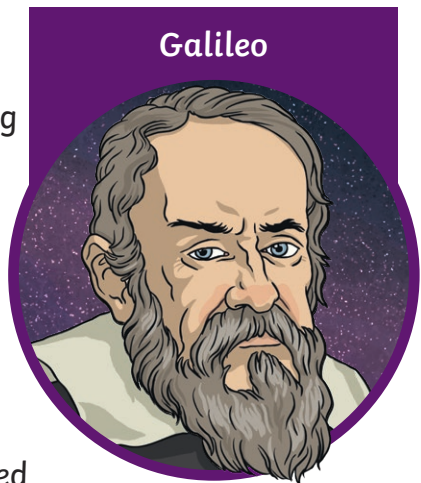


Stephen Hawking

Stephen Hawking was an English scientist, **cosmologist**, teacher and author. He is best known for discovering how the universe was formed and predicting what might happen to it in the future.

A Star Is Born

Born on 8th January 1942, Stephen William Hawking was born exactly 300 years after the death of the famous **astronomer** Galileo – a fact that Stephen was very proud of. He was born during the Second World War, in Oxford, England, where his parents, Frank Hawking and Isobel Walker, had moved to from London to ensure Stephen's safety.



Stephen had three younger siblings: two sisters named Philippa and Mary and an adopted brother named Edward.

His family placed a high value on education and his parents studied at the University of Oxford; his father studied medicine and became a medical researcher while his mother studied **philosophy** and **politics**.

Childhood

Stephen's fascination with space began at an early age when he would enjoy spending time with his mother; lying together on the grass in the garden to watch the stars.

In 1950, the family moved to St Albans in Hertfordshire. At school, Stephen's classmates often called him 'Einstein'. Stephen took the eleven-plus exam a year early and attended St Albans School, where he remained throughout his secondary education. With close friends, he enjoyed playing board games and making model aeroplanes and boats. With the help of their maths teacher, Stephen and his friends built a computer from clock parts and various other recycled objects.

University

Stephen went on to study **physics** and **chemistry** at the same college that his father had attended in Oxford. He took the entry exams a year early, meaning that he was only 17 years old when he started university.

Stephen became a lively, witty and popular member of his class and joined the college boat club, where he became **cox** for a rowing crew – he was said to be a daredevil because of the risks he took in the boat!

Following the completion of his first degree, Stephen attended Cambridge University where he studied **cosmology** and made some incredible discoveries.

It was at Cambridge that Stephen first developed problems with his health. He became very clumsy, regularly falling or dropping things. His speech became slurred and hard to understand.

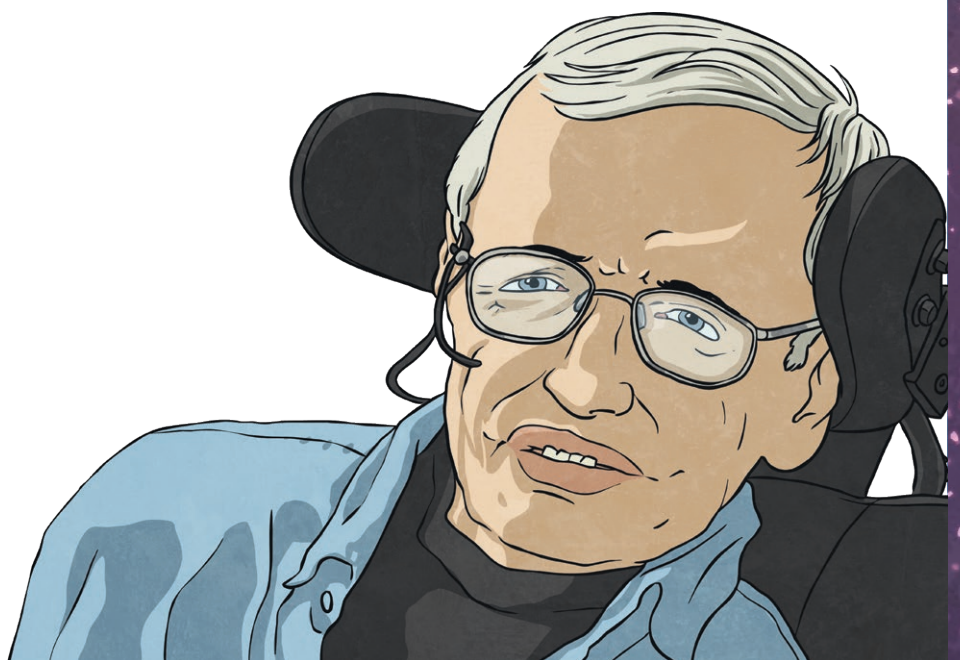
Doctors diagnosed Stephen with Amyotrophic Lateral Sclerosis, or **ALS**, and he was given just two years to live. However, his disease progressed more slowly than doctors had imagined, meaning he was able to return to his studies. In later years, his ALS meant that he used a wheelchair and spoke using a computer voice synthesiser.



