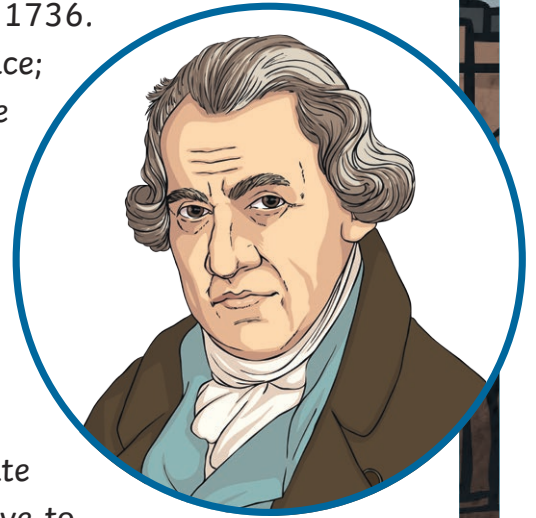


## Scottish Scientist and Engineer

# James Watt

James Watt was born in Greenock on 18th January 1736. In 1755, James went to London to become an apprentice; learning to make scientific instruments. In 1756, he returned to Glasgow, having completed his training. His skills and ability as an engineer soon became known and he worked on building the Forth and Clyde Canal and the Caledonian Canal. He also worked on the improvement of harbours around Scotland.

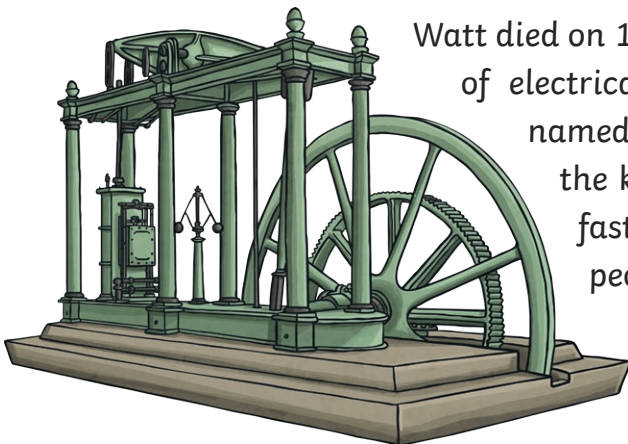


Around 1764, James was given a model steam engine to repair. Steam engines had been invented in the late 1600s before James was born, but they were expensive to run and often broke down. James set about improving them and his new design made these engines more efficient and cheaper to run. His design was patented in 1769.

James Watt and his business partner, Matthew Boulton, then began to make steam engines at a time when there was a great need for machinery from mines, mills making paper, flour or weaving cotton and iron mills. Boulton and Watt, based in Birmingham, became the most important engineering firm in the country. Steam engines were also required by distilleries, canals and waterworks.

James was aware of the need to help buyers of his new engine understand its power. He used the term **horsepower** to describe the rate at which work is done. He worked out that one horse had the strength to pull 33 000 pounds the distance of one foot, in one minute; he referred to this strength as **horsepower**.

Watt's engine had the power of 26 000 horses.



Watt died on 19th August 1819. A unit of measurement of electrical and mechanical power, the **watt**, is named in his honour. James Watt's work was the key to the Industrial Revolution; it began fast-moving and far-reaching changes to people's way of life, in Britain and the rest of the world.

# Questions

Read the text carefully and answer the questions in sentences.

1. Where and when was James Watt born?

---

2. Steam engines had been invented before James Watt was born.

Why were they not more commonly used in industry before 1769?

---

3. Why was there a great need for machinery at this time?

---

---

4. What word did Watt use to describe the rate at which these machines could work?

---

5. How did Watt explain horsepower?

---

---

6. What was the horsepower of Watt's engine?

---

7. Which unit of measurement of electrical and mechanical power is named after James Watt?

---

8. Why do you think James Watt's work was so important?

---

---

---

# Answers

1. Where and when was James Watt born?

**James Watt was born in Greenock on 18th January 1736.**

2. Steam engines had been invented before James Watt was born.

Why were they not more commonly used in industry before 1769?

