**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Notes: How did life evolve/start on Earth?**

*Urey-Miller Experiment*

Scientist designed an experiment to test if \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on Earth could have initiated \_\_\_\_\_\_.

The Urey-Miller Experiment used \_\_\_\_\_\_\_\_\_\_ believed to be present on early Earth, an \_\_\_\_\_\_\_\_\_\_\_ current (simulating lightning), and boiling \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They found that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ were created in a short amount of time.

*Fill in the boxes from the animation:* <http://faculty.massasoit.mass.edu/whanna/122/page4/page29/page61/page61.html>



NASA Scientists create amino acids in space!

<http://www.nasa.gov/centers/ames/news/releases/2002/02_33AR.html>

Scientist shone \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ light on deep-space-like “\_\_\_\_\_\_\_\_\_\_” simulating conditions in \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Deep space ice is common water ice laced with simple molecules (used wood alcohol and ammonia).

Discovered amino acids (essential to life):

These can be made in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ interstellar \_\_\_\_\_\_\_\_\_\_\_\_ where planetary systems and stars are made. Places where \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are made.

The amino acids are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to ones found in carbon-rich \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Earth could have been “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” with amino acids from \_\_\_\_\_\_\_\_\_\_\_\_\_\_. This could have jump-\_\_\_\_\_\_\_\_\_\_\_\_\_\_ life on Earth.

In previous experiments, the irradiated interstellar ice “look-alikes” generated compounds called amphiphiles that can organize themselves to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; and molecules called quinones that play important \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the metabolism of all living organisms on Earth.