

English

Class: 12th

Subject: English

Lesson 14: LOUIS PASTEUR

Author: Margaret Avery

❖ Exercise Short Questions:

1. Describe the early life of Pasteur.

Ans: Louis Pasteur was born in 1822 at Dole, France, in a humble family. His father had been a soldier in Napoleon's army and was honored for bravery. At the age of 2, the family moved to Arbois, where his father ran a small tannery. Pasteur initially showed little interest in

studies, preferring fishing and sketching, but later realized the importance of education and developed a strong passion for work. He studied at Besancon, graduating in Science and Arts, and became a teacher at the college.

2. Give some instances of Pasteur's patriotism.

Ans: In 1848, he joined the National Guard and donated all his savings (150 francs) to the "Altar of the Country."

- In 1870, during the Franco-German War, he tried to enlist in the army but was refused due to paralysis from a stroke.
- He returned his German honorary degree in protest, showing loyalty to France.
- **During the war**, he worked on improving French beer, competing with German brewing, to help his country.

3. What do we mean by spontaneous generation?

Ans: Spontaneous generation is the idea that living organisms can arise from non-living matter spontaneously, without reproduction.

4. How did Pasteur prove that spontaneous generation was not a fact?

Ans: He showed that sterilized substances do not develop life if germs are excluded from air.

- By heating liquids to destroy germs and using filtered air, he proved that bacteria do not appear spontaneously.

-
- He further showed that some germs survive normal boiling, but higher temperatures kill all bacteria, disproving spontaneous generation.

5. Describe the importance and popularity of the silkworm industry in France. What help did Pasteur render in curing the silkworm disease in his country?

Ans: The silkworm industry was a major livelihood in Southern France, with families dedicating rooms and care to rearing silkworms.

In 1865, a mysterious disease devastated silkworms, threatening peasant families.

Pasteur advised:

- Select healthy eggs from disease-free parents.
- Avoid overcrowding and unclean conditions.
- Use microscopes to monitor disease.
- His methods controlled the epidemic, saving millions of francs and inspiring further research into animal diseases.

6. How did Pasteur discover the treatment for the cattle disease, Anthrax?

Ans:

- He proved that Anthrax is caused by germs.
- He cultivated weakened (attenuated) germs of Anthrax.

-
- Injecting these into animals caused only mild illness, but protected them from the deadly form.
 - This method saved millions of sheep and cattle, reducing mortality rates dramatically.

7. How did Pasteur discover the method of making vaccines?

Ans: While working on fowl-cholera, he found that birds inoculated with dead or weakened germs became immune to fresh virulent germs.

- **This led to the principle of attenuated vaccines:** using weakened germs to produce mild illness and immunity against the severe disease.

8. Give an account of Pasteur's treatment of Hydrophobia and how he cured the first patient suffering from it.

Ans: Hydrophobia (Rabies) is caused by a virus affecting the nervous system, leading to severe symptoms and death.

- Pasteur weakened the virus by drying the spinal cord of infected rabbits.
- In 1885, a boy named Joseph Meister, bitten by a rabid dog, was inoculated for 10 days with the attenuated virus.
- The boy recovered fully, marking the first successful human vaccination against Rabies.
- This method was soon applied to hundreds of cases, saving thousands of lives.

9. How did Pasteur show the way to other scientists? Give an account of the discoveries.

Ans: Pasteur's work on germs and vaccination inspired other scientists to study human and animal diseases.

Discoveries following his work include:

- **Diphtheria antitoxin:** mortality reduced from 30.4% → 8.3%.
- Typhoid and plague vaccines, reducing deaths in armies and populations.

Identification of mosquito-borne diseases: malaria and yellow fever.

- Tetanus prevention during World War I.
- Discovery of sleeping sickness transmitted by tsetse fly.
- He transformed medicine, replacing superstition with scientific understanding and establishing the Pasteur Institute for global research.

❖ Important Short Questions:

1. When and where was Louis Pasteur born?

Ans: Louis Pasteur was born in 1822 at Dole, Jura district, France.

2. What was the profession and achievement of Pasteur's father?

Ans: His father was a soldier in Napoleon's army and received the Cross of the Legion of Honour for bravery.

3. How did Pasteur's early life influence his character?

Ans: He inherited discipline, devotion to France, courage, and determination from his father.

4. To which town did Pasteur's family move when he was two years old?

Ans: The family moved to Arbois, where his father ran a small tannery.

5. What hobby did Pasteur enjoy before focusing on studies?

Ans: He loved fishing and sketching his companions.

6. Where did Pasteur graduate in Science and Arts?

Ans: He graduated from Besancon College.

7. Which subject fascinated Pasteur at Besancon College?

Ans: He was deeply interested in Chemistry.

