

Heat Engines

By burning fuels (_____), heat engines are able to produce mechanical energy and use it to do work.

_____ **Combustion Engines: Combustion** of the fuel occurs inside the engine.

First example is the _____ engine

The sequence of steps for the gasoline powered internal combustion engine is:

1- _____	fuel and air enter the combustion chamber/cylinder
2- _____	the fuel/air mixture is compressed by a factor of about 8 to 1, bringing fuel and oxygen atoms closer together to improve combustion
3- _____	fuel/air mixture is ignited by spark plug. Resulting explosion pushes piston, producing mechanical energy.
4- _____	chemical byproducts of combustion are removed as piston pushes exhaust gases out of cylinder

Second example is the _____ engine

The fuel/air mixture is compressed by a factor of about 40 to 1. This much pressure, creates enough heat to ignite the fuel without the need for a spark plug. The diesel engine is more efficient than a gasoline engine at extracting energy from the fuel.

_____ **Combustion Engines: Combustion** of the fuel occurs outside of the engine.

Example is the _____

Fuel burned outside of engine cylinders was used to boil water to steam. The resulting steam expanded and pushed against a piston producing mechanical energy to do work. One drawback to steam engines is they need a steady supply of water to make the steam.