Chapter 2 Beyond the Solar System

8th Grade  Science  Klinger & Sherman

Key Content/Modeling

Assignment 1: Use Packet #3 for May to complete Lessons 2.1, 2.2, 2.3, 2.4, and 2.5 in the Science section, pages 112-128.

Assignment 2: Read Are We Made of Star Stuff? and follow the directions to complete the probe.

Assignment 3: Complete a Frayer model for each of the vocabulary words by following the instructions in the You Try section below.

Assignment 4: Read the selection Astronomy, take Cornell notes or Mark the Text, and answer the questions.

You Try: Create a Frayer model for each of the following words. Identify some of the characteristics and attributes of the word, give some examples, illustrate the word, and use the word correctly in a sentence.

- star
- constellation
- astrology
- nuclear fusion
- particle accelerator
- Red dwarf
- Red giant
- supergiant
- nebula
- star system
- star cluster
- open cluster
- globular cluster

Show me what you know (Proof of learning)

Email your teacher your completed work in whatever format you are comfortable with. We are counting students that are engaged in doing their work or not.

Self-Assessment: What other type of system could be used to classify stars? Design a system to classify stars and explain how the system works.

Science Standard: DCI ESS1.A-Earth and its solar system are part of the Milky Galaxy, which is one of many galaxies in the universe. (MS-ESS1-2)

What am I learning?

Why is astrology not a science?

What is nuclear fusion and why is it important to a star?

How are stars classified?

Where and how are stars formed?

How do I know I learned?

Describe why astrology does not qualify as a real science.

Explain how nuclear fusion creates energy in a star.

Describe the properties that are used to classify stars.

Identify where stars are formed and how they are formed.

Extra Learning Opportunities: How Big is the Universe? Use the following link to go to the web page and explore the interactive slide show!

https://www.cfa.harvard.edu/seuforum/howfar/index.html
A newspaper article reported that astronomers claim people are made of stardust. What does this mean? Circle the answer that best matches what you think “being made of stardust” means.

A “Being made of stardust” is not intended to be taken literally. It means that nobody really knows where atoms come from, any more than we know what “stardust” is.

B The stars produce dust that falls to earth. Over millions of years the dust becomes incorporated into living cells.

C Most of the elements that make up our body were formed inside stars or during supernova explosions.

D Our Sun is a star and since humans eat plants or eat animals that eat plants, we are made mostly of stuff that came from the Sun.

Explain your thinking and describe any evidence that supports your answer. What does “being made of stardust” mean to you?
Think of a clear summer night. Picture yourself standing outdoors gazing at the sky filled with tiny lights glimmering in the distance. Imagine that many generations ago someone standing in the same spot as you gazed up into the sky and saw those same glimmering lights. Imagine that someone, generations from now, may stand in the same spot once more and see the same lights. People have been fascinated by the night sky for thousands of years and probably will continue to be for thousands of years to come. From this interest has grown the science of astronomy.

Just what is astronomy? Very simply stated it is the study of space. It is not, however, a simple science. It includes the study of stars, planets, and all other objects in space. Astronomers (scientists who specialize in astronomy) study how various space objects are formed, what they are made of, and how they move.

Astronomy is not a new science. Stars and other space objects have intrigued people for thousands of years. As early as 4000 B.C., people noticed that the sun and moon moved in regular patterns. The Maya Indians of Central America based their religion on sky observations. The Chinese kept records of stars, comets, sunspots, meteorites, and novas as early as 350 B.C.E. Stonehenge, built in Great Britain, is believed to have been used as an observatory to track the movement of the sun and the moon.

Astronomy is still a young science, with many questions still unanswered and many frontiers still unexplored. Astronomers are constantly striving to learn more and to explore further into space. Modern scientists are limited only by their imaginations, financial support and technology as they continue to seek new knowledge.

What is the universe? It may be defined as simply everything that exists. The concept behind the definition is certainly not simple. Some find it hard to imagine that everything that exists, from the smallest atomic particle to the largest group of galaxies, is a part of the universe.

If we believe that definition is true, then the universe must be amazingly huge! Scientists are not exactly sure about the size of the universe but have recently estimated it to be over 90 billion light years in diameter. This measurement assumes that we are near the middle of the universe. Many scientists call this the observable universe and theorize that it is still much larger. Some scientists believe that the universe has no boundaries, no edges and no limits. Others believe that we may be just one of many universes. This is an idea that is difficult for most to understand. Perhaps as scientists continue to make new discoveries, they will be able to help us understand our vast universe.

What are some of the things that make up the universe? Astronomers have discovered several objects that are included in the vast area known as the universe. Among them are stars, planets, and their moons which form solar systems. In and between these astronomers have identified comets, asteroids, meteors, black holes, dark matter, supernova and quasars. There are groups of solar systems which form galaxies, which are titanic swarms of tens of millions to trillions of stars. Between the stars, there can be vast interstellar clouds of gas and dust. Galaxies are the building blocks of the universe. Groups of galaxies form clusters and large groups of galaxy clusters form super clusters.

The universe is an interesting and intriguing natural phenomenon that will continue to fascinate and astound human kind for many generations to come.
DIRECTIONS: Answer the questions below with complete sentences.

1. What is astronomy?

2. Why might it NOT be considered a simple science?

3. What is an astronomer?

4. What do you believe led to the development of astronomy?

5. Why might it be said that astronomy is a young science?

6. What, other than their imaginations, limits astronomers in their search for new information?

7. What is the universe?

8. Why is the concept behind the definition of the universe not simple?

9. Why is it hard for most people to understand something that has no limits or boundaries?

10. What are three space objects which make up part of the universe?

11. What are groups of solar systems called?

12. Which space objects in the universe can you see, without any instruments, from earth?