**This is because they were expensive to run and often broke down.**

3. Why was there a great need for machinery at this time?

**There was a great need for machinery in industry at this time - from mines, mills making paper, flour or weaving cotton and iron mills. Steam engines were also required by distilleries, canals and waterworks.**

4. What word did Watt use to describe the rate at which these machines could work?

**He used the term horsepower.**

5. How did Watt explain horsepower?

**Watt worked out that one horse had the strength to pull 33 000 pounds the distance of one foot, in one minute.**

6. What was the horsepower of Watt's engine?

**Watt's engine had the power of 26 000 horses.**

7. Which unit of measurement of electrical and mechanical power is named after James Watt?

**The watt is named after James Watt.**

8. Why do you think James Watt's work was so important?

**Various answers. It was important because it allowed huge changes and developments in industry which changed people's lives in Britain and around the world.**

## Scottish Scientist and Engineer

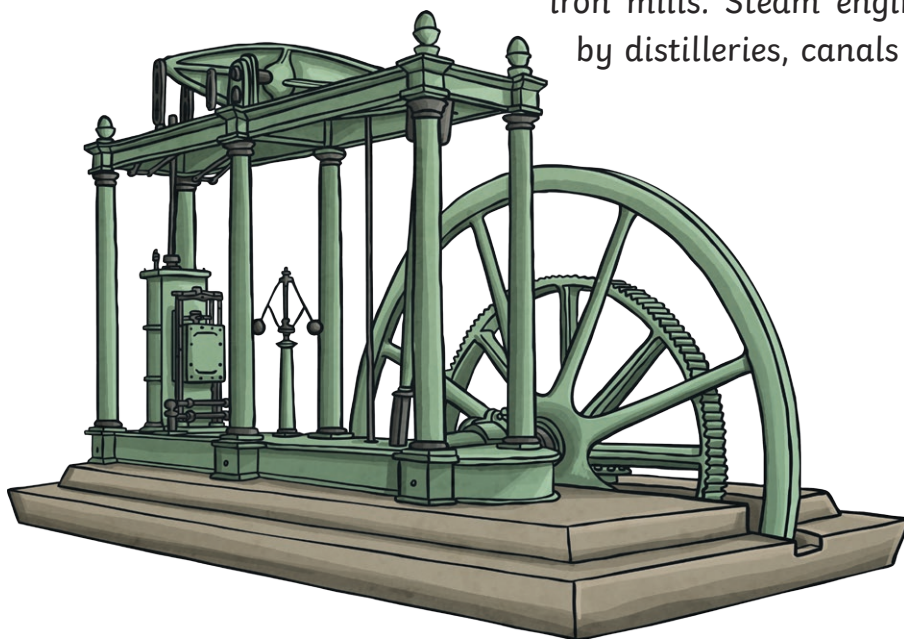
# James Watt

James Watt was born in Greenock on 18th January 1736. In 1755, James went to London to become an apprentice, learning to make scientific instruments. In 1756, he returned to Glasgow, having completed his training. His skills and ability as an engineer soon became known and he was employed on the construction of the Forth and Clyde Canal and the Caledonian Canal. He also worked on the improvement of harbours around Scotland.



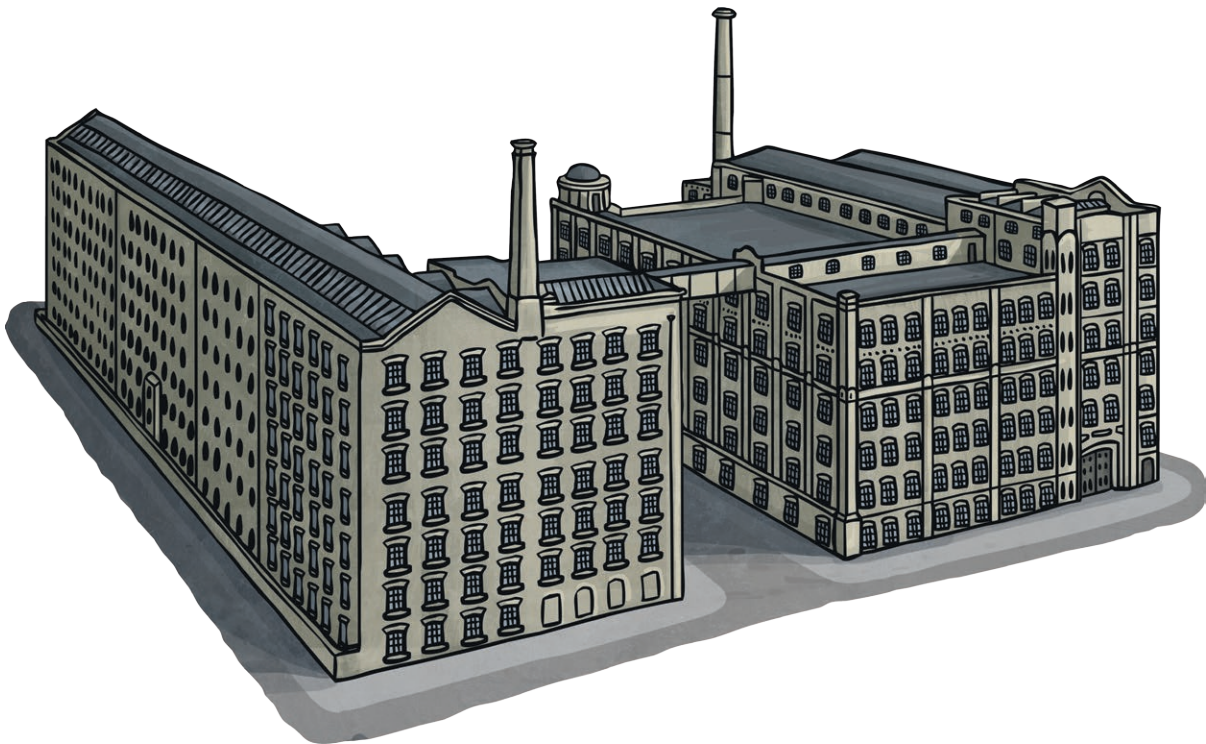
Around 1764, James was given a model steam engine to repair and he thought about how he could improve it. Steam engines had been invented in the late 1600s before James was born, however they were expensive to run and unreliable. James set about improving them and his new design made these engines more efficient and cheaper to run. His design was patented in 1769.