Scientific Discoveries

While at Cambridge University, Stephen studied black holes. At the time, people thought that black holes were a place where gravity pulled so strongly that it pulled everything down into it and nothing could escape. Yet, Stephen discovered that a type of **radiation** was able to elude black holes. This type of radiation was named after him and, using what he had discovered about black holes, Stephen was able to show that the universe had started with a Big Bang and would end in black holes.

Due to his amazing work and incredible sense of humour, Stephen inspired millions of people to become interested in science.





Glossary

ALS: A motor neurone disease that causes muscle weakness, paralysis and respiratory failure. It is a degenerative disease, which means it gets worse over time. There is no cure.

astronomer: A person who studies the positions of the sun, moon, stars and planets.

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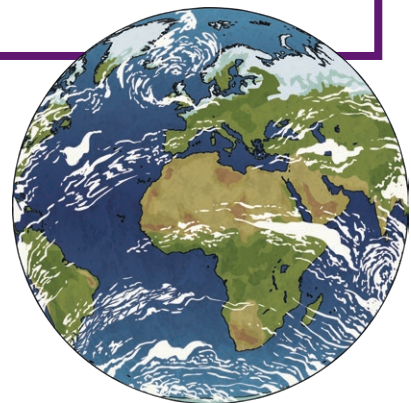
cox: The person who directs the rowers in a boat.

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radiation: Waves of energy that come out of or off something.



Questions

1. 'However, his disease progressed more slowly than doctors had imagined, meaning he was able to return to his studies.'

What does **progressed** mean? Tick one.

- improved
 finished
 developed
 changed

2. Draw **three** lines to match the event to where it happened.

Stephen was a cox for a rowing crew.

St Albans School

Stephen built a computer.

Cambridge University

Stephen was diagnosed with ALS.

Oxford University

3. Name **two** things that Stephen did 'a year early'.

1. _____

2. _____

4. Fill in the missing words.

With the help of their _____, Stephen and his friends
 built a _____ from clock parts and various other recycled objects.

5. Look at the section called **Childhood**.

Find and copy one word which shows that Stephen was interested in space as a child.

6. What was special about the day that Stephen was born? Explain your answer.

7. Summarise Stephen's famous discovery in one sentence.

8. Why do you think Stephen has inspired many people?

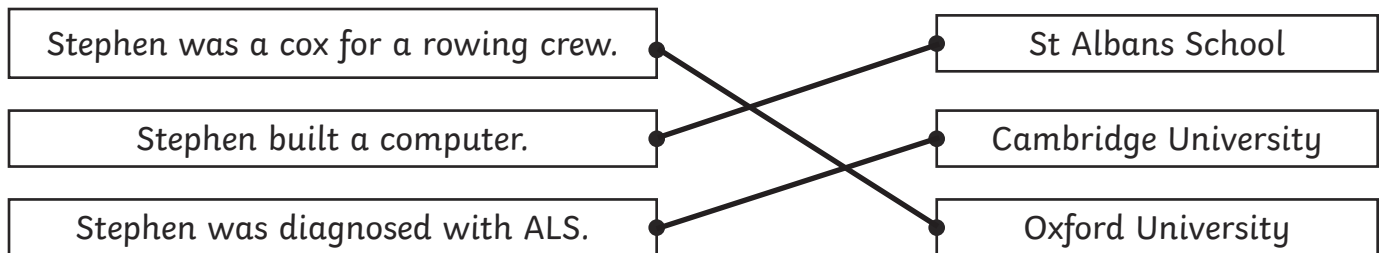
Answers

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What does **progressed** mean? Tick one.

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2. Draw **three** lines to match the event to where it happened.



3. Name **two** things that Stephen did 'a year early'.

Accept any two of the following: took the eleven-plus; took university entrance exams; went to university.

