

UNV1: UNV 1: What is life? Where do we come from? Our planet and the solar system

1.1 Are We Alone in the Universe?

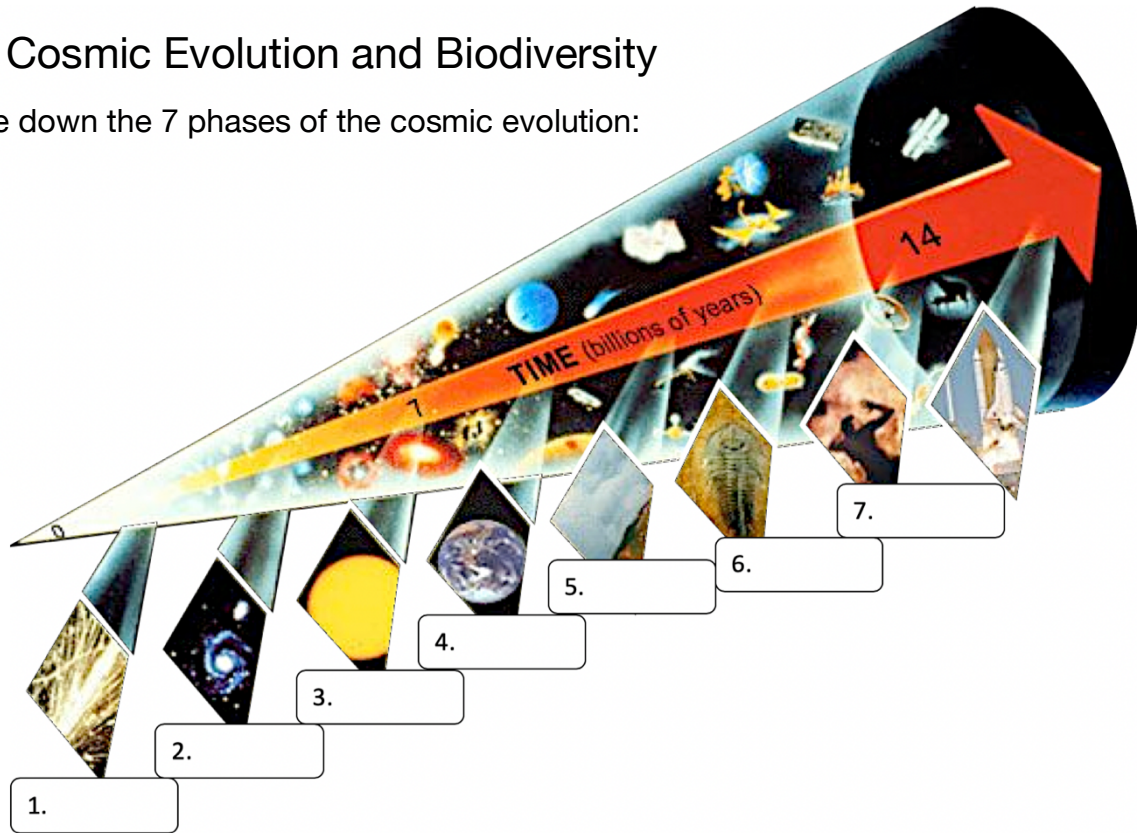
Do you think we are “alone” in the Universe? Why or why not?

What does the Drake equation attempt to calculate?

What new things do you expect to learn in this module?

1.2 Cosmic Evolution and Biodiversity

Write down the 7 phases of the cosmic evolution:



In each of the 7 phases, what was formed that is mentioned in the video?

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

How did life evolved on Earth, as explained in the video? In what form the life most likely started?



THINK:

What do you think "life" is?

Do you think the similar evolution could happen elsewhere in the solar system? In other parts of the Universe? Why or why not?

1.3 The Sun and the Solar System

Fill in the following information, based on what you read on the website provided on SUCourse.

The Sun: Fact Sheet

Radius	_____ km
Mass	_____ times Earth's mass
Age	_____ years
Composition	Mostly _____ and some _____
Temperature at its core	_____ C°
Temperature at surface	_____ C°
The energy source	"Thermonuclear fusion" at its core, in which _____ atoms fuse to make _____, releasing great amount of energy

The inner solar system contains:

The outer solar system contains:

What are the criteria for a celestial body to be called a planet? (established in 2006 by the International Astronomical Union)

What defines the “edge” of the solar system?



THINK:

How would you describe the motions of these solar system constituents with respect to each other? (for example, Earth and the Moon, Earth and Mars, Jupiter and the Sun, etc.)

1.4 Describing Motion

Complete the table below, following the video:

Terms for Describing Motion

Quantity	Definition	Vector/ Scalar	SI Unit
Position (\vec{x})			
Distance (x)			
Displacement ($\Delta\vec{x}$)			
Speed (v)			
Velocity (\vec{v})			
Acceleration (\vec{a})			

Velocity can be defined as: $\vec{v} = \Delta\vec{x}/\Delta t$ or $\vec{v} = d\vec{x}/dt$. What is the difference?

Fill in the equations:

$$\mathbf{v}(t) = \boxed{} \rightarrow \mathbf{x}(t) = \int \boxed{}$$
$$\mathbf{a}(t) = \boxed{} \rightarrow \mathbf{v}(t) = \int \boxed{}$$



THINK:

When do you need to have the initial conditions, $\mathbf{x}(0)$, $\mathbf{v}(0)$, or $\mathbf{a}(0)$?