



## Battle Bots

*Competitors will demonstrate the ability to design and implement a combat robotics engineering system. Assessed skill areas include 3D design, 3D print, assembly, troubleshoot, and overall project documentation.*

<b>On-Site/Off-Site</b>	<ul style="list-style-type: none"> <li>● On-Site</li> </ul>
<b>Contest Date</b>	<ul style="list-style-type: none"> <li>● 3/18/2025</li> </ul>
<b>Contest Location</b>	<ul style="list-style-type: none"> <li>● Convention Center</li> <li>● C-Hall</li> </ul>
<b>Early/Normal Start Time</b>	<ul style="list-style-type: none"> <li>● Normal Start Time</li> <li>● Registration will open at 8:00am. Please report to B-Hall Show Office for Registration. Competition will begin at 10:00am.</li> </ul>
<b>Contest Open/Closed</b>	<ul style="list-style-type: none"> <li>● Closed</li> <li>● Exhibit Halls do not open to observers until 12:00pm.</li> </ul>
<b>Eligibility &amp; Contest Type</b>	<ul style="list-style-type: none"> <li>● Please refer to the Program Guidelines for eligibility- <a href="https://www.ohioskillsusa.org/resources/">https://www.ohioskillsusa.org/resources/</a></li> <li>● State Only Contest (Only runs in Ohio- winner does not proceed to Nationals)</li> </ul>
<b>Clothing</b>	<p><b><u>For Competition Day the Dress Code is:</u></b> Class F</p> <p><b><u>For the Awards Ceremony the Dress Code is:</u></b> Class A or Class J</p> <ul style="list-style-type: none"> <li>● 2025 SkillsUSA Ohio Clothing Guide</li> </ul>
<b>Safety Equipment Required</b>	<ul style="list-style-type: none"> <li>● Safety glasses with side shields or goggles (Prescription glasses can be used only if they are equipped with side shields. If not, they must be covered with goggles).</li> </ul>

