What You Should Know About "Atoms Larger Than Iron"!

1.) Why can't Fe be fused in the core of a star? (fusing elements larger than iron require the input of energy, versus having energy given off as is the case with fusing elements smaller than iron)

2.) When are most elements larger than iron generated? (When large stars supernova, elements up to iron, having been generated via fusion in the star's interior, are blown outward into the universe. During the supernova process, these atoms are loaded with neutrons. Most of these isotopes are unstable having short half-lives. In short order, they radioactively decay is via beta decay. When they do this, a neutron becomes a proton and the atoms becomes a different type of atom, one that is one peg higher on the *atomic number* scale. In many situations, this new atom also a neutron-laden isotope that isn't stable with a short half-life, and beta decay soon pushes it up to the next kind of atom. This process continues until the atoms finally reaches stability. This is where most of the atoms larger than iron on earth came from.

3.) This process is called the "r-process." What does the "r" stand for?
(because this all happens quickly, at least in celestial terms, the "r" stands for "rapid")

4.) Does the process of neutrons being captured, creating an unstable isotope, then radioactively decaying to make a larger atom happen anywhere else? (During the life of a star, this can happen with elements whose half-lives are on the order of hundreds of thousands of years. As this period is short in comparison to the overall life of the star but long in comparison to what happens during a supernova, this process is called the L-process, for "long." Elements like strontium, barium and zirconium, all larger than iron, are found in stars even though they aren't produced by either fusion or the r-process. Where they come from is this L-process.)