

Video Questions

Answers to these questions can be found in the “The Nuclear Fuel Cycle” video. The questions are presented in the order that their answers are given in the video itself.

1. What are we trying to produce, from using uranium as a fuel?
2. How do we obtain natural uranium?
3. What is “yellow cake”?
4. What percentage of uranium is required in nuclear reactors? Is the natural abundance sufficient?
5. What is the purpose of “enrichment”?
6. What is the heat (generated by splitting uranium-235 isotopes) used for?
7. How long is nuclear fuel typically used for?
8. Why is the used nuclear fuel stored under water?
9. What do they make by mixing natural uranium and plutonium?
10. Where can high level waste be safely disposed?

Ordering the Process of Generating Power from Nuclear Fission

Write the letter of the process next to the step number to the left, ordering these steps from 1 (first/earliest step) to 6 (last/latest step).

- 1 — a) The neutrons released from splitting the uranium nucleus travels very quickly, near the speed of light. A moderator (such as heavy water) is used to slow these neutrons.
- 2 — b) To turn heat into useful work (and then energy) a coolant circulates through the reactor to cool it down.
- 3 — c) Uranium is mined and converted into a fuel bundle. Operators load these fuel bundles into a nuclear reactor.
- 4 — d) Slow moving neutrons split apart the uranium nuclei, starting a nuclear chain reaction. A large quantity of heat is released in this splitting.
- 5 — e) The water is turned into high-pressure steam. The pressure pushes the steam into turbines.
- 6 — f) The energy of the spinning turbines becomes electricity by moving magnets within the electrical generator.

Challenge Questions

These have more than one correct response, and your answer should be a logical idea, rather than a specific factually correct response. Feel free to talk to me if you aren't sure where to start with any of these.

1. Why do we call the nuclear fission a “chain reaction”?
2. Why would we want to slow down neutrons in the nuclear chain reaction?
3. How is heavy water different from normal water?
4. What is produced at the end of fission in a nuclear reactor? Include in your answer an example of:
 - a. waste from the enrichment of uranium
 - b. waste from the nuclear process itself
 - c. waste from the electricity generation process.