<p><b>Testing</b></p>	<ul style="list-style-type: none"> <li>● There is no written test required for this competition.</li> </ul>
<p><b>Provided by Contestant (Tool List)</b></p>	<ul style="list-style-type: none"> <li>● Each student team is expected to bring the following: <ul style="list-style-type: none"> <li>□ Robot and all internal components</li> <li>□ Transmitter</li> <li>□ Battery charger and spare batteries</li> <li>□ Various hand tools necessary for troubleshooting and repairing the robot between rounds. Suggested tools include: <ul style="list-style-type: none"> <li>○ Screwdriver</li> <li>○ Hex keys</li> <li>○ Pliers</li> <li>○ Hand file</li> <li>○ Extra fasteners</li> </ul> </li> <li>□ Various circuit troubleshooting tools such as: <ul style="list-style-type: none"> <li>○ Digital Multimeter (DMM)</li> <li>○ Electrical tape</li> <li>○ Soldering iron, solder, brass sponge, flux, etc.</li> <li>○ Wire cutter/strippers</li> <li>○ Small power tools as needed such as: <ul style="list-style-type: none"> <li>○ Dremel, drill</li> <li>□ Power strip</li> <li>□ 25-foot extension cord</li> <li>□ Spare robot components</li> </ul> </li> </ul> </li> </ul> </li> </ul>
<p><b>Contest Notes, Themes, &amp; Deadlines</b></p>	<ul style="list-style-type: none"> <li>● □ RULES, REGULATIONS, AND SCORING RUBRICS ARE 2025 SKILLSUSA COMPETITION GUIDE Please see attached document. Each robot will compete in pool play with two matches guaranteed. The Top 16 robots will be seeded for a single elimination championship bracket based on pool play performance. □ □ To be eligible for the elimination championship bracket, teams must submit their documentation to the contest coordinator. Deadline- documentation must be submitted by March 12th, 2025, by 11:59pm. Upload all pages in one document to the link provided <a href="https://www.dropbox.com/request/p8ps62Jc1rsgCWio9WBv">https://www.dropbox.com/request/p8ps62Jc1rsgCWio9WBv</a> □ Judges will evaluate the journals prior to the event. □</li> </ul>
<p><b>WIFI Provided?</b></p>	<ul style="list-style-type: none"> <li>● No</li> </ul>
<p><b>Special Notes/Rules for All Contests</b></p>	<ul style="list-style-type: none"> <li>● Started in 2024, all Skilled Trade State Contests (most leadership contests already use scenarios) will begin to add a scenario-based component.</li> <li>● <b><u>Wi-Fi will NOT BE AVAILABLE unless listed above</u></b> . If you need WIFI access please plan to bring a hotspot.</li> <li>● All safety requirements will be heavily enforced. Competitors are to follow all safety standards and OSHA Regulations</li> <li>● <b><i>Contestants MUST HAVE A COPY OF THEIR EMERGENCY MEDICAL FORM IN THEIR NAME BADGE AT ALL TIMES</i></b></li> <li>● <b><u>THE FOLLOWING ITEMS ARE PROHIBITED; VIOLATION OF ANY OF THE FOLLOWING MAY RESULT IN COMPETITOR DISQUALIFICATION:</u></b> <ul style="list-style-type: none"> <li>● Contact with Contest Coordinators is prohibited. Contact with Contest Coordinators outside of the SkillsUSA Ohio is strictly prohibited.</li> <li>● Possession of smart watches and/or phones during the contest and/or in contest.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>● Contact with anyone outside of the contest area once the contest begins.</li> <li>● Inappropriate communication between contestants such as verbally degrading another contest.</li> <li>● Cheating on any portion of the contest such as informing another contestant of the skills/test prior to competing.</li> <li>● Lack of Copy Emergency Medical Form in Name Badge.</li> </ul>
<p><b>National Technical Standards</b></p>	<ul style="list-style-type: none"> <li>● Please refer to the <b>2024-2026 National Technical Standards</b> for all contests. All standards included may be tested in any competition.</li> <li>● In conjunction with National Standards, lack of understanding of State Level competition standards (this document) may result in student loss of contest.</li> </ul>
<p><b>Resume/Interview Requirement</b></p>	<ul style="list-style-type: none"> <li>● All SkillsUSA Ohio State Championship Contests will require a short interview component. Students should be prepared with basic job interview skills.</li> <li>● All contestants <b><u>must have a hard copy</u></b> of a one (1) page personal resume.</li> </ul>

# Battle Bots - Plastic Antweight (1 lb) Competition Rules

## SECTION 1: Robot Construction and Functionality

1. **Construction:**
  - a. The chassis, weapon, and lid of the robot must be 3D printed using approved materials - see next section for specifics.
  - b. Machined or cut parts from a block or sheet of plastic material are NOT allowed.
2. **Materials:** Plastic Class means that the construction materials must be 3D printed plastic as described below:
  - a. PET, PETG, ABS, PLA, Tough PLA, or PLA+ are the only materials that can be used for the chassis, lid, and weapons. No other types of filament are allowed (Super PLA Plus, TPU, Carbon Fiber, etc).
  - b. **No Kit Bots.** Robots must be designed by students.
  - c. Motors, wheels, electronics, axles, fasteners and adhesives can be any material, but cannot be used in such a way to enhance the structural integrity, armor the robot, or enhance any weapon. See appendix for examples of rule violations
  - d. Tape and zip ties may be used internally (wire management for example) but may not be used to enhance structure of the weapon or chassis.
  - e. Event Directors make final decisions on gray areas and have the right to reinspect any robot at any time during the tournament.
2. **Weight:** Antweight Plastic Class has a 1 lb (453.59g) weight limit. We will weigh each robot on a gram scale.
  - a. Robots must be equal to or less than **454 grams**
3. **Safety:**
  - a. All Robots must have a light easily visible from the outside of the robot that shows its main power is activated.
  - b. Name of the robot is clearly visible on the bot - engraved or embossed is preferred.
  - c. All robots must be able to be FULLY deactivated, which includes power to drive and weaponry, in under 60 seconds by a manual disconnect
  - d. On Match Day, robots will pass inspection (weight, materials, failsafe).
4. **Radio System:**
  - a. All robots must be radio controlled with 2.4 GHz spread spectrum radio.
  - b. If a robot has a weapon, then all robot systems (drive and weapon) must come to a stop when the transmitter loses power or loses signal.
5. **Batteries:** Examples of batteries that are permitted: NiCads, NiMh, LiIon, LiFe, LiPoly.

