

UNPACKING YOUR ECOSPHERE®

When you unpack your EcoSphere® you may notice that the water is initially a little cloudy. This will clear up after a few hours. If your EcoSphere® arrived cold to the touch, slowly let the EcoSphere® warm up to room temperature. When the temperature is cooler the shrimp's metabolism slows and they may appear still and lifeless. Normally the shrimp will be swimming around within 24 hours. Sometimes the lightweight gravel at the bottom of the EcoSphere® will float to the surface. It will eventually sink back down.

GUIDELINES FOR ECOSPHERE® CARE

Do provide light for the EcoSphere® for at least six to eight hours per day. The light intensity should be suitable for reading and from one of the following sources: ceiling mounted fluorescent lamps or low indirect window light.

Do keep your EcoSphere® at temperatures between 60° and 80° F. Temperatures above 80° can put excess stress on the EcoSphere®. Temperatures below 60° slow down the metabolism of the shrimp.

Do not expose the EcoSphere® to direct sunlight. It is a tiny greenhouse and direct sunlight will overheat it, regardless of the room's temperature. This will also cause the algae to grow rapidly.

Do not handle the EcoSphere® excessively. The EcoSphere® will pick up the heat from your hands.

Do not let the EcoSphere® go for more than 60 hours without light. If the EcoSphere® has received light for several days, it will be "charged" with oxygen.

Do not place the EcoSphere® on televisions, stereo equipment, fireplace mantels, near heating radiators, computer equipment, vents, or in lighted cabinets. It can also pick up heat from exterior walls which are exposed to the sun. Also, be aware of the light source, because it may give off too much heat.

Do not shake, drop, or otherwise treat it roughly.

Do not place the EcoSphere® in front of a window because heat/cold can transfer through the glass. Complete care instructions can be found on our website: www.eco-sphere.com/care/

WHAT IS IN THE ECOSPHERE®?

The shrimp, algae, gorgonia, decorative shells and lightweight gravel are all part of the working ecosystem. These shrimp were chosen because they do not show aggression towards each other. The gorgonia, lightweight gravel and glass offer surface area to the ecosystem. All of these surfaces are places where micro-organisms and algae can attach themselves. The gorgonia is a non-living material and is hand cut for each individual EcoSphere®.

WHAT DO THE SHRIMP EAT?

The shrimp eat the algae and bacteria. Even if the green algae is no longer visible, there is still plenty of other algae and bacteria for the shrimp to eat. Shrimp are crustaceans so their skeleton is on the outside. The pale shrimp-like objects sometimes seen lying on the bottom of the EcoSphere® are exoskeletons. After the old exoskeleton is shed a new one expands and hardens. The shrimp will then consume the discarded exoskeletons.

NOTICE THE AMOUNT OF GREEN ALGAE

This initial quantity is the inoculant required to produce sufficient oxygen for the shrimp. Do not allow the algae to grow much more than this or the chemical balance will change.

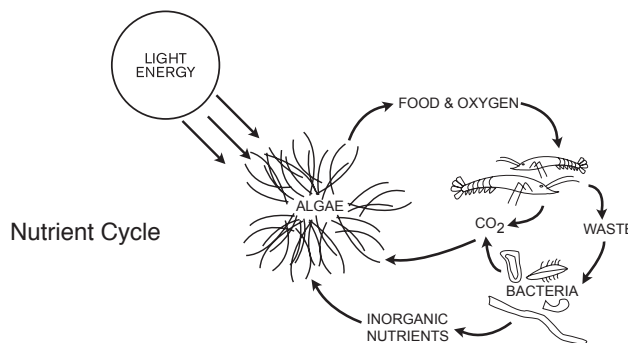
Light controls the growth of the algae. If the algae begins to grow, reduce the amount of light by shading the EcoSphere® or putting it in a darker area. If the shrimp consume the algae, it will grow back when you place it in an area with slightly higher light. It will take about two months for the algae to noticeably regrow. It is not threatening to the system to lose visible algae. **IF THE ALGAE IS GROWING AT A RAPID RATE, THE ECOSPHERE® IS IN AN AREA WHERE THE LIGHT IS TOO BRIGHT. THIS WILL RAISE THE pH LEVEL AND CAUSE THE SHRIMP TO PERISH.**

WHAT IF ONE OF THE SHRIMP DIES?

