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CHAPTER 14 OVERHEAD MASTER

BLM 14-13

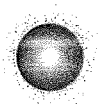
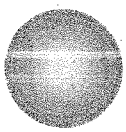
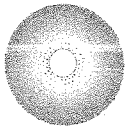
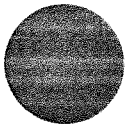
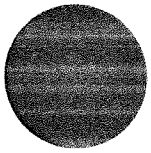
Lifetime versus Mass

Question

1. Describe the relationship between mass and lifetime of a main sequence star.

Blackline Master 15.1b

The Life of Different Types of Stars

Type of Star	Small or Medium Star (mass the same as the Sun's or less; the most common type of star)	Large Star (mass about 10 times the mass of the Sun; rare)	Extremely Large Star (mass about 30 times the mass of the Sun; very rare)
			
Birth	Forms from a small- or medium-sized nebula.	Forms from a large nebula.	Forms from an extremely large nebula.
			
Early Life	Gradually turns into a hot, dense clump that begins producing energy.	In a fairly short time turns into a hot, dense clump that produces large amounts of energy.	In a very short time turns into a hot, dense clump that produces very large amounts of energy.
			
Major Part of Life	Uses nuclear fusion to produce energy for about 10 billion years if the mass is the same as the Sun's, or 100 billion years or more if the mass is less than the Sun's.	Uses nuclear fusion to produce energy for only a few million years. It is perhaps 5000 times as bright as our Sun.	Uses nuclear fusion to produce energy for only about one million years. It is extremely bright.
			
Old Age	Uses up hydrogen and other fuels, and swells up into a large, cool red giant.	Uses up hydrogen and other fuels, and swells to become a red supergiant.	Uses up hydrogen and other fuels, and swells to become a red supergiant.
			
Death	Outer layers of gas drift away, and the core shrinks to become a small, hot, dense white dwarf star.	Core collapses inward, sending the outer layers exploding as a supernova.	Core collapses, sending the outside layers exploding in a very large supernova.
			
Remains	White dwarf star eventually cools and fades.	Core material packs together as a neutron star. Gases drift off as a nebula to be recycled.	Core material packs together as a black hole. Gases drift off as a nebula to be recycled.

Note: These drawings are not to scale.

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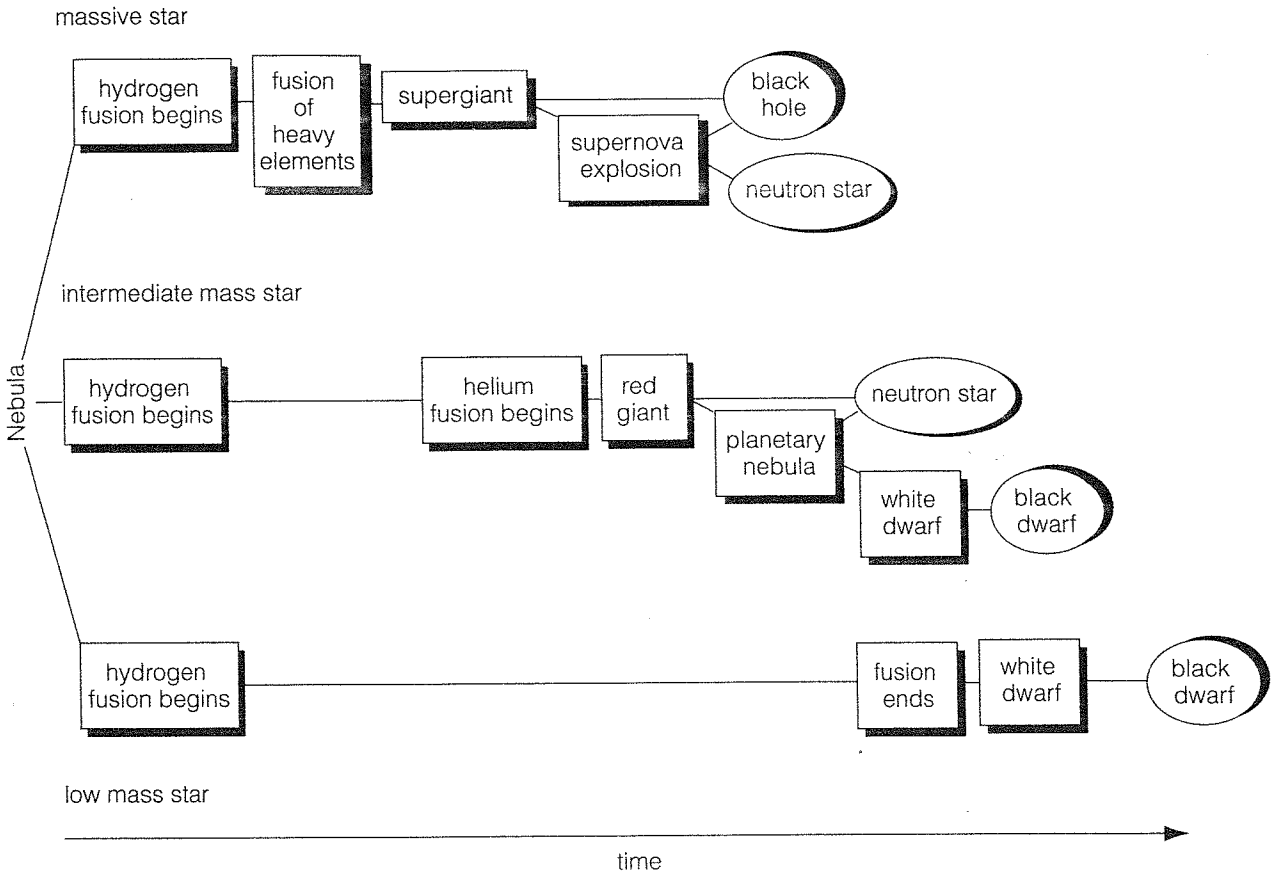
CHAPTER 14 REINFORCEMENT

Evolution of Stars Flowchart

BLM 14-15

Goal • Use the flowchart to gain an overall picture of the evolution and fate of stars.

The Evolution of Stars



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BLM 14-19

CHAPTER 14 REINFORCEMENT

Stages in the Formation of Stars

Goal • Reinforce your understanding of the stages in the formation of stars.

What to Do

Using the list of terms below, complete the following concept map on the formation of a star. You can use terms more than once. Write the correct term in each space.

centre	gas	✓ increases	✓ stable (2x)
compress	✓ gravitational (2x)	main sequence	temperature
dust	helium	✓ nebula	10 billion
fusion	✓ hydrogen	pressure	✓ 10 000 000°C

1. _____ and _____ in a Nebula are attracted by _____ forces and pulled into the _____.

2. As the cloud begins to _____, the temperature increases.

3. When the _____ in the centre reaches 10 000 000°C, _____ of hydrogen into _____ begins.

4. The increased _____ and the energy production stops the gravitational collapse of the star. The star becomes _____ and begins to shine brightly.

5. On a Hertzsprung-Russell diagram, the star is now located on the _____.

6. A star like the Sun will stay stable for _____ years.

