

PRACTICE

Activity 2: Keeping Track of Stuff in a Closed System

Name _____

Date _____

Class _____

Shut the Door Behind You . . . or Else!

Ten years ago, a fascinating and unique experiment took place in the Arizona desert. The building in which this experiment took place stands today as a tourist attraction. It is an entirely enclosed multi-domed structure. There are no plumbing or electrical facilities coming into or going out of the building. There are many windows that allow sunshine to flood into the building, but the windows do not open. The name of the structure is “Biosphere.”

The Biosphere designers were interested in the possibility of colonizing the Moon or Mars. By building Biosphere and sealing people inside, they hoped to learn what problems would arise from living in this kind of system. In 1991, a colony of eight people set about to live inside for two years. The central idea behind the experiment was to create a self-sufficient environment that could be the home for humans on the Moon or Mars.



The Biosphere scientists were trying to develop an ecosystem that includes humans, animals, plants, and microbes living together and providing the essential needs for one another. Utilizing carbon dioxide, plants create oxygen and nourishment for humans. Utilizing oxygen, humans produce carbon dioxide for plants. Animals provide the needed protein for humans. Microbes transform the wastes into reusable products for the entire ecosystem. Water, oxygen, nourishment, and wastes will be recycled throughout the system. The only outside ingredient is the light energy from the Sun.

Answer these questions based on the reading.

1. If the Biosphere is a closed system for mass, will the amount of mass in the Biosphere *increase, decrease, or remain the same* over a long period of time?

Write your reasoning.

2. What would happen to the balance of this system if some of the mass in this system slowly leaked out? For example, what would happen if carbon dioxide were slowly escaping to the outside environment?

3. Compare and contrast the planet Earth with the Biosphere.
