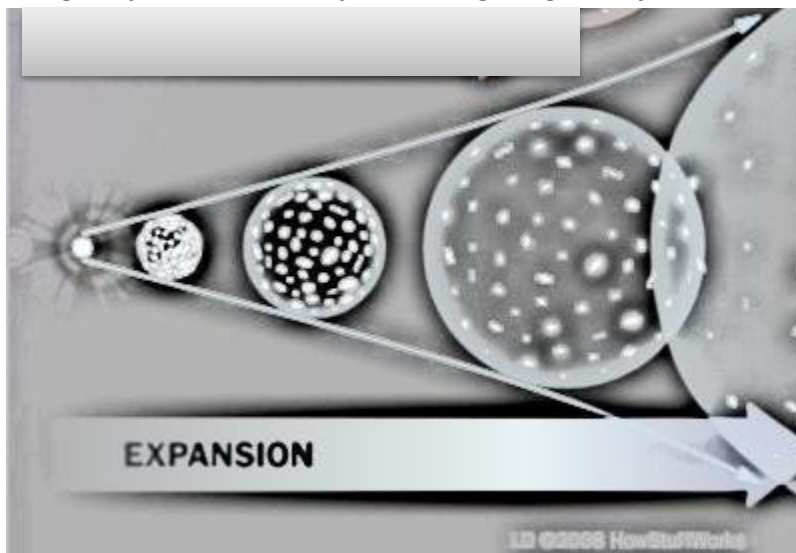


Astronomy Study Guide



Section 1: The Universe

1. Cosmology is the study of _____.
2. Identify the type of cosmology
 - a. The sun is the center of the "Universe" _____
 - b. The Earth is the center of the "Universe" _____
3. The two most abundant gases in the universe are:
 - a. Hydrogen and Lithium
 - b. Helium and Beryllium
 - c. Hydrogen and Helium
 - d. Nitrogen and Oxygen
4. Which gas is the most abundant? _____
5. Using the picture below, explain the Big Bang Theory.



Section 2: Life Cycle of Stars

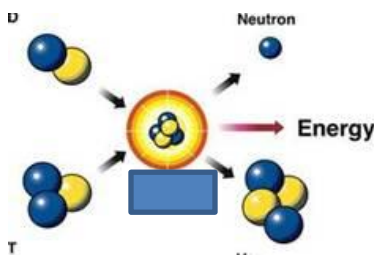
1. Using the word / phrase bank, fill-in the missing information throughout the chart on the next page

nuclear fusion	explosion	massive	fusion
dust	gravity	remains	friction
supernova	gas	dead star	Black Dwarf
supergiant	adds stuff (accretes)	fusion	core of a white dwarf
supernova	most stars belong here	Red Giant	fusion
Pre-Main Sequence	glows		

2. Using the chart on the next page, answer the following questions.

- What is a young star called before fusion begins? _____
- What is a star called after fusion begins? _____
- How is light and heat generated in a protostar? _____
- How is light and heat generated in a pre-main sequence star? _____
- What is the most influential factor in the life and death of a star? _____

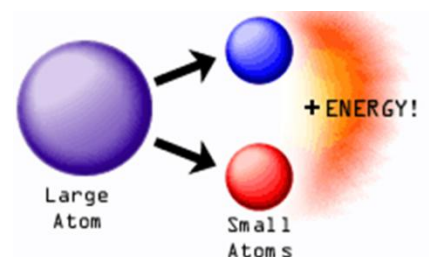
3. The picture shows 2 lighter atoms fusing to make 1 heavier atom. This process, by which stars make their energy, is known as?




- nuclear fission
- nuclear fusion

4. Stars are burning. Is this statement true or false?

5. The picture to the right shows 1 heavy atom splitting to make 2 lighter atoms. This process, by which power plants make their energy, is known as?

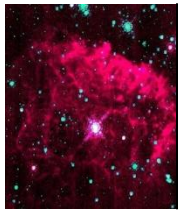




Nebula

Clouds of _____ and _____ .
 The _____ of a _____ .


Gravity pulls gases together causing



Protostar


Area in the center of the nebula that is hot and _____ .
 Only a protostar while it _____ .

