** Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Chapter 25 & 26 Notes: Space**

1. Everything that we can see and observe and is known to exist is called the  **.**
2. Universe is still and .
	1. **Hubble’s Law**: says that the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at which a galaxy is moving away is proportional to its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from us.
		1. Galaxies \_\_\_\_\_\_\_\_\_\_ to us are moving away from us .
		2. Galaxies \_\_\_\_\_\_\_\_\_\_\_\_ from us are moving away .
	2. Observations of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ show a shift in their spectra
		1. **Redshift** means the galaxy is moving \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the light waves
		2. **Blueshift** means the galaxy is moving \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ us and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the light waves
3. If galaxies are continually moving away, then if we \_\_\_\_\_\_\_\_\_\_\_\_\_ their movement, it takes us back to a single \_\_\_\_\_\_\_\_\_\_\_\_ in space and time.
	1. The single point is called a **\_\_\_\_\_\_\_\_\_\_ singularity** or **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ singularity**.
	2. Contained all \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ever to exist.
	3. This point expanded rapidly, suddenly, like an explosion. This sudden expansion is called the **B\_\_\_\_\_\_ B\_\_\_\_\_\_\_ Theory**.
		1. H\_\_\_\_\_\_\_\_\_\_\_\_\_ and h\_\_\_\_\_\_\_\_\_\_\_\_\_ atoms formed first as universe cooled
		2. Hydrogen forms into \_\_\_\_\_\_\_\_\_\_\_, and starts fusion
	4. **Dark Energy** is the force that is causing our universe to e\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Galaxy: a huge group of individual \_\_\_\_\_\_\_\_, star systems, star clusters, \_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_ bound together by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	1. We live in the M\_\_\_\_\_\_\_\_ W\_\_\_\_\_\_ Galaxy
		1. \_\_\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_ Billion stars in our galaxy
		2. Diameter is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ light years
		3. Takes \_\_\_\_\_\_\_\_ million years for our sun to complete \_\_\_\_ orbit
		4. We are a \_\_\_\_\_\_\_\_-spiral galaxy



 Side View of MWG Top View of MWG

* 1. Galaxy classification is by shape, there are 4 types.
		1. Spiral, Barred-Spiral, Elliptical, and Irregular

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| **4 Types of Galaxies** |
| Spiral | Elliptical |
| Barred-Spiral | Irregular |

1. Star Life Cycle:
	1. Born in a **Nebula** (Hydrogen \_\_\_\_\_\_ and \_\_\_\_\_\_\_ cloud)
		1. Gravity pulls it together. The gas gets so compressed that it \_\_\_\_\_\_\_\_\_\_\_, this is called a **p\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
		2. Gravity keeps compressing until Hydrogen atoms are \_\_\_\_\_\_\_\_\_\_\_\_ into H\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
		3. A star is formed when n\_\_\_\_\_\_\_\_\_\_\_\_\_ f\_\_\_\_\_\_\_\_\_\_\_\_\_ begins.
	2. Adult Star- different s\_\_\_\_\_\_\_\_, temp, c\_\_\_\_\_\_\_\_\_ and luminosities.
	3. A star dies when run out of \_\_\_\_\_\_\_\_\_ (run out of atoms to fuse, can’t fuse past Iron)
		1. If they are \_\_\_\_ solar masses or less, die as **white dwarf**
		2. If they are \_\_\_\_\_\_\_\_\_\_\_ solar masses, die as **neutron star**
		3. If they are greater than \_\_\_\_\_ solar masses die as **black hole**
2. Solar System Formation- **The Nebular Theory**:
	1. Star is born from \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ coming together
	2. Most of the mass (99%) goes into the center to form the \_\_\_\_\_\_
	3. The left over matter \_\_\_\_\_\_\_\_\_\_\_\_\_ together around the star

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| Formation of Our Solar System |
| Nebula comes together | Flattens into disk | Protostar is formed, planetessimals form |
| Protoplanets accrete &solar winds blow less dense material out | Planets finish morning with 8 planets. Still left over material |

1. Facts about planets in our solar system:

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| *Mercury* |
| Size: |  |
| Location: |  |
| Orbital plane |  |
| Atmosphere: |  |
| Primary Elements: |  |
| Planet made of: |  |

|  |
| --- |
| *Venus* |
| Size: |  |
| Location: |  |
| Orbital plane |  |
| Atmosphere: |  |
| Primary Elements: |  |
| Planet made of: |  |
| *Earth* |
| Size: |  |
| Location: |  |
| Orbital plane |  |
| Atmosphere: |  |
| Primary Elements: |  |
| Planet made of: |  |

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| --- |
| *Mars* |
| Size: |  |
| Location: |  |
| Orbital plane |  |
| Atmosphere: |  |
| Primary Elements: |  |
| Planet made of: |  |

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| *Jupiter* |
| Size: |  |
| Location: |  |
| Orbital plane |  |
| Atmosphere: |  |
| Primary Elements: |  |
| Planets made of: |  |

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| *Saturn* |
| Size: |  |
| Location: |  |
| Orbital plane |  |
| Atmosphere: |  |
| Primary Elements: |  |
| Planets made of: |  |

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| *Uranus* |
| Size: |  |
| Location: |  |
| Orbital plane |  |
| Atmosphere: |  |
| Primary Elements: |  |
| Planets made of: |  |

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| *Neptune* |
| Size: |  |
| Location: |  |
| Orbital plane |  |
| Atmosphere: |  |
| Primary Elements: |  |
| Planets made of: |  |

1. Other objects in our solar system:
	1. **Comets**: dusty pieces of \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ that partially vaporize when they pass near the sun.
	2. **Meteoroids**: pieces of \_\_\_\_\_\_\_\_\_, usually less than a few hundred \_\_\_\_\_\_\_\_\_ in size, that travel through the solar system.
		1. **Meteor**: when its falling through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
		2. **Meteorite**: when it’s on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	3. **Asteroids**: small, rocky solar-system bodies, most of which are found orbiting the sun in a region between M\_\_\_\_\_\_\_\_\_\_ and J\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
		1. These unaltered remnants show us the \_\_\_\_\_\_ of the solar system and what it originally was \_\_\_\_\_\_\_\_\_ from.

**Standards to know for the test:**

**HIEI:** Classify bodies in Solar System (properties & composition)

 Describe attributes of our galaxy & evidence of multiple Galaxies.

 (Sun, rock & gas planets, asteroids, comets, moons)

 (Size, location, orbital path/plane, atmosphere, elements, % comp)

 (Relative stellar mass, galaxy size/shape)

**H2E3**: Describe how the universe, galaxies, stars, and planets evolve over time.

 (Big Bang, expanding still, H and He formed 1st)

 (Accretion, star life cycle, fusion cycle)

 (Solar system formation, meteor evidence)