

Make your own Biosphere – A garden in a bottle!

A biosphere is any closed, self-regulating system or ecosystem. We live in a very big biosphere called Earth.



What you will need:

- A glass jar (like a jam jar) with lid
- A ruler
- Sand
- Pebbles
- Activated charcoal
- Soil
- Small rocks or pieces of wood
- A few insects
- Plants and moss
- Water

Step 1



Thoroughly clean and dry a glass jar (such as a jam jar). This will prevent mould growing.

Step 2



Add 2-5 cm of clean sand and pebbles to the bottom of the jar.

Step 3



Add 1-2 cm of activated charcoal (you can get this from a pet shop) on top of the sand. This will act as a filter to keep the biosphere clean.



Add your soil - a layer of 5-10cm (good draining soil).



Make it more interesting by adding some small rocks or pieces of wood.



Add some small, slow growing indoor plants and moss. Add a few bugs like worms or beetles to help provide CO₂ for the plants.



Water your biosphere. You want the sand layer to be saturated but be careful not to add too much water. If you notice condensation (after the lid has been put on) then remove it for a day to allow the extra water to evaporate.



Put the lid on and place near a window but not in direct sunlight as it will get too hot and your plants will frazzle!

Step 9



Well done. You have made your own biosphere!

Watch it grow and exist without any external input (apart from light).

Activities

Read the link below about a biosphere watered once in 53 years! Then answer the questions below:

<http://www.dailymail.co.uk/sciencetech/article-2267504/The-sealed-bottle-garden-thriving-40-years-fresh-air-water.html>

Questions

1. What components make up your biosphere?
2. How are each of the components linked (interdependent)?
3. Explain why your biosphere is a 'closed' system.
4. What systems are operating within your biosphere? (think about nutrients, energy and water)
5. Predict what would happen to the biosphere if you removed or changed one of the components?
6. How can the garden in a bottle help us to understand how ecosystems are linked?
7. What other types of biosphere could you create and how would you do this?