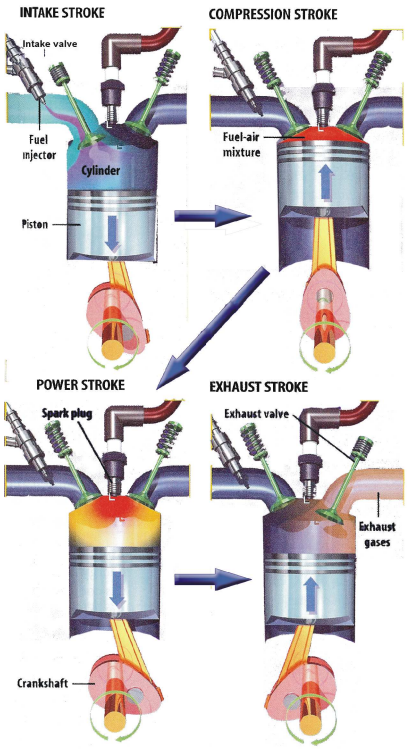
Heat Engines

A **heat engine** is a device that converts thermal energy into mechanical energy. Examples include the internal combustion engine, a turbine, a rocket ship, and a steam engine. Many heat engines work with hot gases. When a gas is heated, the molecules move faster and collide harder, causing the gas to expand. The expanding gas pushes on anything in its path. In this way, heat engines convert heat energy into motion.

The most common heat engine is the internal combustion engine found in trucks, buses, and cars. In an internal combustion engine, gasoline fumes explode in a combustion chamber or cylinder. Gasoline vapors are compressed as a piston moves into the cylinder. The vapors are ignited just as the piston reaches the highest point in the cylinder. Expanding gases push the piston back out of the cylinder. The bottom end of the piston is attached to a crank shaft which rotates, spinning the engine. Momentum of the spinning shaft pushes the piston back into the cylinder. The cycle repeats.

There are two main types of internal combustion engines. Most cars have high compression engines. The fuel is ignited by a spark from a spark plug. These vehicles require high octane fuels with high kindling temperatures. Many trucks and buses, and some cars have low compression engines also known as diesel engines. They use diesel fuel, which has a lower kindling temperature. As the piston moves into the cylinder compressing the gas, it heats up. The fuel is ignited by compression.



Answer the questions below based on your reading above and on your knowledge of physics.

1. What is a heat engine? _____

2. How does a heat engine produce motion? _____

3. In what way is a car engine a heat engine? _____

4. How is a diesel engine different than a standard internal combustion engine? _____