) Architectural (**Airbrush only**)	HP7162	NA
Presentation drawings of Master plan development showing streets, property subdivisions, public use areas, utility locations, easements, contours and development themes.	HP7164	NA
Presentation drawings of Master plan development showing streets, property subdivisions, public use areas, utility locations, easements, contours and development themes. **CADD**	HP7166	NA
Energy Conservation Design: Must include one or more applications of active, passive earth sheltered, hybrid, envelope, or other energy saving designs elements. (Number of sheets as needed)	HP7168	NA
Energy Conservation Design: Must include one or more applications of active, passive earth sheltered, hybrid, envelope, or other energy saving designs elements. (Number of sheets as needed)	HP7170	NA
Computer generated original 3-D Landscape	HP7172	NA
Computer generated original 3-D Architecture	HP7173	NA
Walkthrough Architecture – between 60 Sec and 90 seconds	HP7174	NA
Flythrough Architecture – between 60 Sec and 90 seconds	HP7175	NA
Walkthrough Landscape – 60 Sec. max	HP7176	NA
Flythrough Landscape – 60 Sec. max	HP7177	NA

CONSTRUCTION, MODELING & DESIGN CATEGORY

Items in this category involve projects in which students created and designed structures, models, used commercial kits, or highlighted the design process.

Judging criteria for production will be based on the following areas: degree of difficulty, appearance, finish, and craftsmanship. Material used is calculated as item as displayed.

MAXIMUM BASE SIZE for models: *30" x 42" (unless otherwise stated)*
Model must have hard copy of plan view (A bird's eye view of the ground floor)

REQUIRED MINIMUM DOCUMENTATION:

Documentation is to be considered only when projects are being considered for a Best In State (BIS). Documentation should not be discounted because of method used - hand drawn/written vs. computer created/drawn.

Level 1 Cover - will be provided at contest registration.
Single Page containing a single descriptive paragraph explaining the design, development and production of project

Level 2 - Cover - will be provided at contest registration.
2 pages max - Description of product, design process, description of software/hardware used, production process, list of materials used, sketches, pictures, original drawings used, etc…

Only provide required documentation - DO NOT ADD EXTRA PAGES

MODELS - Architectural

This category is for finished models with detailing, full landscaping, sidewalks, trees, cars, people, etc.	**Individual Entry**
A model of a residential single or multifamily unit	HP7200
A model of an Apartment, Condo, Townhouse, Duplex, etc.	HP7201
A scale model of residential structure not previously listed	HP7202
A model of a Master plan development.	HP7203
A scale model of a commercial structure	HP7204
A scale model of a civil structure	HP7205
A model or display of an automated security or environmental control system	HP7206
A working model of a subsystem	HP7207
A model of a space structure	HP7208
A model of a space based production system	HP7209
A model of an automated facility for manufacturing a product	HP7210
A model of a Recreational facility.	HP7211
Structural Model Residential home (using appropriate scale, material and keeping with current framing standards)	HP7212
A model of a mechanical device/system	HP7213

STUDY MODEL

A study model is similar to the type used by architects for site design and planning. Suggested materials: cardboard, foam board, Styrofoam, paper, plastic, balsa wood, and glue. This model is to be unfinished, no landscaping or finishing methods allowed (only structure and typography)

All study models are a maximum of 24"x36" unless otherwise specified.	**Individual Entry**
Study Model Residential	HP7217
Study Model Commercial (Removable roof not required.)	HP7218

KITS

Entries made from commercial kits. **NO TEAM ENTRIES - INDIVIDUAL ONLY**	**Individual Entry**
Kits——woods	HP7219
Kits——metals	HP7220
Kits——Electrical/electronics	HP7221
Kits——other	HP7222

INTERIOR DESIGN

Projects will be judged on the basis of design: function, color, texture, balance, etc. on a maximum 24"X36" board. The project should be accompanied by data that has (1) complete floor plan set of working drawings, (2) furniture placement, (3) color pallate samples, (4) finish sample board. A design **MUST BE** be entirely the original work of the student.

	Individual Entry	**Team Entry**
Residential	HP7223	HP7224
Commercial	HP7225	HP7226

APPLIED TECHNICAL SCIENCE CATEGORY

DISPLAYS/PORTFOLIOS: The use of photographs, videos, maps, charts, schedules, safety information and other media is encouraged to communicate the message of the entry. The minimum documentation requirement must be an integral part of the display/portfolio.

Entries must be complete and in safe operating condition. All devices and products must be displayed, where feasible, in such a manner as to allow internal inspection of workmanship. High voltage components and potentially dangerous areas must be covered and labeled. Functioning internal combustion engines may be displayed - but per Waco Fire Code cannot have fuel or oil present.