6. **Weapons part 1:** All robots are expected to have to have active weapons. Wedge-only style robots are discouraged. Active weapon robots will receive a 50 point bonus.
7. **Weapons part 2:** While a variety of spinning weapons are encouraged, there are some weapon systems that are not allowed:
  - a. RF jamming
  - b. EMF fields that affect another robot's electronics
  - c. Entangling weapons (nets, tapes, strings, or other materials that entangle).
  - d. Liquids, foams, gasses, powders, sand etc
  - e. Untethered projectiles
  - f. Fire, combustibles
  - g. Light and smoke that impair the viewing of a robot
  - h. Not allowed to physically engulf your opponent

## **Section 2: Match Rules and Match Scoring**

### **1. Match Rules:**

- a. Matches last 2 minutes
- b. Trap door opens at one minute
- c. A robot may restrict movement of the opposing bot for a maximum of FIVE seconds before changing positions (ie. pinning, supporting, lifting)
- d. If a robot becomes stuck due to the construction of the arena, not as a result of the opposing bot, the match will be stopped and the robot will be freed.
  - i. A robot may be unstuck a maximum of one time per match
- e. There are two ways to win:
  - i. #1 - Knock-out or one robot is disabled. If one of the robots falls or is pushed in the trap door, it counts as a knock-out.
  - ii. #2 - Judges' decision. If a match goes the entire allotted time without one robot getting knocked out, the winner is determined by the judges based on the match score sheet.

### **2. Match Scoring:**

- a. Matches will be scored by a panel of judges (2-3) using the following criteria:
  - i. Control
  - ii. Damage
  - iii. Aggression
- b. Match Scoring sheet is located at the end of this document

### **3. Pool Play and Championship Bracket**

- a. Each robot will compete in pool play for two matches. Based on match record and performance, robots will be selected for a single elimination championship bracket. Robot teams that do not submit documentation will not be eligible for selection in the championship bracket.

#### 4. Overall Competition Scoring

- a. Overall Competition Scoring is determined by the sum of the following categories: Documentation, Interview, Qualifying for the championship bracket, and placement in the bracket,
  - i. Documentation score (up to 400 pts)
  - ii. Team Interview (up to 100 pts)
  - iii. Qualifying for the Championship Bracket (150 pts)
  - iv. Placement in the top four in the Championship Bracket (up to 300 pts)
  - v. Active weapon bonus (50 pts)

### Section 3: Inspection and Documentation

#### 1. Inspection:

- a. All bots must pass inspection to be eligible for the competition. In order to pass, bots must meet the following criteria:
  - i. Pass a fail safe procedure test as laid out in Section 1 (All functions must stop operating when power to the radio is switched off. This includes both weapon and drive operations)
  - ii. Meet weight requirements laid out in Section 1
  - iii. Have a light visible on the outside of the robot
  - iv. Be constructed in a manner consistent with guidelines laid out in Section 1

#### Example 1:

In this example, the weapon motor is mounted outside of the robot. The motor mounted in this configuration is considered armor. This is NOT ALLOWED.

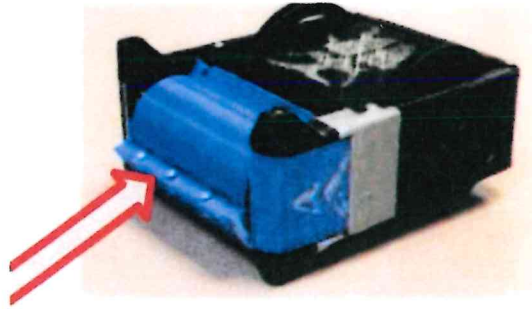


**Example 2:**

Although the fasteners might be holding the weapon together, they serve as a weapon in this case. This is NOT ALLOWED.

