Notes - Chapter 3 Lesson 2: The Sun and Other Stars (p.103)

* Hotter objects have atoms that move faster.
* Nuclear fusion is when heat moves atoms faster causing them to collide into larger objects. This process releases much energy that powers a star.
* A star = a ball of gas held to together by gravity with a core formed by nuclear fusion (millions or hundreds of millions of degrees).
* Stars shine when energy leaves its core and travels throughout the star.
* Stellar composition = what is in a star (ie. what gases are in it).
* All stars begin with H and He in their cores. He is denser than H so it sinks into the inner core of a star.
* Stars have three interior layers. The radiative zone = a shell of cooler H gas above the star’s core.
* Above the radiative zone is the convection zone: where hot gas moves up towards the surface and cooler gases move deeper into the interior. Light travels quickly in this zone.
* The three outer layers of a star begin after the convection zone. The outer layers compose a star’s atmosphere.
* The photosphere = the apparent surface of a star (where light radiates into space).
* Above the photosphere is the chromosphere (orange-red layer). The corona = the wide, outermost layer. Here, the temp. is the hottest. It has an irregular shape and can extend for millions of km.
* The atm. of a star can change rapidly.
* Sunspots = regions of strong magnetic activity. Prominences = clouds of gas in loops that extend into the corona. Flares = when brightness rapidly increases. They are violent eruptions and can last for hours.
* Coronal mass ejections (CMEs) = huge bubbles of gas that get ejected from the corona
* Solar wind = created when charged particles stream away from the Sun.
* The closes star to the Sun (Proxima Centauri) is 4.2 light-years away.
* Many stars are by themselves. Most commonly, they exist in pairs (binary clusters).
* The two types of star clusters are a(n) globular and open cluster. Each cluster formed at the same time and are the same distance from Earth.
* Stars are classified according to their spectra.
* In space, blur stars are hottest and red coldest. Orange, white, and yellow stars are in the middle. The most massive stars tend to be blue-white.
* The Hertzsprung-Russell Diagram (H-R diagram) is a graph that plots the luminosity vs. temperature of stars. It helps to categorize stars.
* Most stars are currently in the main sequence region of the H-R diagram. Massive stars are giants (the largest being super giants). White dwarfs are unusually small.