4. Fill in the missing words.

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Find and copy one word which shows that Stephen was interested in space as a child.
fascination

6. What was special about the day that Stephen was born? Explain your answer.

Pupils' own responses, such as: Stephen was born exactly 300 years after Galileo died, a fact that he was very proud of because Galileo was a famous astronomer.

7. Summarise Stephen's famous discovery in one sentence.

Pupils' own responses, such as: Stephen discovered a type of radiation that is able to escape from black holes, despite the fact that nothing else can.

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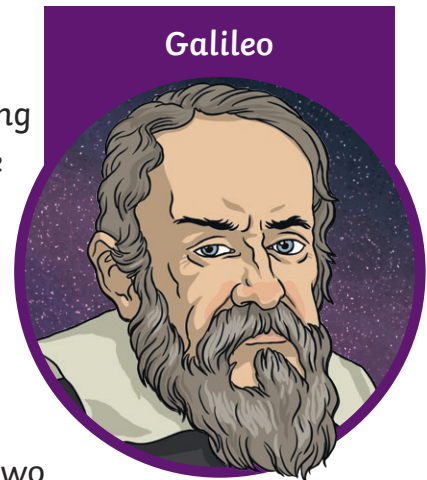
Pupils' own responses, such as: Many people are interested in space from a young age, as Stephen was, so it is inspiring for them to see that he was able to pursue his dreams, becoming an amazing cosmologist.

Stephen Hawking

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Childhood

Stephen's fascination with science, particularly space, began at an early age, when he would enjoy spending time with his mother; lying together on the grass in the garden to watch the stars.

When Stephen was a child of eight, the family moved to St Albans in Hertfordshire, a town about 20 miles north of London. At school, Stephen was often referred to as 'Einstein' by his classmates. After taking the eleven-plus exam a year early, Stephen attended St Albans School. He remained there throughout his secondary education and made close friends, with whom he enjoyed playing board games and making model aeroplanes and boats. With the help of his maths teacher, Dikran Tahta, Stephen and his friends built a computer from clock parts, an old telephone switchboard and various other recycled parts.

University

Inspired by Mr Tahta, Stephen wanted to study maths at university, despite his father advising him to study medicine. Stephen compromised and chose to study **physics** and **chemistry** at the same college that his father had attended. He took the entry exams a year early, meaning that he was only 17 years old when he started university.

Stephen became a lively, witty and popular member of his class, interested in classical music and science fiction. He also joined the college boat club, where he became **cox** for a rowing crew – he was said to be a daredevil because of the risks he took in the boat!

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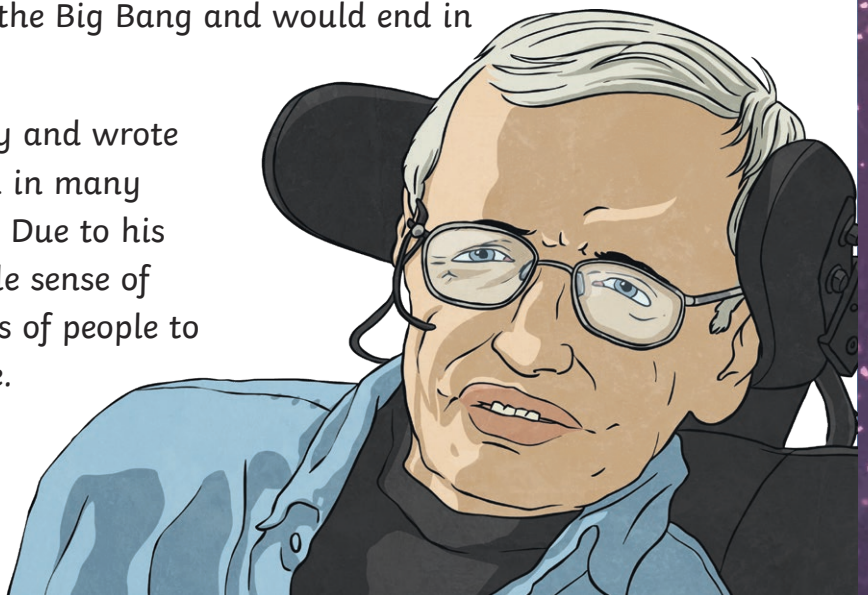
Scientific Discoveries



While at Cambridge University, Stephen studied black holes. At the time, people thought that black holes were a place where gravity pulled so strongly that it pulled all matter down into it and even light couldn't escape. Stephen, however, discovered that a type of **radiation** was able to elude black holes. This particular type of radiation was named after him and, using what he had discovered about black holes, Stephen was able to show that Einstein's general **theory of relativity** implied that

space and time began with the Big Bang and would end in black holes.

