red orange yellow white blue violet

B 5/6

ESS 100 (Stapleton) Name: _____

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, "Planetary" nebula, white dwarf → black dwarf

5. What is a "main sequence" star?

   A star that is only fusing hydrogen in its core

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

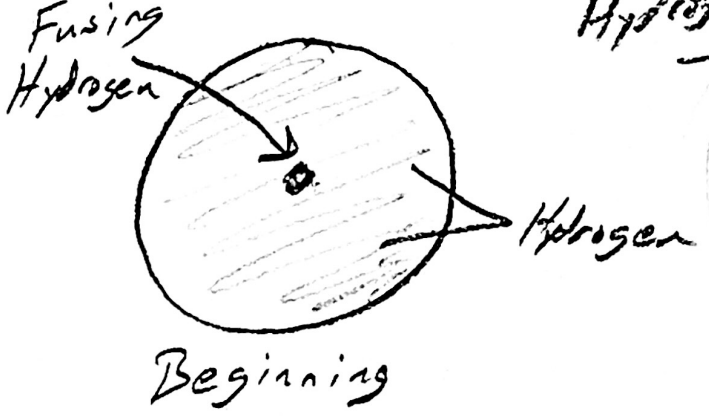
Color is white → medium temperature

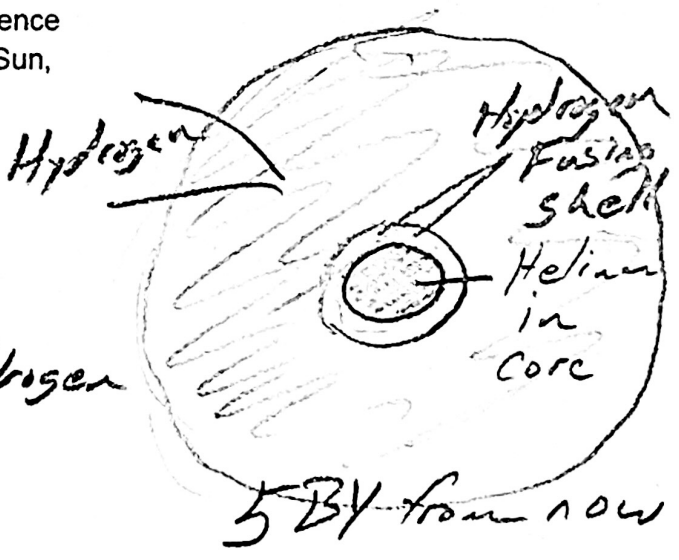
large stars have more pressure and higher temperature → medium mass

7. Right now, our Sun is a main sequence star. What will happen to end this stage of our Sun's life?

   It will run out of Hydrogen in its core.

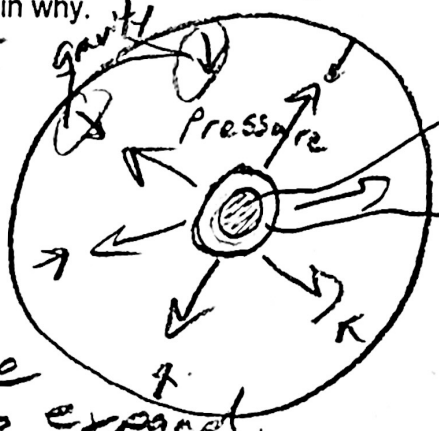
8. Draw cross-section diagrams of our Sun at the beginning and the end of main sequence stage of life. Label the materials in the Sun, and explain why they are there.





9. In its next stage of life, our Sun will become a red giant. In this stage, what wi
happen to Our Sun's size? Explain why.

It will get bigger, gravity
Helium will start
to fuse in the core.
Increased fusion will
create stronger
pressure that will cause
the sun to expand.



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

As the outer layers of the sun
expand, their energy is spread out,
resulting in cooler temperatures on
the surface.

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

It turns from white to red
because the surface cools down.

12. What will are the sources of the Sun's energy during the Red Giant stage?

- Helium fusion in the core
- Hydrogen fusion in a shell around the core

13. When the red giant stage of our Sun's life ends, what will happen to its size? Explain why.

It will rapidly shrink.
The sun will run out of fusable
Helium and hydrogen. Fusion will
stop. Without the hot gas pressure
in the core, gravity will
cause it to shrink.

14. As our Sun enters its final stage of life, what will happen to its color and temperature? Explain why. Gravity will compress it, causing the sun to heat up and turn white.

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

Compression (due to gravity)

16. This final stage of life begins after the red giant stage, when the Sun will become a planetary nebula. This is basically a bunch of colorful gases surrounding a white dwarf star.

17. The colorful gases will eventually be blown away, and the Sun will then be just a white dwarf.

18. There are actually a few more stages in our Sun's life. Our Sun will eventually turn into a red dwarf, then a brown dwarf, and finally a black dwarf. This will happen because...

It will slowly lose its heat to space, eventually becoming cold and dark.

19. Our Sun is about 4.6 billion years old, and it will turn into a red giant in about 5 billion years from today.