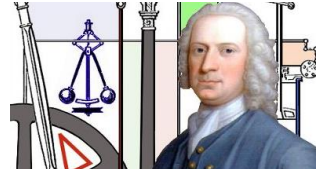


History activity 1: Comprehension Questions



Watch the video and/or read the information about James Watt.
Answer the questions below.

1. Prior to steam engines, how were factories and mills powered?
2. Watt did not invent the first the steam engine, but improved an existing one. What was the name of the inventor who designed the first 'useful' steam engine in the UK and when was this invented?
3. How did a steam engine work?
4. What raw material was needed in order to heat water and produce steam? How easy/hard was it to obtain this?
5. What were steam engines used for? What did they power?
6. Why did steam engines have such an enormous impact as an invention?
7. Steam engines disappeared from factories when electricity became a more convenient way of powering things. How is electricity generated today? Thinking about the planet and our environment, what are renewable sources of energy and why would it be better to explore these?

History activity 2: Horsepower Calculations

Read the information about horsepower below. Horsepower is still used to describe the power of vehicles and some machines (how much 'work' they can do. You will need a calculator to complete some of the activities below. (You can use the calculator on a mobile phone).



James Watt 2019

Horsepower Activity

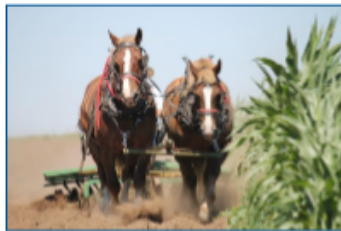
Horsepower

Horsepower is a unit of measurement invented by Watt. He needed to show how efficient and powerful his improved steam engine could be. Horses were commonly used for lifting, pulling and carrying.

Watt observed horses lifting coal from mines in buckets and estimated that they could lift 33,000 pounds a foot high in a minute. He named this One Horsepower and stated that his steam engine was 5 times more powerful than a horse.

A *pound* is about half a kilogram.

A *foot* is about 30 centimetres.



James Watt 2019 Watt in the World Learning Sessions, Follow-on activities

Children can work in pairs to measure their own horsepower. Watch out you will be using pounds and feet!

1. Find out your weight in kilograms. (Multiply by 2.2 to get the weight in pounds) _____ = a
2. Find a set of stairs and count them. Measure the riser (the height between the steps) and multiply by the number of steps. Convert centimetres to feet by multiplying this number by 0.0328 _____ = b
3. Using a stopwatch and a running start measure how long it takes to run from the bottom step to the top. Measure this in seconds _____ = c
4. Use your answers to carry out the sum below. (Using 9.81 to represent constant gravitational pull.)

$$a \times 9.81 \times b$$

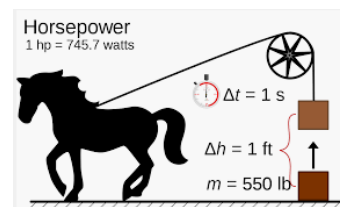
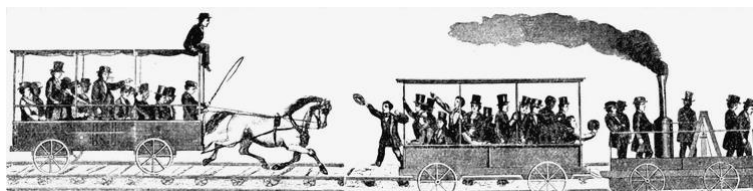
Divide by c to give answer in Watts

Now divide by 746 to get your horsepower!

Horsepower is still used to describe the power of cars, lawn mowers, chainsaws and even vacuum cleaners!



Have a look around you house. Can you find out how much horsepower your vacuum cleaner (this would be in Watts), lawn mower or family's car (or your favourite) has?



History activity 3: Design a Coat of Arms

Watch the videos and/or read the information about James Watt. Find out as much as you can about him and his inventions. Design a new coat of arms to represent him and his achievements.



James Watt 2019

Coat of Arms Activity

Family Values

James Watt's son, also called James, did everything he could to honour his father after his death. He created an impressive memorial, had a book written about him and even designed a family crest that reflected the values of his father.

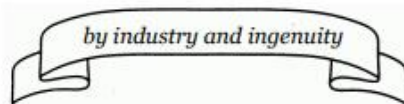
Each part of the crest has a symbolic meaning:

The elephant is for **strength**

The snakes round a staff are for **wisdom**

The club is for **special enterprise**

The motto translates to:



Consider the values that matter to you and design your own coat of arms.



James Watt 2019 Watt in the World Learning Resources

Coat of Arms image courtesy of Birmingham City Council, Library of Birmingham



Design your coat of arms here: