Great Oaks Heating, Ventilating and Air Conditioning Essential Skills Profile

This profile provides an outline of the skills required for successful completion of this career program. Additional information is located on the Great Oaks website at https://hs.greatoaks.com/future-students/essential-skills-for-high-school-programs and selecting the corresponding career program.

Recommended WorkKeys® Scores for Heating, Ventilating, and Air Conditioning

Applied Mathematics – 4
Workplace Documents – 4
Graphic Literacy – 5

*Practice tests and more information at https://jobseeker.ohiomeansjobs.monster.com/Assessments/Home.aspx

Recommended Essential Skills to Successfully Complete the Program			
Rating Key:	**Low = Slightly Essential**	**Medium = Essential**	**High = Very Essential**

Key Vocational Factors		**Rating**
Visual Acuity	The ability to detect differences/details visually	Medium
Depth Perception	The ability to detect the physical distance/depth of objects in space and time	Medium
Oral Communication	The ability to express/explain ideas	High
Oral Expression	The ability to verbally explain and express self in an intelligible manner so others will understand	High
Written Communication	The ability to communicate in a written format and record information accurately	Medium
Physical Mobility/Strength	Extended standing, bending, stooping, use of ladders, working inside and outside, and working on roofs or at high levels above the ground or on ground level	Medium
Eye-hand Coordination	The ability to use tools	High
Auditory Acuity	The ability to detect differences in pitch and sound	Low
Safety Understanding	Able to comprehend hazards of working with tools, materials, equipment, and environmental conditions; able to wear personal protective equipment suitable for task	High

Worker Trait Skills	**Rating**
Ability to get along with others	Medium
Ability to work independently, without close supervision	High
Ability to work toward work including tasks of minimal interest	Medium
Ability to follow and retain:	
Multistep oral instructions	Medium
Written instructions/technical manuals - multistep	High

Simple to complex diagram instructions	High
Visual models or demonstrated instructions	High
Ability to use tools of trade (voltage or current meters, screwdrivers, pressure indicators, power saws, hammers, etc.)	High
Ability to use numerical data (count, measure, compute, etc.) in applied setting	High
Ability to discriminate between objects of similar:	
Size, shape, color and spatial relationship	Medium
Ability to organize work process/follow defined procedures	High
Coordination (eye-hand)	Medium
Able to sequence events or follow a sequence as necessary	High
Ability to sequence events of follow a sequence as necessary	High
Dexterity (fine finger)	Medium
Equipment Maintenance: Performing routine maintenance on equipment and determining when and what kind of maintenance is needed	High
Installation: Installing equipment, machines, wiring, or programs to meet specifications	High
Quality Control Analysis: Conducting tests and inspections of products, services, or processes to evaluate quality or performance	High

Applied Mathematics Skills * Recommended WorkKeys® Scores 4	
Understanding of numbers	Work with whole numbers and decimals. Convert fractions to decimals and/or convert from decimals to percentages.
Mathematical calculations	Use one or two-step calculations to solve problems, decide what information, calculations or unit conversions to use to answer a problem
Solving problems with math	Solve problems that require mathematical operations with multiple units (e.g. 6 feet 4 inches or 4 hours 30 minutes), identify calculation mistakes
Workplace Documents Skills * Recommended WorkKeys® Scores 4	
Complexity	Straightforward with some longer sentences and may contain conditional situations
Information and detail	Mostly informative and can be several details
Vocabulary	Mostly common with some advanced words
Document type	Informational, instructional and policy-type documents
Graphic Literacy Skills * Recommended WorkKeys® Scores 5	
Using charts/graphs	Locate information in charts or graphs
Interpreting information	Compare two or more pieces of information, identify trends/patterns, make inference and identify graphics that accurately represents data, identify the most effective graphic for a defined purpose

Additional Recommended Abilities

Problem Sensitivity	The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
Finger Dexterity	The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.
Near Vision	The ability to see details at close range (within a few feet of the observer).

