Lesson 1 The View from Earth

CHAPTER 22 DRW

Name _____

Scan *Lesson 1. Read the lesson titles and bold words. Look at the pictures. Identify three facts you discovered about how astronomers observe the night sky. Record your facts in your Science Journal.*

Main Idea

Looking at the Night Sky

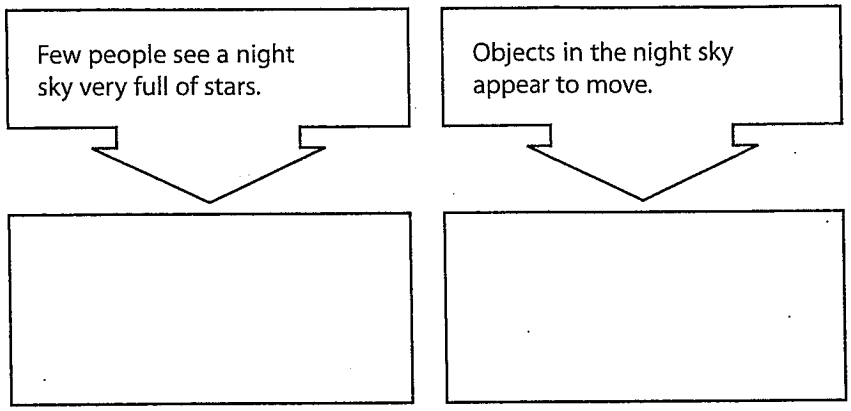
I found this on page _____.

I found this on page _____.

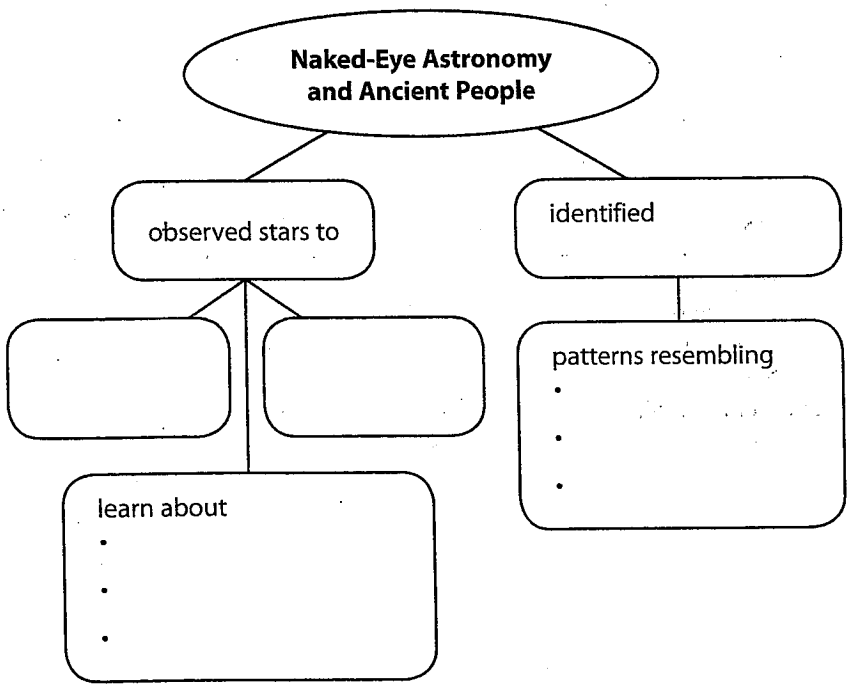
I found this on page _____.

Details

Explain *facts associated with viewing the night sky.*



Characterize *astronomy before the invention of the telescope.*



Assess *the usefulness of constellations to astronomers.*

_____

_____

_____

Main Idea

I found this on page _____.

Details

Categorize *observations that astronomers can study at various wavelengths.*

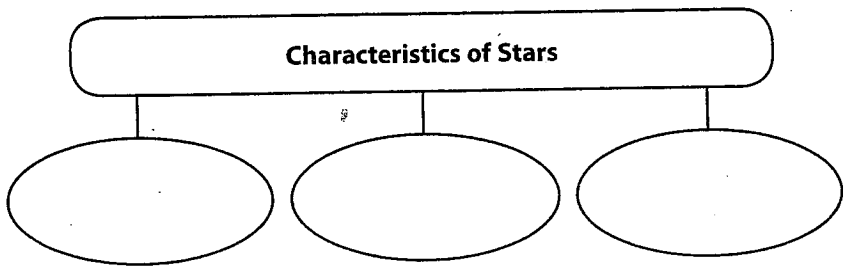
Waves	Used to study
Radio	
Infrared	
Ultraviolet	
X-rays and gamma rays	

I found this on page _____.

