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Fission versus fusion worksheet answers

By Duke Energy January 30, 2013 In the sun, fusion reactions occur at very high temperatures and enormous gravitational pressure In the sun, fusion reactions occur at very high temperatures and enormous gravitational pressure The base of nuclear energy uses the power of atoms. Both fission and fusion are core processes where atoms are adapted to create energy, but what is the difference between the two? Simply put, fission is the distribution of an atom in two, and fusion is the combination of two lighter atoms in a larger one. They are opposing processes, and therefore very different. The word cleavage means dividing or splitting into parts (Merriam-Webster Online, www.m-w.com). Nuclear fission releases heat energy by splitting atoms. The surprising discovery that it was possible to create a nuclear gap was based on Albert Einstein's prediction that mass could be turned into energy. In 1939, scientist began experiments, and a year later Enrico Fermi built the first nuclear reactor. Nuclear fission occurs when a large, slightly unstable isotope (atoms with the same number of protons but a different number of neutrons) is bombarded by high-speed particles, usually neutrons. These neutrons are accelerated and then smashed into the unstable isotope, causing it to split, or break into smaller particles. During the process, a neutron is accelerated and strikes the target core, which is in the majority of the nuclear reactors today Uranium-235. This splits the target core and breaks it down into two smaller isotopes (the fission products), three high-speed cuts and a large amount of energy. This resulting energy is then used to heat water in nuclear reactors and eventually produce electricity. The high-speed neutrons ejected become projectiles that initiate other fission reactions, or chain reactions. The word fusion means an amalgamation of individual elements into a unified whole. Nuclear fusion refers to the union of atomic nuclei to form heavier nuclei, resulting in the release of huge amounts of energy (Merriam-Webster Online, www.m-w.com). Fusion occurs when two isotopes with a low mass, typically isotopes of hydrogen, unite under conditions of extreme pressure and temperature. Fusion is what drives the sun. Atoms of Tritium and Deuterium (isotopes of hydrogen, hydrogen-3 and hydrogen-2, respectively) unite under extreme pressure and temperature to produce a neutron and a helium isotope. Along with this, a huge amount of energy is released, which is several times the amount that is produced from split. Scientists continue to work on controlling nuclear fusion in an effort to create a fusion reactor to produce. Some scientists believe that there are possibilities with such an energy source, because fusion creates less radioactive material than fission and almost unlimited fuel supply. However, progress has been slow due to challenges with understanding how to control the response in a contained space. Both fission and fusion are nuclear reactions that produce energy, but the applications are not the same. Fission is splitting a heavy, unstable core into two lighter nuclei, and fusion is the process by which two light nuclei combine with releasing huge amounts of energy. Fission is used in nuclear reactors because it can be controlled, while fusion is not used to produce power, because the reaction is not easy to control and is expensive to create the necessary conditions for a fusion reaction. Research continues on ways to better harness the power of fusion, but research is in experimental stages. Although different, the two processes have an important role in the past, present and future of energy creation. Duke Energy Nuclear @DE_Nuclear Christie was one of four women in its 95-person engineering class. Now, is happy to be one of an increasing number o ... Enter your email address to follow this blog and receive notifications of new messages by email. Opt out of these emails

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