

ASTRONOMY WEBQUEST..... EXPLORE THE UNIVERSE



Use the suggested websites to answer the following questions.

General Astronomy

<http://starchild.gsfc.nasa.gov/docs/StarChild/questions/question19.html>

What is a light year?

It's a unit of distance. It's the distance light can travel in one year.

What is a parsec?

3.26 light years

What is an astronomical unit? This is the distance between the Earth and the Sun (150, 000, 000 kilometers)



Stars <http://library.thinkquest.org/26220/stars/formation.html>

http://burro.astr.cwru.edu/stu/stars_birth.html

<http://seds.org/messier/glob.html>

What is a nebula?

A cloud of dust and gas

How are stars born?

Stars are born in a nebula (interstellar clouds of dust and gas)

What happens to stars as they age?

These young stars undergo further collapse, forming main sequence stars. 90% of a stars life remains in the main sequence which is where the star burns only hydrogen.

Stars expand as they grow old.

What are red giants?

A red giant is a relatively old star whose diameter is about 100 times bigger than it was originally, and had become cooler (the surface temperature is under 6,500 K). They are frequently orange in color.

What is a white dwarf?

A white dwarf is a small, very dense, hot star that is made mostly of carbon. These remain after the red giant star loses its outer layer.

What is a Globular Cluster?

Globular clusters are gravitationally bound concentrations of approximately ten thousand to one million stars

What is the relationship between Globular Clusters and the Milky Way?

Globular clusters make up the Milky Way.

Lifecycle of a Star

<http://www.enchantedlearning.com/subjects/astronomy/stars/lifecycle/>

<http://btc.montana.edu/ceres/html/LifeCycle/starsbackground.htm>

http://www.windows.ucar.edu/tour/link=/the_universe/Nebula.html

http://www.windows.ucar.edu/tour/link=/the_universe/Strange.html

http://www.windows.ucar.edu/tour/link=/the_universe/Galaxy.html

<http://outreach.atnf.csiro.au/education/everyone/pulsars/>



Stars and planets are made from gases in a __ nebular (clouds of gas)____.

The Milky Way Galaxy is approximately 100,000 or 150,000 light years across.

How much longer will our Sun last? 5 billion years

Lifetimes of stars range from 10,000 to 100,000 years.

Our star orbits the centre of our galaxy about once every _____ years.

A teaspoon of material from a neutron star can weigh about _____.

Stars are made mainly from the gases __Helium____ and __Hydrogen____.

Describe the stages of a star's life cycle in the correct order.

Sun-like Stars (Mass under 1.5 times the mass of the Sun) --> Red Giant --> Planetary Nebula --> White Dwarf --> Black Dwarf

Huge Stars (Mass between 1.5 to 3 times the mass of the Sun) --> Red SuperGiant --> Supernova --> Neutron Star

Giant Stars (Mass over 3 times the mass of the Sun) --> Red SuperGiant --> Supernova --> Black Hole

What is a supernova?

Stars don't last forever. Occasionally, a star bigger than our Sun will end its life in a huge explosion, called a **supernova**.

What are the possible end-products of a supernova?

Formation of new stars or a blackhole

What is a pulsar?

This type of neutron star is called a **pulsar**...**Pulsars** are detected by their rapidly repeating radio signals beamed at Earth from those charged particles trapped in the magnetic field...

How is a pulsar formed?

A pulsar is a [neutron star](#) which emits beams of radiation that sweep through the earth's line of sight. Like a [black hole](#), it is an endpoint to stellar evolution. The "pulses" of high-energy [radiation](#) we see from a pulsar are due to a misalignment of the neutron star's rotation axis and its magnetic axis. Pulsars pulse because the [rotation](#) of the neutron star causes the radiation generated within the magnetic field to sweep in and out of our line of sight with a regular period.

Some neutron stars -- such as the Crab -- emit radio waves, light, and other forms of radiation that appear to pulse on and off like a lighthouse beacon. Called pulsars, they don't really turn radio waves on and off - - it just appears that way to observers on Earth because the star is spinning. Astronomers pick up the radio waves only when the pulsar's beam sweeps across the Earth.

Pulsars possess a powerful magnetic field that traps and accelerates charged particles, and shoots them through space as radio waves. Their rapid rotation makes them powerful electric generators, capable of accelerating charged particles to energies of millions of volts. The Crab, the youngest and most energetic pulsar, produces enough energy to power the nebula and make it expand. The real difference between a neutron star and a pulsar is that a pulsar has a magnetic field that is misaligned with the rotation axis -- being tilted at an angle of about 30 degrees to the rotation poles.

A pulsar's energy output lights up and expands the nebula around it. This action robs energy from the pulsar's rotation, so that it spins slower over time. This "spin-down" rate is a tiny percentage per year, so that it will take about 10,000 years for the pulsar to slow to half its current rotation speed. As time progresses, the Crab's pulses will become less intense, and its X-ray emissions eventually will end. The nebula itself will disappear after only a few thousands years. Eventually only the radio pulsar, beaming every few seconds, will remain.

