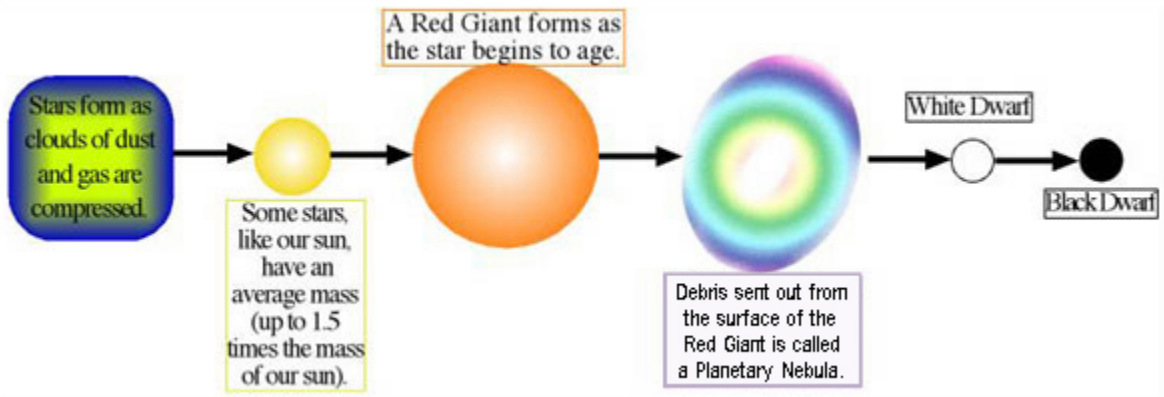
Unit 4 Study Guide- Quiz 1

1. What is the single factor that determines the path that a star takes during its life time?
   The initial mass of the star – average mass or massive mass

2. All stars begin with the same 3 stages. List and define them.

Nebula – a cloud of gas and dust (very wispy)
Protostar - a condensing and heating of the cloud of gas and dust with gravity pushing in and gas pressure pushing out (not in balance yet = no fusion)
Main Sequence star – hydrogen fusion begins to create helium, gravity pushing in and gas pressure pushing out are equal/balanced

3. Draw & label the path of an average (medium) mass star below:



4. A main sequence star fuses hydrogen to form helium. A main sequence star becomes a red giant when it runs out of hydrogen to fuse and begins to fuse helium into carbon. Stars can fuse elements up to iron.

5. The other elements in the universe are formed from supernova events.

6. Which stage of a star has a balance between gravity pushing in and fusion pushing out? Main sequence and red giant/red supergiant stages

7. Our sun is an average mass star. What evolutionary stage is our sun in? halfway through it's main sequence stage

8. Will the sun go supernova? Why or why not? If not, what will eventually happen to the sun?
   No, only massive mass stars go through supernova events. Our sun will turn into a planetary nebula when helium is no longer available to fuse. It will eventually die as a white dwarf into a black dwarf.

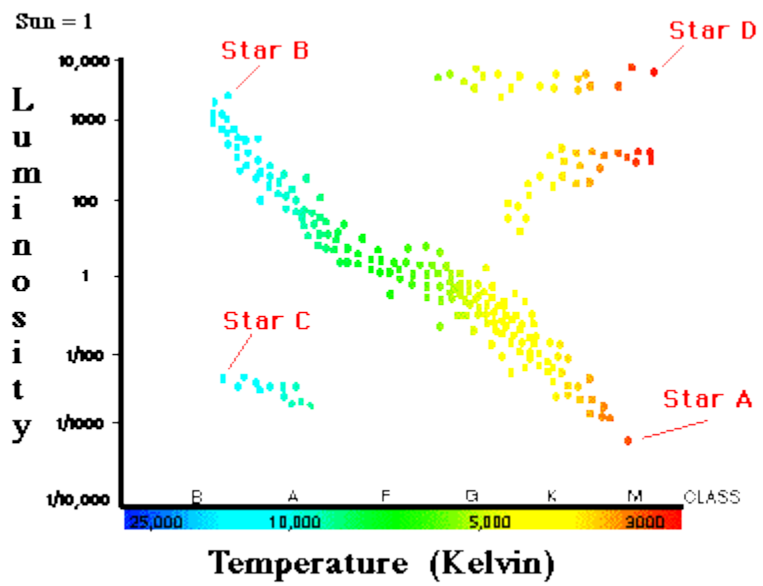
9. The surface color of a star indicates its temperature.

10. What color are the hottest stars? blue

11. What color are the coolest stars? red

12. An H-R diagram plots the relationship between what 2 star characteristics? Temperature vs Luminosity/Magnitude

13. Draw an HR Diagram. Label the axis's and the main groups.



14. There are 3 main groups of stars on an H-R diagram. List them & describe their temperature (hot or cold) & absolute magnitude (bright or dim).

Star Group	Hot or Cold	Bright or Dim
Main Sequence	Ranges from hot in the upper left hand corner to cold in the bottom right hand corner	Ranges from brightest in the upper left hand corner to cold in the bottom right hand corner
Red Giant and Supergiant	Cold	Bright
White Dwarf	Hot	Dim

Big bang questions:

17. The Big Bang is a theory that explains how the universe was formed 13.7 billon years ago.

18. What did the universe look like before the big bang? The universe existed as a tiny speck in space.

19. How could the universe be squeezed so small? Atoms as we know it didn't exist. So all matter and energy could be stacked and squeezed into a tiny space.

20. What started the expansion of the universe? The unified forces theory (the 4 forces acting on the "speck in space")

21. What are Quarks? The most basic parts of an atom. What do quarks combine to form? Protons, Neutrons, and Electrons

22. H and He condense into gas clouds call nebulas.

23. The gas clouds evolve into stars.

24. Stars combine to form galaxies.

25. The Big Bang theory tells us that the universe is moving. Describe how the universe is moving: The universe is expanding.

26. If the light from a galaxy is said to be red-shifting what does that tell you about how the galaxy is moving? The galaxy is moving away as the light wave is being elongated.

27. If the light from a galaxy is said to be blue-shifting what does that tell you about how the galaxy is moving? The galaxy is moving towards as the light wave is being compressed.