**Guided Notes: Star Elements**

Our sun is just like countless other stars in the universe. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are two types of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ released by the sun during \_\_\_\_\_\_\_\_\_\_\_\_\_\_ fusion reactions deep inside the sun. In a nuclear fusion reaction, two \_\_\_\_\_\_\_\_\_\_\_\_\_\_ collide and are \_\_\_\_\_\_\_\_\_\_\_\_\_\_ together to make a new \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Nuclear fusion \_\_\_\_\_\_\_\_\_\_\_\_\_\_ also release a large amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_, some of which can be transformed into light and \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Key Terms:**

* Define nuclear fusion: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Define light element: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Define heavy element: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Define luminosity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Key Concepts:**



* Hydrogen, as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and simplest atom on the periodic table, has one \_\_\_\_\_\_\_\_\_\_\_\_\_\_, sometimes a \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and one \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the next largest, with two \_\_\_\_\_\_\_\_\_\_\_\_\_\_, two \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and two \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Moving through the periodic table, the atoms get \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and become \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ because they are made up of more and more protons, neutrons, and electrons.
* Scientists call the first \_\_\_\_\_\_\_\_\_\_\_\_\_\_ elements on the periodic table, the three smallest elements, the light elements. These elements—hydrogen, helium, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ —have one, two, and three protons in their \_\_\_\_\_\_\_\_\_\_\_\_\_\_, respectively.
* As the early universe \_\_\_\_\_\_\_\_\_\_\_\_\_\_ after the big bang, clouds of the light elements \_\_\_\_\_\_\_\_\_\_\_\_\_\_ into dense bodies.
* Due to high \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_, hydrogen started undergoing nuclear \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and stars were born.
* In all but the smallest of these stars, additional \_\_\_\_\_\_\_\_\_\_\_\_\_\_ fusion \_\_\_\_\_\_\_\_\_\_\_\_\_\_ took place, forming atoms with even more \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in their \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* In larger stars, the fusion reactions continued until \_\_\_\_\_\_\_\_\_\_\_\_\_\_ was produced.
* These elements produced in stars by \_\_\_\_\_\_\_\_\_\_\_\_\_\_ fusion are called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ elements.
* Elements \_\_\_\_\_\_\_\_\_\_\_\_\_\_ than \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are made in large to very \_\_\_\_\_\_\_\_\_\_\_\_\_\_ stars.
* Their high \_\_\_\_\_\_\_\_\_\_\_\_\_\_ creates more \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and higher \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the interior, making it easier for nuclear fusion reactions to take place.
* Toward the end of the star’s life cycle, when the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ fuel has been used up, the star collapses in on itself and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ with tremendous energy.
* The explosion has enough energy for some of the elements in the star to fuse together to make even heavier elements.
* This process makes elements that are as heavy as \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The star’s explosion, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_, then scatters the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ across space to form the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ that can condense into new \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The rest of the elements on the periodic table are ones that scientists have \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* These elements are \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and exist \_\_\_\_\_\_\_\_\_\_\_\_\_\_ before breaking down into other, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ atoms.
* Scientists are not sure if these elements can \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the universe and be made by \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* If stars are capable of making these elements, the elements do not last \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and scientists have not been able to \_\_\_\_\_\_\_\_\_\_\_\_\_\_ them.