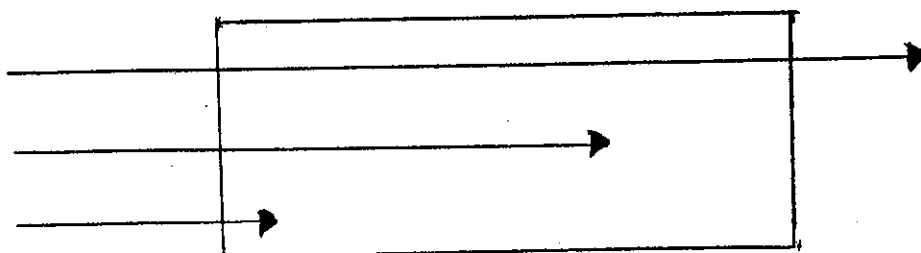


ANALYSIS OF ALPHA, BETA, AND GAMMA RADIATION

1. Which type of radiation is most penetrating?
2. Which type of radiation is least penetrating?
3. Which particle has the greater charge, alpha or beta?
4. Which particle is heavier, alpha or beta?
5. If they have the same amount of energy, which is moving faster, alpha or beta?
6. Which would exert a greater force on the electrons of an atom? Explain.
7. Based on your answer to #6, which particle would produce the most ions as it moves through air?
8. Now think about the ability of the two particles to penetrate. If both particles have the same amount of energy and if the formation of ions requires a specific amount of energy, which particle could travel further before it runs out of energy?
9. Based upon these answers, which particle should have the greatest range?
10. Does this agree with your observations from your experiment?
11. Compared with alpha and beta radiation, would you expect gamma radiation to travel farther or not as far to expend its energy?
12. Which arrow represents the path of the alpha particle, which the beta particle, and which the gamma ray?



13. Which type of external radiation can cause skin burns but cannot damage internal organs?
14. Which type of external radiation will not damage any living tissue in your body?
15. Which type of external radiation could affect your internal organs?
16. Sometimes internal tumors are treated by irradiating them with beams of external radiation. Which type of radiation must be used? Why?
17. Is exposure of the skin to external alpha radiation dangerous?
18. Which type of external radiation presents the greatest hazard?
19. Which radiation produces its ionization within the shortest distance?
20. Remember that the more ionizations that occur within a cell, the more likely the cell is to die. If sources of alpha, beta, and gamma radiation are in a cell, which is most likely to kill it?
21. Is internal alpha radiation dangerous?
22. Which internal radiation might escape the body without expending all of its energy?
23. How would the number of ion pairs formed by the alpha and the beta compare? (Assuming the source is internal and neither radiation escapes the body.)
24. Which internal radiation would produce the greatest concentration of ion pairs?