

To our teachers:

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Name: * _____

Date: * ____ / ____ / ____

Class Hour: * ____

Survey of Nuclear Phenomena

Year I was born: _____

Major source of knowledge of nuclear phenomena (check those that apply):

____ School ____ Internet ____ Television ____ Conversation with others

The following statements are designed to survey your understanding of nuclear-related issues. Mark the blanks to indicate whether you agree (A), or disagree (D), with the statement as written. You may mark some statements (U), meaning you are unable to answer because of insufficient knowledge. However, keep this response to an absolute minimum.

Place your answers here,
on the left-hand blank:



- | | |
|-------------|---|
| ____ / ____ | 1. The atom is the smallest particle in nature. |
| ____ / ____ | 2. Atoms of the same element are alike in all ways. |
| ____ / ____ | 3. An isotope is formed when the number of protons in the nucleus of an atom is changed. |
| ____ / ____ | 4. Radiation and radioactive materials are unnatural. They did not exist on Earth until created by scientists. |
| ____ / ____ | 5. Radioactive and nonradioactive forms of an element behave the same chemically. |
| ____ / ____ | 6. The half-life of a radioactive isotope is the time required for half of its radioactive nuclei to decay. |
| ____ / ____ | 7. If the half-life of a radioactive substance is six hours, all of its radiation will have decayed away in 12 hours. |
| ____ / ____ | 8. Radioactive material with a short half-life always presents less risk than one with a long half-life. |

- ___ / ___ 9. The rate of decay for a radioactive substance can be slowed down by extreme cooling.
- ___ / ___ 10. Lead (which is very dense) is the best protective shield against exposure to radiation.
- ___ / ___ 11. Increasing your distance from a radiation source generally reduces the amount of radiation you receive.
- ___ / ___ 12. Background radiation comes from both natural sources and human activities.
- ___ / ___ 13. The human body is capable of detecting radioactivity.
- ___ / ___ 14. All radiation causes cancer.
- ___ / ___ 15. Electromagnetic radiation should be avoided at all costs.
- ___ / ___ 16. Atomic fission occurs when a heavy atomic nucleus is split into smaller nuclei accompanied by the release of massive amounts of energy.
- ___ / ___ 17. Energy-producing nuclear fusion reactions combine light atomic nuclei and releases enormous amounts of energy in the process.
-
- ___ / ___ 18. Individuals vary in their ability to safely tolerate exposure to radiation.
- ___ / ___ 19. If you are exposed to radiation, you become radioactive.
- ___ / ___ 20. The human body naturally contains a small amount of radioactive material.
- ___ / ___ 21. Medical X rays and medical scans carry potential risks as well as benefits.
- ___ / ___ 22. Physicians use injections of radioactive elements in the diagnosis and treatment of certain disorders.
- ___ / ___ 23. A physician can tell a cancer patient whether their cancer was caused by radiation, or caused by something else.
- ___ / ___ 24. Cells that divide rapidly are more sensitive to radiation than cells that divide slowly.
- ___ / ___ 25. Radiation can be used to treat the spread of cancer.
- ___ / ___ 26. Television screens give off radiation.
- ___ / ___ 27. Home smoke detectors may contain radioactive materials.
- ___ / ___ 28. Talking on a cell phone, keeping it stored near your body, or being near a cell tower exposes your organs to harmful ionizing radiation that alters your cells.
- ___ / ___ 29. Food that is exposed to radiation to destroy pathogens becomes radioactive and loses most of its nutritional value.
-
- ___ / ___ 30. Small amounts of matter are converted into immense quantities of energy in nuclear weapons.

- ___ / ___ 31. The uranium fuel used to power a nuclear power plant can be used to make a nuclear bomb.
- ___ / ___ 32. A nuclear power plant can explode like a nuclear bomb, killing millions of people.
- ___ / ___ 33. Nuclear power currently supplies about 10% of our country's total electricity needs.
- ___ / ___ 34. Nuclear power plants are less expensive to build than coal-fired plants.
- ___ / ___ 35. Nuclear power plants use much smaller quantities of fuel than coal-fired plants.
- ___ / ___ 36. Coal, natural gas, hydroelectric, wind, and nuclear power plants all use turbines to generate electricity.
- ___ / ___ 37. To date, no one has died from radiation released by nuclear power plants in the United States.
- ___ / ___ 38. In the United States, the largest source of man-made radiation comes from nuclear power plants.
- ___ / ___ 39. Nuclear power plants release large amounts of radiation into the environment during normal operations, while coal-fired power plants release none.
- ___ / ___ 40. Nuclear power plants do not give off air pollution during normal operations.
- ___ / ___ 41. Nuclear power plants produce radioactive wastes that pile up in massive, unmanageable quantities and remain dangerous for thousands of years.
- ___ / ___ 42. A national system for the long-term storage of radioactive wastes is now in operation.
- ___ / ___ 43. The majority of nuclear waste generated up to this time has come from nuclear power plants.
- ___ / ___ 44. Initially, nuclear wastes are very radioactive, but become less reactive over time.
- ___ / ___ 45. Nuclear wastes can be neutralized or made nonradioactive.
- ___ / ___ 46. Nuclear power plants produce wastes that could be converted into useful materials.
- ___ / ___ 47. The US has opened up more than one new nuclear power plant each year (on average) since 2000.
- ___ / ___ 48. Some states have banned the construction of new nuclear power plants.
- ___ / ___ 49. Nuclear power plants are vital to the functioning of the US economy.
- ___ / ___ 50. Much smaller, modular (nuclear) reactors (SMR's) are currently being designed for use in the US with applications like data centers.
- ___ / ___ 51. The United States should increase its reliance on nuclear power to

generate electricity.