Class Starters & Enders

Making the Most of Instructional Time
Five Minute Lessons

Class Starters and Enders help utilize the last minutes of class when a lesson ends but there is not enough time to start another, or for an interest approach at the beginning of class. Mini-lessons correlate to GPS in the programs areas below.

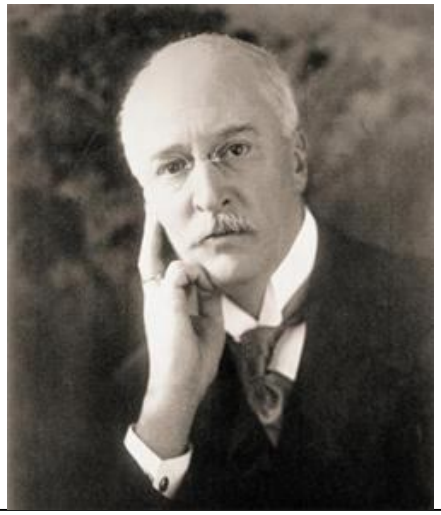
Start your engines

Program Areas: Agriculture, Engineering and Technology, Metals Technology, Transportation

Instructions: Read the material and make notes of important points, answer questions, and be ready to discuss this topic.

Rudolf Diesel (1858-1913) was born in Paris and was the son of Bavarian immigrants. He received his education from Munich Polytechnic and was employed as a refrigerator engineer. Diesel's formal education was mainly focused on the gasoline and steam engines. Diesel patented the first "internal combustion engine" also commonly known as the diesel engine. Diesel set out to invent the diesel engine to improve efficiency of the gas engine, and as a way for independent artisans to compete with the large industries.

Diesel enjoyed engine design. He created many heat engines including a solar-powered air engine in addition to the diesel engine. Diesel's invention was the first to prove that fuel could be ignited without a spark but rather with pressure. He published his paper on his invention in 1893 and in August the engine ran on its own power for the first time. The original model was more efficient than the steam engine, and after three years of improvements he demonstrated another model that was 75 percent more efficient than the steam engine. By 1898 he was a millionaire and his model was manufactured to power pipelines, electric and water plants, automobiles, marine craft, mines, oil fields, factories and transoceanic shipping.



Rudolf Diesel is the inventor of the first diesel engine. The diesel engines used today are refined and improved versions of his original model.

The basic difference between a diesel and gasoline engine is fuel is sprayed into the combustion chamber through the fuel injector nozzles right as air in the chamber has been placed under so much pressure that it is hot enough to ignite the fuel. Diesel engines are more efficient at carrying heavy weight over long distances than gasoline engines. Although diesel fuel can be made from many different types of fuel, the most common is made from crude oil.

The advantages of diesel engines are that they burn less fuel, have twice as long of a life, and have minimal carbon monoxide levels in the exhaust when compared with petroleum engines. They are also considered safer because they won't explode. While they are more reliable and can easily adapt to damp climates, one of the disadvantages is that they aren't as reliable in the cold because of waxing or gelling that can occur in the fuel lines.

Rudolf Diesel's invention is still being used; however, today there are 2 and 4 stroke diesel engines. The 4 stroke engine is most like the classic diesel engine and is used in trucks, buses and even some cars. The 2 stroke has a much higher power to weight ratio for larger engines and is used in locomotives and marine propulsion (in submarines).

Review Questions

1. At Munich Polytechnic what did Diesel study?
2. Besides the diesel engine, what other type of engine did Diesel design?
3. How many years did it take Diesel to perfect his model before it was manufactured?
4. Name some machinery that uses a diesel engine.
5. Explain the main difference between a diesel and gasoline engine.
6. In what scenario would a diesel engine be more efficient than a gasoline engine?

History Connection

Students can research topics such as the history of the automotive industry during the industrial revolution to present day and how the use of automobiles affected the American lifestyle, the economy and the environment.

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