Draw *an arrow beside the table above to show the energy level of wavelengths in the direction of lowest energy to highest energy.*

I found this on page _____.

Identify *three characteristics of stars that astronomers can study using* spectroscopes.



Measuring Distances

I found this on page _____.

Contrast *terms associated with measuring distance in the universe.*

Parallax	Astronomical unit	Light-year
	about _____ km	about _____ km

Main Idea

Measuring Brightness

I found this on page _____.

I found this on page _____.

I found this on page _____.

I found this on page _____.

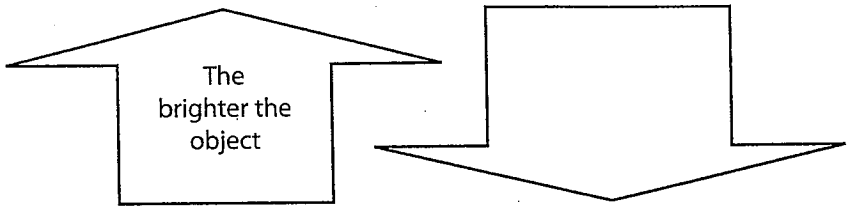
Details

Identify *two ways astronomers measure the brightness of stars.*

1. _____

2. _____

Relate *the appearance of celestial objects with the number values of their* apparent magnitudes.



Contrast apparent magnitude *and absolute magnitude. Circle the magnitude that measures* luminosity.

Apparent Magnitude	Absolute Magnitude

Complete *the statement below.*

If a scientist knows a star's _____ and its _____, he or she can calculate the star's _____.

Analyze It Explain why it is not possible to know what is going on elsewhere in the universe at exactly this moment.

_____

_____

_____

_____

Lesson 2 The Sun and Other Stars

Predict *three facts that will be discussed in Lesson 2 after reading the headings. Record your predictions in your Science Journal.*

Main Idea

How Stars Shine

I found this on page _____.

I found this on page _____.

Composition and Structure of Stars

I found this on page _____.

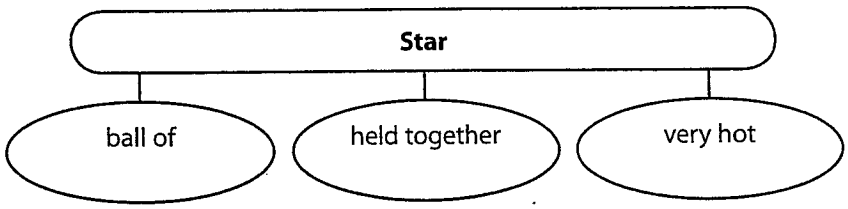
I found this on page _____.

Details

Sequence *the process of* nuclear fusion.

1. Atoms of hot gas move quickly.
2. Atoms _____, and nuclei _____.
3. Great amounts of _____ are released, making the star shine.

Characterize *a* star.



Explain *why the Sun is the most easily observed* star.

_____

_____

Describe *the inner and outer layers of the Sun.*

	Layer	Description
Interior Layers	Core	
	Radiative zone	
	Convection zone	
Outer Layers	Photosphere	
	Chromosphere	
	Corona	

Main Idea

I found this on page _____.

Details

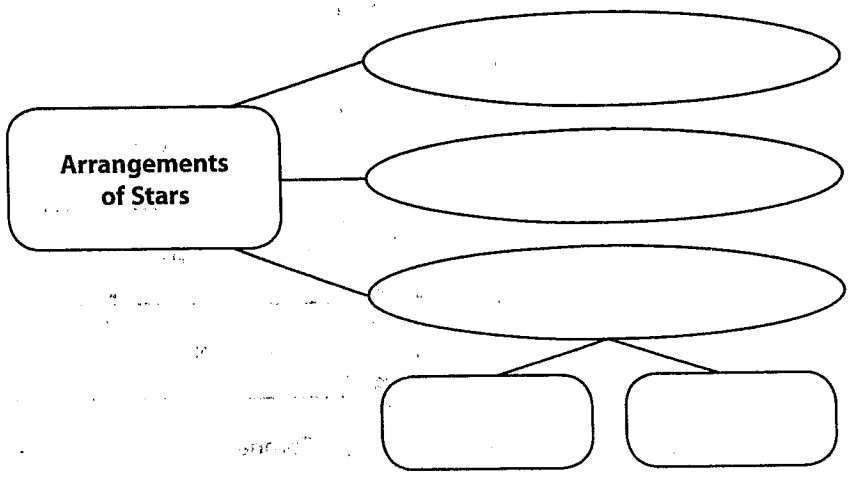
Detail *features that change on the Sun over short periods of time.*