REQUIRED MINIMUM DOCUMENTATION:
Documentation is to be considered only when projects are being considered for a Best In State (BIS). Documentation should not be discounted because of method used - hand drawn/written vs. computer

Level 1 - Cover Page - will be provided at contest registration. Single Page containing a single descriptive paragraph explaining the design, development and production of project. NO SCHOOL LOGOS.

Level 2 - Cover - will be provided at contest registration.

2 pages max - Description of product, design process, description of software/hardware used, production process… (minimum of 1 page in this section)

Only provide required documentation - DO NOT ADD EXTRA PAGES

MULTIDISCIPLINARY

	Individual Entry
A comprehensive display encompassing selected learning activities interfacing at least two school disciplines. *(Math, Science, English, etc.)*	HP8000
A comprehensive display encompassing selected learning activities interfacing more than four school disciplines, *(Science, Math, etc.)*	HP8001

AERODYNAMICS

Develop and produce airfoils for the following. Provide drag and lift test results for each airfoil. Document the research of the air foil aerodynamics.	**Individual Entry**
Air foil testing for automobile	HP8002
Air foil testing for airplane	HP8003
Air foil testing for rockets	HP8004
Develop a portfolio that explains the process of flying including checklist for preflight, during flight, post-flight, flight plans and pilot log	HP8005
Static display showing principles or mechanics of flight	HP8006

CONSTRUCTION TECHNOLOGY

Home/commercial building - static display of a partial model that demonstrates the use of structural concepts.	**Individual Entry**
Display the use of construction products, processes, or techniques	HP8007
A display of a full size construction structure	HP8008
A display of an organizational chart for a construction company including job descriptions for each position	HP8009
A display to Illustrate the difference 2 or more types of structures	HP8010
A display of a study of the types, grades, and strength of selected materials used in construction. (Metal, wood, polymers, others)	HP8011

ELECTRONICS/ELECTRICAL

These entries do allow kits in each classification.	**Individual Entry**
A schematic diagram of wiring installations, residential or commercial, must include location, local wiring code and proof of compliance with code	HP8012
A display of electrical energy storage device	HP8013
A display of electronic communications devices (radio, TV, telephone etc.)	HP8014
A display of electronic communication systems	HP8015
A display of properties of electrical/electronic components, not-semiconductor	HP8016
A display of properties of electrical/electronic components, semiconductor	HP8017
A display of applications of electrical robots	HP8018
Residential Wiring	HP8019
Residential Wiring A schematic diagram of wiring installations, residential or commercial, must include location, local wiring code and proof of compliance with code	HP8020
Production of eletrical/electronic motor	HP8021
Production of alarm circuits	HP8022
Production of audio systems	HP8023
Production of games/toys	HP8024
Production of communication device	HP8025
Production of electrical/electronic testing device	HP8026
Production of student-made printed circuit boards	HP8027
Production of logic circuits	HP8028
A model to display the generation of electrical energy from alternate sources	HP8029
A model to display the conservation of electrical energy	HP8030
A model of electrical distribution/transmission	HP8031
A student fabricated electronic device (non-kit)	HP8032
Power efficiency study. A display of the test results of a comparison study of electrical usage of at least five different items. Display must include statement of problem to be researched, results should outline electric usage in kWh amps, voltage drop, and time. Research would determine cost of kWh in test area and determine cost use during test time for each item	HP8033
Computer interfacing and /or instrumentation	HP8034

ENERGY, POWER, & TRANSPORTATION

Static displays that demonstrate the extraction, processing, transferring, controlling and / or use of the following:

	Individual Entry
Solar energy	HP8040
Power generation	HP8041
Electrical energy	HP8042
Hydraulics	HP8043
Pneumatics	HP8044
A display or the application of national safety codes	HP8045
A display about fuel resource, exploration, extraction, processing and utilization	HP8046
A display about energy Safety	HP8047
A display of energy conservation	HP8048
A display about the generation of electrical energy from fossil fuels	HP8049
A display about the generation of electrical energy from nuclear fuels	HP8050
A display about the generation of electrical energy from alternate sources	HP8051
A display about the application of energy from alternate sources	HP8052
A display about the conversion of electrical energy into power	HP8053
A display about distribution of electrical energy	HP8054
A display about distribution transmission storage of energy	HP8055
A display of the results of a comparison of an energy device which includes problem statement, testing guidelines and identifies the variables. The labeled example must identify the source, transmission and control of energy. (ex: solar cooker)	HP8056
A display of internal combustion engines to show principle, utilization, restoration, and impact	HP8057
A display about external combustion engines to show principle, utilization, restoration, and impact	HP8058
Rebuilt single cylinder engine. List of procedure, bill of parts, and time sheet are required documentation	HP8059
External/internal combustion engines - operation and maintenance Running - Maximum 5 horsepower	HP8060
External/internal combustion engines - operation and maintenance. Static display	HP8061
Transmission device - operational	HP8062
A display of principles, utilization and impact of fluid power systems	HP8063
A display of principles, utilization and impact of mechanical power systems	HP8064
A display of principles, utilization and impact of power systems	HP8065
Mechanical/fluid energy power devices - operational and maintenance	HP8066
A display about a career in the power / energy field	HP8067
A display about a career in the transportation field	HP8068
A display about the factors that effect the purchase and use of energy products	HP8069
A display about the factors that effect the purchase and use of power products	HP8070
A display about the marketing of power, energy, or transportation product or or service	HP8071
A display about highway transportation	HP8072
A display about railway transportation	HP8073
A display about air or space transportation	HP8074
A display about pipeline transportation	HP8075
A display about water transportation	HP8076
A display of the results of a comparison of an transportation device which includes problem statement, testing guidelines and identifies the variables. The labeled example must identify the source, transmission and control of energy. (ex: air rocket)	HP8077

