My knowledge of biology tells me that this is not correct. The material that constitutes a plant (primarily carbon) comes from the carbon dioxide that the plants get from the air. To see whether a plant builds itself of material that comes from the soil, a reasonable experiment would be to weigh dry soil and a seed, grow a plant from the seed in the soil, extract the plant from the soil, dry the soil and the plant, and weigh them. If the soil has lost mass and the plant has gained the same amount of mass, this would support Aristotle’s idea. A constant soil mass or a gain in soil mass would cast serious doubt.

(10^{11} \text{ stars/galaxy}) \times (10^{11} \text{ galaxies/universe}) = 10^{22} \text{ stars/universe}

We are given that (8 \text{ min.}) \times c = 1 \text{ AU}, where c is the speed of light. In words, an AU is 8 light-minutes. 4 light-years is just is 4*365*24*60 light-minutes. So the number of AU’s in 4 light-years is (4*365*24*60)/8 AU = 262,800 AU.

“Before you can be reasonably convinced that you are right about a particular idea, you should be sure that you understand the objections and the positions of your most articulate antagonists. You should find out whether your views are supported by sound knowledge of opposing ideas or by your misconceptions of opposing ideas. You make this distinction by seeing whether or not you can state the objections and positions of your opposition to their satisfaction.” (pg. 12)

Answers vary. Many wrote that not knowing inspires exploration and preserves an open mind.

“Scientists use the word theory in a way that differs from its usage in everyday speech. In everyday speech a theory is no different from a hypothesis—a supposition that has not been verified. A scientific theory, on the other hand, is a synthesis of a large body of information that encompasses well-tested and verified hypotheses about certain aspects of the natural world.” (pg. 10)

The universe will ultimately (1) expand without bound becoming infinitely diffuse, (2) collapse in on itself, or (3) asymptotically approach a static state. The fate is determined by the universe’s energy density and expansion rate.

Observations of the cosmic microwave background indicate that the universe is nearly flat. (See Hobson, pg. 311.) Observations of supernova explosions reveal that our universe is undergoing an accelerated expansion and it is believed that it will continue to do so for all time. (Hobson, pg. 314.)