

Core Skills Analysis

Career and Technical Education

- Gained practical insight into HVAC systems and their components through direct work experience.
- Developed an understanding of HVAC industry work processes including installation, maintenance, and repair.
- Learned workplace skills such as time management, communication with clients and colleagues, and following safety protocols.
- Observed problem-solving techniques and use of specialized tools and equipment specific to HVAC technology.

Science and Engineering

- Applied principles of thermodynamics and heat transfer in real-world settings.
- Witnessed the mechanical operation of heating, ventilation, and air conditioning systems.
- Understood how energy efficiency and environmental factors influence HVAC design and function.
- Learned troubleshooting methods for mechanical and electrical HVAC issues.

Tips

Tips: To deepen understanding of HVAC work, consider engaging in hands-on projects such as building a simple model HVAC system to illustrate airflow and heat exchange. Encourage shadowing different roles within the HVAC company to appreciate the variety of skills and tasks involved. Supplement learning with online tutorials and videos explaining HVAC system components and repair techniques. Discuss energy conservation and environmental impacts, prompting the student to think critically about sustainable solutions in HVAC design.

Book Recommendations

- [The Complete Guide to HVAC Systems](#) by David Collins: An introductory book that explains HVAC technology, including the science behind heating and cooling systems, with practical applications.
- [Cool Comfort: A Guide to Basic HVAC](#) by James C. Watkins: A clear guide focusing on the fundamentals of HVAC systems, designed for beginners and career explorers.
- [How Things Work: The HVAC Edition](#) by Sarah Phillips: This book makes the mechanical functions of HVAC systems accessible and engaging with easy-to-understand explanations and illustrations.

Learning Standards

- CCSS.ELA-LITERACY.W.9-10.2: Write informative/explanatory texts to examine and convey complex ideas and concepts clearly.
- CCSS.MATH.CONTENT.7.EE.B.3: Solve real-world and mathematical problems involving the properties of operations and conversion between units, relevant to HVAC measurements.
- Next Generation Science Standards (NGSS) HS-PS3-3: Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
- CCSS.ELA-LITERACY.SL.9-10.1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners about HVAC work experiences.

Try This Next

- Create a troubleshooting checklist worksheet for common HVAC problems encountered during work shifts.

- Write a brief report or presentation detailing the HVAC system components and their functions observed on the job.