Feature	Details
Sunspots	
Prominences	
Flares	
Coronal Mass Ejections (CMEs)	
Solar wind	

Groups of Stars

I found this on page _____.

Categorize *ways* stars *exist in space.*



Main Idea

Classifying Stars

I found this on page _____.

I found this on page _____.

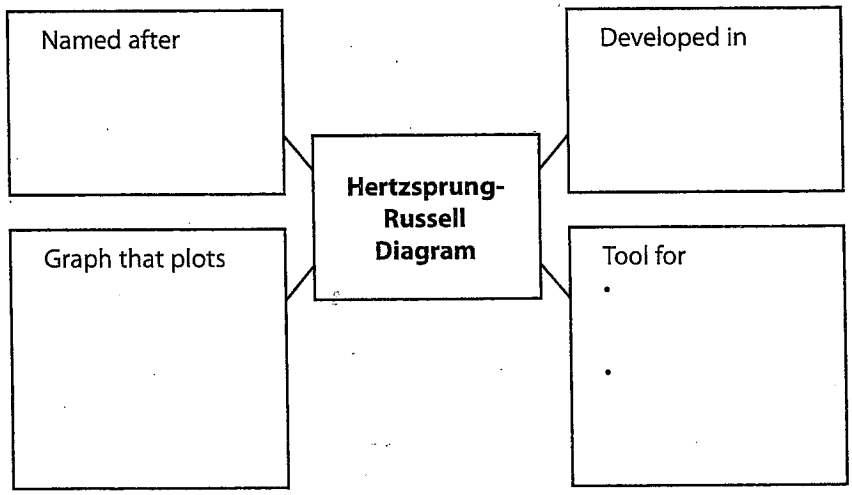
I found this on page _____.

Details

Order stars' *colors, generally, by temperature. Draw arrows to represent increasing mass.*

Color	Temperature	Mass
	↑	
	↑	
	↑	
	↑	
Red	↑	

Characterize *the* Hertzsprung-Russell diagram.



Generalize *trends on the main sequence of the* Hertzsprung-Russell diagram.

_____

_____

Synthesize It Compare and contrast the Sun with other stars in the universe.

_____

_____

_____

_____

_____

Lesson 3 Evolution of Stars

Skim *Lesson 3 in your book. Read the headings and look at the photos and illustrations. Identify three things you want to learn more about as you read the lesson. Record your ideas in your Science Journal.*

Main Idea

Life Cycle of a Star

I found this on page _____.

I found this on page _____.

End of a Star

I found this on page _____.

Details

Sequence *the change of a* nebula *to a visible star.*

A nebula begins as a _____, _____, and _____ cloud of _____ and _____.

↓

_____ causes the _____ parts to _____ forming _____.

↓

A protostar contracts until _____.

↓

The _____ around the protostar _____, and the protostar becomes _____.

Order *the changes in the life cycle of a massive star.*

Stage	Elements Formed
Massive star and red giant	• hydrogen → • helium →
Larger red giant	• hydrogen → • helium → • carbon →
Red supergiant	hydrogen → helium → _____ → _____ → _____ → _____ → _____

Explain *why the Sun will not become a supergiant. Identify what it will become.*

_____

_____

Main Idea

I found this on page _____.

Details

Sequence *what will happen to the solar system when the Sun runs out of fuel.*

The Sun

will run out of _____ and

become _____.

will begin to fuse _____, and

it will _____.

will run out of _____ and _____

_____, absorbing _____

_____.

will push _____ farther out and

will finally become a _____.