Knowledge Required in Heating, Ventilating, and Air Conditioning Field

Building and Construction	Knowledge of materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures.
Mechanical	Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
Customer and Personal Service	Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

Additional Considerations

Must enjoy working with their hands, able to follow directions, and work independently	Must possess good communication skills
Must be aware of surroundings such as live electrical points, safety glasses, overhead dangers, safety harness requirements, and gas lines	Must be able to problem solve
Wear a uniform	Must have high integrity

Heating, Ventilating, and Air Conditioning Work Activities

Test pipe or tubing joints or connections for leaks, using pressure gauge or soap-and-water solution.	Test electrical circuits or components for continuity, using electrical test equipment.
Repair or replace defective equipment, components, or wiring.	Connect heating or air conditioning equipment to fuel, water, or refrigerant source to form complete circuit.
Discuss heating or cooling system malfunctions with users to isolate problems or to verify that repairs corrected malfunctions.	Repair or service heating, ventilating, and air conditioning (HVAC) systems to improve efficiency, such as by changing filters, cleaning ducts, or refilling non-toxic refrigerants.
Install, connect, or adjust thermostats, humidistats, or timers.	Record and report time, materials, faults, deficiencies, or other unusual occurrences on work orders.

Study blueprints, design specifications, or manufacturers' recommendations to ascertain the configuration of heating or cooling equipment components and to ensure the proper installation of components.	Comply with all applicable standards, policies, or procedures, such as safety procedures or the maintenance of a clean work area.
Install auxiliary components to heating or cooling equipment, such as expansion or discharge valves, air ducts, pipes, blowers, dampers, flues, or stokers.	Lay out and connect electrical wiring between controls and equipment, according to wiring diagrams, using electrician's hand tools.
Inspect and test systems to verify system compliance with plans and specifications or to detect and locate malfunctions.	Install and test automatic, programmable, or wireless thermostats in residential or commercial buildings to minimize energy usage for heating or cooling.
Adjust system controls to settings recommended by manufacturer to balance system.	Cut or drill holes in floors, walls, or roof to install equipment, using power saws or drills.
Install or repair self-contained ground source heat pumps or hybrid ground or air source heat pumps to minimize carbon-based energy consumption and reduce carbon emissions.	Recommend, develop, or perform preventive or general maintenance procedures, such as cleaning, power-washing, or vacuuming equipment, oiling parts, or changing filters.
Install dehumidifiers or related equipment for spaces that require cool, dry air to operate efficiently, such as computer rooms.	Install magnetic-centrifugal chillers, compressors, or related equipment to cool air temperatures through the use of recirculating water.
Measure, cut, thread, or bend pipe or tubing, using pipe fitter's tools.	Wrap pipes, securing insulation in place with cement or wire bands.
Install or repair air purification systems, such as specialized filters or ultraviolet (UV) light purification systems.	Assemble, position, and mount heating or cooling equipment, following blueprints or manufacturer's specifications.
Fabricate, assemble, or install duct work or chassis parts, using portable metal-working tools or welding equipment.	Install radiator controls for room-level zone control heating of residential or commercial buildings.

Technology

Word Processing software	Spreadsheet software
Office Suite software	Database user interface and query software
Computer aided design (CAD) software	Specialized electronic reading equipment

Available Certifications

Credential	Ohio Graduation Points
EPA 608 Type I	12
EPA 608 Type II	12
EPA 608 Type III	12
EPA Universal	12
Aerial Work Platform (AWP) Operation	2
OSHA 10 – Construction	2
CPR/First Aid Certification	1

Possible College Credits

College Credit Plus (CCP)	The CCP program provides Ohio high school students an opportunity to complete college courses and earn transcripted credit.
Career Technical Assurance Guides (CTAGs)	CTAGs award college credit for career-technical coursework to students who complete an approved course and earn a qualifying score on the end of course exam.
Articulated Credit	Some Great Oaks career-technical programs have agreements with colleges where student can earn credit toward a specific degree.

Please speak with your school counselor, Great Oaks counselor and/or career technical instructor to learn more about these potential opportunities

Possible Career Pathways

Apprentice	HVAC Installation/Service Technician
Sheet Metal Fabricator	Appliance Repair Technician
Sales	Service Manager
Green Energy Specialist	Project/Job Estimator
Design or Product Engineer	HVAC Owner/Operator