

## Star Facts – A Basic Scientific Perspective

- Stars are cosmic energy engines that produce heat, light, ultraviolet rays, x-rays, and other forms of radiation
- They are composed largely of gas and plasma, a superheated state of matter composed of subatomic particles.
- Though the most familiar star, our own sun, stands alone, about three of every four stars exist as part of a **binary system** containing two mutually orbiting stars.
- on a clear, dark night Earth's sky reveals only about 3,000 stars to the naked eye.
- Their brightness is a factor of how much energy they put out, which is called their **luminosity**
- Hot stars are white or blue, whereas cooler stars appear to have orange or red hues.
- Stars may occur in many sizes, which are classified in a range from **dwarfs** to **supergiants**.
- Hydrogen is the primary building block of stars.
- The gas circles through space in cosmic dust clouds called **nebulae**.
- Young stars are called **protostars**.
- Main sequence stars like our own sun exist in a state of nuclear fusion during which they will emit energy for billions of years by converting hydrogen to helium.
- Stars evolve over billions of years.
- The larger a star's mass, the shorter its lifespan will be
- As stars move toward the end of their lives much of their hydrogen has been converted to helium
- Helium sinks to the star's core and raises the star's temperature—causing its outer shell to expand. These large, swelling stars are known as **red giants**.
- The red giant phase is actually a prelude to a star shedding its outer layers and becoming a small, dense body called a **white dwarf**
- White dwarfs cool for billions of years, until they eventually go dark and produce no energy. At this point, which scientists have yet to observe, such stars become known as **black dwarfs**.
- A few stars eschew this evolutionary path and instead go out with a bang—detonating as **supernovae**.
- These violent explosions leave behind a small core that may become a **neutron star** or even, if the remnant is large enough, a **black hole**.