3.5 Great Scientists

Warming Up!

Chit-Chat:

1. What would you like to learn about in your Science period?

Ans: I would like to learn about great scientists and their experiments.

2. Have you ever tried to do an experiment on your own? If yes, tell me about it.

Ans: Yes, I have ever tried to do an experiment on my own. It was about how to identify adulteration in different food items.

3. What would you like to learn about in your English classes?

Ans: I would like to learn about great English writers and their writings in different forms.

Inventions

(a) Think of as many examples of the following as you can within five minutes and write them in the appropriate column.

Type of Machine	Examples
Simple Machines that are operated by hand	Juicer, sewing machine, mixer, punch machine, stapple, packing machine
Machines that run on electricity	mixer, grinder, washing machine, air blower, hair dryer
Electronic devices	computer, tablet, fridge, air conditioner, Television

(b) Write as many uses of the following as you can• Form groups of four. Compare your lists. Make a long list by putting together the lists of all members.

(a) A cloth bag – carry bag, bring vegetables and groceries, store useful things.

(b) a wicker basket – carry different things, groceries vegetables.

(c) a glass bottle or jar – Put ghee, put sugar.

(d) a steel bowl – Put cooked vegetables, put pickle.

(e) a thick string or rope – tie different things, drying cloth.

Margin Questions for Discussion:

1) Guess what the passage is about?

Ans: The passage is about the great scientist and how achieved success with hard-work and perseverance.

2) What were the odds against Faraday in his childhood?

Ans: Michael Faraday faced many odds in his childhood. He was born into a poverty-stricken family in a dirty London suburb. He suffered from a speech defect as a child. He had to leave the school. He had to work with a bookbinder.

3) What is meaning of ‘Reading became his obsession’?

Ans: Reading became his obsession means someone became fascinated to reading.

4) What is meaning of ‘Electricity became of lifelong fascination’?

Ans: ‘Electricity became of lifelong fascination’ means Faraday was fascinated to electricity. He always thought about electricity in his whole life.

5) Why do you think Faraday’s friend gave him a free ticket to Davy’s programme?

Ans: I think Faraday’s friend gave him a free ticket to Davy’s programme because his friend knew that he was poor and could not buy a ticket for Davy’s programme. He also knew Faraday was fascinated by the subject of electricity.

6) What was the subject of Davy’s lecture?

Ans: “Mysterious force of electric fluid.”

7) What actions and thoughts of Faraday show that he was inspired by Davy?

Ans:

1) He bound the notes that he had written on Davy’s lecture into book and wanted to gift it to Davy some day.

2) Faraday decided that day he didn’t just want to sell book, he wanted to be a great scientist.

3) Davy became his role model.

4) He wanted Davy to become his mentor.

8) Why did Davy choose Faraday as his secretary?

Ans: Davy chose Faraday as his secretary because a chemical explosion happened inside Davy’s lab and he was temporarily blinded. He needed an assistant with an excellent memory to help him. He was reminded of Faraday and decided to hire him as his secretary.

9) Was Davy fair in his treatment of Faraday? How did Faraday respond to that treatment?

Ans: Davy was not definitely fair in his treatment of Faraday. Faraday was relentless. He worked day and night and learnt as much as he could Davy's experiments. Though much of his job now was cleaning labs, at least he got to see some of Davy's leading experiments.

10) What happens when electric current is applied to wire?

Ans: When electric current is applied to a wire it causes that wire to behave like a magnet.

11) An induction motor is a commonly used electrical machine. What example of its use are given here?

Ans: The induction motor is commonly used in fans, air conditioning, sewing machines, photograph, power tools, cars and even trains and aeroplane engines.

12) Give one example of "Faraday was a good pupil."

Ans: Faraday solved the problem. In fact, he went further and the result was the first induction motor, which converted electrical current into continuous mechanical motion.

13) Give one example of "Davy was not a good mentor."

Ans: One would think, as a teacher Davy was happy at his pupil's achievement. But in reality, he was jealous.

14) Write the idea behind an electrical generator.

Ans: The idea behind an electrical generator, Faraday noticed that if he moved a magnet it could produce electrical current, thus he could now convert motion into electricity. This is how the electrical generator was born something still used today to generate all kinds of power, like dynamos and other devices.

15) Why were Faraday's drawing not accepted? Does it mean they were wrong?

Ans: Faraday's drawing was not accepted because Faraday did not know much

about advanced mathematics. So, he just copied the iron filing patterns with his hand. He was unable to explain them in the form of mathematical equations. It does not mean they were wrong.

English Workshop

1. Write what is implied in the following sentences.

(a) But few know his inspirational life story, which is all about courage and fighting against the odds.

(What does it tell you about Faraday's life?)

Ans : Michael Faraday was born into a poverty-stricken family, suffered from a speech defect, had to end his formal education, had to start working at the age of thirteen. His life was full of odds like no social status, no money and education. Finally, he achieved a great success in spite of all these odds.

