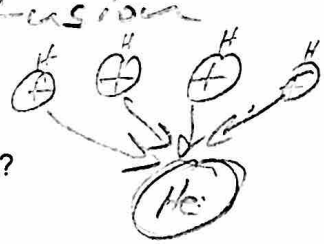
ESS 100 (Stapleton) Name: Key

Notes: Life Cycle of our Sun(and other medium sized stars)

1. What process gives our Sun its energy? Nuclear Fusion

2. What is the Sun's main fuel? Hydrogen



3. What is produced inside the Sun when this fuel is fused together?
Helium

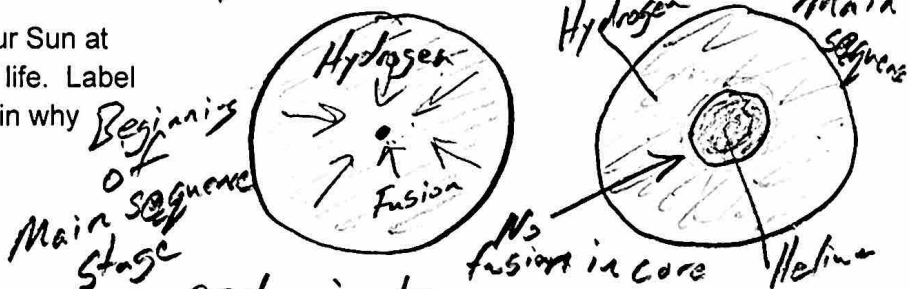
4. What are the stages of our Sun's life (in order)?
Nebula, Protostar, Main Sequence Star, Red Giant, White dwarf, black dwarf
Hot center of nebula

5. What is a "main sequence" star?
A star that is fusing hydrogen in its core (center) [Our Sun is one]

6. What color is our Sun, and what does that tell us about our Sun's temperature and mass? Explain your reasoning.
White → temperature is medium → Pressure is medium → Mass is medium

7. Right now, our Sun is a main sequence star. What will happen to end this stage of our Sun's life?
The core will run out of hydrogen to fuse. Fusion stops in the core.

8. Draw a cross-section diagram of our Sun at the end of main sequence stage of life. Label the materials in the Sun, and explain why they are there.



9. In its next stage of life, our Sun will become a red giant. In this stage, what will happen to Our Sun's size? Explain why.
Sun will expand, because the fusing hydrogen will move outward.

10. When our Sun becomes a red giant, what will happen to its temperature? Why?

Cools down because fusion closer to the Sun's surface is less intense because there is less pressure.

11. When our Sun becomes a red giant why will it turn red?

It cools down. Red = cool.

12. What will be the source of the Sun's energy during the Red Giant stage?

Fusion of hydrogen in a "shell" outside the core

13. What will cause our Sun to enter its final stage of life (white dwarf)?

Runs out of hydrogen that can be fused. All fusion stops.

14. As our Sun enters its final stage of life, what will happen to its size? Explain why.

It will shrink because it cools down when fusion stops.

15. As our Sun enters its final stage of life, what will happen to its color and temperature? Explain why.

Heats back up because it compresses itself as it shrinks. Heating turns it from red to white (hotter color)

16. What is the source of the Sun's energy at this stage?

Compression

17. There is actually one more stage in our Sun's life. Our Sun will eventually turn into a black dwarf. This is because...

Space will cool it down until it has no energy and no light.

18. Our Sun is about 5 billion years old, and it will turn into a red giant in about 5 billion years from today.