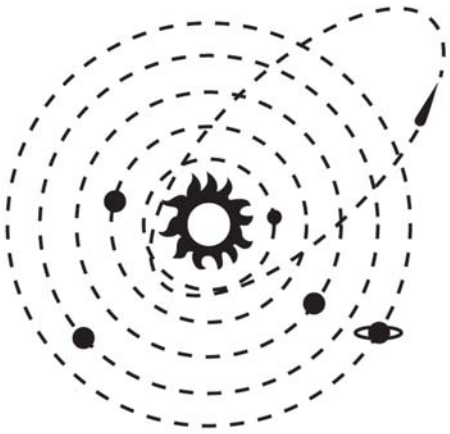
Name _____



Exploring the Universe: What is Cosmology?

Cosmology is a fascinating branch of science that helps us understand the vastness of the universe, its origins, and its future. It delves into the mysteries of space, time, and the cosmos. In this reading passage, we will explore what cosmology is and how scientists study the universe.

Cosmology is the scientific study of the universe's origin, evolution, and eventual fate. It seeks to answer some of the most profound questions about our existence, such as how the universe began, what it's made of, and how it will end. To understand cosmology better, let's break down some of its key components.

- **The Big Bang Theory:** Cosmologists believe that the universe began with a massive explosion known as the Big Bang. This explosion happened about 13.8 billion years ago, and it marked the birth of our universe. Imagine the universe as a rapidly expanding balloon; it started as an incredibly tiny, hot, and dense point, and it has been expanding ever since.
- **Studying the Universe:** Cosmologists use powerful telescopes and sophisticated instruments to observe the cosmos. Telescopes, like the Hubble Space Telescope, capture images of distant galaxies, stars, and planets. These observations provide valuable clues about the universe's past and present.
- **Dark Matter and Dark Energy:** Cosmologists have discovered that the universe is made up of not only visible matter but also dark matter and dark energy. Dark matter cannot be seen with telescopes, but its presence is detected through its gravitational effects on visible matter. Dark energy, on the other hand, is a mysterious force that is causing the universe's expansion to accelerate.
- **Cosmic Microwave Background**: One of the most important pieces of evidence for the Big Bang theory is the cosmic microwave background radiation. This faint glow of radiation fills the universe and is a remnant of the early, hot universe. It provides strong support for the idea that the universe had a fiery beginning.
- **The Expanding Universe:** The universe is constantly expanding, which means galaxies are moving away from each other. Imagine dots on an inflating balloon; as it expands, the dots move farther apart. The discovery of the expanding universe was a significant breakthrough in cosmology.