(b) Even then Davy did not have much hope for Faraday.

(What do the words 'even then' suggest?)

Ans: Faraday's intention was to be a great scientist. Davy dismissed all his aspirations in the field of science. He appointed Faraday his secretary and later lab assistant. Faraday toiled and learnt about Davy's experiments. In spite of hard work and getting knowledge and experience, Davy had not hoped for Faraday's scientific career, because of his social status and education.

(c) People started telling Davy that of all his discoveries, the best was Faraday himself.

(What does it suggest about Davy's work?)

Ans: Faraday became a celebrity scientist overnight. But Faraday did not receive recognition for his success from Davy. So, people started telling Davy that Faraday himself was his best discoveries.

2. Break the passage into convenient smaller sections. Give sub-headings or titles to each section.

Line No.	Lines from text	Title
1-47	Michael Faraday is .... he just kept trying.	Faraday's early life
48-86	Destiny had a strange .... directed at Faraday	Destiny for Faraday
87-118	Faraday became a celebrity..... difficult times	Faraday's achievement
119-172	He then took.....discoveries	Fortune favours the brave

3. List the different gadgets and instruments mentioned in the passage. Find more information about at least 3 of them, using the internet.

Ans: Gadgets and instruments from the passage

Fans, air conditioning, sewing machines, photographs, power tools, cars, telescopes, microscopes, electric generators, dynamos, electronics and communication system etc.

Fan: A fan is a machine used to create flow within a fluid, typically a gas such as air. The fan consists of a rotating arrangement of vanes or blades which act on the fluid. The rotating assembly of blades and hub is known as an impeller, a rotor, or a runner. Usually, it is contained within some form of housing or case. This may direct the airflow or increase safety by preventing objects from contacting the fan blades. Most fans are powered by electric motors, but other sources of power may be used, including hydraulic motors hand cranks and internal combustion engines. Fans produce flows with high volume and low pressure (although higher than ambient pressure), as opposed to compressors which produce high pressures at a comparatively low volume. A fan blade will often rotate when exposed to a fluid stream, and devices that take advantage of this, such as anemometers and wind turbines, often have designs similar to that of a fan,

Sewing machine: A sewing machine is a machine used to stitch fabric and other materials together with thread, sewing machines were invented during the first Industrial Revolution to the amount of manual sewing work performed in clothing companies. Since the invention of the first working sewing machine, generally considered to have been the work of Englishman "Phonons in 1790, the sewing machine has greatly improved the efficiency and productivity of the clothing industry. Home sewing machines are designed for one person to sew individual items while using single stitch type. In a modern sewing machine, the fabric easily glides in and out of the machine without the inconvenience of needles and thimbles and other such tools used in hand sewing, automating the process of stitching and

saving time. Industrial sewing machines, by contrast to domestic machines, are larger, faster, and more varied in their size, cost, appearance, and task.

Telescope: A telescope is an optical instrument that aids in the observation of remote objects by collecting electromagnetic radia tion (such as visible light). The first known practical telescopes were invented in the Netherlands at the beginning of the 17th century, by using glass lenses. They found use in both terrestrial applications and astronomy. Within a few decades, the reflecting telescope was invented, which used mirrors to collect and focus the light. In the 20th century, many new types of telescopes were invented, including radio telescopes in the 1930s and infrared telescopes in the 1960s. The word telescope now refers to a wide range of instruments capable of detecting different regions of the electromagnetic spectrum, and in snow cases other types of detectors. The word telescope (front the Ancient Greek, tele "far" and scopes in "to loo k or see"; telescopes "far-seeing") was coined in 16 1 1 by the Greek mathematician Giovanni Demisiani one of Galileo Galilei's instruments presented at a banquet at the Accademia dei Lincei. In the Starry

4. Find out more about the following scientists with the help of the internet.

Ans: This a project-based activity. The students should complete it

Language Study:

5. Find the following matter in the passage and COPY the missing words.

(a) When he was twelve, his mother was forced to take him out of school.

(b) One day he came across a book on electricity which had been sent to his master for binding.

(c) Faraday decided that he wanted to be a great scientist.

(d) Davy never believed Faraday could do anything in the field of science.

(e) People started telling Davy that of all his discoveries the best was Faraday himself.

(f) He handed him a piece of Bavarian glass, which was used in the lenses in

telescopes and microscopes and asked him to reverse engineer it.

(g) He went on to prove that these patterns were not a property of iron filings.

(h) It was Maxwell who translated Faraday's idea into a set of equations that are now called Maxwell's equations.

6. Now complete the following sentences using your own words.

(a) When he was twelve, he-got the first the prize in speech competition.

(b) One day he came across a book on Art of s peaking.

(c) He decided that he wanted to be the best speaker.

(d) He never believed that he would become a successful speaker.

(e)People started telling him that he was the best speaker.

(f) He handed him the medal which he got in the state level competition.

(g) He went on to prove that he was the best orator.

(h) It was his teacher who supported him in every situation.