**Example 3:**

Same picture as Example 2. Duct tape is being used in a way to structurally enhance the robot. This is NOT ALLOWED.



2. **Documentation:** Documentation must be submitted by March 12, 2025. Bots without documentation may still compete in pool play but will not be eligible for the elimination rounds. Documentation Scoring guide is on the next page.



## 2025 Ohio SkillsUSA Documentation Scoring

<b>Criteria</b>	<b>30-40</b>	<b>20-29</b>	<b>0-19</b>
<b>Problem Definition</b>	Describes the challenge with words and pictures. States the team's goals for accomplishing the challenge.	Identifies the challenge to be solved	Does not identify the challenge to be solved
<b>Research and Brainstorming</b>	3 or more viable approaches to the challenge with labeled diagrams.	1-2 viable approaches to the challenge	Does not list the results of brainstorming and research sessions
<b>Select an Approach</b>	Explains why the selected approach was chosen and why other alternatives were not chosen.	Explains why the selected approach was chosen.	Does not explain why the selected approach was chosen.
<b>CAD</b>	Detailed models and assemblies of all parts with dimensioned drawings. Billions and parts list is included	Detailed models and assemblies of most parts. Some dimensioned drawings are included	No or minimal models shown
<b>3D Print settings</b>	Print settings were optimized for the designed application. Considered wall thickness, infill density, infill pattern, bottom and top layers, temperature, speed, bed adhesion, etc.	Some settings were identified but not optimized	Few or no settings were mentioned
<b>Build Log</b>	Pictures showing progress toward the goal. Key milestones were captured in pictures.	Some pictures were included that show build progress.	No pictures or minimal pictures are included.
<b>Bill of Materials</b>	Provides a parts list that shows all the components used in the design. List includes vendor and cost.	Parts List is included but lacks detail.	No Parts List or incomplete Parts List
<b>Circuit Diagram</b>	Drawing of circuit plan is clear and neatly labeled	Drawing of circuit is included.	No circuit drawing or incomplete drawing
<b>Testing and Evaluation</b>	Evaluates the solution. Provides words, diagrams, pictures, and/or data to support findings.	Evaluates the solution but lacks details in words, diagrams, pictures, and/or data.	No testing or evaluation is evident.
<b>Overall appearance of quality</b>	The documentation is neat and well organized.	The documentation lacks neatness or organization	The documentation lacks neatness and organization.



# 2025 Ohio SkillsUSA Inspection Sheet

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Robot Name: \_\_\_\_\_

Robot Builders or Team Name: \_\_\_\_\_

School Name: \_\_\_\_\_

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**Check the Box if Standard is Met**

- 3D Printed - Chassis, Weapon, Lid
  - Appropriate use of other materials (non 3D printed pieces cannot be used as armor)
  - Visible Light (may be internal or external but must be clearly visible)
  - Bot name clearly visible (Embossed or engraved is preferred)
  - Fail-Safe (robot functions, both weapon and drive systems, come to a stop within 60 seconds of the radio being shut off)
  - Weight: \_\_\_\_\_
- 

PASS

**Circle One**

FAIL

Documentation Submitted by 3/12/25  YES  NO (not eligible for elimination rounds)

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Robot Builder Signature: \_\_\_\_\_

Inspector Signature: \_\_\_\_\_

## 2025 SkillsUSA Battle Bots Match Scoring

Pool# \_\_\_\_\_ Match # \_\_\_\_\_

Bot Name	Aggression (Must Total 5)	Control (Must Total 6)	Damage (Must Total 6)	Points

**WINNER:** \_\_\_\_\_ **KnockOut:** \_\_\_\_\_ **Decision:** \_\_\_\_\_

## SkillsUSA Battle Bots – Overall Competition Scoresheet

Team Name: \_\_\_\_\_ School Name: \_\_\_\_\_

Bracket Placement (up to 450 pts)	Documentation (up to 400 pts)	Interview (up to 100 pts)	Active Weapon (50 pts)	Total Points

Knockouts For: \_\_\_\_\_ Knockouts Against: \_\_\_\_\_