

Starry Lives, Starry Skies

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Many of the stages in the life stories of the stars can be observed in the night sky -- some with just your eyes, some with binoculars or a telescope. On our website, you can find examples using our [Your Sky Tonight star chart](#) and request a picture from our [Internet Telescope](#).

Step-by-step Instructions:

In this activity, a student or a group of students is asked to find an example of each of the six stages in the life of a star in the sky.

1. First ask students to read the essay on [Lives of the Stars](#) under “Astronomy Topics” on this site.

2. Have them make a list of the first six stages on the life of a star from the essay:

1. prenatal
2. birth
3. adulthood
4. crisis
5. old age
6. death

and explain briefly what is happening during that stage.

3. Have them make an observing scrapbook or log book with a page for each stage. Now give them the assignment of identifying 1 to 3 examples of each stage in the sky.

Sites for discovering information about different kinds of celestial objects include:

- The Messier Catalog organized by type of object: <http://www.seds.org/messier/objects.html>
- The Hubble Space Telescope pictures, organized by type of object: <http://hubblesite.org/newscenter/archive/browse/>
- The National Observatory Image Gallery: http://www.noao.edu/image_gallery/
- The STARS site by James Kaler with information on the brightest stars (sometimes a bit technical): <http://www.astro.uiuc.edu/~kaler/sow/>

The handout sheet has examples of objects in each stage, but it would be good for students to use the Web or some astronomy books to find examples for themselves.

4. Have them make a star map of the location of one object for each stage, using the [Your Sky Tonight star chart](#). Most sky objects are not visible all year long; students should determine from the chart whether or not the object they are interested in is visible tonight or what month it will be visible in their sky.

5. If the object is visible in the night sky from the U.S., students can request a photo from our [Internet Telescope](#). They can also see if there is a picture on our [Astrophoto Gallery](#); if not, they

could try to find a photo in one of the web galleries in section 3 (above) and add them to their scrapbook or log book.

6. How many stages could they illustrate with an object in the sky tonight?

Then, each group or student might be assigned one particularly interesting sky object to research in more depth and fit into the grand sequence of star lives.

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Seeing in the Dark: Starry Lives, Starry Skies Activity

HANDOUT: Stages in a Star's Life: Objects to Observe

M numbers refer to the Messier Catalog; NGC stands for New Galactic Catalog -- both are compilations of fuzzy objects in the sky -- nebulae, star clusters, and galaxies.

- 1. Prenatal** -- a collapsing clump of gas and dust starts toward becoming a star
 - The Orion Nebula (M42)
 - The Rosette Nebula (NGC 2237)
 - The Trifid Nebula (M20)
 - The Cone Nebula (NGC 2264)
 - The Eagle Nebula (M16)
- 2. Birth** -- when fusion begins and the star stops collapsing; many stars are born in star clusters
 - Star Cluster in the Center of the Rosette (NGC 2244)
 - The Pleiades (M45)
 - The Wild Duck Cluster (M11)
- 3. Adulthood** -- the long period when nuclear fusion allows a star to shine stably
 - The Sun
 - Alpha Centauri (the nearest star to the Sun)
 - Vega
 - M13 Globular Cluster
- 4. Crisis** -- when a star swells up into a red giant and loses some of its mass
 - Betelgeuse
 - Antares
 - Aldebaran
- 5. Old Age** -- low-mass stars produce a planetary nebula, and high-mass stars make heavier elements using nuclear fusion
 - The Ring Nebula (planetary nebula M57)
 - The Helix Nebula (planetary nebula NGC 7293)
 - The Dumbbell Nebula (planetary nebula M27)\
 - Rigel (a blue supergiant massive star)
 - Deneb (a blue supergiant massive star)
- 6. Death** -- low-mass stars collapse to become white dwarfs, high-mass stars explode as a supernova
 - Sirius B (the white dwarf companion of Sirius; Sirius is easy to see with the naked eye, the companion requires a serious telescope)
 - The Crab Nebula (supernova remnant M1)
 - The Veil Nebula (supernova remnant NGC 6960 & 6992)