ENERGY, POWER, & TRANSPORTATION (continued)

Static displays that demonstrate the extraction, processing, transferring, controlling and / or use of the following:

	Individual Entry
A display about the factors that effect the purchase and use of transportation products	HP8078
Transportation system - industrial, land, air, sea	HP8079
An application of energy or power to solve a problem	HP8080

MANUFACTURING

	Individual Entry
A comprehensive display of students assembly and or maintenance of production machines and or equipment.	HP8081
A display of an organizational chart for a manufacturing company including job descriptions for each position	HP8082
A display of a study of the types, grades, and strength of selected materials used in manufacturing. *(Metal, wood, polymers, others)*	HP8083
A display of several production career opportunities including; (a) employment opportunities, (b) education or training needed, (c) job descriptions, (d) effective methods of securing jobs, and (e) future long term employment outlook	HP8084
A display of an entrepreneur production venture which must include; (a) minimum, (b) organizational chart, (c) sales forecast, (d) market survey, (e) two product samples	HP8085
A display to demonstrate computer applications in production systems	HP8086

MATERIALS

	Individual Entry
A display of materials testing	HP8087

LASERS

A display that demonstrates the use of the light energy through the use of a laser emitting device. SAFETY GLASSES REQUIRED FOR JUDGES.

	Individual Entry
Laser generation	HP8088

BIOTECH

Activities entered in this classification must have portfolio documenting research in the area and illustrate or explain a method for solving the problem.

	Individual Entry
Biotech health portfolio	HP8089
Display of nanotech technology	HP8090
Display of Hydroponics technology	HP8091
Display of ergonomics,	HP8092
Display of other Biotech research activity	HP8093

ROBOTICS/PROGRAMMING

This section gives schools with robotics programs a place for their students to show/display their work/efforts. Display area not to exceed a space that is 4 feet wide x 18 inches deep and 4 feet tall. Projects may include the use of LEGO, VEX or Fisher Technique robotic kits.

	Entry
Robotic programming (must have printout of program with entry) teach pendant method	HP8094
Robotic programming (must have printout of program with entry) any computer based program—i.e., C++, Java, etc…	HP8095
Robot using two sensors and only 1 controlling unit	HP8096
Robot using 3 – 4 sensors and only 1 controlling unit	HP8097
Robot using 3 – 4 sensors and 2 or more controlling units	HP8098
Robot using 5 or more sensors and only 1 controlling unit	HP8099
Robot using 5 or more sensors and 2 or more controlling	HP8100
Static display of a robotic application that moves materials/parts for delivery to an assembly line or inventory area*	HP8101
Static display of a robotic application that welds materials or assembles parts for a product*	HP8102
Static display of a robotic application that involves working with a hazardous material or safety application*	HP8103
Static display of a robotic application not mentioned above*	HP8104
B.E.S.T. 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.	HP8102
F.I.R.S.T. 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.	HP8103
F.T.C. 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.	HP8104
VEX Robot display (not the TSA NQE VEX event): must include the robot (may or maynot be in working condition), engineering notebook from the contest, photos and/or DVD of the robot in action at actual event.	HP8105
Other robot system application not listed above The display must include photos and/or DVD of the robot in action at actual event.	HP8106

Remote Operated Vehicle Display (Underwater Robotic R.O.V.)	**Entries Per Region** 3	**High School**
		MP8107

	Entries Per Region			Individual Entry
SAFETY POSTER		3		HP8108

A poster to illustrate safety principles in the classroom enviroment or in the workplace.
Poster Sizes allowed: 18x24, 22x28, or 24x36 (sizes are in inches)
Safety posters may be computer generated / printed.
Posters cannot be framed but can be laminted.

	Entries Per Region			Individual Entry
Club T-shirt		3		HP8109

A display of one T-shirt, designed and produced for club members to wear. No copy writing will be allowed.

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**.

	Entries Per Region				Individual Entry
Activities in more than two curriculum areas		15			HP8110
Communication Technology		15			HP8111
Power/Energy/Transpiration		15			HP8112
Manufacturing/Construction		15			HP8113
Bio-Tech		15			HP8114