PVC URINALS

by **Thinkenstein** on July 4, 2009

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intro: PVC URINALS

We all have to pee sometime. Some go behind a bush. Some use a toilet and flush 5 gallons of water down the drain every time they pull the handle.

In this instructable I will introduce you to a simple alternative, one that uses less water than a flush toilet. Water is a resource that is becoming scarcer over time; one that we should conserve better.

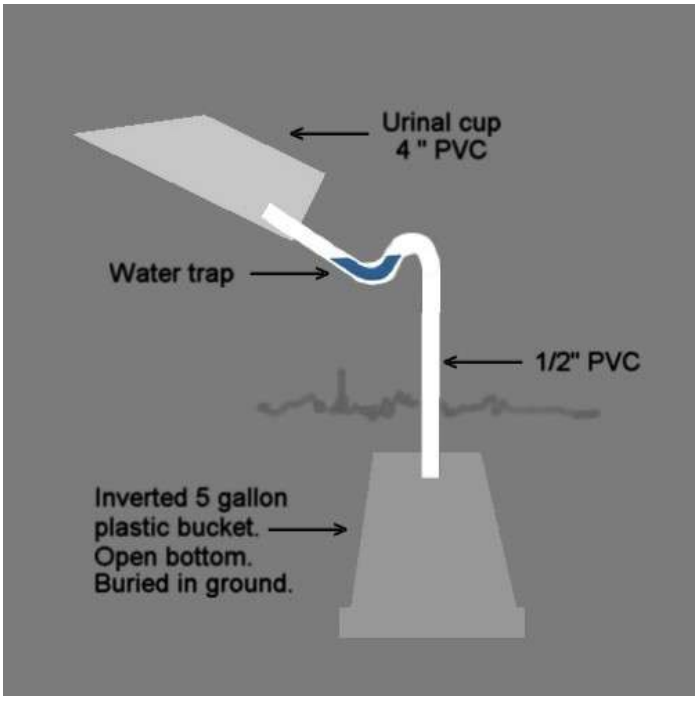
PVC, polyvinyl chloride, is a thermoplastic. It softens with heat and hardens up again when it cools. It is easily available in most hardware stores in the form of pipe, and is not very expensive. Considering all the things one can make out of it, I would even call it cheap.

You will find several different urinal designs here. Grab a glass of your favorite beverage and read on.

step 1: THE BASIC IDEA

The basic urinal is composed of a cup to catch the urine, an "S" shaped piece of 1/2 inch diameter pipe that conducts the urine to the ground, and a buried 5 gallon bucket. The inverted bucket creates an air chamber. The urine enters the air chamber and filters into the ground.

The "S" bend in the pipe creates a small reservoir that holds the last of the flush water. This is the same as the trap under a sink. It prevents vapors from beyond the water reservoir from rising in the pipe and smelling up the room. The system is basically odorless.



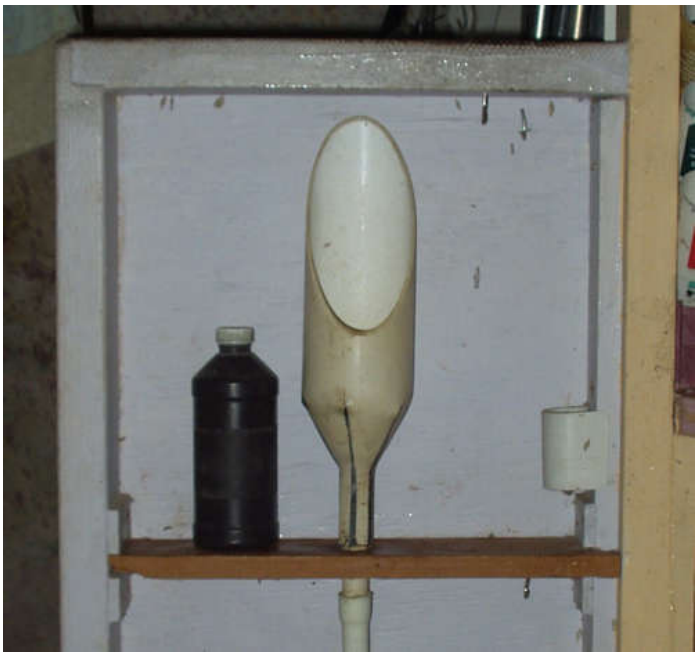
step 2: THE FIRST URINAL I MADE

This is the first urinal I made. For my first 8 years I lived in a 12 X 16 ft. plywood cabin. Facilities were primitive and outdoors. When it rained, that was a slight problem, one which inspired this indoor solution.

