

# Astronomy Ranking Task: Star Evolution & Lookback Time

## Exercise #1

**Description:** Imagine that the four stars listed below all became Main Sequence (MS) stars at exactly the same time 10 billion years ago but in different locations of the universe.

**Cosmo Star** is an O spectral class star with a MS lifetime of 3 million years. Its life will eventually end as a SN type II and become a black hole. Cosmo Star is located in a galaxy 10 billion light years (ly) from Earth.

**Ollie Star** is a K spectral class star with a MS lifetime of 30 billion years. Its life will eventually end as a slowly cooling white dwarf. Ollie Star is located in the MW at a distance of 10,000 ly from Earth.

**Sullivan Star** is an F spectral class star that is part of a binary star system. It has a MS lifetime of 5 billion years. Its life will eventually end in a SN type I that completely destroys Sullivan Star. Sullivan Star is located in a galaxy 6 billion ly from Earth.

**Sliver Star** is a B spectral class star with a MS lifetime of 20 million years. Its life will eventually end as a SN type II and become a neutron star. Sliver is located in the MW at a distance of 40,000 ly from Earth.

**A. Ranking Instructions:** Rank the stars (from first to last) based on when they became main sequence stars.

Ranking Order: First 1  2  3  4  Last

Or, all the stars became main sequence stars at the same time.  (indicate with check mark).

Carefully explain your reasoning for ranking this way:

**B. Ranking Instructions:** Rank the stars (from first to last) based on when they reach(ed) their final end state.

Ranking Order: First 1  2  3  4  Last

Or, all the stars reach(ed) their final end state at the same time.  (indicate with check mark).

Carefully explain your reasoning for ranking this way:

# Astronomy Ranking Task Star Evolution Lookback Time

**L Cohen**



**Astronomy Ranking Task Star Evolution Lookback Time:**

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