CLASS NOTES

• Star - _______________________________ 

  - Majority of known matter in the galaxy

• Thermonuclear Fusion - _______________________________ 

  - Manner in which stars create ____________ 
  - Four hydrogen nuclei [each with a mass of about 4.030 mass units] join to form a helium nucleus with a mass of only about 4.003 energy units 
  - The mass that is lost is converted into ______________ and radiated into space as ______________ and ______________

\[
P + P \rightarrow \text{Deuterium} \\
P + P \rightarrow \text{Tritium} + \text{Energy} \\
P + P \rightarrow \text{Helium} + P + P
\]
Stars and Stellar Evolution

- Types and Parts of Stars:
  - Nebula -
  - Main Sequence Stars -
  - Red Giant Star -
  - Super Giant Star -
  - Red Dwarf Star -
  - White Dwarf Star -
- Stellar Evolution -
  - Dependent on the mass of the star
  - More massive stars have a lifespan of a few million years
  - Less massive stars have a lifespan of trillions of years

Diagram: Protostar (early stage of star) → Supergiant → Giant → High-mass stars → Medium-mass stars
1. The final stage in the life cycle of the most massive stars is a
   a. black hole
   b. supergiant
   c. black dwarf
   d. white dwarf

2. Energy is produced in the cores of main sequence stars when
   a. lighter elements undergo fusion into heavier elements
   b. heavier elements undergo fusion into lighter elements
   c. cosmic background radiation is absorbed
   d. cosmic background radiation is released

3. The final stage in the life cycle of the least massive stars is a
   a. black hole
   b. supergiant
   c. black dwarf
   d. white dwarf

4. Which object in space emits light because it releases energy produced by nuclear fusion?
   a. Earth's Moon
   b. Halley's comet
   c. Venus
   d. Polaris
4. Which process generates the energy that is released by stars?
   a. nuclear fusion
   b. thermal conduction
   c. convection currents
   d. radioactive decay

5. Which property primarily determines whether a giant star or a supergiant star will form?
   a. mass
   b. color
   c. shape
   d. composition

6. What causes clouds of dust and gas to form a protostar?
   a. magnetism
   b. gravitational attraction
   c. expansion of matter
   d. cosmic background radiation

7. Which process combines lighter elements into heavier elements and produces energy within stars?
   a. fusion
   b. insolation
   c. conduction
   d. radioactive decay