TECHNOLOGIES

3-D PRINTING & DESIGN: Choose one of the following classes based on your interest and skill level.
Each county may submit 2 entries total from 50276, 50277, 50278, 50279; and 1 entry from 50280

50276 3-D Design Beginner: No 3-D Printer or 3-D printed object is required for this exhibit. Exhibit a simple 3-D rendered design using Computer Aided Design (CAD) Software such as Tinker CAD or Inventor. The design must be an object that performs a specific task, and may not be based on already existing 3-D models. It must be able to be 3-D printed. Any CAD software can be used, but files must be in .STL format. Bring your design on a Jump Drive to be viewed for judging. Exhibits in this class may not have multiple parts, doors, hinges, or any sort of mechanics.

Exhibitors are expected to use the engineering design process to complete their designs. This process is important to the outcomes and exhibitors must keep a log outlining the step-by-step notes, sketches, and documentation from throughout the design process. The logbook should define the problem that is being solved/use of the object and describe in detail each step of the Engineering Design Process taken during the creation of the invention.

50277 3-D Design Advanced: Exhibitors are expected to go above and beyond those expectations set in 3-D design beginner. No 3-D Printer or 3-D printed object is required for this exhibit. Exhibit a complex 3-D rendered design using Computer Aided Design (CAD) Software such as Tinker CAD or Inventor. The design must be an object that performs a specific task, and may not be based on already existing 3-D models. It must be able to be 3-D printed. Any CAD software can be used, but files must be in .STL format. Bring your design on a Jump Drive to be viewed for judging. Exhibits in this class MUST not have multiple parts, doors, hinges or some sort of mechanistic feature to accomplish a specific task.

Exhibitors are expected to use the engineering design process to complete their designs. This process is important to the outcomes and exhibitors must keep a log outlining the step-by-step notes, sketches, and documentation from throughout the design process. The logbook should define the problem that is being solved/use of the object and describe in detail each step of the Engineering Design Process taken during the creation of the invention.

50278 3-D Printing Beginner: Exhibit a simple 3-D printed object designed using Computer Aided Design (CAD) Software such as Tinker CAD or Inventor. The 3-D printed object must perform a specific task, and may not be based on already existing 3-D models. It must be 3-D printed using ONLY A COMMERCIALLY AVAILABLE HOME/DESKTOP 3-D PRINTER. In addition, original design files must accompany each exhibit. These files must be in .STL format. Bring your design on a jump drive to be viewed for judging. Exhibits in this class may not have multiple parts, doors, hinges or any sort of mechanics.

Exhibitors are expected to use the engineering design process to complete their designs. This process is important to the outcomes and exhibitors must keep a log outlining the step-by-step notes, sketches, and documentation from throughout the design and print process. The logbook should define the problem that is being solved/use of the object and describe in detail each step of the Engineering Design Process taken during the creation of the invention.

50279 3-D Printing Advanced: Exhibitors are expected to go above and beyond those expectations set in 3-D Printing beginner. Exhibit a Complex 3-D printed object designed using Computer Aided Design (CAD) software such as Tinker CAD or Inventor. The 3-D print must be an object that performs a specific task, and may not be based on already existing 3-D models. Exhibits in this class MUST have multiple parts, doors, hinges or some sort of mechanical feature. It must be 3-D printed using ONLY A COMMERCIALLY AVAILABLE HOME/DESKTOP 3-D PRINTER. In addition, original design files must accompany each exhibit. These files must be in .STL format. Bring your design on a Jump Drive to be viewed for judging.

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the object and describe in detail each step of the Engineering Design Process taken during the creation of the
invention.

**50280  3-D Printing & Design Ready4Life Challenge: (Open to 11- to 18-year-olds enrolled in any 3-D project)**
Exhibits in this category must include the following: a) a physical representation of the career or business product
such as a model, prototype or display/portfolio that includes images of accomplished work; b) verbal or written
explanations that demonstrate knowledge of the related career or business fields, potential careers, and the
appropriate requirements for achievement in those fields. The judging criteria for this class values thoroughness of
career and/or business exploration and pursuit above the workmanship of the physical specimen on display.

**UNMANNED AERIAL VEHICLES/SYSTEMS (DRONES):** Choose one of the following classes based on your
interest and skill level. Each county may submit 2 entries total from 50281 and 50282; and 1 entry from 50283

**50281  UAV Display:** Prepare a display related to the Drones/UAV project on the topic of your choosing. The
exhibit may include, but isn’t limited to, original works, objects, demonstrations, digital presentations, programs,
websites, games, apps, performances, or posters which you have made. Choose whatever method best shows
what you’ve learned. You must furnish any equipment you need for your exhibit. Internet service will not be
provided for the exhibit. All exhibits must include something visual, such as a printed copy of a digital presentation,
which will remain on display during the exhibition. Electronic equipment will only be used during your personal
judging time and will not remain on display during the entire exhibit period. Non-UAV/ Drone projects should not
be entered in this class.

**50282  UAV Unmanned Aerial Systems:** Exhibit one Unmanned Aerial Vehicle and associated system assembled
or made by the member. UAV or Drone exhibits in this class must be either originally designed or built from a kit of
reconfigurable parts and components. These displays are limited to multicopters (tri, quad, hex, and octocopters),
as well as FPV airplanes and flying wings with wingspans up to 36". The UAV MUST have a Flight Controller and
utilize a camera/video transmission system. The exhibit will be a static display. The Drone should be in good flying
condition with batteries fully charged, and all UAS components (including Video System) ready to demonstrate. DO
NOT display your UAV with the propellers on, but rather on the table to the side of your UAV. The Drone will not
be flown unless the weather permits, and flights have been approved by the local FAA/Air Traffic Control Tower.
Attach the printed directions of the UAV if any were used.

**50283  UAV Ready4Life Challenge: (Open to 11- to 18-year-olds enrolled in any UAV project)**
Exhibits in this category must include the following: a) a physical representation of the career or business product
such as a model, prototype or display/portfolio that includes images of accomplished work; b) verbal or written
explanations that demonstrate knowledge of the related career or business fields, potential careers, and the
appropriate requirements for achievement in those fields. The judging criteria for this class values thoroughness of
career and/or business exploration and pursuit above the workmanship of the physical specimen on display.