

Build a camping cooler

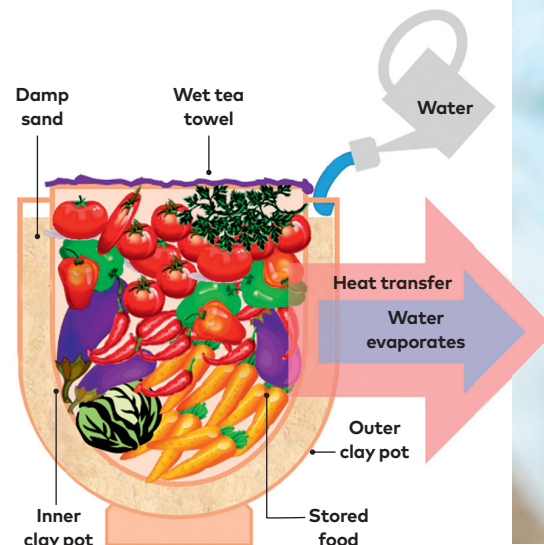
Keep your drinks and snacks cool when camping with this clever clay device.

What you need

- Two unglazed clay or terracotta plant pots, one small enough to fit inside the other
- Strong tape
- Around two kilos of sand
- A tablespoon
- A watering can or jug
- Water
- A tea towel
- Food or drinks
- Foil, paper or waxed fabric to wrap food

How does it work?

The secret of this two-pot cooler is evaporation – the turning of water from liquid into vapour. Evaporation breaks bonds between water molecules and this releases energy that the water absorbs as heat from its surroundings. As water evaporates from the damp sand through the unglazed wall of the outer pot, it sucks out heat from further inside the cooler. Sweat works in the same way: as it dries, it draws heat out of your skin so you cool down. The cooler must be dry and warm enough outside for the water in the sand to keep evaporating – if the air nearby is too cold and damp, it can't absorb water vapour. People have used unglazed pots to keep things cool for thousands of years but this structure was devised by a Nigerian teacher, Mohammed Bah Abba, in the 1990s.



This experiment is adapted from *Science Workshop* by Anna Claybourne, published by Hachette Children's, £12.99.



SMART SOLUTION

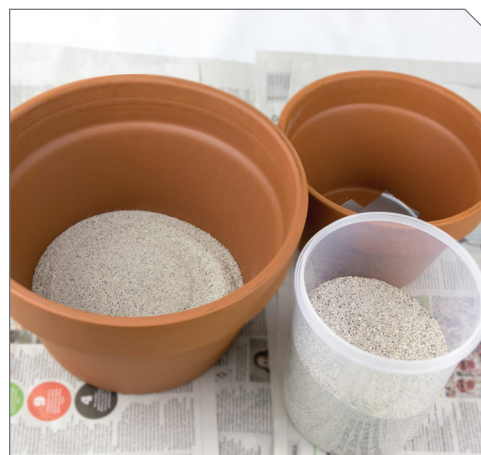
This low-tech, power-free pot-in-pot refrigerator is perfect for use in hot, dry environments. It changed the lives of people living in rural Nigeria – its inventor's native country.



The cooler is perfect for outdoor feasts.



1 It is easiest to make your pot outdoors, so take everything outside and tape over any holes in the base of your pots until they are watertight. If you have to do it inside, cover the floor with old newspaper so that it is easier to clean up afterwards.



2 Pour some sand inside the bigger pot until you have an even layer on the bottom. Place the smaller pot inside it, and check if the rims of the two pots are at an equal level. If not, remove some sand or add some more, until the pot rims are equal.



3 Spoon sand into the gap between the pots, being careful not to get any inside the smaller pot. When the gap is completely full, use the jug or watering can to pour water into the sand. This will make the sand sink down, so top up the gap and water it again.



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4 Wrap your food, making sure there are no holes, and place the wrapped items inside your inner pot, along with any drinks. Wet a tea towel, wring it out and lay it over the top of the cooler, then leave the whole structure somewhere dry.



5 Your cooler should last for a long time, as long as you keep the sand layer nice and damp by adding more water to it about twice a day. You could use a thermometer to compare how warm it is inside and outside your cooler.



6 Keep in mind that this cooler will not be as cold as an electric fridge, so don't store any food that can go off quickly unless properly chilled – like fish or meat. The cooler works best for cold drinks and picnic food, such as fruit, sandwiches or vegetables.