Nuclear Fusion: Guided Notes

As mentioned before, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ begin in dust and gas clouds called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Gravity pulls \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the nebula into a spinning cloud. As more and more atoms of hydrogen are brought into the cloud, they begin to \_\_\_\_\_\_\_\_\_\_\_\_\_ each other, creating greater and greater amounts of \_\_\_\_\_\_\_\_\_\_\_\_. When the temperature reaches \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ degrees Fahrenheit, a nuclear reaction begins. Atoms of hydrogen are \_\_\_\_\_\_\_\_\_\_\_\_\_, or joined, to form \_\_\_\_\_\_\_\_\_\_\_ atoms. A great deal of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is released as this happens. The energy is given off as \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ in all directions. The star is born.

Nuclear fusion is what keeps a star \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Our sun has been fusing millions of tons of hydrogen into helium every second for the past five billion years and will continue for another five billion. This fusion happens deep in the \_\_\_\_\_\_\_\_\_\_\_ of the star where temperatures and pressure are unbelievable.

A more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ star goes through a different death. When a star that is many times larger than our sun turns into a red giant or a supergiant, it doesn’t evolve into a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Instead, because of its terrific gravity, it fuses the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atoms made from fused helium atoms into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ elements. In other words, the star continues to carry on fusion and produces heavier and heavier elements. By the time the core of the star is mainly \_\_\_\_\_\_\_\_\_\_ atoms, it stops the fusion process. Then the star explodes in a violent explosion called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A supernova could be brighter than a million of our suns. The temperature during the supernova can exceed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ degrees Celsius, which is greater than 180 billion degrees Fahrenheit. This is hot enough to fuse the iron atoms to make even heavier elements. The elements, gases, and dust of the star explode into space to form a new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This nebula could become the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for a whole new group of stars.