

SKILLS DEMONSTRATION
HVAC (NCCT03)

National Center for
Construction Education and Research

SKILLS DEMONSTRATION: HVAC (NCCT03)

(Print) Student's Name:	Date:
(Print) Teacher's Name:	School Name:
Teacher's Signature:	(Print) Registered Test Site Administrator's Name:

This Skills Demonstration is designed to allow students to demonstrate competency by performing various tasks associated with the knowledge requirements of the National Construction Career Test (NCCT) developed by the National Center for Construction Education and Research (NCCER). Students may complete Skills Demonstration tasks at any time throughout the school year. Use the attached form for a convenient method of tracking each student's achievements. A summary form is also included; you may use this to record results of the Skills Demonstration process for your entire class. This summary form may be used to facilitate the written test by indicating which students have successfully completed the Skills Demonstration component of the NCCT process.

Note:

- ▶ Students should be reminded of their progress status regarding completing the Skills Demonstration tasks throughout the year, so they can concentrate on areas needing improvement.
- ▶ Students (at the teacher's discretion) may repeat a Skills Demonstration task if they do not demonstrate competence on the first attempt.
- ▶ All Skills Demonstration tasks must be successfully completed before credit may be given for completion of the Skills Demonstration.
- ▶ The following rating scale may be of benefit in monitoring student progress in completing the Skills Demonstration:
 - 1. Competent—completed tasks accurately with no supervision**
 - 2. Completed tasks with minimum supervision**
 - 3. Training recommended—completed task only with direct intervention by the teacher**
 - 4. Did not complete this task**
- ▶ As students complete the entire Skills Demonstration successfully, enter the information requested on the summary form for the class.

INSTALLATION TECHNIQUES

Piping Practices	1	2	3	4
Using type L copper tubing and flare fittings provided by the teacher, sketch a loop that will require two 90-degree bends, one 90-degree elbow, one tee, and one cut of the tubing. Assemble the loop and follow teacher directions for pressure-testing the loop.				
Skills Demonstration Acceptance Criteria				
▶ Layout sketch done correctly				
▶ Proper PPE used and safety procedures followed				
▶ Tubing cut correctly				
▶ Bends made with no flat spots				
▶ Flares made correctly with no errors				
▶ Fitting connection made properly with proper tools				
▶ Pressure test performed to teacher requirements				
▶ Leak test performed, and any leaks corrected				
Using type L copper tubing and sweat fittings provided by the teacher, sketch a loop that will require two 90-degree bends, one 90-degree elbow, one tee, and one cut of the tubing. Assemble the loop and follow teacher directions for pressure-testing the loop.				
Skills Demonstration Acceptance Criteria				
▶ Layout sketch done correctly				
▶ Proper PPE used and safety procedures followed				
▶ Tubing cut correctly—clean and free of burrs				
▶ Bends made with no flat spots				
▶ Connections soldered correctly with no errors				
▶ Pressure test performed to teacher requirements				
▶ Leak test performed and any leaks corrected				

Basic Electricity	1	2	3	4
Use a clamp-on ammeter to measure current in a motor circuit provided by the teacher.				
Skills Demonstration Acceptance Criteria				
▶ Proper PPE used and safety procedures followed				
▶ Ammeter used correctly				
▶ Ammeter read correctly and readings recorded accurately				

INSTALLATION TECHNIQUES (CONTINUED)

Introduction to Cooling	1	2	3	4
Use a gauge manifold set to measure and record low-side and high-side pressures in an operating system provided by the teacher.				
Skills Demonstration Acceptance Criteria				
▶ Proper PPE used and safety procedures followed				
▶ Manifold gauge properly connected and calibrated				
▶ Proper steps followed in sequence and without error				
▶ Results correctly read and recorded				
▶ Manifold gauge correctly disconnected and system returned to normal operating condition				

Introduction to Heating	1	2	3	4
Use a manometer to measure and set manifold pressure on a gas-fired furnace provided by the teacher.				
Skills Demonstration Acceptance Criteria				
▶ Proper PPE used and safety procedures followed				
▶ Manometer properly connected to gas valve				
▶ Readings interpreted correctly and recorded accurately				
▶ Adjustment made correctly and verified				
▶ Equipment returned to normal operating condition				

Troubleshooting	1	2	3	4
Use a VOM and capacitor checker to check a metal case start-run capacitor (out of the circuit) provided by the teacher.				
Skills Demonstration Acceptance Criteria				
▶ Used proper PPE and safety procedures				
▶ Ensured capacitor is discharged				
▶ Checked terminal to terminal				
▶ Checked terminal to metal case				
▶ Properly used capacitor checker and recorded MFD value of capacitor				
▶ Verified condition (good or defective)				

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(Print) Teacher's Name:	Date:
Teacher's Signature:	School Year (e.g., 2003–2004):

Note:

- ▶ Print the name of each student in the class.
- ▶ Indicate with an "X" whether the student successfully completed the Skills Demonstration.
- ▶ Remember all tasks associated with the Skills Demonstration must be successfully completed before credit is given.
- ▶ Maintain the Class Summary form along with each student's individual performance record as required by your local school district.

	Student's Name	Completed Successfully
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