

# Trivia Questions for Fusion Energy Week

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*Note:*

This document compiles questions related to fusion physics for outreach purposes. Any questions can be used in a Kahoot game online and be used for a broader audience. This way people from other backgrounds could join along and learn about fusion. – Kirtan Davda

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1. What is nuclear fusion?
  - A) Splitting of an atomic nucleus
  - B) Combining two nuclei to form a heavier one ☒
  - C) The decay of radioactive elements
  - D) A type of chemical reaction
  
2. Which element is primarily used as fuel in fusion reactions?
  - A) Uranium
  - B) Helium
  - C) Hydrogen ☒
  - D) Carbon
  
3. What process powers the Sun?
  - A) Nuclear fission
  - B) Chemical combustion
  - C) Hydrogen fusion into helium ☒
  - D) Radioactive decay
  
4. How does nuclear fusion differ from fission?
  - A) Fusion splits atoms while fission combines them
  - B) Fusion creates more radioactive waste
  - C) Fusion combines atoms while fission splits them ☒
  - D) Fusion is currently used in nuclear power plants
  
5. Why is fusion considered a sustainable energy source?
  - A) It requires fossil fuels
  - B) Hydrogen is abundant and the waste is minimal ☒
  - C) It is already used worldwide for electricity
  - D) It produces large amounts of CO<sub>2</sub>
  
6. Which isotopes of hydrogen are commonly used in fusion?
  - A) Protium and helium-3

- B) Deuterium and tritium ✓
- C) Oxygen and hydrogen
- D) Uranium-235 and uranium-238

7. What is the most studied fusion reaction for power generation?

- A) Hydrogen-Helium fusion
- B) Deuterium-Tritium fusion ✓
- C) Fission of uranium
- D) Carbon fusion

8. Why is tritium not naturally abundant?

- A) It decays quickly and must be artificially produced ✓
- B) It is only found in outer space
- C) It reacts violently with oxygen
- D) It is heavier than uranium

9. What is a byproduct of the D-T fusion reaction?

- A) Carbon dioxide
- B) Neutrons and helium ✓
- C) Gamma rays and uranium
- D) Hydrogen peroxide

10. What is the biggest challenge in achieving controlled fusion on Earth?

- A) Finding enough fuel
- B) Controlling the extreme temperatures and pressures ✓
- C) Producing radioactive waste
- D) Storing excess electricity

11. At what temperature does fusion typically occur?

- A) 1,000°C
- B) 10,000°C
- C) 1 million°C
- D) Over 100 million°C ✓

12. What is plasma?

- A) A liquid metal used in fusion reactors
- B) A state of matter where atoms are ionized ✓
- C) A type of nuclear fuel
- D) A solid at high temperatures

13. Which device is most commonly used to confine fusion plasma?

- A) A fission reactor
- B) A gas chamber
- C) A tokamak ✓
- D) A steam turbine

14. What role do magnetic fields play in fusion reactors?

- A) They generate heat
- B) They contain and stabilize plasma ✓
- C) They absorb neutrons
- D) They convert heat into electricity

15. What is an alternative to magnetic confinement fusion?

- A) Plasma electrolysis
- B) Laser-driven inertial confinement fusion ✓
- C) Geothermal fusion
- D) Neutron bombardment

16. What is ITER?

- A) A nuclear fission reactor
- B) A future commercial fusion plant
- C) An international fusion experiment in France ✓
- D) A type of plasma state

17. Where is the Joint European Torus (JET) located?

- A) France
- B) United Kingdom ✓
- C) United States
- D) China

18. What breakthrough did the National Ignition Facility achieve in 2022?

- A) First fusion-powered city
- B) First fusion reaction with net energy gain ✓
- C) First fusion spacecraft
- D) First plasma at room temperature

19. What is the purpose of a "breeder blanket" in fusion reactors?

- A) To store helium
- B) To generate tritium fuel from lithium ✓
- C) To capture solar energy

D) To cool down plasma

20. What type of neutron is produced in the D-T fusion reaction?

- A) Low-energy neutron
- B) 14.1 MeV neutron ☒
- C) Alpha neutron
- D) Electron neutrino

21. What is one major engineering challenge in commercial fusion?

- A) Extracting power efficiently ☒
- B) Finding enough uranium
- C) Storing radioactive waste
- D) Cooling the reactor with water

22. Why is fusion considered safer than fission?

- A) It can't cause a meltdown ☒
- B) It produces more waste
- C) It uses uranium as fuel
- D) It requires constant supervision

23. When do experts predict commercial fusion power could be available?

- A) Already available
- B) 2030s-2040s ☒
- C) Never possible
- D) In the next 5 years

24. How could fusion impact the future of energy?

- A) Provide nearly limitless clean energy ☒
- B) Replace all fossil fuels overnight
- C) Eliminate the need for electricity
- D) Create radioactive waste for thousands of years

25. Which of the following is NOT a name of a private company working on fusion?

- A) Proxima
- B) Zap
- C) Marvel
- D) DC ☒

26. Who found out what stars are made up of?

- A) Dr. Albert Einstein

- B) Dr. Neil Degross Tyson
- C) Dr. Cecilia Payne ☒
- D) Dr. Rosalind Franklin

27. Which one of the following is an inertial confinement physicist?

- A) Dr. Cynthia Philips
- B) Dr. Kathy McCarthy
- C) Dr. Felicie Albert ☒
- D) Dr. Kathreen Thome