

## Earth Oven Course



Did you love to make mud pies when you were a kid? Why not construct an earth oven by using the earth from under your feet — one of the best building materials on the planet. And the skills you need are just the ones you were born with.

Follow the steps outlined below and you'll enjoy crusty, chewy and richly flavoured bread, pizza and other baked goodies in no time.

### Get Ready

Collect your shovel, a wheelbarrow and/or some buckets, a tape measure, scraps of lumber, a plastic tarp and kitchen utensils (for sculpting). Purchase some straw, engineering bricks, sharp sand and building sand. Dig up some clay from your back garden or find somewhere that has some under the topsoil.

To start, prepare a base for the oven. If you're going to use the oven a lot, you'll want to build the oven floor at waist-height. Use what you have — rocks, broken-up concrete, logs, old metal barrels or even sawhorses. If you don't mind working low, build on the ground.

### The Floor

Twenty to 27 inches is a good size to the oven floor, but to determine your exact needs make a mock-up of what you want to bake and calculate how much space it takes. Make your oven floor by setting engineering bricks or fire bricks on a level bed of smooth, tamped sand, 4 to 6 inches deep. Used bricks are great, but should be free of old mortar. Set the first one level and solid. Hold the next brick level and just above the sand; gently kiss its long side to the long side of the previous one. Set it down flat and firm. Don't wiggle it. If one brick stands up a bit proud, tap it down to make it flush with the rest.

### Make a Form

Shape a pile of moist sand on the floor bricks. (This can be any kind of sand, or even loose topsoil. The form will be covered with your mud mix, then removed to form the oven's interior.) The form should be a few inches higher than *half* the oven floor's width. [For example: An oven 27 inches wide (one-half of which equals 13½ inches) should stand 16 to 20 inches high.]

Hold a level across the top; measure the distance to the floor to calculate the interior height of your oven. Multiply it by 63 percent (0.63) to determine the proper height for your oven door. *Write this number down!*

### **Mix Mud**

Good oven building soil usually is found below the topsoil. It contains clay which, like cement, holds things together. Use it straight out of the ground and mix it with sand. If you have nowhere to dig, look for construction sites, road cuts or river banks. Clay subsoil should feel sticky, slippery and a bit greasy (in contrast, silt and organic matter feel floury and crumbly). Wet, you should be able to roll it into snakelike ropes and bend it easily. The mix is usually one part clay subsoil and anywhere from one to three parts sharp sand; pure clay subsoil also works, but tends to shrink and crack more.

A tarp makes mixing mud easier on your back (6-by-8 foot minimum; bigger is easier). To mix, two people should hold opposite corners of the tarp and roll, but not lift, the mix from side to side. You also can stomp the mud while wearing boots or better yet, mix it with your bare hands and feet. If you muck around in the mixture, be sure it is free of sharp debris.

Add water a little at a time, then jump in and do the twist, breaking up the clay and mashing the sand into it. Dance until it starts to clump like dough for piecrust.

Pack a hard ball (50 to 100 pats), and drop it from chest height. It should hold together. If it doesn't, add a little water. If it's too wet, add dry mix. Or you can continue and just allow more drying time, whichever is easier to do.

### **Build**

Cover your sand form with sheets of wet newspaper to keep the mud walls from sticking to the sand form, smoothing the sheets flat. Next, cover it with a layer of mud 3 to 4 inches thick. To maintain an even thickness, use the width of your hand as a gauge, maintain a clean, square edge on the layer as it arches up and over the form, and angle the top of the mud layer *inwards* as you go up. Press the mud against itself, not against the sand form, and don't worry about the doorway.

When it's done, take a flat board and pack the material until it sits solidly against the form.

If your sand dome was 18 inches high, your doorway should be 63 percent of the height, or 11¼ inches. The doorway's width should be one-third to one-half of the oven's inner diameter. Scratch a line in the mud where the door will be, cut a hand-sized hole to start and dig a narrow channel into the form. Do not remove any more of the sand form.

