

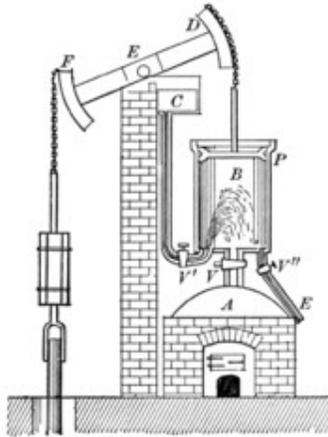
The combustion engine – The steam engine

The industrial revolution (1760 – 1830 apx) was an integral part of history that has helped pave the way to our current technologies and reliance's as a society. The period saw the transition into new manufacturing techniques and methods that saw the production of resources skyrocket. One of the main driving forces of the industrial revolution was the **steam engine**. While the first useful steam engine was designed and developed in 1712 by Thomas Newcomen and was used to pump water, it wasn't until 1763, when James Watt developed a more refined version that required much less heat (and hence fuel) to function. This meant that the steam engine could be incorporated extensively and efficiently for many tasks, becoming an integral part of the industrial revolution. This week we will be looking at the basics of the steam engine and Newcomen's design.

The first useful steam engine

The principle of the steam engine is quite simple. By heating water through the burning of a fuel source, the steam generated can provide enough pressure to drive a piston, "doing work". The piston falls down again (by cooling or other methods) and the process repeats.

The first useful steam engine, developed by Thomas Newcomen utilised these basic principles. The lifting and falling of the piston was one directional and was used for pumping water out of mines. His design was very inefficient as the piston needed to be cooled by spraying it with water, requiring a lot of fuel to reheat enough steam and the piston itself every time.



The following video does a good job at explaining how this steam engine works. You only need to watch up until the 4 minute mark.

<https://www.youtube.com/watch?v=GMgP-4O99qU>

Only one question for you to answer to demonstrate you have at least watched the video and hopefully read this document:

How many cycles per minute could Newcomen's steam engine perform?