



ANS NUCLEAR MERIT BADGE: Radiation Health and Safety Worksheet

ANSWER KEY

1. The two main types of electromagnetic radiation are Non-ionizing and ionizing.
2. All of the following are types of radiation EXCEPT:
 - a. Electromagnetic
 - b. Kryptonite**
 - c. X-rays
 - d. Non-Ionizing (i.e. Radio Waves, Visible light, etc.)
3. ionization is caused when an electron is added to or removed from an atom.
4. X-rays were first discovered by Wilhelm Roentgen
5. Radioactivity is the tendency of an element to give off charged particles or rays (i.e., to emit energy).
6. Two charged particles that are emitted by a radioactive element are Alpha particles and Beta particles .
7. Cloud Chambers track the path of electrically charged particles.
8. Which statement about radioactive decay is FALSE?
 - a. During decay, the atom will actually change from one element to another.
 - b. Radioactivity can be measured in either curies or becquerels.
 - c. Double-life determines how long it takes an element to decay .**
 - d. In alpha decay an element 'loses' 2 protons and 2 neutrons.
9. Draw the international symbol for radiation:





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10. List two examples of the effects of Acute Radiation:
- erythema (redness of the skin)**
 - epilation (hair loss)**
11. Radiation can be used in which of the following? (more than one answer may be circled)
- Medicine**
 - Agriculture**
 - Industry**
 - Security**
 - Space**
12. Which of the following is NOT a radiation detector?
- Film Packet
 - Ionization Chamber
 - Geiger-Müller (GM) Detector
 - Translucent Ray Gun**
13. To reduce the amount of radiation you receive from a source you should Increase _____ the distance between you and the source, use shielding , and Decrease _____ the time you are exposed to the source as much as you can.
14. List one common item that emits radiation: **Answers will vary and can include: Rocks and soil, space, the Sun, Radon gas, Food and water, bananas, X-ray machines, Tritium dial wristwatches, Gas lantern mantles , Smoke detectors.**
15. ALARA _____ is an acronym for “As Low As Reasonably Achievable”.