Stephen taught at university and wrote books which have been read in many countries around the world. Due to his amazing work and incredible sense of humour, he inspired millions of people to become interested in science.





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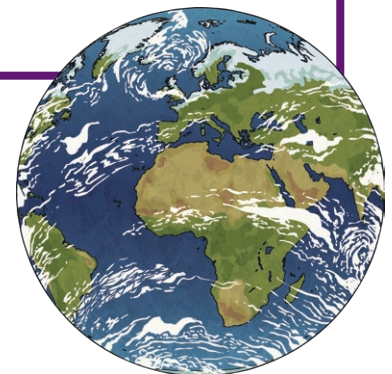
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theory of relativity: The idea that as something approaches the speed of light, mass and energy change.



Questions

1. What nickname did Stephen have in school? Tick one.

- Einstein
- St Albans
- Galileo
- Edward

2. Number the following statements from 1-5 to show the order in which they happened. The first one has been done for you.

- Stephen was diagnosed with ALS.
- Stephen made a computer with his friends.
- Stephen discovered a type of radiation that can elude black holes.
- Stephen was a cox for a rowing crew.
- 1 Stephen took the eleven-plus exam a year early.

3. Name **two** things that Stephen did 'a year earlier' than was expected.

1. _____
2. _____

4. Fill in the missing words from this sentence.

He remained there throughout his _____ education and made close friends, with whom he enjoyed playing board games and making model _____ and boats.

5. Find and copy a phrase from the text which shows that Stephen agreed to do something different at university following his father's advice.

6. Sum up Stephen's scientific discoveries.

7. Why do you think Stephen was so popular?

8. How is Stephen similar to another famous explorer or scientist?

9. Why do you think Stephen was inspired by his maths teacher?

Answers

1. What nickname did Stephen have in school? Tick one.

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- 5** Stephen discovered a type of radiation that can elude black holes.
- 3** Stephen was a cox for a rowing crew.
- 1** Stephen took the eleven-plus exam a year early.

3. Name **two** things that Stephen did 'a year earlier' than was expected.

Accept any two of the following answers: took the eleven-plus; took university entrance exams; went to university.

4. Fill in the missing words from this sentence.

He remained there throughout his **secondary** education and made close friends, with whom he enjoyed playing board games and making model **aeroplanes** and boats.

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Stephen compromised

6. Sum up Stephen's scientific discoveries.

Pupils' own responses, such as: Stephen discovered a type of radiation that is able to escape from black holes, despite the fact that nothing else can; he used this knowledge to show that space and time began with the Big Bang and would end in black holes.

7. Why do you think Stephen was so popular?

Pupils' own responses, such as: He was popular because many people are fascinated by space; Stephen tried to answer the questions that are often asked about the universe and was a funny man.

8. How is Stephen similar to another famous explorer or scientist?

Pupils' own responses, such as: Stephen is similar to Professor Brian Cox because they both have a keen interest in the science of space.

9. Why do you think Stephen was inspired by his maths teacher?

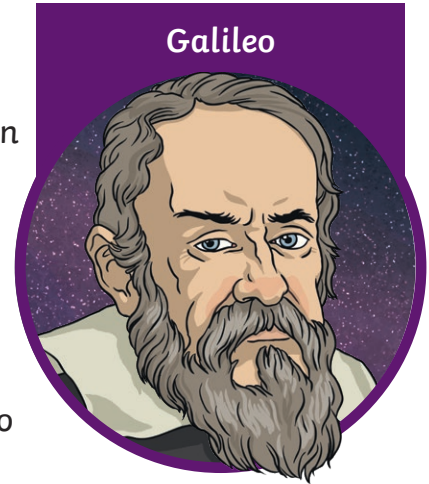
Pupils' own responses, such as: His maths teacher took the time to work with him on things that interested him (building computers) and so Stephen would have been inspired to be like this man.

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Stephen's fascination with science, particularly space, began at an early age, when he would enjoy spending time with his mother; lying together on the grass in the garden to watch the stars.

