

Name \_\_\_\_\_

Course/Section \_\_\_\_\_

Date \_\_\_\_\_

Professor/TA \_\_\_\_\_

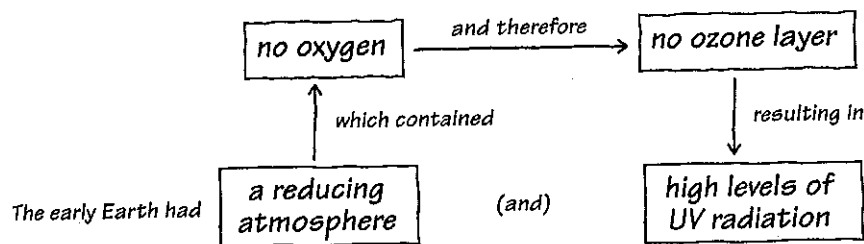


### Activity 25.1 What do we know about the origin of life on Earth?

Construct a concept map of conditions on the early Earth and the origin of life-forms. Be sure to include definitions or descriptions of all the terms in the list below. Keep in mind that there are many ways to construct a concept map.

- Begin by writing each term on a separate sticky note or piece of paper.
- Then organize the terms into a map that indicates how the terms are associated or related.
- Draw lines between terms and add action phrases to the lines that indicate how the terms are related.
- If you are doing this activity in small groups in class, explain your map to another group of students when you are done.

Here is an example:



#### Terms

- |   |                             |                                  |
|---|-----------------------------|----------------------------------|
| no oxygen                                     | protobiont                  | prokaryotes                      |
| reducing atmosphere                           | micelle                     | RNA world                        |
| high-oxygen atmosphere                        | phospholipid bilayer        | Eukarya                          |
| sunlight                                      | ammonia                     | energy source                    |
| electrical discharge (for example, lightning) | phospholipids               | carbon source                    |
| amino acids                                   | water                       | mode of nutrition                |
| ozone layer                                   | Stanley Miller              | anaerobic bacteria               |
| sugars  | methane                     | cyanobacteria (blue-green algae) |
| nucleic acids                                 | molecular clocks            | Gram stain                       |
| DNA   | heat                        | antibiotics                      |
| inorganic compounds                           | heterotrophs                | penicillin                       |
| organic compounds                             | autotrophs                  |                                  |
| carbon dioxide                                | high levels of UV radiation |                                  |
|   | low levels of UV radiation  |                                  |



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c. What was produced in the experiment?

d. What did the results imply about the possible origin of life on Earth?

e. There is general agreement that life must have evolved in the oceans originally and only much later invaded land. What factors of the physical environment on the early and evolving Earth support these ideas? Changes in which of these factors were essential for life to survive on land?

f. Most of us can't imagine a world without oxygen. However, as you learned earlier, chemically oxygen is a powerful oxidizing compound. What effect(s) would the increase in oxygen levels of the atmosphere have on the organisms that existed at that time?