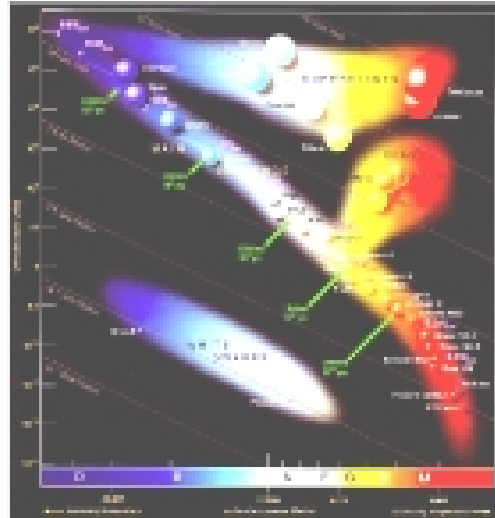
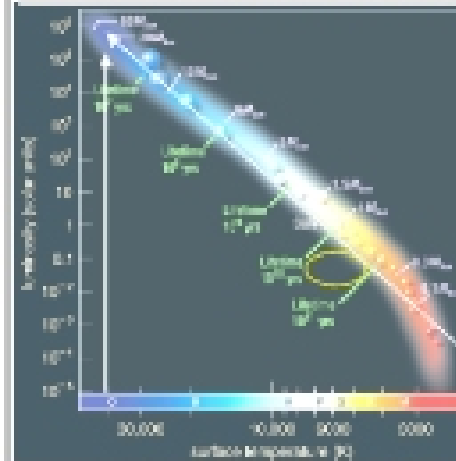


### Schematic H-R Diagram



State what an H-R Diagram is and why the information inferred from it is important to the study of stars.

### Significance of the main sequence: characteristics revealed!

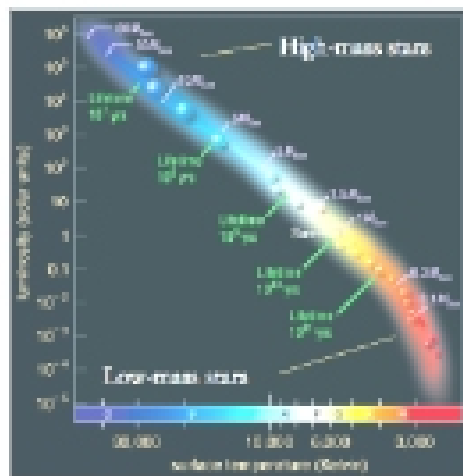


Main-sequence (MS) stars are fusing hydrogen into helium in their cores.

- High luminosity MS stars are hotter.
- Low luminosity ones are cooler.

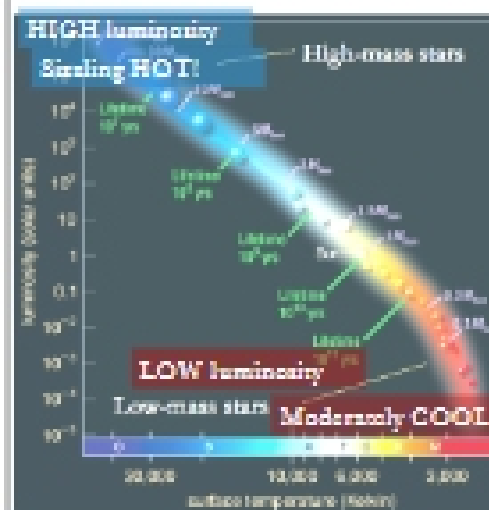
### MASS-LUMINOSITY RELATIONSHIP

State what an H-R Diagram is and why the information inferred from it is important to the study of stars.



Measurements of masses of MS stars show that the hot, blue stars are much more massive than the cool, red ones.

State what an H-R Diagram is and why the information inferred from it is important to the study of stars.



Summary: From analysis of main-sequence stars, we find it is the masses of those core hydrogen-fusing stars that determine their luminosities and temperatures (spectral types).

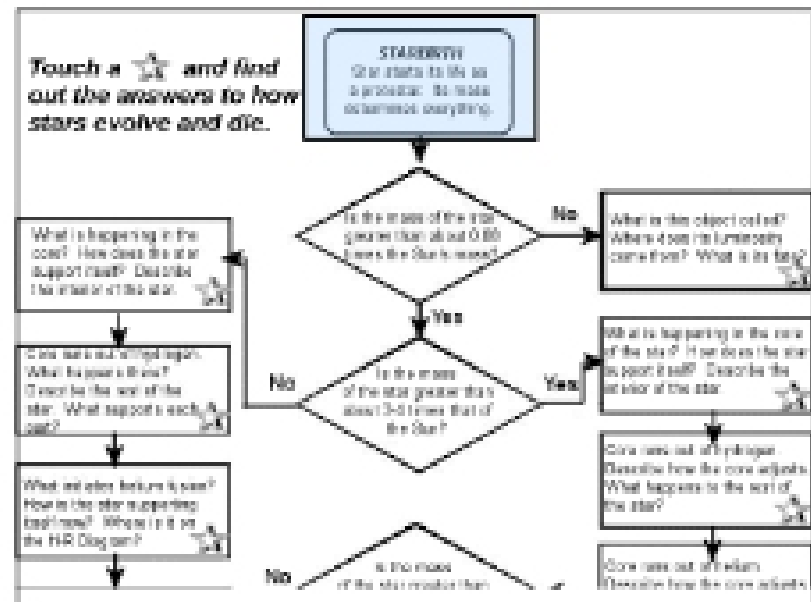
State what an H-R Diagram is and why the information inferred from it is important to the study of stars.

- State which properties of stars can be determined directly from an H-R diagram and which must be inferred by indirect means.
- Explain what is meant by the mass-luminosity relationship and why the "main-sequence" for stars is significant



Learning goals: Be able to ....

- ❑ summarize the future of the Sun on a rough timescale;
- ❑ apply the basics of the conservation of energy and the battle between gravity and outward pressure to what "drives" a star to evolve at each major stage of evolution;
- ❑ explain what is meant by subgiant, red giant branch, electron degeneracy, helium flash, horizontal branch, planetary nebula, white dwarf.



**Brown Dwarf**

[http://uknowledge.uky.edu/astro\\_journals/astro\\_ejournal\\_C\\_02.html](http://uknowledge.uky.edu/astro_journals/astro_ejournal_C_02.html)

- In between a star and a planet
- Jupiter < BD mass < 0.08 Sun
- Radiates in infrared due to temperature.
- Mass too low to start fusion in core.
- Slowly cools over millions of years.