Along with a business partner, Matthew Boulton, James Watt began to make steam engines at a time when there was a great need for efficient machinery in industrial settings all over the country. Boulton & Watt, based in Birmingham, became the most important engineering firm in the country and there was a huge demand from mines, mills making paper, flour or weaving cotton and iron mills. Steam engines were also required by distilleries, canals and waterworks.



James was aware of the need to help buyers of his new engine understand its power. He used the term **horsepower** to describe the rate at which work is done. He worked out that one horse had the strength to pull 33 000 pounds the distance of one foot, in one minute; he referred to this strength as **horsepower**. Watt's engine had the power of 26 000 horses.

Watt died on 19th August 1819. A unit of measurement of electrical and mechanical power, the **watt**, is named in his honour. James Watt's work was the key to the Industrial Revolution; it began fast-moving and far-reaching changes to people's way of life, in Britain and the rest of the world.



# Questions

Read the text carefully and answer the questions in sentences.

1. Where and when was James Watt born?

---

2. Why did James go to London?

---

---

3. Why was James employed on the construction of the Forth and Clyde Canal and the Caledonian Canal?

---

---

4. Why did James want to improve the design of steam engines?

---

---

5. What were the benefits of James Watt's new design for steam engines?

---

6. Why was there a great need for efficient machinery at this time?

---

---

---

---

7. How did James help buyers understand the strength of his machines?

---

---

8. Explain what horsepower means.

---

---

9. Why do you think a unit of measurement of electrical and mechanical power was named in James Watt's honour?

---

---

10. *James Watt's work was the key to the Industrial Revolution.*

What do you think this statement means?

---

---

---

# Answers

1. Where and when was James Watt born?  
**James Watt was born in Greenock on 18th January 1736.**
2. Why did James go to London?  
**James went to London to become an apprentice; learning to make scientific instruments.**
3. Why was James employed on the construction of the Forth and Clyde Canal and the Caledonian Canal?  
**He was employed on the construction of the Forth and Clyde Canal and the Caledonian Canal because he had become known for being a skilled and able engineer.**
4. Why did James want to improve the design of steam engines?  
**They were expensive to run and unreliable.**
5. What were the benefits of James Watt's new design for steam engines?  
**James Watt's new design made steam engines more efficient and cheaper to run.**
6. Why was there a great need for efficient machinery at this time?  
**There was a great need for efficient machinery at this time because industry needed it in order to grow and meet demand. Mines, mills making paper, flour or weaving cotton and iron mills as well as distilleries, canals and waterworks all required new machinery.**
7. How did James help buyers understand the strength of his machines?  
**To help buyers understand he used the term horsepower to describe the rate at which work was done by the machines.**
8. Explain what horsepower means.  
**Watt worked out that one horse had the strength to pull 33 000 pounds the distance of one foot, in one minute.**
9. Why do you think a unit of measurement of electrical and mechanical power was named in James Watt's honour?  
**Various answers. Perhaps because of the work he had done in developing electrical and mechanical power.**
10. *James Watt's work was the key to the Industrial Revolution.*  
What do you think this statement means?  
**Various answers. Perhaps it means his work opened the door for huge developments and expansion in industry because of the power that could now be harnessed through machinery.**