The age of the shrimp is unknown and it is not unusual for a shrimp to die. When a shrimp dies it will decompose and become nutrients for the system. Nothing goes to waste in the EcoSphere®. If the shrimp are dying over a short period of time, it usually indicates the EcoSphere® is in an environment that is not beneficial to the system. Common causes for shrimp death are temperatures that are outside of the desired range and too much light.

HOW DOES THE ECOSPHERE® WORK?

The EcoSphere® works on energy. The EcoSphere® is a small biological battery, storing light energy converted biochemically. Food and oxygen cannot be produced for the shrimp if the system is starved for light. Light, together with carbon dioxide in the water, enables the algae to produce oxygen. The shrimp breathe oxygen in the water and nibble on the algae and bacteria. Bacteria break down the shrimp's waste into nutrients which the algae again utilize. The shrimp and bacteria also give off carbon dioxide that the algae use to produce oxygen.



CLEANING YOUR ECOSPHERE®

Do not be alarmed if film or spots form on the inside of the glass. These spots are another form of algae called diatoms and are of nutritional value to the shrimp. We have furnished two magnets to help clean the inside of the glass. Bringing the handbook magnet (located on reverse) up to the glass

will attract the inner magnet. With the two magnets together gently move the magnets along the glass until a section of the glass appears clean.

WHAT TO LOOK FOR

The algae is constantly growing, dying and being eaten by the shrimp. As time goes on, it is likely that there will be noticeable changes in the composition of the algae. Some of the older EcoSpheres® in our laboratory have lost all of their visible green algae. These systems continue to live for years because they contain heavy populations of single-celled algae that covers the surfaces of the branch, lightweight gravel and glass. In a new EcoSphere® a white fungus may appear floating on the surface and is a harmless seasonal growth. The health of the organisms inside depends on water chemistry, which is a function of the algae growth. If the algae overgrows, it will raise the pH of the water and kill the shrimp.

HOW LONG WILL THEY LIVE?

The average life of an EcoSphere® is 2 to 3 years. The life expectancy of the shrimp used in the EcoSphere® can exceed five years. The oldest EcoSpheres® are over 10 years old and are still going strong.

WHY IS THERE CONDENSATION INSIDE?

Condensation will take place inside the EcoSphere® if it is warmer inside the system than outside. Since the EcoSphere® is a tiny greenhouse this occurs quite often.

DO THE ANIMALS & PLANTS REPRODUCE?

There have been cases of reproduction by the shrimp, but it's rare. The algae and the bacteria in the EcoSphere® do reproduce continuously. As the years go by, noticeable and gradual changes may occur in the algae's population. These changes will include the green algae turning into blue-green algae. Over time, nutrients bind with other chemicals and are no longer useful to the green algae.

WHAT DOES THE ECOSPHERE® REPRESENT?

The EcoSphere® represents our planet on a small scale, and the shrimp represent the human race. Thus, the EcoSphere® shows that the human race is in constant jeopardy of extinction. We can learn, through the EcoSphere®, the importance of maintaining the delicate balance with our environment.

HOW WERE ECOSPHERES® DISCOVERED?

Two scientists, the late Dr. Joe Hanson and the late Dr. Clair Folsome, originally discovered the EcoSphere®. NASA became interested in these systems for two reasons. First, this tiny model of the Earth could add information to NASA's "Mission To Planet Earth" program aimed at studying Earth's biosphere. Second, it could help NASA's research on human life support systems directed towards the construction of space stations for exploring our solar system.