LEVEL UP 2026 - 2027

NYS SkillsUSA

HEAVY EQUIPMENT OPERATION

PURPOSE

To evaluate each competitor's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of heavy equipment operation.

ELIGIBILITY

Open to active SkillsUSA members enrolled in programs with heavy equipment operation and maintenance as an occupational objective.

Competitors must have completed at least one full semester or equivalent curriculum experience, including in-seat operation of heavy equipment. (For eligibility purposes, training simulators do not qualify as "heavy equipment operation.")

CLOTHING REQUIREMENTS

NYS SkillsUSA – Mechanic

- White crew neck short-sleeved T-shirt
- Work pants or jeans,
- Leather or steel-toed work shoes.
- Long hair must be restrained.
- **hard hat**
- **Reflective vest class 2 minimum,**
- **outdoor clothing**
- **leather work gloves**
- Safety glasses with side shields or goggles, (Prescription glasses can be used only if they are equipped with side shields approved by OSHA(Z-87). If not, they must be covered with goggles.)
- ***Note:*** **Contestants must wear their official contest clothing to the contest orientation meeting. Also bring #2 pencil, resume, and safety assurance form**
- **Competition days: attire on the days scheduled for heavy equipment operation will include eye protection, safety toe/protective toe cap footwear that covers the ankles, and optional industry-standard high visibility rain gear.**

SAFETY INSTRUCTION AND VERIFICATION OF TRAINING

Important: Both the instructor and the competitor certify that by registering for this competition, the competitor has received instruction in heavy equipment operation and has demonstrated knowledge of the operation, basic machine and maintenance components, and safe usage of the following — but not limited to — equipment and machines:

1. Surveying Equipment and Grade Control Systems
2. Excavators
3. Wheel Loaders
4. Haulage Systems (trucks)
5. Skid Steers
6. Compact Track Loaders
7. Bulldozers
8. Compaction Equipment

Both the instructor and competitor also certify that SkillsUSA NY, SkillsUSA Inc., the national technical committee, and national judges are released from all responsibilities relating to personal injury resulting from their use. Competitors will be removed from the competition if proper training has not been provided and/or they are using the equipment in an unsafe manner.

EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
   a. All materials, tools and equipment needed for the competition.

2. Supplied by the competitor:
   a. Eye protection safety glasses
   b. Hard hat
   c. Class 2 minimum high visibility vest
   d. Safety footwear as described under the Clothing Requirements section
   e. Optional rain/outerwear for outdoor competition.
   f. All competitors must create a one-page resume and submit it at orientation

RESUME REQUIREMENT

Competitors must create a one-page resume to submit at orientation. Failure to submit a resume will result in a 10-point penalty.

DEVICES

Cell phones or other electronic devices not approved by the NYS Chairperson will be collected by the contest chair during the competition. Chairpersons will announce their acceptance by listing it on their standard or at the orientation meeting. In case of emergencies, advisors should allow the competitors to take their phones to the contest areas.

If the competitor uses their device in a manner that compromises the integrity of the competition, the competitor's score may be penalized.

SCOPE OF THE COMPETITION

The competition is defined by industry standards as identified by SkillsUSA technical committee, which includes Volvo Construction Equipment, Caterpillar Inc., Komatsu, and John Deere Construction and Forestry.

KNOWLEDGE PERFORMANCE

All competitors are required to take the SkillsUSA professional development test at orientation,

The competition will include a written knowledge exam to assess knowledge of principles, theories, and procedures used in heavy equipment operation. Competitors are required to take the SkillsUSA Professional Development Test.

SKILLS PERFORMANCE

The competition will include a series of stations where students will operate or inspect construction and surveying equipment, complete a written knowledge test, and participate in an interview.

COMPETITION GUIDELINES

1. Competitors may be assigned problems or projects requiring as little as 10 minutes to perform or as long as four (4) hours.
2. The following general safety rules will be followed:
   a. Seat belts must be worn at all times during the operation of equipment.
   b. No loose clothing is permitted.
   c. Long hair must be tied behind the head or netted.
   d. Gloves must not be worn during the operation of machinery unless competition requires.
   e. Any liquid or grease spilled must be cleaned up immediately and reported to the judge.
   f. All injuries, no matter how slight, must be reported immediately to the judge.
3. In addition, competitors will be judged on safety, operation performance and a written test. Points allowed will be assigned by the technical committee based on the difficulty of the assigned task.

STANDARDSANDCOMPETENCIES

HEO 1.0 — Demonstrate competencies related to safety

1.1. Demonstrate knowledge of OSHA, MSHA, NIOSH requirements
1.2. Present understanding of personal protection and basic principles of safety
1.3. Understand and practice safe equipment operation and maintenance

HEO 2.0 — Demonstrate competencies related to machine component identification

2.1. Identifies and describes the common
2.2. uses, types, components, instruments, parts, controls, and attachments on all machines listed in this document
2.3. Demonstrates comprehension of prestart inspection procedures
2.4. Demonstrates comprehension of preventative maintenance requirements
2.5. Demonstrates use of hand signals

HEO 3.0 — Demonstrate competencies related to grades

3.1. Demonstrates comprehension of preparing graded surfaces using heavy equipment
3.2. Identification of construction stakes and interpretation of marks on each type of stake
3.3. Demonstrates comprehension in grading slopes
3.4. Discusses how soil conditions affect equipment performance and explains techniques for working with various types of soils
3.5. Understands basic math skills required for site. Including methods and practice in calculating the areas and volumes of various geometric shapes, as well as formulas and methods used to calculate cut and fill requirements on a job.
3.6. Demonstrates comprehension of reading and interpreting site plans

HEO 4.0 — Demonstrate competencies related to excavators

4.1. Identifies and describes the common types, uses, and components and parts of excavators
4.2. Demonstrates comprehension of safety guidelines, prestart inspection procedures, and preventive maintenance requirements
4.3. Performs startup and operation, and demonstrates work activities and maneuvers associated with an excavator
4.4. Uses Excavator to complete assigned task
4.5. Demonstrates understanding of planning and executing earthmoving activities on various types of construction projects

HEO 5.0 — Demonstrate competencies related to wheel loaders

5.1. Identifies and describes the common types, uses and components and parts of wheel/track loaders

5.2. Demonstrates comprehension of safety guidelines, prestart inspection procedures, and preventive maintenance requirements
5.3. Performs startup and operation, and demonstrates work activities and maneuvers associated with a wheel/track loader
5.4. Uses wheel/track loader to complete assigned task

HEO 6.0—Demonstrate competencies related to haulage systems

6.1. Identifies and describes the common types, uses and components and parts of haulage systems
6.2. Demonstrates comprehension of safety guidelines, prestart inspection procedures, and preventive maintenance requirements
6.3. Performs startup and operation, and demonstrates work activities and maneuvers associated with a haulage system
6.4. Uses Hauler to complete assigned task
6.5. Demonstrates understanding of loading and dumping procedures on and off road

HEO 7.0—Demonstrate competencies related to bulldozers

7.1. Identifies and describes the common types, uses, and components and parts of bulldozers
7.2. Demonstrates comprehension of safety guidelines, prestart inspection procedures and preventive maintenance requirements
7.3. Performs startup and operation, and demonstrates work activities and maneuvers associated with bulldozers
7.4. Uses dozer to complete assigned task

HEO 8.0—Demonstrate competencies related to compaction equipment

8.1. Identifies and describes the common types of compaction equipment; the primary instruments, controls, and attachments of a roller
8.2. Performs startup and operation, and demonstrates work activities and maneuvers associated with a compactor
8.3. Uses compactor to complete assigned task