Vocabulary words- Unit 4

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| Isotope | An atom that has the same # of protons as another atom, but that has a different # of neutrons |  |
| Radioisotope | An isotope that is radioactive, or emits radiation  \*used in medicine and industry |  |
| Half-life | Length of time required for half of a given sample of a radioisotope to decay |  |
| Strong nuclear force | A force that holds the nucleus together- an attractive force that overcomes the electric repulsion between protons  \*significantly strong only between subatomic particles that are extremely close |  |
| Nuclear equation | An equation that keeps track of the reaction’s components |  |
| Nuclear reaction | Changes that occur to the atom’s nucleus  \*changes the composition of an atom’s nucleus  \*produce alpha, beta, & gamma radiation |  |
| nuclear bombardment reaction | Reaction in which a high speed nuclear particle collides with a nucleus to produce a different nucleus |  |
| Radioactive decay | When an atom emits one of these (gamma, alpha, or beta) types of radiation  \*the original nucleus decomposes  \*the sums of the before and after atomic numbers are the same (\*think Dalton’s Atomic Theory) |  |
| Composition | What something is made up of |  |
| Decay | When something decomposes (or breaks down) |  |
| Unstable nuclei | \*happens when nuclei have too few OR too many neutrons  \*atomic # 83 and greater are radioactive (means no # of neutrons is sufficient to “glue” the nucleus together forever |  |
| Stable nuclei | Not radioactive  \*Atomic # 1-20 almost equal #s of protons & neutrons  \*Atomic #s 20-82 need many more neutrons than protons to be stable |  |
| Alpha radiation | High energy alpha particles (2 protons & 2 neutrons)  \*do not have penetrating power (stopped by paper or clothing)  \*travels only a few centimeters before stopped  \*NO health hazard |  |
| Beta radiation | \*High speed electrons (not the ones in orbit around the nucleus)  \*Mass # 0 because neutron & proton mass same  \*A neutron changes into a proton AND an electron  \*100x’s more penetrating than alpha radiation (1-2mm into solid material)  \*can damage skin & pass through clothing |  |
| Gamma rays | Very energetic form of light that our eyes cannot see  \*no particles  \*penetrates more than alpha or beta combined  \*can go through solid material, body tissue and is only stopped by concrete or lead  (\*think of the lead vest they put on you at the dentist’s office) |  |