Friction continues generating heat, but no more
 matter accretes



_____ Begins, Star Expands and Contracts

Low Mass –



Main Sequence

Very High Mass -

_____ Ends

_____ Ends




Nova
 *

High Mass –
Supergiant






White Dwarf



Supernova
 _____ ,
 outer layers are lost very
 quickly, star is 1million
 times brighter



Neutron Star
 * core of a



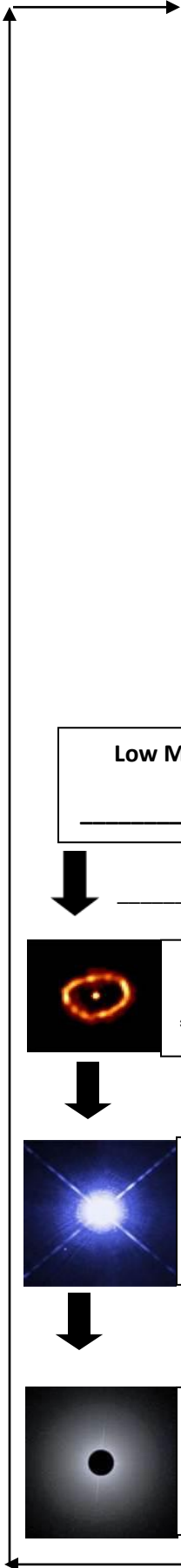


Neutron Star

Collapse Continues

Black Hole
 The core of a star so
 _____ and that has so
 much _____ that light
 cannot escape

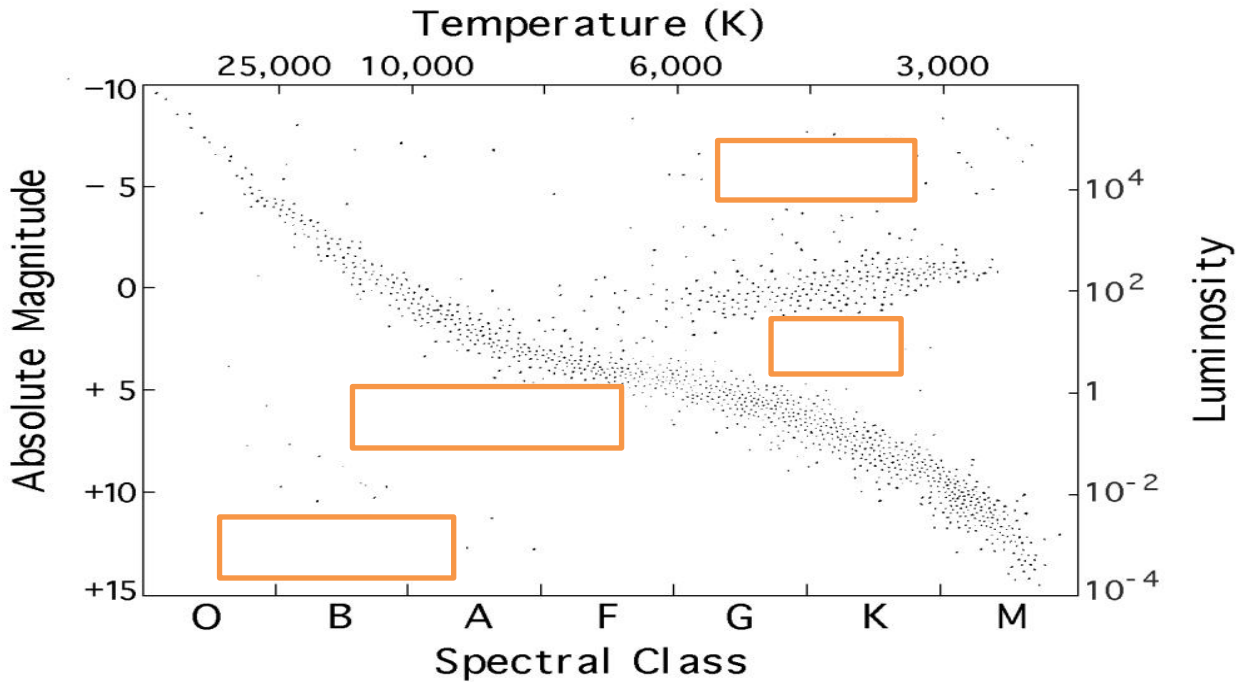
Creates a nebula



Section 3: Hertzsprung-Russell Diagram

1. What type of information can you get from a Hertzsprung-Russell Diagram?
 - a. The age of the star and the surface temperature of the star
 - b. How far through the star's life cycle it is and the surface temperature of the star
 - c. The age of the star and how far through the star's life cycle it is

