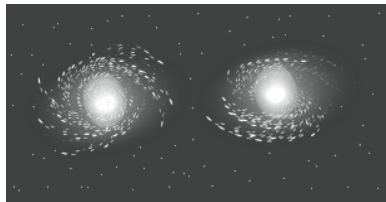


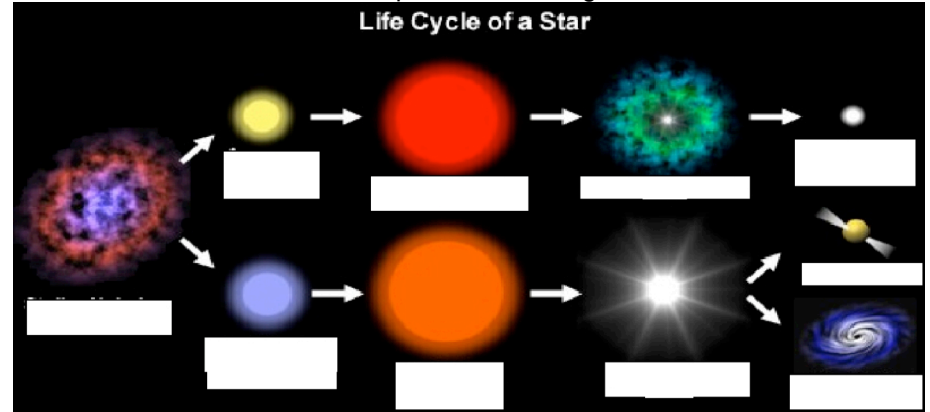
Review Questions:

- A star's ____ magnitude does not depend on its distance from Earth.
a. big bang theory b. absolute c. cosmology d. apparent e. elliptical
- The study of the formation of the universe is called ____
a. big bang theory b. absolute c. cosmology d. apparent e. elliptical
- Our sun is located in the arm of a pinwheel-shaped ____ galaxy called the Milky Way
a. spiral b. absolute c. black hole d. neutron e. elliptical
- A ____ is so small and massive that not even light can escape its gravitational pull.
a. spiral b. absolute c. black hole d. neutron e. elliptical
- Elliptical galaxies and the halos of spiral galaxies contain groups of stars called:
a. spiral b. globular clusters c. black hole d. supernovas e. elliptical
- Which of the following magnitudes indicates the brightest star?
a. -1 b. 0 c. -0.11 d. +4
- Which of the following is the largest?
a. nebula b. galaxy c. neutron star d. globular cluster
- Which of the following is hottest?
a. red supergiant star b. small black-dwarf star c. yellow star d. blue star
- According to the big bang theory, the universe is about:
a. 470 billion yrs old b. 500 billion yrs old c. 4.7 billion yrs old d. 15 billion yrs old
- A star's apparent magnitude is dependent on
a. its distance from Earth b. its energy output c. its size d. all of the above
- The galaxies pictured would *best* be classified as
a. irregular galaxies b. symmetrical galaxies
c. barred galaxies d. spiral galaxies
- A galaxy is *best* described as a cluster of
a. millions of stars b. billions of stars.
c. hundreds of stars d. thousands of stars
- To express the distance between the Milky Way galaxy and other galaxies, the *most* appropriate unit of measurement is the
a. meter b. kilometer c. light-year d. astronomical unit
- Which of the following sets contains only objects that shine as a result of reflected light?
a. moons, planets & comets b. planets, stars & comets c. moons, comets & stars d. planets, stars & moons
- The universe contains galaxies, stars, and planets. How does gravity affect these bodies in space?
a. Gravity pulls bodies away from each other.
b. Gravity organizes bodies into nebulas, galaxies, and planetary systems.
c. Gravity attracts bodies with similar compositions to each other.
d. Gravity causes bodies to be scattered randomly throughout the universe.

