How does

burning coal produce energy?

Burning the coal reacts with oxygen in the air to form carbon dioxide and produces intense heat. As the coal burns, the stored chemical energy converts into thermal energy.

How does water/steam power the

engine?

Heat from burning coal heats the water to a boiling temperature. Once hot enough, steam builds and the pressure inside the water chamber increases. This pressurized steam flows from the top of the chamber, through the pipes, and into the engine where it interacts with the piston.

How does the piston move?

Hot steam is introduced in short bursts on alternating sides of the cylinder, causing major pressure differences on either side of the piston. The piston then slides back and forth from the high pressure side to the low pressure side.

How do

the wheels of the train move?

The flywheel stores energy from the piston’s jerky motion through a concept called conservation of angular momentum. The flywheel is connected to the wheels of the train by couplings and rods. The energy from the flywheel is then released evenly so that the wheels of the train move at a constant speed.

Chemical Energy

Thermal Energy

Mechanical Energy

Rotational Energy