

SECTION 29.3 *Stellar Evolution*

In your textbook, read about the basic structure of stars.

Use each of the terms below just once to complete the passage.

carbon	helium	hydrostatic equilibrium	iron
luminosity	magnesium	mass	neon
nuclear fusion	oxygen	silicon	temperature

For a star to be stable, it must have (1) \_\_\_\_\_, which is the balance between gravity squeezing inward and pressure from (2) \_\_\_\_\_ and radiation pushing outward. This balance is governed by the (3) \_\_\_\_\_ of the star. The (4) \_\_\_\_\_ inside a star determines the star's energy output, or (5) \_\_\_\_\_.

Stars on the main sequence produce energy by fusing hydrogen into (6) \_\_\_\_\_. Once a star's core has been converted into helium, it may react if the temperature is high enough. If the temperature is high enough, (7) \_\_\_\_\_ can react with helium to form (8) \_\_\_\_\_, then (9) \_\_\_\_\_, then (10) \_\_\_\_\_, and then (11) \_\_\_\_\_. Other types of reactions can produce even heavier elements, the heaviest being (12) \_\_\_\_\_.

In your text, read about stellar evolution and life cycles.

For each statement below, write *true* or *false*.

- \_\_\_\_\_ 13. As a star ages, its internal composition changes as a result of rising temperature.
- \_\_\_\_\_ 14. As nuclear fuel runs out, a star's internal structure and its mechanism for producing pressure change to counteract gravity.
- \_\_\_\_\_ 15. The formation of a star begins with a cloud of interstellar gas and dust called nebula.
- \_\_\_\_\_ 16. A nebula collapses on itself as a result of its high temperature.
- \_\_\_\_\_ 17. As a nebula contracts, its rotation forces it into a disk shape with a hot condensed object at the center, which will become a new star.
- \_\_\_\_\_ 18. A new star often illuminates the gas and dust surrounding it.

SKIP  
\* We'll do  
in class!  
together!

## SECTION



## Reinforcement

## Evolution of Stars

**Directions:** The following terms represent, in random order, different steps in the formation and life of a star. Number the steps in the space provided as follows: the first step 1, second step 2, and so on.

- \_\_\_\_\_ 1. fusion reaction
- \_\_\_\_\_ 2. big bang
- \_\_\_\_\_ 3. giant
- \_\_\_\_\_ 4. nebula
- \_\_\_\_\_ 5. white dwarf
- \_\_\_\_\_ 6. protostar

**Directions:** Answer the following questions by writing the letter of the correct answer on the line provided.

- \_\_\_\_\_ 7. Which of the following statements best explains why a star is on the main sequence?
  - a. The star's mass is approximately equal to the mass of the Sun.
  - b. The gravitational force balances the force from nuclear fusion.
  - c. The star has just become a supernova.
  - d. The star's temperature lies in the main sequence range.
- \_\_\_\_\_ 8. Which type of star is formed from a supernova?
  - a. giant
  - b. supergiant
  - c. neutron star
  - d. white dwarf
- \_\_\_\_\_ 9. The Hertzsprung-Russell diagram plots
  - a. the temperatures of stars on the horizontal axis and the masses on the vertical axis.
  - b. the magnitudes of stars on the horizontal axis and the temperatures on the vertical axis.
  - c. the magnitudes of stars on the vertical axis and the temperatures on the horizontal axis.
  - d. the masses of stars on the vertical axis and the temperatures on the horizontal axis.
- \_\_\_\_\_ 10. How is energy from the core of the Sun transmitted to the photosphere?
  - a. nuclear fusion
  - b. radiation and convection
  - c. radiation
  - d. convection