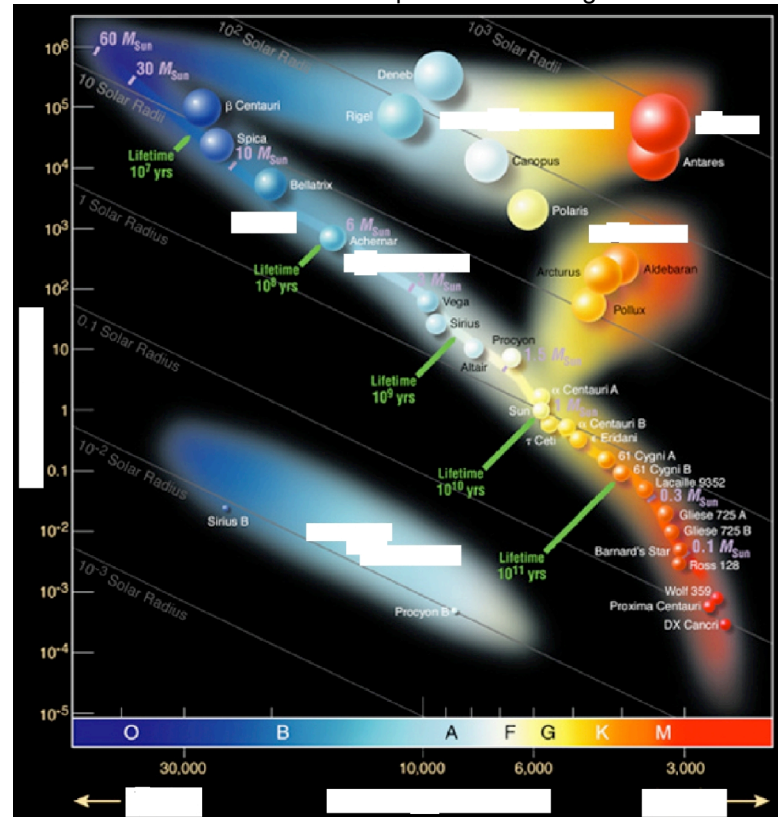


The Universe Beyond

Complete the labeling



Complete the labeling



Name:

Period:

Science Number

Section 1: Stars (p 484-490)

Skim the section "Color of Stars" on page 484 and match the item to the star color & to the correct temperature by drawing a line. (use color pencils)

Bunsen Burner	Red	Medium
Candle Flame	Yellow	Hottest
Campfire Ember	Blue	Coollest

Use pages 484-485 to fill in the blanks:

When you look at a white light through a glass prism, you see a rainbow. This rainbow of colors is called a _____. ... Stars are made of various gases that are so dense, they act like a hot solid. For this reason, the "surface" of a star, or the part that we see, gives off a continuous spectrum. ... If we were to look at [a neon] sign with an astronomer's spectrograph, we would not see a continuous spectrum. Instead, we would see _____.

How are stars "classified"? _____

Complete the chart below:

Types of Stars			
Class	Color	Surface Temperature (°C)	Elements Detected
O	Blue	Above 30,000	
B			Helium & Hydrogen
	Blue-white	7,500 – 10,000	
F			Hydrogen & heavier elements
	Yellow	5,000 – 6,000	Calcium & other metals
	Orange		Calcium & molecules
M		Less than 3,500	

What class does our sun belong in? _____
 What color is our sun? _____

Teach a parent: Today's concept :

Life cycle & color of stars: What they are, how they are different
Types of galaxies: What they are, how they are different

Help your parent become an expert !

Be sure they write what they have learned from your teaching

Parent Response

1. _____ I'm not sure my child really understands, therefore, I don't either. Please work with him/her and let's try again.
2. _____ The concept was explained thoroughly with effective examples he/she created. "By golly, I think they've got it!"
3. _____ WOW! My child did an exceptional job! It was logically explained, therefore I caught on immediately and feel confident about teaching it to others. The self-created examples were a perfect fit. My child even asked me a question at the end to make sure I understood. I believe my child could effectively teach this concept to others.

Parent Signature: _____ Date: _____

Mom or Dad Comments: Please explain how your student taught you this concept and * what you learned in 3-5 sentences! * This is critical for them to receive full points

Life cycle & color of stars: _____

Types of galaxies: _____

Additional space for notes:

Vocabulary: Section 1-2-3

Word/pg	Definition: Book or your words
spectrum	_____
Apparent Magnitude	_____
Absolute magnitude	_____
Light year	_____
parallax	_____
White dwarf	_____
Red giant	_____
supernova	_____
Neutron star	_____
pulsar	_____
Black hole	_____
galaxy	_____
nebula	_____
quasar	_____

Distances in Space

Learn about the units of length used to measure distances in our solar system and beyond.

Because astronomers study objects over such extremely large distances, astronomers commonly use units of length that are much bigger than the ones we usually use. Two common units of distance used in astronomy are the astronomical unit (AU) and the light-year.

Astronomical Unit

The astronomical unit (AU) is the average distance from the Earth to the sun, measured to be about 1.5×10^8 km. It is a convenient unit to use when discussing distances within our solar system.

