Unit focus: Electricity
Text focus: Biography

STAGE 6

Benjamin Franklin

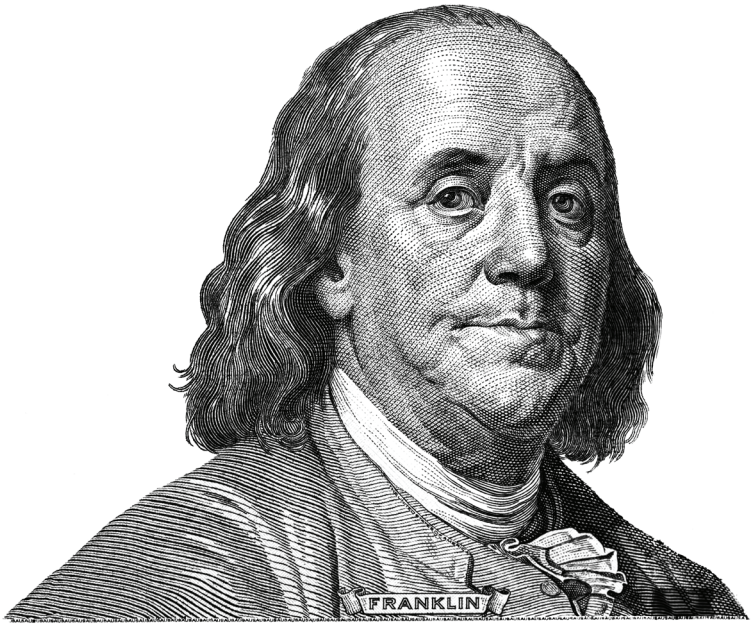
During his lifetime, Benjamin Franklin achieved many things. Not only was he one of the founding fathers of the United States of America, but he was also a prolific inventor. He didn't complete his formal education because he ran out of money, but he read enough books to compensate for this. He was 37 when he first developed an interest in electricity, something that would stick with him for the rest of his life.

For a long time, it was assumed that electricity was generated by rubbing two objects together. This made sense because that was how static electricity seemed to be created (try rubbing a balloon on a carpet or your jumper), but it turned out to be wrong. Benjamin Franklin was the first person to realise that electricity is actually the movement of a charge from one area to another. Eventually, he proved that it is charged particles moving from a higher charged area to a lower charged area. The particles that move are called electrons, and they always travel to where there are less of them. In a battery, there are lots of electrons at the negative terminal and none at the positive, and so they flow away from the negative terminal, through the circuit and towards the positive terminal. Franklin was the first person to use the terms positive and negative in terms of electricity.

At the time of Franklin's first experiments, scientists had discovered that electricity could be stored in something called Leyden jars. These were the first example of a battery. They were made of a glass jar coated with metal foil on the inside and outside. They were then filled with water. It was believed for a long time that the electricity was stored in the water, but Franklin soon proved that it was stored in the glass between the foil. He went on to prove that the jar could be made of any material, but the material used would affect how much electricity could be stored. This was one of the first and most important discoveries on the way to making usable batteries. Franklin's first working battery was made out of glass windows and lead plates. He called it the "electric battery" and was the first person to use the term at all.

Until Benjamin Franklin, the fact that lightning is electrical hadn't been proved. In 1752, Franklin flew a kite during a storm to try to prove the fact. The kite was connected to a Leyden jar and

slowly collected a charge from the storm cloud. This proved to everybody that thunderstorms contained a lot of electrical power. This was a major breakthrough because most buildings at the time were made of wood and lightning strikes were damaging many of them. He was able to use this knowledge to create the lightning rod. He realised that holding a pointed object towards the lightning would capture the charge, much like his kite had. He experimented with attaching tall metal rods to buildings. These would capture the charge of a lightning strike and pass it harmlessly down to the ground, saving thousands of buildings and many more lives.



RETRIEVAL FOCUS

1. How old was Benjamin Franklin when he became interested in electricity?
2. What type of device did Franklin use to collect electricity to begin with?
3. Where did people think electricity was stored in these devices?
4. Where was it actually stored?
5. When did Benjamin Franklin prove that lightning was electrical?

VIPERS QUESTIONS

S Why was Franklin important to the United States of America?

I How could you create static electricity according to the text?

V Find and copy a word in the text that tells you Franklin made up for the fact he didn't complete his education.

V Which word in the text has a definition closest to "tried out new methods"?

S Why did Franklin's lightning rod save lives?

Answers:

1. 37
2. Leyden jars
3. The water
4. The jar
5. 1752

S: He was one of the founding fathers

I: Rubbing a balloon on a carpet or jumper

V: Compensate

V: Experimented

S: It meant that lightning strikes didn’t destroy wooden buildings anymore