

**Scientific Inquiry and Nuclear Chemistry Learning Goals  
(Standards 1 and 4)**

- 1. I can identify the I.V. and D.V. of an experiment.
- 2. I can write a problem statement for an experiment.
- 3. I can write a hypothesis for an experiment.
- 4. I can identify the control group of an experiment.
- 5. I can explain the reason why there is a control group in experiments.
- 6. I can read and explain data from a data table.
- 7. I can write a conclusion for an experiment that includes: the purpose, the results, specific data from the results, and whether or not the hypothesis was proven or disproved. (Using complete sentences.)
- 8. I can write the definition of matter.
- 9. I can name some items that are not matter.
- 10. I can recall that all matter is made up of tiny particles called atoms.
- 11. I can recall that all atoms are neutral.
- 12. I can name the 3 subatomic particles that make up an atom.
- 13. I can name the charge, location and mass (amu) of each subatomic particle.
- 14. I can state where all of the mass and most of the volume of an atom is located.
- 15. I can complete a particle inventory of any given atom.
- 16. I can describe how an isotope is different from an atom.
- 17. I can determine state of matter of an element by looking at the periodic table.
- 18. I can identify parts of an element block on the periodic table (atomic mass, atomic #, and element symbol).
- 19. I can list the four fundamental forces of the universe, compare their strengths and give an example of each force.
- 20. I can define nuclear fusion and fission and give examples of both.
- 21. I can explain how fusion in the Sun releases enormous amounts of energy ( $E = mc^2$ ) and forms some of the elements over time.
- 22. I can describe the types of radioactive decay (alpha, beta & gamma decay).
- 23. I can define alpha and beta particles and gamma rays, their properties and their energy.
- 24. I can define what half-life is for a radioactive element.
- 25. I can use half-life in calculating the decay of a radioactive element.