Universe http://starchild.gsfc.nasa.gov/docs/StarChild/universe_level2/universe.html

What is a black hole?

Black holes are extremely compact space objects that were once massive stars which collapsed inward due to the force there gravity.

Quasar is short for...

Quasi-stellar

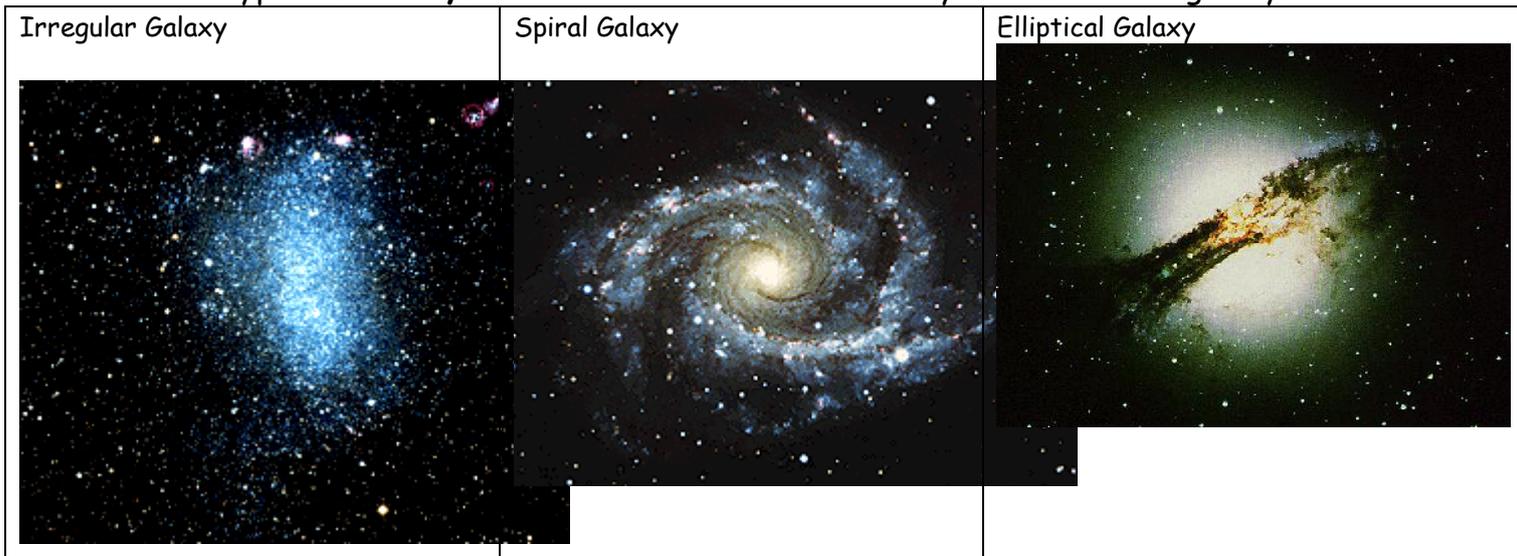
How much energy do quasars give off?

Quasars give off more energy than 100 galaxies combined

What gives a star its light?

A star is a brilliantly glowing sphere of hot gas whose [energy](#) is produced by an internal [nuclear fusion](#) process

Sketch 3 types of **Galaxy**. Indicate which one most closely resembles our galaxy.



Milky Way Galaxy

<http://curious.astro.cornell.edu/milkyway.php#questions>

http://www.efn.org/~jack_v/Universe.html

<http://cass.ucsd.edu/public/tutorial/mw.html>

<http://science.howstuffworks.com/dictionary/astronomy-terms/milky-way.htm>

Describe our Galaxy (The Milky Way Galaxy) and its structure.

What is the Earth's place in our Galaxy?

We live on the third planet from the sun at a distance of 8.3 light minutes (150 million kilometres or 93 million miles)

How many stars make up the Milky Way Galaxy?

250 billion stars

How old is our galaxy?

13-15 billion years old

What shape is the Milky Way?

Spiral Galaxy

Describe the Milky Way and our galactic neighborhood.

Sister Galaxy: The largest galaxy in our group is called the Andromeda Spiral. A large spiral similar to the Milky Way. It is about 2.3 million light years from Earth and contains about 400 billion stars.

Closest Star: Alpha Proxima is our nearest neighboring star: 4.3 light years away.

What role does gravity play in our galaxy and universe?

Laws of Motion and the movement of planets/satellites

http://spaceplace.nasa.gov/en/kids/phonedrmarc/2002_july.shtml

Describe the motion of our planets (Newton).

Read the following background articles on how the universe began, and how galaxies merge and collide.

http://www.space.com/scienceastronomy/051212_mystery_monday.html

http://www.space.com/scienceastronomy/merging_blackhole_021119.html

http://www.space.com/scienceastronomy/astronomy/spongy_universe_010522-1.html