Physics **Name**: _____

The Expanding Universe?

In this multimedia activity you will search for information about the formation and current state of our universe. Of course, this is all speculation, but the theories have evidence that supports them and the work we have done in recent years in cosmology is phenomenal! Strap yourself in and get ready for a ride in the *Information Super Highway*…

Materials

Computer
Internet Explorer software

The Journey Begins…

Did you ever wonder where the Earth came from or how it began? When you think about all the variation and wonders of the Earth we live on it is incredible. But, that is nothing compared to what's going on in the *Cosmos*. Think for a second about what you know about our universe, it's formation, the formation of all the objects in it, and the ultimate fate of the universe. Answer the questions below (you may need to do some online research to get the answers!):

1.) What is *cosmology*?

2.) How did our universe form?

3.) How did our sun form and what will happen to it?

4.) How do planets form?

5.) What is the *Big Bang Theory*?

6.) What is the *Doppler Effect* and how does it support a *Big Bang Theory*?

7.) How old is the universe?

Tune in, Sign on, Explore…
Sign on to the Internet using a browser application.
Learn a bit about Edwin Hubble by going to the URL:

http://oposite.stsci.edu/pubinfo/spacecraft/Primer/Hubble_Expand.htm
http://oposite.stsci.edu/pubinfo/spacecraft/Primer/Top_Findings.htm
http://www-groups.dcs.st-and.ac.uk/~history/Mathematicians/Hubble.html

Write down some facts about his life. List at least 3 of his achievements.

1.)

2.)

While you're there check out Albert Einstein…
http://www-groups.dcs.st-and.ac.uk/~history/Mathematicians/Einstein.html

Write down some facts about his life. List at least 3 of his achievements.

1.)

2.)

Go to the URLs below. Read them and answer the questions. Remember that any underlined, blue text is hyperlink that will take you to another site on the web with related information. Explore!

> http://csep10.phys.utk.edu/astr162/lect/cosmology/hubble_constant.html
> http://www.infoplease.com/ce5/CE012889.html
> http://www.physics.purdue.edu/astr263l/inlabs/hubble.html
>
> (the following questions refer to the first site above but other info can be found at the latter two.)

Read about the *Hubble Law*. State it in your own words below:

Now, write down how the *Hubble Constant* is determined.

What is *Redshift* and how is it related to the *Doppler Effect*?

What is the "age of the universe" as we understand it now (click the hyperlink at the top of the page)?

Go to the second site listed above (infoplease.com) and answer the following questions.

What are the two main cosmological theories? Describe them.

1.) _____

2.) _____

Can you find any other theories? State them.

What do *gravitation* and *relativity* have to do with our understanding of the cosmos?

What are the elementary particles that make up the universe (you may want to visit *the Particle Adventure* at http://particleadventure.org/index.html)?

What is antimatter? Is it real?

What is a quasar?

What is a binary star? What is the closest binary star system to us?

Now, Let's really have some fun! Go to the hyperlink http://hubble.nasa.gov/index.php. This takes you to a web site dedicated to the **Hubble Telescope**. Next, click on the button entitled *MultiMedia*. Now check out the TONS of pictures of our universe. Another cool animation called *How Planetary Nebulae are Formed* can be found at: http://oposite.stsci.edu/pubinfo/qt/ssudec.mov.