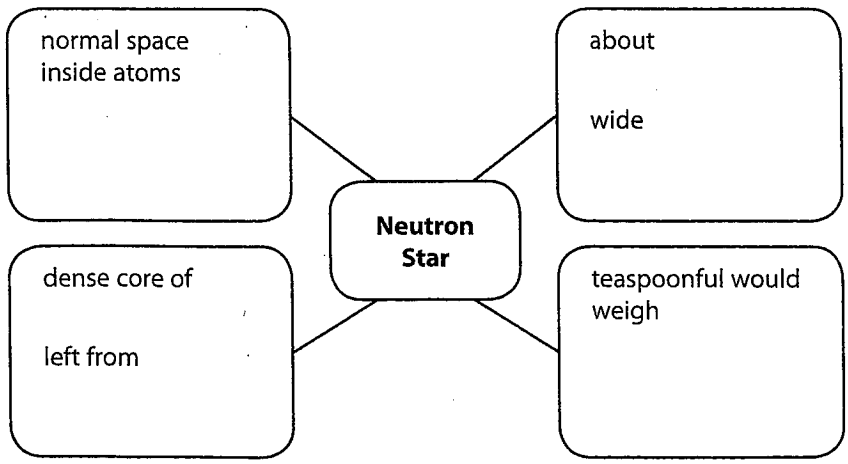
I found this on page _____.

Order *the formation of a* supernova.

Iron forms in the star's core.			The star explodes.

I found this on page _____.

Characterize neutron stars.



Main Idea

I found this on page _____.

Details

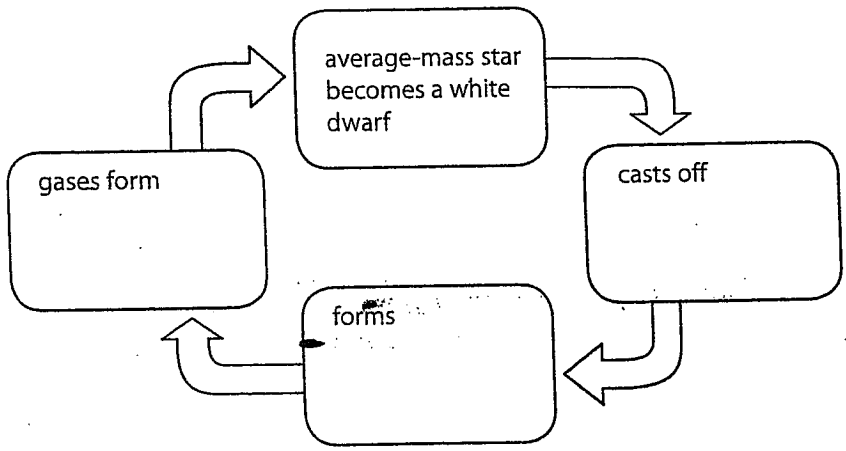
Compare and contrast *a* black hole *with the star from which it formed.*

	Original Star	Black Hole
Size		
Mass		
Gravity		
Appearance		

Recycling Matter

I found this on page _____.

Diagram *the cycle of a planetary* nebula.



I found this on page _____.

Identify *three examples of elements found on Earth that are released in* supernova *remnants.*

1. _____ in _____
2. _____ in _____
3. _____ in _____

Connect It Summarize how the force of gravity factors into at least three processes in the formation of stars.

_____

_____

_____

_____

_____

Lesson 4 Galaxies and the Universe

Predict *three facts that will be discussed in Lesson 4 after reading the headings. Record your predictions in your Science Journal.*

Main Idea

Galaxies

I found this on page _____.

I found this on page _____.

I found this on page _____.

Details

Relate *the number of stars in* galaxies *and the universe.*

Galaxy	Universe
hundreds of billions of	hundreds of billions of

Contrast *scientific knowledge about* dark matter.

Dark Matter	
Scientists know that...	
Scientists hypothesize that...	
Scientists don't know...	

Categorize *details about types of* galaxies. *List at least four details about each type.*

Spiral	Elliptical	Irregular
•	•	•
•	•	•
•	•	•
•	•	•

Main Idea

I found this on page _____.

