Unit 3 Engine Fundamentals 2019

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 1**
Length: **3 weeks**
Status: **Published**

Summary

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Students will be taught the basic components, function, and operation of a simple four stroke internal combustion engine. They will be taught how the engine is used as the power plant of the vehicle. The cause and correction of minor problems that can occur will also be studied.

Introduction:

The goal of this unit is to give students a basic understanding of how an engine works, and how it is used on many applications to perform various jobs, the content will be the understanding of how simple tools are used to create a complex machine to do work. The content introduced will be in accordance with STEAM learning and incorporate all the elements of the acronym. The Science (Physics) of how work is done. The Technology of how a complex machine is developed using all of the Six Simple Machines. The Engineering of such a machine. The Art (or as I like to say Automotive) in the design of an aesthetically pleasing automobile, and the Math involved in making all the elements of an automobile come together to provide a means of transportation and joy.

July 2019

Standards

LA.RST.9-10.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
LA.RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
LA.RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.
LA.RST.9-10.5	Analyze the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).
LA.WHST.9-10.2.C	Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.
MA.K-12.1	Make sense of problems and persevere in solving them.

MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.5	Use appropriate tools strategically.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP11	Use technology to enhance productivity.
SCI.HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
SCI.HS-PS2-5	Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.
SCI.HS-PS3-3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
SCI.HS-PS4-5	Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
CAEP.9.2.12.C.4	Analyze how economic conditions and societal changes influence employment trends and future education.

Essential Questions

How does a four stroke internal combustion engine work?

What are the four strokes of the engine and describe and explain what is happening in the engine during each stroke?

How do the components work together to create power?

Objectives

Students will know…..

what a four stroke internal combustion engine is

what a misfire is and what may be the cause.

how a crankshaft and camshaft work together in an internal combustion engine.

Students will be skilled at…..

determining how the major components work together to create power

simple diagnostic procedures to determine the cause of minor problems

the use of various tools to perform specific tasks

Learning Plan

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

Teacher led discussion on operation of a four-stroke internal combustion engine

Use of video and internet information.

Use of Modern Automotive Technology text and workbook chapter 11.

Task sheets and hands on application of learned material.

Guiding questions throughout the lesson to determine level of understanding.

Closing discussion and anticipatory set.

Assessment

answer essential questions Formative Assessment

complete a test on engine operation and component function and purpose Summative Assessment

participate in class discussions regarding proper tool use and safety procedures when working on or diagnosing engine related problems Formative Assessment

Job Sheets - Formative Assessment

Materials

Modern Automotive Technology text and workbook Chapter 11

Related Job Sheets

Visual aids

Auto Data Dase

Modifications

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