

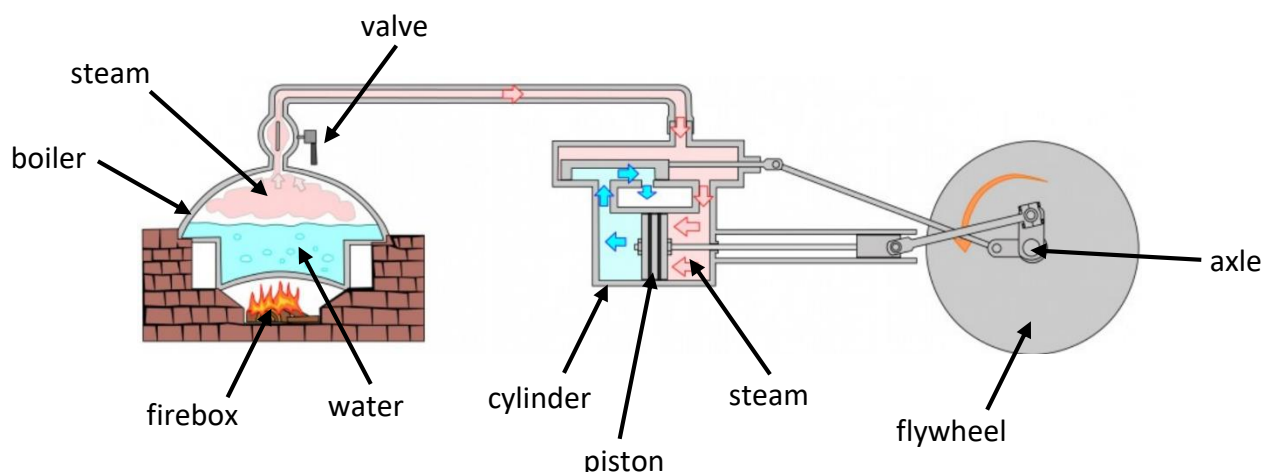
L.O. To describe how a steam engine works.	What I think	What my teacher thinks
Remember to/that:		
Write in a neat, joined script, in full sentences.	☐	☐
Describe the function of the firebox.	☐	☐
Describe the function of the boiler.	☐	☐
Describe the function of the flywheel.	☐	☐
Describe what happens to the steam.	☐	☐
Draw a simple diagram.	☐	☐
Include technical vocabulary.	☐	☐
Describe what the steam power was be used for.	☐	☐

Until the late 18th century, power for industry in Sheffield came through the use of water wheels positioned in the many rivers around the city. These were often used to run grinding wheels in the manufacture of farmers' tools.

During the 19th century, steam power was developed, which allowed workshops to be less dependent on the water levels in the rivers, as well as the flexibility to be located more widely. More importantly, steam engines were able to generate far more power than a water wheel.

The drawing shows some of the key features of a simple steam engine. A coal (or wood, or oil) fire in the firebox heats a boiler of water. When the water in the boiler reaches 100°C, it boils, creating water vapour and steam. As the boiler is sealed, the water cannot expand as it is heated, so the pressure inside the boiler increases. This increase in pressure can be used, through a valve, to push a piston sealed inside a cylinder. The piston is attached to a flywheel which turns the to and fro movement of the piston into the rotation of an axle. The axle can be attached to many different mechanical devices, such as grinding and polishing wheels, sheet metal rollers, water pumps for mines, wheels on trains, electricity generators or ships' propellers.

The ability to produce huge amounts of power quickly transformed the iron and steel manufacturing processes in Sheffield, enabling significant increases in production capacity.



In Sheffield, we can still see examples of water-powered workshops at the Abbeydale Industrial Hamlet. At the Kelham Island Museum, the largest working steam engine in Europe, the enormous River Don Engine, can be seen.

Steam engines and water power in industry have now largely been replaced by electricity, although the principles of steam power are still an important part of electricity generation.

Your tasks, using the information provided, and in your own words;

- 1) Describe the purpose of the firebox
- 2) Describe the purpose of the boiler
- 3) Describe the purpose of the flywheel
- 4) Describe what happens to the steam
- 5) Draw your own version of the diagram