I keep a bottle of water beside the urinal. When it comes time to flush it only takes about a cup of water or less. I repeat: a cup of water or less.

The plywood room has now been incorporated into the larger cement structure, and other urinals have been incorporated into the design, both indoors and outdoors. You never have to run far to take care of business.

Note how the large pipe which is the cup was cut and heat formed to adapt to the 1/2 inch drain pipe. I used a paste epoxy to seal any leaks.



step 3: MEN'S URINAL WITH A LID

This is one of the outdoor urinals. The lid helps to keep leaves out of it. Plus, it was fun to make the hinge; a piece of stainless steel welding rod going through a sleeve of folded-over PVC.

To flatten PVC for making a lid: 1. Cut a section of pipe with a wood saw. 2. Cut the section down one side. 3. Heat it over a gas stove until it softens. 4. Put it on the floor with a piece of plywood over it and stand on it until it cools and hardens.

To fold the edge for the hinge: 1. Heat the edge with a propane torch. 2. Fold it over, with the hinge rod in place. 3. Hold it with a piece of wood until it cools and hardens.

Looking down into the urinal cup, you can see how it is formed. I heated the end of the large pipe, inserted the smaller diameter drain pipe, and pinched the large pipe between two pieces of wood to close the end around the drain pipe. I think I used a little white cement to seal any leaks around the drain pipe.

A bottle with a hole drilled in the lid is used for the flush water.

step 4: MALE AND FEMALE OUTDOOR URINALS

These use the same basic design as the previous urinal. They are sections of 4 inch pipe, cut at an angle at the receiving end and heat formed at the drain end.

The higher one is for the men and the lower one is for the women. The women squat and back in. There are two doors at either end of this bathroom area that provide privacy.

The garden hose is used for flushing.

step 5: UPSTAIRS URINAL

This is the urinal in the upstairs bedroom. It's nice to have one handy for night use without having to go downstairs.

As you can see, you can get rather fancy and decorative with the heat forming if you care to. This also doubles as a hand-washing sink, and as a faucet for a hose.

step 6: FOR THE LADIES

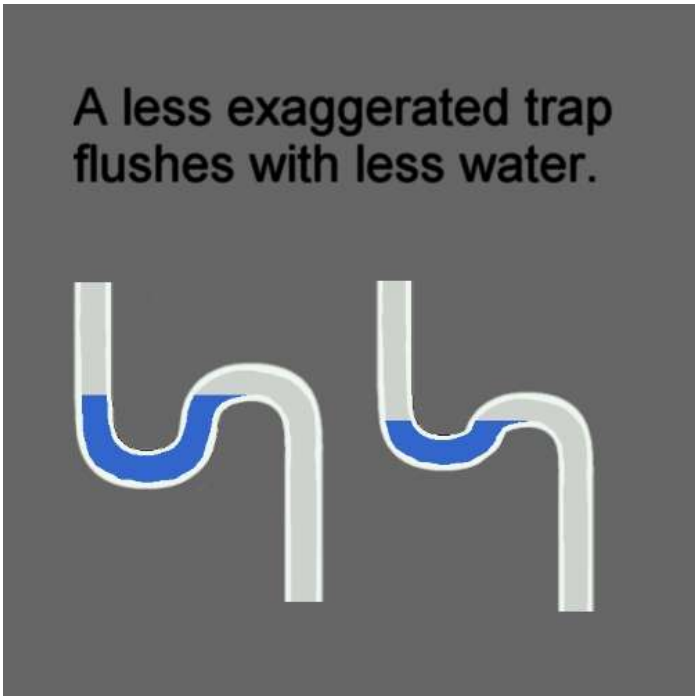
The ladies have not been forgotten.

