



ANS NUCLEAR SCIENCE MERIT BADGE

Nuclear Power Technology Worksheet

ANSWER KEY

1. Albert Einstein made multiple contributions to nuclear science, including the photoelectric effect, mass defect, and the equation $E=mc^2$.
2. Nuclear Energy is the energy produced when an atom is split or fused.
3. Fission produces two daughter atoms (fission fragments), neutrons, and lots of Energy.
4. A Nuclear Reactor is a device in which a self-sustained nuclear fission chain reaction can be maintained and controlled.
5. Control Rods are used to control a nuclear reaction by absorbing neutrons.
6. There are currently 104 nuclear reactors in the United States, producing - 20 % of our nation's electricity.
7. A Pressurized Water Reactor (PWR) has three loops, while a Boiling Water Reactor (BWR) has two loops.
8. Used fuel is stored in cooling pools and/or dry casks.
9. Requirements for permanent storage include prevention of seepage into the water supply.



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10. Contamination is when radioactive material is deposited on skin, clothing, or any place in the environment where it should not be.
11. Intensive testing is done performed on used fuel casks to ensure the protection of the used fuel rods inside, including tests for fire resistance and strength.
12. List two purposes of nuclear reactors other than power supply:
 - a. Research
 - b. Production of medical isotopes
13. List the name or location of three specific nuclear reactors:
 - a. Comanche Peak Nuclear Power Plant, Glen Rose, TX
 - b. South Texas Project, Bay City, TX
 - c. TAMU Nuclear Science Center, College Station, TX
14. The sun produces energy through fusion, which is the combining of two atoms to make one larger atom.
15. Fusion has not been able to reach the break-even energy point.