Details

Explain *why scientists liken the large-scale structure of the universe to a sponge.*

_____

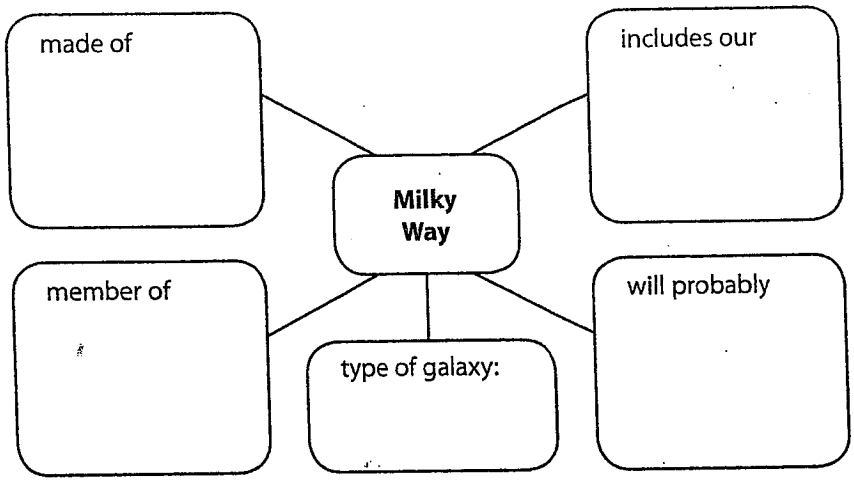
_____

_____

The Milky Way

I found this on page _____.

Characterize *the Milky Way.*



I found this on page _____.

Illustrate *the Milky Way, and describe Earth's position in it.*

Earth's position: _____

The Big Bang Theory

I found this on page _____.

Restate *the* Big Bang theory.

_____

_____

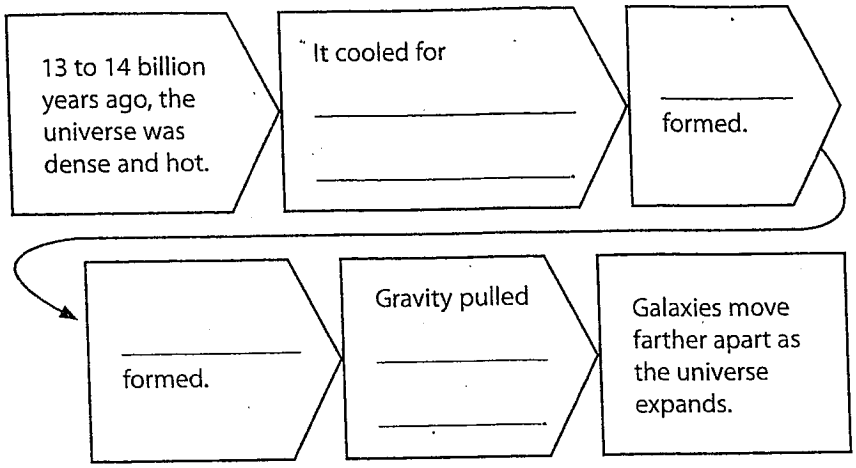
_____

Main Idea

I found this on page _____.

Details

Sequence *the expansion of the universe.*



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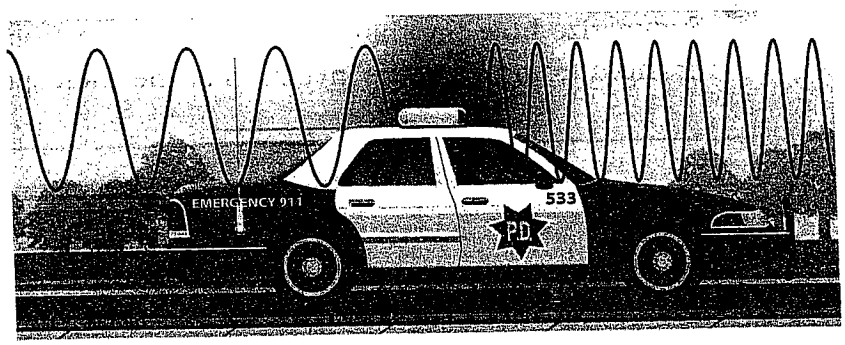
Differentiate *sound waves in the* Doppler shift.



To an observer in front of the car's motion:

_____

To an observer behind the car:

_____

I found this on page _____.

Relate *dark energy to the rate the universe is expanding.*

Scientists theorize that dark energy is pushing galaxies apart because _____.

Synthesize It Predict what will happen to the Sun, the solar system, and the Milky Way in billions of years.

_____

_____

_____

_____