## Scottish Scientist and Engineer

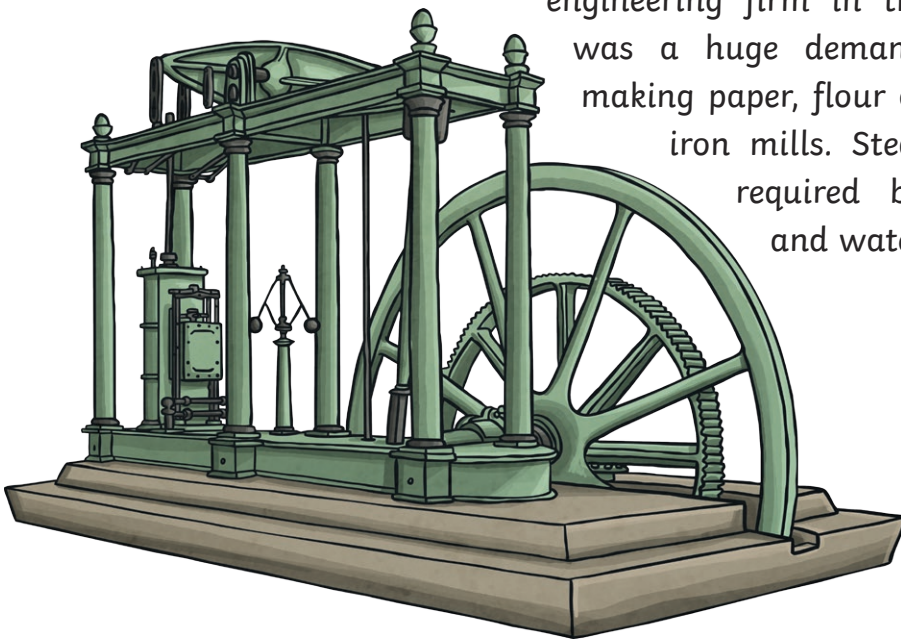
# James Watt

James Watt was born in Greenock on 18th January 1736 and, as a boy, was educated at home. In 1755, James went to London to become an apprentice scientific instrument maker. In 1756, he returned to Glasgow, having completed his training. His skills and ability as an engineer soon became known and he was employed on the construction of the Forth and Clyde Canal and the Caledonian Canal. He was also involved in the improvement of harbours around Scotland.



Around 1764, James was given a model steam engine to repair and he thought about how he could improve it. Steam engines had been invented in the late 1600s before James was born, however they were expensive to run and unreliable. James designed a separate condensing chamber for the steam engine, along with other improvements, and his design was patented in 1769. James Watt's design made these engines more efficient and cheaper to run.

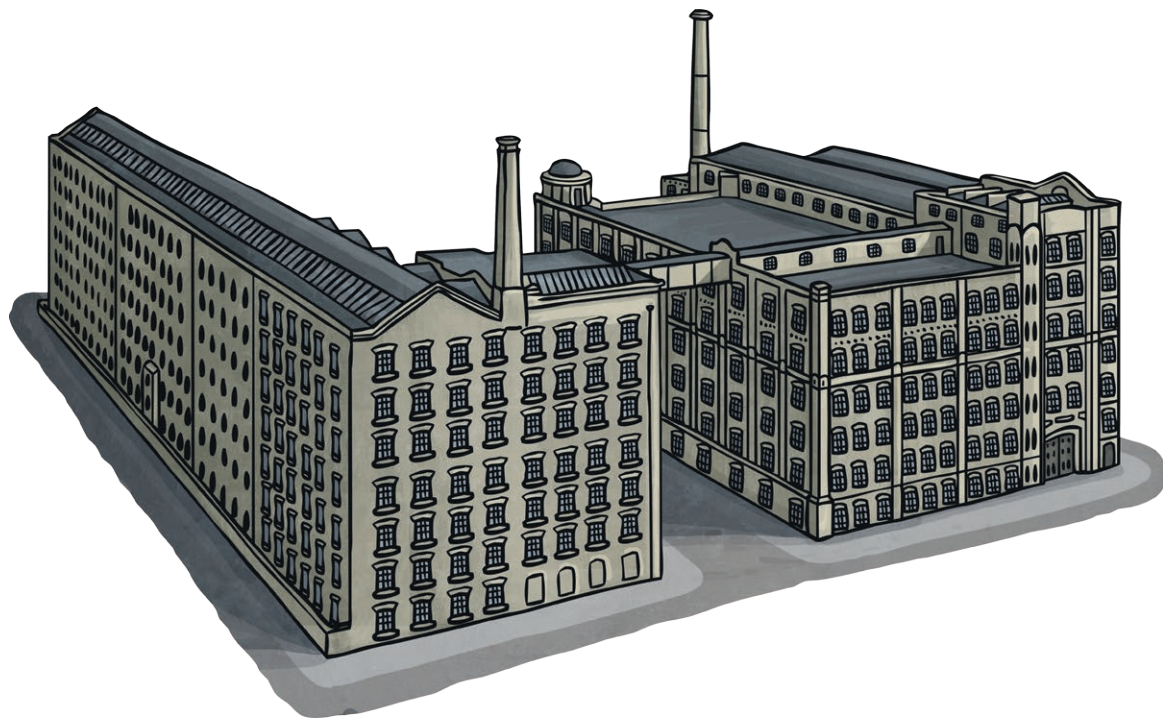
Along with a business partner, Matthew Boulton, James Watt began to make steam engines at a time when there was a great need for efficient machinery in industrial settings all over the country. Steam was the main source of power. Boulton & Watt, based in Birmingham, became the most important engineering firm in the country and there was a huge demand from mines, mills making paper, flour or weaving cotton and iron mills. Steam engines were also required by distilleries, canals and waterworks.