2. Using the following Hertzsprung-Russell Diagram, answer the questions that follow:



- a. What group of stars would be located at Letter A? _____
- b. What size would stars in the lower left hand corner (D) be? _____
- c. To which group (letter) would the sun belong to? _____ Name the group: _____
- d. A star located at letter A would have a (hot / cool) temperature and (would be / would not be) bright.
- e. How do we know that stars in group A are the furthest along in their life cycle?

- f. Where would a hot star be located on a Hertzsprung-Russell Diagram?

- g. You can tell how old a star is on a Hertzsprung-Russell Diagram.
 - i. True
 - ii. False

3. What is absolute magnitude?
 - a. The brightness of a star as though all stars are the same distance from Earth
 - b. The brightness of a star as we see it from Earth
 - c. The brightness of a star as we see it from space
4. Explain apparent magnitude.
5. If a star is very bright as it appears from Earth, what can you conclude about absolute magnitude and apparent magnitude?
6. How are absolute and apparent magnitude useful to astronomers?

Section 4: The Sun

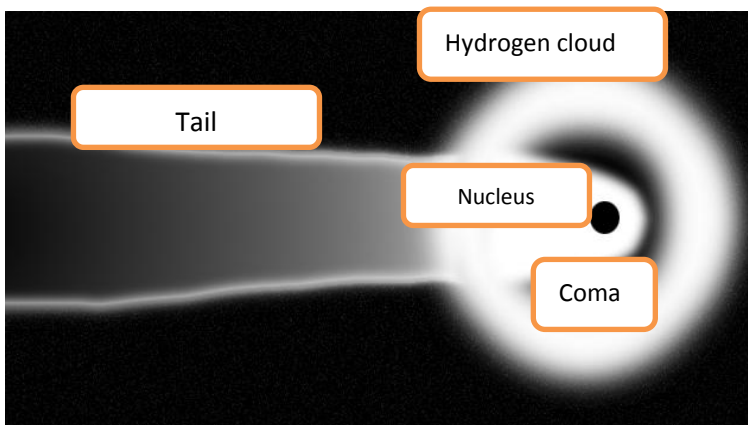
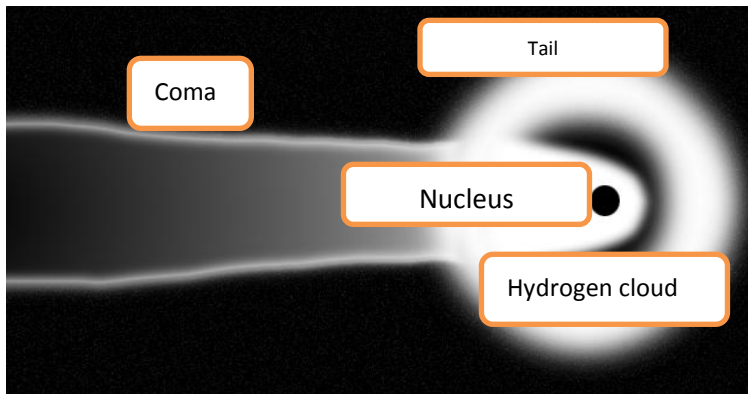
1. How do *granules* move energy from the core of the Sun?
 - a. Hydrogen gas rises and falls in individual pockets which is known as convection
 - b. Hydrogen gas is exerted by explosions in the core
 - c. Oxygen is pushed out from the core of the sun through solar flares
2. What are Solar Flares?
 - a. Holes in the surface of the Sun made by the surface hitting its magnetic field
 - b. High energy portions of the sun that are lost into space by increased nuclear fusion in certain areas
 - c. The outermost layer of the sun.
3. What kind of star is the sun? _____

Section 5: Solar System

1. What is the asteroid belt?
 - a. Area of space between Mars and Jupiter filled with rocky debris.
 - b. The area of space that makes up the outer edge of a black hole
 - c. The area of space where stars begin to form

2. Where is the asteroid belt located?
- a. Between Jupiter and Saturn
 - b. Between the sun and Mercury
 - c. Between Mars and Jupiter
 - d. At the outer edge of a black hole

3. Which drawing is a correctly labeled representation of a comet?



4. Where do comets originate?
- a. Asteroid Belt
 - b. Kuiper Belt
 - c. Nebular Belt
 - d. Planetary Belt

5. What is the difference between a comet and a meteoroid?

6. Fill in the chart with the appropriate information about each object

Meteor	Meteoroid	Meteorite

7. Explain gravity's role in the formation of the solar system. Be specific!

Section 6: Telescopes

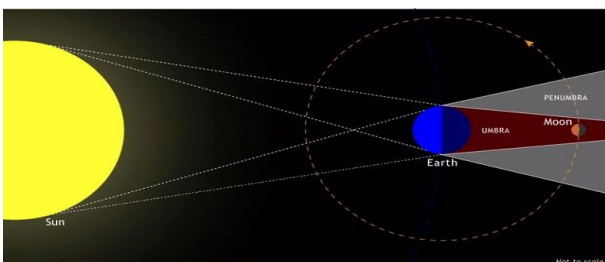
1. Complete the chart on telescopes

Name:		Reflecting		
Type:	Optical telescope		XXXXXXXXXX	XXXXXXXXXX
What does it use to work?				
What do they collect / detect?		Visible light		

2. Of the two optical telescopes, which gives you the clearest image? Why?

3. Explain the importance of the Hubble Space and the Spitzer Space Telescopes with regards to images they send back to Earth.

Section 7: Eclipses



1. What type of eclipse is depicted to the left? Explain how you know.

2. What is the umbra?
 - a. Part of an eclipse; an area where only part of the light is blocked
 - b. Part of an eclipse; an area where light is completely blocked
 - c. Full Shadow
 - d. Partial Shadow
 - e. Both A and C
 - f. Both B and D

3. What is a solar eclipse?
 - a. When the moon gets between Earth and the sun, and the moon casts a shadow over Earth.
 - b. When the Moon passes directly behind the Earth into its umbra

4. What is the penumbra?
 - a. Part of an eclipse; an area where only part of the light is blocked
 - b. Part of an eclipse; an area where light is completely blocked
 - c. Full Shadow
 - d. Partial Shadow
 - e. Both B and C
 - f. Both A and D

5. How does the location and size of the umbra and penumbra change from a lunar to solar eclipse?

Section 8: Planets

1. This planet is the 2nd largest in the solar system. It is the least dense planet. It releases more energy than it receives from the Sun. This planet's rings are made of small ice covered rocks.
 - a. Saturn
 - b. Uranus
 - c. Jupiter

2. This planet appears blue. It has an almost horizontal axis of rotation because of an object impacting it. Its moons are named after characters from Pope and Shakespeare. It is the 3rd largest planet.
 - a. Saturn
 - b. Uranus
 - c. Jupiter

3. This planet has an odd orbit that doesn't clear debris and it lacks a gravitational pull. This planet is actually a dwarf planetoid.
 - a. Mars
 - b. Earth
 - c. Pluto

4. This planet has the largest volcano in the solar system. Its atmosphere contained oxygen that was used to oxidize the surface. It has polar ice caps of frozen carbon dioxide.
 - a. Saturn
 - b. Mercury
 - c. Mars

5. This object has a composition like that of Earth's. It rotates at the same rate as Earth. It has no atmosphere and a very cratered surface. The surface also contains two areas, the Lunar Maria and the Lunar Highlands.
 - a. Venus
 - b. Moon
 - c. Earth

6. This is the largest planet in the solar system. Its cyclonic storm is called the Great Red Spot. It is composed mainly of gas and liquid metallic hydrogen. It has a rocky core 10-15 times the size of Earth. It has small faint rings. It is as large as a planet can be.
 - a. Saturn
 - b. Mercury
 - c. Jupiter

7. Venus has a very (low / high) surface temperature. Explain why.

8. When astronomers talk about Mercury having the greatest temperature extremes, what do they mean?

9. Explain why Mars is no longer considered to be very similar to Earth.

10. What is regolith?