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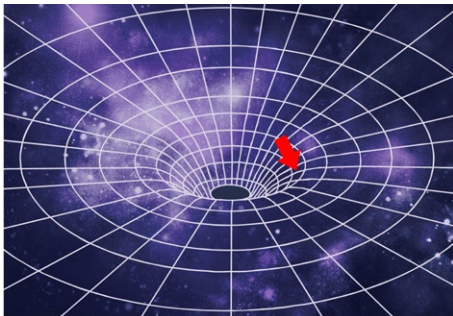
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It was at Cambridge that Stephen first developed problems with his health. He became very clumsy, regularly falling or dropping things. His speech became slurred and hard to understand.

Doctors diagnosed Stephen with Amyotrophic Lateral Sclerosis, or **ALS**, and he was given just two years to live. However, his disease progressed more slowly than doctors had imagined, meaning he was able to return to his studies, marry his first wife, Jane Wilde, and start a family. In later years, his ALS meant that he used a wheelchair and communicated using voice synthesis technology.

Scientific Discoveries



While at Cambridge University, Stephen studied black holes. At the time, people thought that black holes were a place where gravity pulled so strongly that it pulled all matter down into it and even light couldn't escape. Stephen, however, discovered that a type of **radiation** was able to elude black holes. This particular type of radiation was named after him and, using what he had discovered about black holes, Stephen was able to show that Einstein's general **theory of relativity** implied that space and time began with the Big Bang and would end in black holes.

Stephen explained how black holes worked: imagine that it is like a river with a waterfall. If you are swimming in the river away from the top of the waterfall, you may be able to swim away fast enough so that you don't go over the edge, but as you get nearer to the edge, you cannot swim fast enough to escape the current of the water.



You will be pulled over the edge of the waterfall. This is how matter is pulled into a black hole. The edge of a black hole is called the event horizon. Past the event horizon, nothing can travel fast enough to escape the black hole.

Stephen taught at university, gave many talks and wrote books which have been read in many countries around the world. Due to his amazing work and incredible sense of humour, he inspired millions of people to become interested in science.

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Questions

1. 'Stephen Hawking was an English scientist, cosmologist, teacher and author. He is best known for discovering how the universe was formed and predicting what might happen to it in the future.'

What does **predicting** mean? Tick one.

- describing
- speculating
- understanding
- knowing

2. Who helped Stephen to build a computer? Tick one.

- Frank Hawking
- Jane Wilde
- Isobel Walker
- Dikran Tahta

3. Find and copy one word from the text which shows that Stephen wasn't afraid of danger.

4. Name **two** things that Stephen enjoyed doing as a child.

5. Why do you think people called Stephen 'Einstein' at school?

6. Give **two** things that Stephen used to help him carry on with his career as his ALS progressed.

7. Summarise Stephen's discoveries about black holes.

8. Why do you think Stephen was keen to teach and share his knowledge?

9. Why do you think Stephen tried to explain events in space using objects on earth (such as the waterfall)?

10. Which part of Stephen's life do you think was the most important? Give evidence to support your answer.

Answers

1. 'Stephen Hawking was an English scientist, cosmologist, teacher and author. He is best known for discovering how the universe was formed and predicting what might happen to it in the future.'

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3. Find and copy one word from the text which shows that Stephen wasn't afraid of danger.

daredevil

4. Name **two** things that Stephen enjoyed doing as a child.

Accept any two of the following: watching the stars; playing board games; making model aeroplanes and boats; building a computer.

5. Why do you think people called Stephen 'Einstein' at school?

Pupils' own responses, such as: Stephen was interested in science and started school a year early: this is similar to Einstein as he was a scientist and was very clever.

6. Give **two** things that Stephen used to help him carry on with his career as his ALS progressed.

Accept: (a) wheelchair; voice synthesis technology.

7. Summarise Stephen's discoveries about black holes.

Pupils' own responses, such as: Stephen discovered a type of radiation that is able to escape from black holes, despite the fact that nothing else can; he used this knowledge to show that space and time began with the Big Bang and would end in black holes.

8. Why do you think Stephen was keen to teach and share his knowledge?

Pupils' own responses, such as: Stephen was passionate about space and had discovered amazing things about the universe which he wanted to share with people; he taught others so that further studies could be carried out in the future.

9. Why do you think Stephen tried to explain events in space using objects on earth (such as the waterfall)?

Pupils' own responses, such as: The discoveries that Stephen made were very complicated. By explaining them with everyday language, he was making his knowledge accessible to all.

10. Which part of Stephen's life do you think was the most important? Give evidence to support your answer.

Pupils' own responses, such as: I think that his time as a child watching the stars was the most important, because, without this inspiration, he might never have gone on to study the universe.