James was aware of the need to help buyers of his new engine understand its power. He used the term **horsepower** to describe the rate at which work is done. He worked out that one horse had the strength to pull 33 000 pounds the distance of one foot, in one minute; he referred to this strength as **horsepower**. Watt's engine had the power of 26 000 horses.

When Watt retired in 1800, he was a wealthy man. He patented several other important inventions including the steam indicator, which records the steam pressure inside an engine.

Watt died on 19th August 1819. A unit of measurement of electrical and mechanical power, the **watt**, is named in his honour. James Watt's work was the key to the Industrial Revolution; it began fast-moving and far-reaching changes to people's way of life, in Britain and the rest of the world.



# Questions

Read the text carefully and answer the questions in sentences.

1. Summarise James Watt's early life.

---

---

---

2. *His skills and ability as an engineer soon became known...*

What do you think this statement means?

---

---

3. Why had steam engines never been commonly used in industry before 1769?

---

---

4. What did James do to improve the design and what were the benefits of his new design?

---

---

5. What was the main source of power in industry at this time?

---

6. Give two reasons why James Watt and Matthew Boulton's engineering firm became the most important in the country.

1. \_\_\_\_\_

---

2. \_\_\_\_\_

---

7. What was James aware of, in order to help buyers of his machinery?

---

---

8. What is horsepower and how did James explain it?

---

---

---

9. When James Watt retired in 1800 he was a wealthy man.

Why do you think this was the case?

---

---

10. *James Watt's work was the key to the Industrial Revolution.*

What do you think this statement means?

---

---

---

# Answers

1. Summarise James Watt's early life.  
**James Watt was born in Greenock on 18th January 1736 and, as a boy, was educated at home. In 1755, James went to London to become an apprentice scientific instrument maker.**
2. *His skills and ability as an engineer soon became known...*  
What do you think this statement means?  
**Various answers. It means James Watt became known as a skilled and able engineer. His reputation as an excellent engineer became known to others.**
3. Why had steam engines never been commonly used in industry before 1769?  
**Steam engines had never been commonly used in industry because they were expensive to run and unreliable.**
4. What did James do to improve the design and what were the benefits of his new design?  
**James designed a separate condensing chamber for the steam engine along with other improvements. James Watt's design made these engines more efficient and cheaper to run.**
5. What was the main source of power in industry at this time?  
**Steam was the main source of power.**
6. Give two reasons why James Watt and Matthew Boulton's engineering firm became the most important in the country.  
**They became the most important because**  
**1 - it was a time when there was a great need for efficient machinery in industrial settings all over the country**  
**and**  
**2 - there was a huge demand from mines, mills making paper, flour or weaving cotton and iron mills for their machines. Steam engines were also required by distilleries, canals and waterworks.**
7. What was James aware of, in order to help buyers of his machinery?  
**James was aware of the need to help buyers of his new engine understand its power.**
8. What is horsepower and how did James explain it?  
**Horsepower is the term used to describe the rate at which work is done. Watt worked out that one horse had the strength to pull 33 000 pounds the distance of one foot, in one minute; this strength is horsepower.**

9. When James Watt retired in 1800 he was a wealthy man.

Why do you think this was the case?

**James Watt was a wealthy man because his engines and other important inventions had been bought by industry around the world.**

10. *James Watt's work was the key to the Industrial Revolution.*

What do you think this statement means?

**Various answers. Perhaps it means his work opened the door for huge developments and expansion in industry because of the power that could now be harnessed through machinery.**