Additive Manufacturing

To evaluate each team's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of Digital and Additive Manufacturing (AM).

On-Site/Off-Site	• On-Site
Contest Date	• 3/18/2025
Contest Location	• Convention Center • C-Hall
Early/Normal Start Time	• Normal Start Time • Registration will open at 8:00am. Please report to B-Hall Show Office for Registration. Competition will begins at 10:00am.
Contest Open/Closed	• Open • Exhibit Halls do not open to observers until 12:00pm.
Eligibility & Contest Type	• Please refer to the Program Guidelines for eligibility- **https://www.ohioskillsusa.org/resources/** • Straight to State Contest (No Regional Qualifier)
Clothing	**For Competition Day the Dress Code is:** Class F **For the Awards Ceremony the Dress Code is:** Class A or Class J • **2025 SkillsUSA Ohio Clothing Guide**
Safety Equipment Required	• N/A
Testing	• There is no written test required for this competition.
Provided by Contestant (Tool List)	• Each team is responsible for bringing their 3D Printed model to the competition for testing. No parts will be printed at the competition. Models must adhere to the contest outlines from

	the proposed standards. Present design to judges and answer questions Showcase the functionality of the 3D printed component. Each participant must present hard copy of resume to the judges. Each participant must have one, these will not be collected, only verified that they have them. Provide engineering notebook (guideline below) Be clearly labeled with contestant number, date and page number on each page Begin with a problem statement Include discovery and documentation of approach to solve the problem Include sketched design concepts with critical features labeled. Critical dimensions clearly labeled in design sketch. Consideration for designing for additive manufacturing distinctly addressed (i.e., part strength, part orientation) especially including any expected risk during printing screenshots of the print time and material usage for all printed parts. Design decisions and alternatives are documented and evaluated thoughtfully. Presentation Criteria The team clearly describes their understanding of the problem to be solved. Design Process: good design logic is used for key design choices was intentional and well-communicated. The presentation is professional and well-rehearsed. Practical evaluation: Team demonstrates visually (videos, photos, drawings, animation, etc.) the tasks they improved, both before and after. Teams may use a laptop to assist with the presentation, though not required. The presentation emphasizes quantize improvements (measured and estimated) of time, quality, or cost of the improvement as well as any DFAM tactics employed.
Contest Notes, Themes, & Deadlines	• Competition will begin immediately after orientation. All competitors must check-in by 10:00 a.m. Computers and other related items may be dropped off prior to competition. Orientation and Contest area will be closed to observers until 12:00 pm. No instructors are permitted inside the contest zone. Upon arrival at orientation, students will be provided the timeslot for their competition. The first timeslot will begin at 10:30 a.m. and will run every 30 minutes until we have accommodated the number of teams there to compete. Students are to return to the competition area 30 minutes after the last timeslot (official time will be provided at the competition) to hear the top 6 teams that will be called back for the 2nd round of group judging. The top placing teams will be selected from this group of 6. Please note that competitors will need to eat lunch outside of their presentation times.
WIFI Provided?	• No
Special Notes/Rules for All Contests	• Started in 2024, all Skilled Trade State Contests (most leadership contests already use scenarios) will begin to add a

	scenario-based component. • **<u>Wi-Fi will NOT BE AVAILABLE unless listed above.</u>** If you need WIFI access, please plan to bring a hotspot. • All safety requirements will be heavily enforced. Competitors are to follow all safety standards and OSHA Regulations • ***Contestants MUST HAVE A COPY OF THEIR EMERGENCY MEDICAL FORM IN THEIR NAME BADGE AT ALL TIMES*** • **<u>THE FOLLOWING ITEMS ARE PROHIBITED; VIOLATION OF ANY OF THE FOLLOWING MAY RESULT IN COMPETITOR DISQUALIFICATION:</u>** • Contact with Contest Coordinators is prohibited. Contact with Contest Coordinators outside of the SkillsUSA Ohio is strictly prohibited. • Possession of smart watches and/or phones during the contest and/or in contest. • Contact with anyone outside of the contest area once the contest begins. • Inappropriate communication between contestants such as verbally degrading another contest. • Cheating on any portion of the contest such as informing another contestant of the skills/test prior to competing. • Lack of Copy Emergency Medical Form in Name Badge.
National Technical Standards	• Please refer to the **2024-2026 National Technical Standards** for all contests. All standards included may be tested in any competition. • In conjunction with National Standards, lack of understanding of State Level competition standards (this document) may result in student loss of contest.
Resume/Interview Requirement	• All SkillsUSA Ohio State Championship Contests will require a short interview component. Students should be prepared with basic job interview skills. • All contestants **<u>must have a hard copy</u>** of a one (1) page personal resume.

