Chapter 18 Section Review Answer Key

Assignments:

- Section Review questions 1-12 on page 647
- Section Review questions 1-10 on page 657
- Section Review questions 1-11 on page 666

Answers to questions 5 & 6 of Section 2, question 5 - 8 of Section 3, and questions 5 - 8 can be found in the textbook answer key.

Section 1 Review Assignment

1. Nucleons are protons and/or neutrons.
2. The strong force holds the nucleus together.
3. The dots representing 256 known stable nuclei cluster over a range of neutron-proton ratios are referred to as a band of stability.
4. The mass defect is the difference between the mass of an atom and the sum of the masses of the atom's protons, neutrons, and electrons.
5. The mass is converted in an enormous amount of energy when a nucleus forms.
6. The difference is one neutron.
7. It has a greater number of neutrons (126) than protons (83) in the nucleus.
8. Even numbers
9. A smaller nucleus is generally more stable - reasons vary: electron shielding, neutrons stabilizing.
10. Higher binding energy means greater stability.
11. $^{6}_{3}$Li - even number and *N/Z* close to one.
12.
    a. stable
    b. stable
    c. unstable
    d. stable
    e. unstable

Section 2 Review Assignment

1. beta particle
2. Nuclear fission is the splitting of the nucleus of a large atom into two or more fragments, a process that produces additional neutrons and a lot energy. Nuclear fusion is the combination of two small atoms to form a large nucleus, a process that releases energy.
3. When a positron and an electron collide, the two particles are converted entirely into electromagnetic energy or gamma rays - a process called annihilation of matter.
4. Critical mass is the minimum mass of a fissionable isotope that provides the number of neutrons needed to sustain (or start) a chain reaction.
5. Answers can be found in the textbook answer key.

6. Answers can be found in the textbook answer key.
7. Answers can be found in the textbook answer key.
8. Answers can be found in the textbook answer key.
9. The reaction stops when the material is used up.
10. No, its a different isotope, not a anew element.

Section 3 Review Assignment

1. The half-life is the time required for half of a sample of a radioactive substance to disintegrate by radioactive decay or natural processes.
2. Carbon-14 dating measures the amount of carbon-14 that is not re[placed after an animal/plant dies.
3. The half-life is 1.28 billion years.
4. Smoke detectors, detection of art forgeries, medical applications like PET scanning
5. Answers can be found in the textbook answer key.
6. Answers can be found in the textbook answer key.
7. Answers can be found in the textbook answer key.
8. Answers can be found in the textbook answer key.
9. Living at the same time - tests for paintings from different times.
10. Need to test a shorter span of time, not geological time.
11. Answers can be found in the textbook answer key.