**Study Questions for Stars Quest**

Use your PPT notes, textbook (L1 chapters 21-22, L2 chapter 30) and your brain to answer these.

1. List the following distance units in order from smallest to largest: parsec, AU, kilometer, light-year.
2. Explain the difference between nuclear fission and fusion reactions. Which type occurs on the sun? What elements are involved in this process?
3. What are stars mainly composed of? What happens to a star when the hydrogen in its core has all been converted to helium?
4. Why does a star change over time? What is hydrostatic equilibrium?
5. Differentiate between apparent magnitude, absolute magnitude and luminosity. Compare the sun in terms of these numbers.
6. How old is our sun? In which stage (of the star life cycle) is our sun? What stage will our sun be next and when?
7. How/where is energy created in the sun? What is the difference between nuclear fusion reactions and nuclear fission reactions? What does E = mc2 have to do with all of this?
8. What determines the lifecycle of a star? Why don’t all stars explode as supernovae? Will our sun ever explode in a supernova?
9. What can astronomers learn about a star from its spectral lines?
10. Using the HR Diagram below, determine how an increase in mass would affect the basic properties of a star (temperature, color, brightness).
11. Where are 90% of stars (including our sun)located on the

diagram? Be able to interpret the diagram and discuss the

basic properties of white dwarfs, red giants, main sequence stars and

supergiants.

1. What does star color correspond to? What do the spectral types

(OBAFGKM) represent?

1. How are heavier elements (above Helium) formed in a star?
2. Make a diagram and label the entire lifecycle for a medium mass star like our sun. Be sure to include these terms placed in the correct sequence: black dwarf, protostar, main sequence, white dwarf, red giant, nebula, fusion, planetary nebula.
3. Make a diagram and label the entire lifecycle for an extremely high mass star (like Betelgeuse). Be sure to include these terms placed in the correct sequence: protostar, supernova, main sequence, black hole, neutron star, red giant, nebula, fusion, planetary nebula
4. Look at the diagram below showing stellar parallax. How was YOUR experiment (using a meterstick and string) analogous to this diagram?



1. What relationship exists between parallax angle and distance to a star?
2. Is a magnitude -3 star brighter or dimmer than a magnitude 0 star? By how much? (Remember- each order of magnitude is a difference of 2.5x).
3. Sirius has about twice the parallax angle of Altair (0.379 and 0.194 respectively). Is Sirius closer or farther away from us than Altair?