8. What was Pasteur's initial performance in the Ecole Normale entrance exam?

Ans: In 1842 he ranked 14th, and in 1843 he improved to 4th place.

9. At what age did Pasteur become Deputy Professor at Strasbourg?

Ans: He became Deputy Professor at age 26.

10. Who was Pasteur's wife and when did they marry?

Ans: He married the daughter of the Rector of Strasbourg Academy in 1850.

11. Give an instance of Pasteur showing patriotism in 1848.

Ans: He joined the National Guard and donated 150 francs to the Altar of the Country.

12. Why was Pasteur refused military service in 1870?

Ana: Because he had partial paralysis due to a stroke.

13. What did Pasteur do with his German honorary degree during the Franco-German war?

Ans: He returned it in protest, showing his hatred of Germany.

14. How did Pasteur help France during the war without enlisting?

Ans: He worked on improving French beer production to compete with German beer.

15. What is meant by spontaneous generation?

Ans: It is the belief that life can arise from non-living matter.

16. How did Pasteur disprove spontaneous generation?

Ans: He showed that sterilized liquids remain lifeless if germs are excluded from the air.

17. What did Pasteur discover about the heat-resistance of some germs?

Ans: Some germs survive normal boiling, but higher temperatures kill them completely.

18. Why was Pasteur's work on spontaneous generation important for modern science?

Ans: It laid the foundation for microbiology and understanding of germs, stimulating further research.

19. Why was the silkworm industry important in Southern France?

Ans: It was a major source of livelihood for peasants; every family relied on it.

20. What caused the silkworm epidemic in 1849–1865?

Ans: A mysterious disease attacking moths and worms.

21. How did Pasteur suggest preventing silkworm disease?

Ans: By collecting eggs from healthy moths and maintaining clean, uncrowded, and well-ventilated conditions.

22. What role did microscopes play in Pasteur's silkworm research?

Ans: They were used to examine eggs and identify healthy ones.

23. What was the economic impact of Pasteur's intervention?

Ans: It saved millions of francs and revived the silk industry.

24. How did Pasteur prove that Anthrax was caused by germs?

Ans: Through experiments showing that the bacillus caused the disease.

25. What method did Pasteur use to protect cattle from Anthrax?

Ans: He developed a vaccine using weakened (attenuated) germs.

26. How did Pasteur's anthrax vaccine reduce animal deaths?

Ans: Vaccinated animals developed immunity, and mortality dropped drastically.

27. How did Pasteur discover the method of weakening germs for vaccination?

Ans: He observed that birds injected with dead or weakened germs became immune to virulent germs.

28. What is meant by an attenuated germ?

Ans: A weakened form of a germ that causes mild illness but provides immunity.

29. How does inoculation with weakened germs protect animals or humans?

Ans: It stimulates the immune system to resist future infections without causing severe disease.

30. What is hydrophobia and what causes it?

Ans: Hydrophobia, or rabies, is a viral disease affecting the nervous system, usually transmitted by a dog bite.

31. How did Pasteur prepare the vaccine for rabies?

Ans: He dried the spinal cord of infected rabbits, weakening the virus.

32. Who was the first human patient cured of rabies?

Ans: Joseph Meister, a boy bitten by a rabid dog.

33. How many days did the inoculation for Joseph Meister last?

Ans: The treatment lasted 10 days.

34. How many people had received rabies vaccination by 1899?

Ans: Over 23,000 people, with very few deaths.

35. Name some diseases studied by scientists following Pasteur's methods.

Ans: Diphtheria, typhoid, cholera, tuberculosis, tetanus, Malta fever.

36. How did diphtheria mortality change after antitoxin discovery?

Ans: From 30.4% to 8.3%.

37. How did typhoid inoculation reduce deaths in the British army?

Ans: Deaths reduced from 300–600 to 20 in India.

38. How did Pasteur's discoveries help in controlling malaria and yellow fever?

Ans: By identifying mosquitoes as carriers and promoting control and prevention measures.

39. How was sleeping sickness controlled in Uganda using Pasteur's methods?

Ans: By controlling tsetse fly transmission, deaths reduced from 8,003 to 1,546.

40. What is the significance of the Pasteur Institute?

Ans: It is a world-famous research center established in honor of Pasteur, promoting medical science and vaccine research.

Note:

This chapter is designed to provide a solid foundation of knowledge, with the goal of deepening understanding and encouraging further exploration of the subject. The content has been carefully selected to support effective learning and inspire students to engage with the topic more deeply.

Author: Muhammad Asghar

Purpose: To contribute to education by offering insightful, valuable content that enhances learning and understanding.

Copyright & Usage Policy

© 2026 Muhammad Asghar. All rights reserved.

No part of these notes may be reproduced, redistributed, or used for commercial purposes without explicit written permission from the author. These notes are intended solely for personal study and educational use.