



Things to make and do

TOP TIP
Your ecosystem
doesn't require much
water, but may need a
top-up once a month.

Make a mini ecosystem

Create your own miniature rainforest world that recycles its own water.

What you need

- A two-litre clear plastic bottle with a lid
- Ruler
- Pen
- Scissors
- Small stones
- Activated carbon (sold in pet shops and garden centres)
- Pistachio shells
- Compost or soil
- Small plants, such as ivy, ferns, herbs or weeds
- Moss (from garden centres or walls outside)
- Water
- Sticky tape

DID YOU KNOW?

The longest surviving terrarium is nearly 60 years old. Created in 1960, it has survived on just half a litre of water and has only been opened once.



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WARNING!
Ask an adult to help
you cut the plastic
bottle.



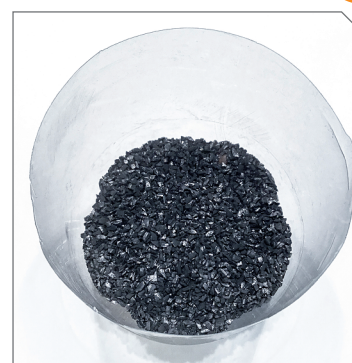
1 Measure 10cm from the base of the bottle using a ruler. Draw a line around the bottle.



2 Ask an adult to help you cut along the line. The base of the bottle is the planter and the top is the cover.



3 Place a layer of stones in the bottom of the planter.



4 Next, cover the stones with a layer of activated carbon.



5 Then, add enough pistachio shells to cover the layer of activated carbon (about 1–2cm thick).



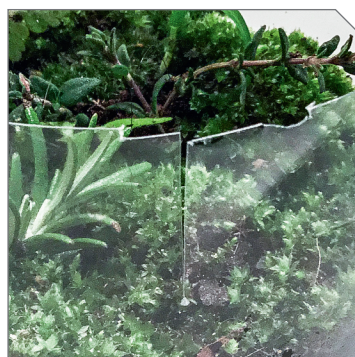
6 Finally, add a thick layer of compost or soil, filling the planter to about 2cm below the top.



7 Find small plants from your garden or a garden centre and plant them carefully in the soil.



8 Cover the soil with layer of moss, taking care not to damage the plants.



9 Now, cut a vertical slit in the top of one side of the base. The slit should end just above level of the moss.



10 Pour in a small amount of water (roughly 50ml, or around four tablespoons).



11 Fit the top part of the bottle over the bottom part. Seal your ecosystem closed using sticky tape.



12 Find a spot for your terrarium that gets lots of natural light, but don't put it in direct sunlight.

How does it work?

What you have built is also known as a closed terrarium. This is an ecosystem (a community of living things and their environment) that receives no input from outside. Sealed inside the plastic bottle, your terrarium creates its own water cycle. This is a miniature version of Earth's own water cycle.

Moisture from the soil and plants evaporates inside the warm bottle. When it hits the sides of the bottle, the water vapour condenses (turns back to liquid) and runs back into the soil. The water drains through

the layer of pistachio shells and is filtered by the charcoal, which keeps the mini ecosystem healthy and clean. The stones at the bottom stop the terrarium from getting waterlogged.

Just like our planet, your terrarium receives energy from the Sun. Light enters the bottle and the plants use it to turn water and carbon dioxide into food. This process is called photosynthesis. If humans are ever to travel to and colonise other planets, we will need to carry self-sustaining ecosystems with us to provide us with food and air to breathe.

