**GPS – Nuclear reactions notes**

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| ***Bellwork*** | |
| http://www.sr.bham.ac.uk/xmm/images/atom/radioactivity_240_201.jpg | 1. Listen to the nuclear decay song, then list 3 things you remember from the song. |
| 1. **Nuclear Radioactivity:**    1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪compose of protons and neutrons    2. Strong force 🡪 causes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to be attracted.    3. Powerful only when protons and neutrons are closely \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ together.    4. Large nucleus is held \_\_\_\_\_\_\_\_\_\_\_ tightly than a small nucleus 2. **Nuclear decay** happens when the \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ is not large enough to hold the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_together.  a. The nucleus gives off \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ until they transform into a different isotope or another element. 3. **Isotopes** 🡪 atoms with the same number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but different number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.   Examples: Carbon-14 6 protons, 8 neutrons  Carbon-12 6 protons, 6 neutrons   1. An atom’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ will depend on the ratio of protons to neutrons in the nucleus.    1. A nucleus with either too many or too few neutrons compared to protons is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. POP QUIZ: Explain why nuclear decay occurs.   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. History:    1. 1896 – Henri Becquerel discovered radioactivity with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    2. 1898 – Marie Curie discovered radioactivity with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| 1. **Nuclear radiation –** Particles and energy released from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ nucleus. There are 3 types:    1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ particles    2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ particles    3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ rays 2. **Alpha particles 🡪** consist of 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with a charge of +2. They do not travel far due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Though they are the least penetrating form of radiation, they can cause serious \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. 3. **Beta particles 🡪** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ emitted during the decay of a neutron into a proton in an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ nucleus. They can travel farther and faster than alpha particles because beta particles are so \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. 4. **CH10_02dGamma Rays 🡪** high energy electromagnetic radiation emitted by a nucleus during radioactive decay. They have no \_\_\_\_\_\_\_\_\_\_\_\_\_ and no \_\_\_\_\_\_\_\_\_\_\_\_\_\_. These rays can penetrate matter deeply, even \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | |