Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pd: \_\_\_\_\_ Ast: \_\_\_\_\_

**STARS & GALAXIES NOTES**

**MEASURING DISTANCES IN SPACE**

1. Due to enormous distances within our Solar System, scientists created a unit of distance called an AU. What is an AU?
2. Due to even greater distances between objects outside the Solar System, even AU’s aren’t big enough. What unit did scientists create to deal with these enormous distances?
3. A \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ light travels in one Earth-year. It is ***NOT*** a measure of \_\_\_\_\_\_\_!
4. How many light-years away is the nearest star (Proxima Centauri)?
5. How many light years away is the other side of our own galaxy (Milky Way)?

**STARS**

1. \_\_\_\_\_\_\_\_\_\_ are massive balls of \_\_\_\_\_ held together by \_\_\_\_\_\_\_\_\_\_ with a core so hot that \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ occurs.
2. Stars are born inside of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, an immense cloud of \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_. \_\_\_\_\_\_\_\_\_\_\_\_ causes particles to gather around areas of higher \_\_\_\_\_\_\_, pulling in more and more particles. Once enough matter has condensed, the \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ are great enough to begin nuclear fusion.
3. \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ occurs under intense heat and pressure. The \_\_\_\_\_\_\_\_\_\_\_\_ of multiple atoms fuse into one atom, releasing a lot of \_\_\_\_\_\_\_\_\_\_\_\_.
4. How are stars classified?
5. How are star classifications represented?
6. How can you tell which stars are hotter/cooler?
7. How do scientists measure how bright a star appears from Earth?
8. Stars that are on the MAIN SEQUENCE fuse \_\_\_\_\_\_\_\_\_\_\_\_ atoms into \_\_\_\_\_\_\_\_\_\_ atoms. About \_\_\_\_\_% of the stars in our universe are on the main sequence. The more \_\_\_\_\_\_\_ a star has, the \_\_\_\_\_\_\_ time it spends on the main sequence. What happens to a star when it stops fusing hydrogen into helium depends on its \_\_\_\_\_\_\_.
9. When LOW MASS stars leave the main sequence, they become a \_\_\_\_\_ \_\_\_\_\_\_\_\_ and fuse \_\_\_\_\_\_\_\_\_\_ atoms into \_\_\_\_\_\_\_\_\_\_ atoms. When the helium runs out, they are not hot enough to fuse the carbon and fusion stops. The star then collapses and becomes a \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_. Over time, the heat energy gradually cools off until the star is just a cold sphere of carbon called a \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_.
10. When HIGH MASS stars leave the main sequence, they are able to fuse heavier and heavier elements in their core as they become a \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Once the core is full of \_\_\_\_\_\_\_\_, it cannot continue fusion any longer. The star collapses and explodes in an event called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. At this point it will either end up as a dense core of neutrons called a \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_, or if it has enough mass, it will collapse into a sphere so massive that its gravity prevents even light from escaping. This is known as a \_\_\_\_\_\_\_ \_\_\_\_\_\_\_.

THE SUN

1. Our Sun is a Class-\_\_\_ Main Sequence Star, otherwise known as a “\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_”.
2. How long is our Sun expected to stay on the main sequence?
3. How far are we through the Sun’s main sequence life cycle?
4. What will happen to our Sun when it stops fusing hydrogen into helium?
5. Where does nuclear fusion occur within the Sun?
6. List the 3 interior layers of the Sun.
7. List the 3 layers of the Sun’s atmosphere.
8. Which layer is “visible” when you look at the Sun?
9. Regions of strong magnetic activity on the Sun’s surface are known as \_\_\_\_\_ \_\_\_\_\_\_\_.
10. Clouds of gas erupting from the surface of the Sun are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
11. \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (CMEs) are bubbles of gas that are ejected from the corona.
12. Charged particles are constantly streaming away from the Sun. This is called the \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_.
13. How did Galileo determine that the Sun is rotating?
14. The Sun has a “differential rotation”, meaning that different parts rotate faster than others. Where does the Sun rotated the fastest?
15. What does the Sun orbit?
16. Where is the Sun located?

GROUPS OF STARS

1. Two stars that orbit each other bound by gravity are known as a \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_.
2. A \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ is a group of stars in “close” proximity to one another.
3. When hundreds of billions of stars are grouped together by gravity, it is called a \_\_\_\_\_\_\_\_\_\_.
4. When we look at the Milky Way Galaxy from Earth, what does it look like?
5. What are the three main types of galaxies that we observe?
6. What type of galaxy is the Milky Way?
7. Astronomers observe that all of the other \_\_\_\_\_\_\_\_\_\_\_\_ are moving \_\_\_\_\_\_\_ from us (and one another). What do they think this means?