SkillsUSA 2025 Additive Manufacturing State Challenge

Make It Run

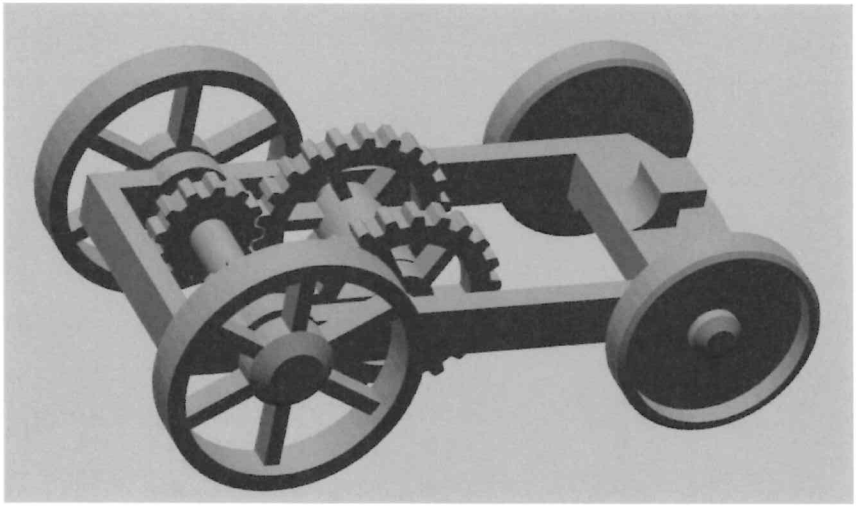
Welcome to the "Make It Run" challenge!

The task at hand is to design and fully print a 4 wheeled vehicle powered only by a single rubber band. The vehicles will then be tested on a "track" for functionality, and additional scoring.

Design Considerations:

- Interlocking parts
- Printed Assemblies
- Snap fits
- Printable Tolerances
- Motion
- Kinetic to Potential Energy

Example of Basic Design



Competition Requirements

1. The design **must** be completely 3D printed.
2. The design **must not** contain any outside hardware (axles, screws, washers
3. The design **can** be 3d printed using any technology.
4. The design **must** contain a legibly printed team number/name
5. The design **can** contain 3D printed bodies that are assembled after printing for the final part.
6. The final design **can** use super glue for assembly, for a loss of points
7. Parts **must** have printed wheels
8. The design **must** contain at least 3 moving parts
9. Wheels **can not** be larger than 3 inches in diameter
10. The design **must** be powered only by a single rubber band
11. The printed design **must** have moving bodies.
12. The design **must not** exceed 6" x 4" x 4"
13. 3D Printed Design - Students **must** create a design that:
    - Is original and designed by contestant
    - Print all parts in less than **12** hours total
    - Uses less than **5** cubic inches of model and/or support combined for all parts.

Tips for Competitors

Here are some tips to maximize the points awarded to you:

- Build debossed text on a horizontal surface for best results. This may require building the part on its edge or standing up.
- Utilize soluble support structures for print in place assemblies
- Understand the achievable design tolerance of your printer for print in place, or hand assembled designs to allow motion between parts.
- Leverage post-processing techniques to smooth printed bodies.
- Additional moving parts may add to your score but can produce more points of failure on the final assembly.
- Use online resources (YouTube, GrabCAD Tutorials)
- Whenever intellectual property (IP) deters you from a project, try using approximate geometries to communicate the design intent.
- Optional design for additive manufacturing learning resources:
    - Stratasys Think Additively™ Masterclass:

- https://youtube.com/playlist?list=PLUYaY5EIPtNBdU-s-7l9rl05lBHHlTarI