This is a hand-held urinal cup, with a molded PVC bottom. It is filled, emptied into the man's urinal and then rinsed out.

step 7: THE DRAIN PIPE

Three drain pipes are shown here. Each has a heat formed "S" bend in it which traps water and prevents odors from rising in the pipe.

Try to make the "S" bend with the minimum amount of curvature necessary to create a water trap. The more exaggerated the bend is, the more water it will take to flush the system.

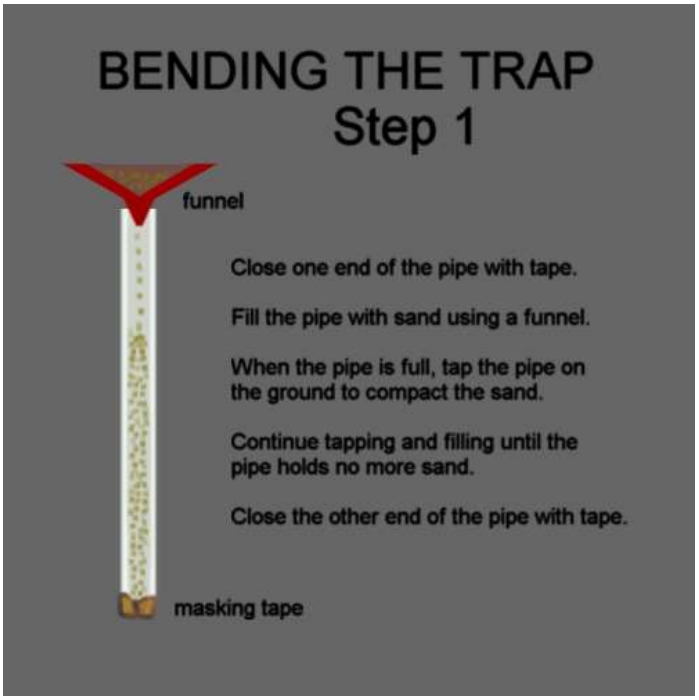


step 8: BENDING THE TRAP - 1

Without something inside the pipe to keep the passage open when you bend it, the pipe will pinch closed. The first step in bending the pipe is to fill it with sand.

Use masking tape to cover one end of the pipe. Fill the pipe with sand using a funnel. Tamp the pipe on the ground to compact the sand. Fill and tamp repeatedly until the pipe will hold no more sand. Cover the other end of the pipe with tape.

You are now ready to heat and bend the pipe.



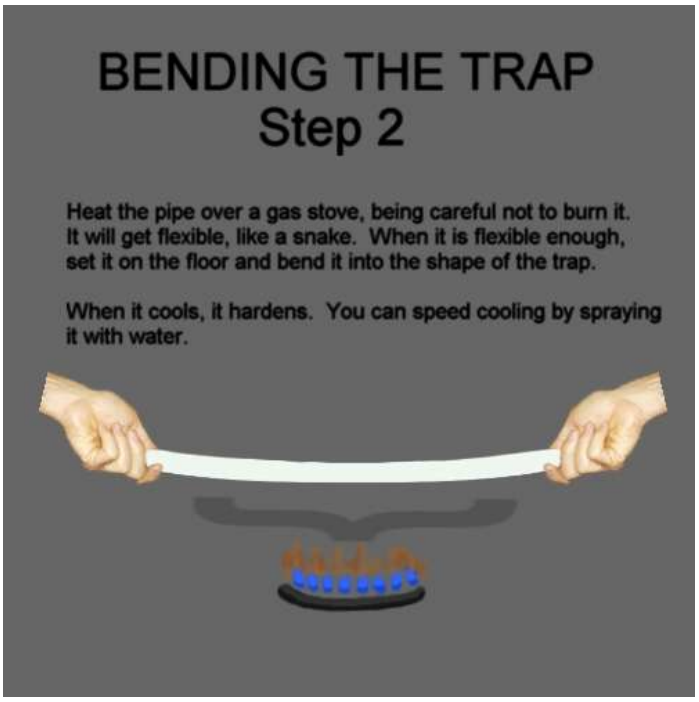
step 9: BENDING THE TRAP - 2

You want the ends of the pipe to stay cold, so that they will fit into standard plumbing fittings. Hold the pipe ends with your hands and heat the center area, where the "S" bend will go.