1. Saturn has an average distance of 9.5 AU from the sun. How many centimeters is this?

2. Pluto, the outermost planet in the solar system, is about 6×10^9 km from the sun. How many astronomical units (AU) is this?

Light-year

The light-year is defined as the distance that light travels in a year. (The speed of light is 3×10^5 km/s.) For instance, Alpha Centauri, the closest star to the Earth after the sun, is 4.3 light-years from us.

3. How long does it take light from this star to reach us?

4. The star Betelgeuse, meaning “armpit of the giant,” is 310 light-years from Earth. How many hours does light from this star take to reach Earth?

5. How many AUs are in a light-year? (*Hint: There are approximately 31,536,000 seconds in a year.*)

Additional Notes: _____

Star Puzzle

Try this word search after you finish reading Chapter 19.

Fill in the blanks in the clues below.

- _____ is the apparent shift of nearby stars relative to more-distant stars as Earth orbits the sun.
- A(n) _____ cluster is a group of older stars located in the halo of spiral galaxies.
- The study of the origin and future of the universe is called _____.
- A _____ is so small and massive that its gravity does not even let light escape.
- A _____ is a small, hot star that is near the end of its life.
- A(n) _____ galaxy has distinctive arms and a nuclear bulge.
- The rainbow of colors that make up white light is the _____.
- A _____ is a star of about two solar masses formed from a supernova.
- A(n) _____ galaxy has a very bright center and contains almost no gas and dust.
- A _____ is a giant cloud of gas and dust.
- A large, cool star formed when a star runs out of hydrogen is a _____.
- A spinning neutron star is a _____.
- The _____ magnitude of a star is how bright it looks.
- The explosive death of a star is a _____.
- A tiny point of light that is very small, very far away, and very bright is called a _____.
- A large grouping of stars in space is a _____.
- The _____ theory states that the universe began when all of its contents suddenly expanded outward.
- A group of stars that form when a lot of gas and dust come together is known as a(n) _____ cluster.

4

STAR REVIEW

- What 3 main characteristics do scientists use to classify stars?
 - _____
 - _____
 - _____
- What unit do scientists use to measure distance to the stars? (*Choose one*)
 - a. Astronomical Units b. Kilometers c. Light-minutes d. Light-years
- What gases are Class O stars made of? _____ & _____
- Complete the following for our sun:
 - Class: _____ Color: _____ Surface Temperature: _____
- Use the stars listed in the table to the right to answer the following; which star is probably the...
 - The largest? _____
 - The hottest? _____
 - The brightest? _____
 - The smallest? _____
 - The coolest? _____
 - The dimmest? _____

Betelgeuse, a red giant
Sirius B, a white dwarf
Our Sun, a main-sequence yellow star
Beta Centauri, a main-sequence blue star

6. Unscramble each vocabulary word (from your STAR notes) to decode the secret message.

LABNUE
4

PUSRLA
6 13

EDR TINGA
11 2

HTEIW WARDF
10

BACLK LEOH
1 7

ROSROATTP
8

TAISUENPGR
3

PANSUEROV
9 12

NEORUTN SART
5

Hey, Timon, ever wonder what those sparkly dots are up there?

1 2 3 4 5 6 7 8 9 10 11 12 13

Section 3: Galaxies (p 496-499)

Use pages 496-497 to complete the chart below:

Types of Galaxies		
Name	Description	Picture
<i>Spiral Galaxy</i>		
<i>Elliptical Galaxy</i>		
<i>Irregular Galaxy</i>		

Use page 498 to define the terms below:

Gas Cloud: _____

Open Cluster: _____

Globular Cluster: _____

Copy Figure 18 in this box

Star Puzzle, continued

19. The diagonal pattern of stars on an H-R diagram is known as the _____.

20. _____ background radiation comes from all directions in space.

