

No one knows exactly how life originated on Earth, but two opposing ideas are presented below.

Scientist 1

The idea that Earth could have given rise to life independently is mistaken. Life on this planet must have come from elsewhere for several reasons. First of all, complex life appears very suddenly in the geological record. Secondly, all life on Earth has a very similar biochemistry. If life originated on Earth, one would expect regional variations in biochemistry, similar to the variations in species spread over large areas. Finally, the time when life first appeared in the geological record was also a time when large numbers of meteorites struck the Earth. The meteorites must have caused life to appear on the Earth. The simplest hypothesis is that the meteorites brought life with them.

Scientist 2

Life need not have been imported from outer space. The chemicals required for life existed on the surface of the Earth at the time life first appeared. The fact that all life has a similar biochemistry can be explained by considering that any group of chemicals that won the race to life would probably have used the “almost-living” as food. Since we can offer explanations for what happened without relying on a meteorite of unknown composition that might have fallen on Earth, we should stick to hypotheses that have fewer unknowns.

1. (EMI 503) Which of the following statements is an assumption made by Scientist 1?
 - a. Complex life forms can develop quickly.
 - b. Meteorites burn up as soon as they hit the Earth’s atmosphere.
 - c. There is a cause-and-effect relationship between meteors falling and the origin of life.
 - d. The changes on the Earth’s surface due to the presence of life attracted meteor showers.
2. (EMI 505) Which of the following, if true, strengthens Scientist 2’s argument the most?
 - a. Only 5% more meteors than normal fell on the Earth during the time life began.
 - b. Only 5% of the meteorites studied contained organic molecules.
 - c. A simulation of early Earth showed the spontaneous formation of complex molecules.
 - d. Meteorites containing amoebas have been found.
3. (EMI 505) Which of the following, if true, strengthens Scientist 1’s argument the most?
 - a. Only 5% more meteors than normal fell on the Earth during the time life began.
 - b. Only 5% of the meteorites studied contained organic molecules.
 - c. A simulation of early Earth showed the spontaneous formation of complex molecules.
 - d. Meteorites containing amoebas have been found.
4. (EMI 502) Which scientist would be likely to disagree with the idea that life on different planets could have different biochemistries?

a. Scientist 1	c. Both scientists
b. Scientist 2	d. Neither scientist
5. (EMI 503) Which of the following questions would be the most difficult for Scientist 1 to defend his theory against?
 - a. Why was there more meteorite activity earlier in Earth’s history?
 - b. Why have other meteors not brought other life based on a different biochemistry?
 - c. Why did complete life emerge suddenly?
 - d. Why should meteor activity have any connection to the origin of life?