

From Birth to Burnout: Learning about the Life Cycle of a Star

Purpose

The purpose of these activities is to introduce students to stars and their life cycle.

Students will be able to

1. Define important vocabulary related to the life cycle of stars.
2. Summarize the processes of creation and stages of development of stars, from birth to burnout, noting different types of stars.

Important Vocabulary (key terms in bold)

star	nebulae	galaxy	spiral
Milky Way	constellation	Orion	dwarf
protostar	hydrogen	helium	fusion
supernova	Sun	cluster	black hole
neutron star	barycenter	binary star system	pulsar
luminosity	telescope	planetarium	

Learning about Stars

Students fill in a KWL chart about stars, during a teacher-led lecture/discussion.

(** See below for printable activity sheet.)

Super Stars

Students take notes during a lecture/discussion about the nature of stars. Alternatively (or in addition to the lecture), students can read about stars online at the Enchanted Learning website

(<http://www.enchantedlearning.com/subjects/astronomy/stars/index.shtml>). (The teacher can make printed copies of the information at this site for the students, if computer access is a problem.)

A Star is Born

Students view the movie “Lifecycle of a Star” online at the BrainPop website (<http://www.brainpop.com>). Following the movie, students complete a study guide (from <http://sciencespot.net/>) that summarizes some main points. This activity can be completed individually, in small groups, or as a whole class.

(** See below for printable activity sheet.)

Defining the Stars

Students write out definitions of selected vocabulary from a provided list (see above). Students use dictionaries, class texts, and/or other reference materials to clearly define each vocabulary word.

KWL CHART

Stars

<i>Know</i>	<i>Want to learn</i>	<i>Learned</i>

Name _____

Lifecycle of a Star

A BrainPop.com Movie Study Guide

DIRECTIONS: Fill in the blanks below, using terms given in the word bank below.

WORD BANK

10	100	1000	Billions
Black	Black hole	Brown	Cepheid
Collapse	Contracts	Core	Dense
Dust	Elements	Energy	Expands
Gas	Gravity	Heat	Helium
Hydrogen	Light	Main sequence	Mass
Million	Neutron	Nuclear Fusion	Pressure
Protostar	Pulsars	Red giant	Stars
Sun	Supernova	Surface	White

1. Stars change during their lifetime, which can be _____ of years long. They start out as diffuse clouds of _____ and _____ drifting through space. _____ pulls the clouds together causing clumps to form. If the clump is large enough, the _____ caused by gravity inside a _____ begins to generate _____.

2. The heat and pressure builds until _____ reactions begin to take place inside the core. Gravity pulls _____ atoms together, smashing and fusing them into heavier _____ atoms. This process generates an enormous amount of _____ and the star ignites entering its _____.

3. Our _____ is a main sequence star about halfway through its _____ billion year long main sequence. Eventually our sun will use up all of its hydrogen and the _____ will be so hot the star will expand to many times its current size to become a _____.

4. A red giant star has a _____ that has cooled and glows red. It burns helium and fuses it into heavier _____. Since these reactions are not as powerful as burning hydrogen, the star starts to _____ after about 10 _____ years.

5. What happens after this point depends on the _____ of the star. A star the size of our sun will enter its _____ phase, which means it _____ and _____ and it loses its outer layers in the process. The star's mass is lost until it collapses into a _____ dwarf, which will lose energy and become a _____ or _____ dwarf.

6. Stars bigger than our sun will collapse so quickly they explode into a _____. New _____ can form from the gas and dust left from the explosion. The core that is leftover after a supernova may form a _____ star. Some neutron stars, called _____, spin rapidly and give off pulses of radio waves.

7. If the leftover core was above a certain mass, it will continue to collapse in on itself and form a _____ area called a singularity or _____. Its gravity is so powerful that nothing within its range can escape it - not even _____!

8. Try the Movie Quiz to find the answers for each question.

How do clusters of stars form?

Where is our sun in its life cycle?

How many stars make up a globular cluster?

How long does a star remain a main sequence star?

What are the phases of a star's life cycle in the proper order?

What is a supernova?

What does a supernova become?

What gases make up a main sequence star?
