

Directions:

Match the terms in the box on the right to the statements below by writing the letter next to the terms in the blank spaces next to the statements.

Answers can be used more than once.

- a. alpha
- b. beta
- c. gamma
- d. neutron
- e. proton

1. _____ can penetrate paper, but not thick aluminum
2. _____ can penetrate thick aluminum, but not concrete
3. _____ cannot penetrate paper
4. _____ ${}^4_2\text{He}$
5. _____ ${}^0_{-1}\text{e}$
6. _____ Z number of an element is the number of these
7. _____ a reactant and a product of nuclear fission
8. _____ repel each other in the nucleus
9. _____ has no mass and no charge
10. _____ Two isotopes of the same element have the same number of these in common.
11. _____ Two isotopes of the same element have different number of these.

Complete these reaction equations, using the periodic table to identify any elements.

12. ${}^{214}_{83}\text{Bi} \rightarrow {}^0_{-1}\text{e} +$ _____
13. ${}^{54}_{26}\text{Fe} + {}^4_2\text{He} \rightarrow {}^1_0\text{n} +$ _____
14. ${}^{230}_{90}\text{Th} \rightarrow {}^4_2\text{He} +$ _____
15. ${}^1_1\text{H} + {}^2_1\text{H} \rightarrow {}^0_0\gamma +$ _____
16. ${}^1_0\text{n} + {}^{239}_{94}\text{Pu} \rightarrow {}^{137}_{52}\text{Te} +$ _____ $+ 3({}^1_0\text{n})$