EPS 100 (Stapleton) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Star Lifetimes Questions

1. What is the general name that includes gamma rays, x-rays, ultraviolet, visible light, infrared, microwaves, and radio waves?

2. a. Draw and label two waves, one with a longer wavelength, and one with a shorter wavelength.

b. Which waves have the most energy? [Hint: think of the waves as ropes that are being shaken.]

3. List the colors of the visible spectrum from longest wavelength to shortest wavelength.

4. Rank these star colors from hottest to coolest. Orange, Red, Yellow, Blue, White

5. a. Which stars are the hottest, larger stars or smaller stars?

b. Why?

6. Stars get their energy from a process called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In this

process, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are combined by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to form

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . In this process, mass is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mass is converted into energy.

7. a. When elements fuse in a star, lighter elements fuse to become heavier elements. Where do these heavier elements go?

b. Why?

8. In our sun, the main source of energy is the fusion of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

9. What is the heaviest element that can be created by fusion in a very large star?

10. In our sun, there is a balance between pressure pushing outward from the inside of the star and pressure pushing inward from the outside of the star.

1. What is the source of the pressure that squeezes the star inward?
2. What is the source of the pressure pushing outward from the inside of the star?

11. a. At some point, our sun will run out of hydrogen that it can fuse. When this happens, the

next fuel that will fuse is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. At this point, the sun will expand, and its color will shift to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because the surface will be cooler than before. At this point, the sun will be called a

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. a. After all nuclear fusion ceases in our sun, it will \_\_\_\_\_\_\_\_\_\_\_ (expand or shrink).

b. This change in size will cause the sun’s temperature to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

c. This change in temperature will cause its color to change from \_\_\_\_\_\_\_\_\_\_\_\_\_ to

\_\_\_\_\_\_\_\_\_\_\_.

1. At this point, the sun will be called a \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

13. The early universe was about 75% hydrogen and 25% helium. Where did the rest of the elements come from?

a. Where did the lighter elements come from (up to the mass of iron)?

b. Where did the heavier elements (heavier than iron) originate?

14. “One solar mass” means…

15. After a supernova, the material left over from a very large star can have three different fates:

2. If the leftover material is between 1 and 3 solar masses, it can become a:
3. If the leftover material is over 3 solar masses, it can become a: