Unit 5 Heating and Cooling

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 2**
Length: **2 weeks**
Status: **Published**

Summary

In this unit, students will learn how the automotive heating/cooling system operates. They will learn the names of major system components, their operation, simple diagnosis, and repair. Safety procedures will be emphasized while working around coolant and the high temperatures of a cooling system.

The goal of this unit is to teach the students the importance of the automotive heating and cooling system and how the science of thermodynamics is applied to achieve and maintain the proper operating temperature of an automobile engine. The content introduced will be in accordance with STEAM learning and incorporate the STEM elements in the acronym. The Science will be in learning about the pressurization and heat transfer of a fluid in accordance with thermodynamic principles, and how it is applied in the automotive heating and cooling system. The Technology and Engineering is involved in the design and construction of heating and cooling system components, such as heat exchangers and pumps, and their application in a vehicle's heating and cooling system. The Math involved will be the computation of how a fluid's boiling point is increased by pressurization.

Revised July 2025

Essential Questions

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What are the functions of an automotive heating/cooling system, and how do the components work together to maintain operating temperature?

What precautions need to be taken when testing or working on the heating and cooling system, and why?

How do the thermostat, water pump, and radiator operate, and what are their functions?

What are two basic tests performed on heating/cooling systems, and why is it necessary for them to be performed?

Enduring Understandings

Students will understand the function, operation, components, and purpose of the automotive heating/cooling system, and its importance to the vehicle's overall operation.

Objectives

Students will know…..

how an automotive heating/cooling system operates and basic diagnostic procedures.

the precautions to take while working on heating/cooling system.

how to test the system in order to make a proper diagnosis.

Students will be skilled at…..

testing and diagnosing the functions of radiators, heater cores, and hoses

Learning Plan

Preview the essential questions and connect to learning throughout the unit.

Teacher led discussion on what a heating/cooling system's purpose is and how it operates.

Hands on Task Sheets on heating and cooling systems.

Written test on essential knowledge and lesson mastery.

Closing discussion and anticipatory set.

Assessment

Formative Assessment:

Answer essential questions on heating and cooling

Participate in class discussions regarding proper tool use and safety procedures when working on or diagnosing heating and cooling system-related problems

Job Sheets

Exit Tickets

Summative Assessment:

Quizzes and test on heating and cooling system operation, function, and purpose

Alternative Assessment:

heating/cooling system presentation

Benchmark Assessment:

Final Exam

Materials

Modern Automotive Technology Textbook

Video Clips

Internet Research

Automotive Data Base

Standards

ELA.L	Language
ELA.R	Reading
ELA.W	Writing
CS.9-12.8.1.12.AP.5	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
CS.9-12.8.1.12.CS.4	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.
CS.9-12.8.2.12.EC.1	Analyze controversial technological issues and determine the degree to which individuals, businesses, and governments have an ethical role in decisions that are made.
WRK.9.2.12.CAP.2	Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.
WRK.9.2.12.CAP.4	Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.
WRK.9.2.12.CAP.5	Assess and modify a personal plan to support current interests and post-secondary plans.
WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.4	Demonstrate creativity and innovation.
FCSE.9-12.1.1.5	Determine goals for life-long learning and leisure opportunities for all family members.
FCSE.9-12.1.1.6	Develop a life plan, including pathways to acquiring the knowledge and skills needed to achieve individual, family, and career goals.

Modifications

https://docs.google.com/spreadsheets/d/1AckQSTlNShzlM-rDV5YKYUFm2WMCxJQiS10rEZ4jCC8/edit?usp=sharing