You will need to add two more layers for extra insulation and a fine finish plaster if you want.

The second layer is mixed with coarsely cut straw and applied as before.

The third layer is also mixed as before but with builders sand and finely cut straw to give a smoother finish.

## **Remove the Form**

Before you remove the sand form, the mud walls should be dry enough to resist collapsing. It will take around 4 weeks for the walls to completely dry, therefore, remove the sand form gradually over the first few weeks. Remember to stop when you hit the newspaper layer.

## **Make It Beautiful**

Basic finishing can be done by rubbing the oven's exterior smooth with a chunk of milled lumber, a metal trowel or spoon, or a polished rock. More complex shapes and finishing require more mud material with additions like straw, manure, lime and Earthen pigments. Make your oven into a sculpture, a hemispherical mural, a bench or a whole building, or keep it simple and abstract.

A rain-soaked oven takes a long time to heat up, so building a roof — as simple or complex as you choose — will protect your oven from the weather. But do not cover the oven with paint or cement! An earthen oven needs to breathe — trapped moisture will destroy it.

## **Make the Door**

To make your door, cut a paper template to fit the opening, then use it to cut out the door. The door doesn't need to fit perfectly, since you can drape it with a wet cloth, which also keeps the door from charring and adds moisture for baking. (You can also soak the door in water or line the back of it with metal or foil.)

To use the oven, build a fire in it and let the smoke come out of the door opening. When the oven is fully dry and has been fired for two to three hours, you'll notice that the black soot on the inside of the dome has disappeared; that's the sign that the oven is ready to use. Rake out the coals and begin baking, putting the door in place to hold in the heat.

## ***Getting the Most Out of Your Oven***

Many people build earth ovens for the crisp bread crust and chewy crumb texture that only high-temperature, retained-heat ovens can provide. But wood-fired ovens go far beyond bread, and are capable of roasting, broiling, steaming or braising.

Bearing in mind the time, effort and firewood you put into your oven, you'll want to get the most out of it. Awareness, attention and experience will be your best teachers.

With practice, you'll get a reliable feel for the right temperatures. Thermometers are OK, but a very hot oven will destroy a typical oven thermometer that only goes up to 500 degrees.

When the oven is too cool to cook, but still warm, you can incubate yogurt, dry herbs or fruit, or dry your next load of firewood, which will help to make your next oven-firing faster and more efficient.

If the oven floor seems too hot compared to the rest of the oven, place an overturned baking tray on the floor to trap a layer of insulating air and keep pan bottoms from burning. Remember, burnt offerings are part of the process. As you experiment, you'll get used to your own oven and timing. Start with bread, pizza and less demanding, wet dishes like soups, stews and braised vegetables, which all cook wonderfully in mud ovens. Keep a lid on the pot to keep moisture in.

Once you have a sense of how well your oven holds heat with what degree of firing, it's easy to move on to roasts, pies and cakes.

A conventional gas or electric oven bakes bread with a lot of hot air, or convection. An earth oven uses conduction, convection *and* radiation, providing faster, more thorough baking and better flavour.

Here's how it works: Build a fire in the hollow earthen dome. The dense walls soak up heat for two to three hours, after which the oven's interior reaches about 700 degrees. Remove coals, sweep the oven floor, and let the temperature stabilize and even decline a bit. Slide your loaves onto the oven's hot floor.

Heat is conducted immediately from floor to loaf, creating a higher, airier loaf (an effect called "oven spring"). The intense heat drives moisture from the crust, making it crisp and filling the oven with steam.

Convection then disperses that superheated steam, caramelizing sugars in the crust and creating the unique flavour and texture of authentic earth-baked bread.

The oven walls radiate heat equally throughout the oven — no hot or cold spots — so many loaves bake as thoroughly as one.

An earthen oven holds heat for several hours, so after the bread (or pizza) is done, you can cook anything: vegetables, meats, casseroles, soups, stews, cookies, cakes, pies, or puddings. And when the oven is too cool to cook (usually after several hours), you can use the remaining heat to dry the wood for your next fire.