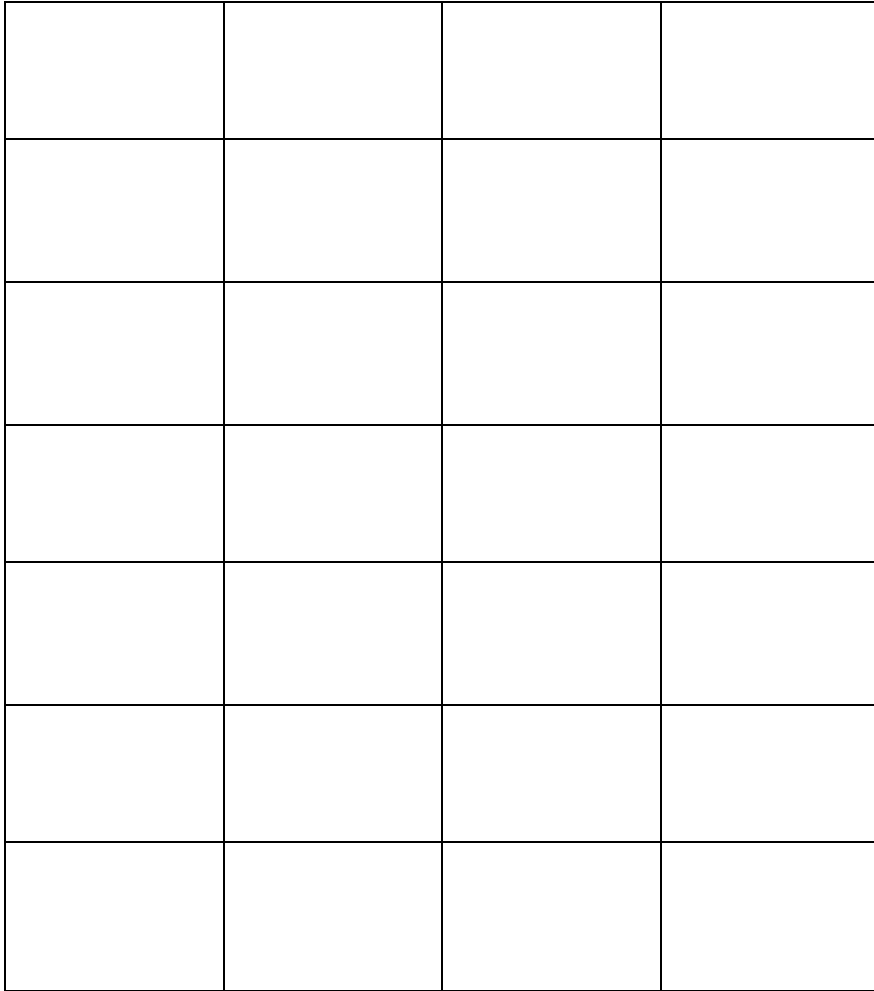
Use the clues on the previous page to find the chapter concepts in the word-search puzzle below. Words may be hidden horizontally, vertically, diagonally, or backward.

E	C	N	B	L	A	C	K	H	O	L	E	Z	V	T	K
L	W	O	E	F	Q	A	V	O	N	R	E	P	U	S	R
L	H	C	S	U	T	X	A	L	L	A	R	A	P	A	E
I	I	O	A	M	T	J	M	X	R	Q	J	R	S	R	X
P	T	S	R	L	I	R	D	R	H	O	K	L	B	Y	E
T	E	M	E	X	U	C	O	A	D	Z	U	I	U	C	C
I	D	O	D	T	Y	B	X	N	E	P	Y	W	N	T	L
C	W	L	G	G	V	I	E	Z	S	X	S	E	E	F	R
A	A	O	I	C	A	E	T	N	A	T	U	F	N	H	A
L	R	G	A	O	Y	P	S	L	G	Q	A	X	L	M	L
R	F	Y	N	O	Z	P	A	N	E	Q	O	R	Q	D	U
E	M	G	T	Y	I	G	A	S	L	N	U	P	R	G	B
C	U	A	Y	R	D	B	N	R	S	Q	B	A	E	Q	O
M	C	H	A	N	G	I	B	H	K	N	Z	W	S	N	L
W	T	L	W	I	A	M	U	R	T	C	E	P	S	A	G
R	K	I	B	M	A	P	P	A	R	E	N	T	M	B	R

Additional Notes: _____

The HR Diagram

1. Label the Y-axis in black ink.
2. Label the Spectral Type on the X axis using black ink
3. Label the Temperature on the X-axis using the colors from the book
4. Draw, label & color our sun
5. 4. Draw, label & color Polaris, the North Star
6. 4. Draw, label & color ONE **white dwarf star**



Follow the directions & use pgs 492&3 to complete the HR diagram

7. Draw, label & color ONE **red giant**
8. Draw, label & color TWO **red dwarf stars**
9. Draw, label & color THREE **blue star**
10. Draw, label & color FIVE **main-sequence** stars
11. Shade in the Main-Sequence

