**ESS Review Guide**

**Unit 2: The Evolution of Our Universe**

 The following guide is designed to reinforce your understanding of the concepts and processes related to the creation and evolution of our Universe, from its birth to the present day. Please read each question carefully, and then use clear, complete thoughts to express your answers. You should use your notes from this unit to help you in answering these questions.

According to current scientific understanding:

a. When did the Big Bang event happen?

b. What caused the Big Bang to happen (why did it happen)?

Briefly describe the 1st second of the Universe after the Big Bang.

a. What forms of matter were created?

b. What (besides matter) appeared in the Universe within the 1st second after the Big Bang?

Describe the important characteristics of the Universe during its first 380,000 years of existence.

Briefly describe the two most important pieces of scientific evidence that support the Big Bang/expanding Universe Theory.

a.

b.

Identify two ways in which the creation of the first stars changed our Universe.

a.

b.

What needed to happen in order for the first heavy atomic elements to appear in our Universe?

Briefly describe how the conditions needed to produce atoms of silver (Ag) differ from those needed to produce helium (He).

In what significant way did our Universe begin to change as the first generation of stars began to get old and die?

When did our Solar System form?

What kinds of materials did our Solar System form out of? Where did these materials come from (how were they produced)?

What is a plasma? Why is the interior of the Sun made of plasma?

Briefly describe how the Sun’s heat and energy is created?

What are the specific steps of the process by which fusion turns protons into Helium-4?

What can scientists learn by studying the color of light that is emitted by stars?

What is the relationship between the color of light, and the energy contained in that light?

Briefly describe how light is created in atoms.

What is the Doppler Effect?

What is the relationship between the Doppler Effect and the “redshift” of observed galaxies?

How do scientists use light to determine how far away stars are?