Keep turning the pipe, and moving it from side to side to keep from over-heating and burning the pipe.

As the plastic softens, the pipe will sag. When it is nice and flexible, set it on the floor and bend it into the "S" shape you want.

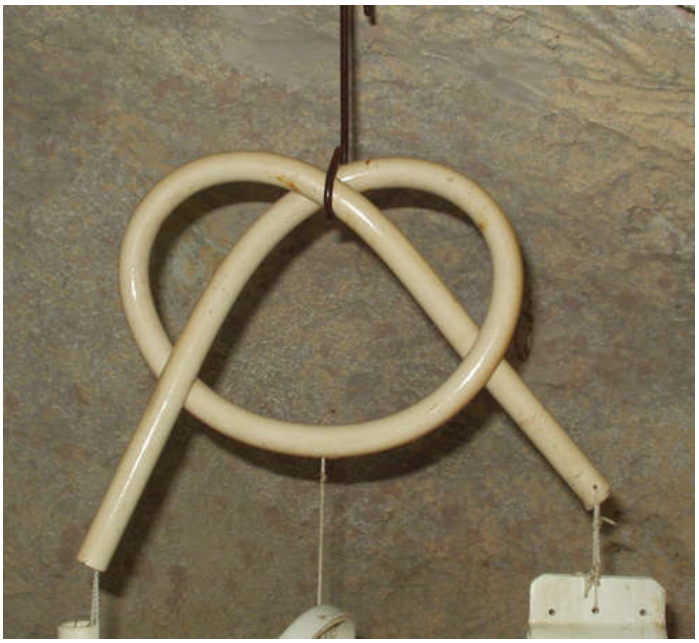
You can speed cooling and hardening by spraying the pipe with water, or using a water-soaked sponge.



step 10: BENDING THE TRAP - 3

When the pipe has cooled, take the tape off the ends and empty the sand out of the pipe. Flush the last of the sand out with water.

Just for the sake of showing what is possible with this pipe bending technique, see the photo of the pretzel below.



step 11: THE BURIED BUCKET

The air chamber, and reservoir for urine and flush water, is a plastic bucket turned upside-down without a lid.

Make an entry hole in the bottom of the bucket for the drain pipe. A large drill, X-acto knife, and half-round file are what I used to make the holes in mine. Keep the hole tight, if you can. It helps everything stay in place while you assemble it.

Dig a hole, assemble the parts and bury the bucket.

step 12: FINAL COMMENTS

Urine is not full of toxic bacteria like excrement is, so there is no health risk to pumping it into the ground around your home in small quantities like this.

Urine even has fertilizer value for plants. Pure urine, like concentrated fertilizer, can burn plants, but if it is diluted with water, at least three parts water to one part urine, plants like it.

Don't worry about plants dying around the buried buckets, or spreading disease. It won't happen.

I live in the country, and this system works fine for me. I realize that urban environments create special limitations. Personally, I think the world is over-populated and our freedom is too often limited by that.

You can always dump your waste water in public sewers, but try to conserve flush water. Remember, I do it with a cup or less. Urinals in private bathrooms are not a bad idea.

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Comments

17 comments **Add Comment**

monkeys5150 says: Jul 31, 2009. 6:56 PM **REPLY**

Very nice, in fact I will be doing the same when me and my buddies buy some land here in a few years. Just curious, do you have a system to take care of the other waste or just urine? I've seen some off the grid type toilets online but they are a bit on the expensive side.

Thinkenstein says: Jul 31, 2009. 7:40 PM **REPLY**

I have a cement flush toilet I made, with a septic tank.

Ecologically, I think composting is the way to go. Try to find The Humanure Handbook. http://www.jenkinspublishing.com/humanure.html You don't need much more than a bucket to use his system. It's not "waste" anymore when you can put it to good use.

Here's one link for composting toilets. http://www.solareagle.com/sunmar.html

spamhaterbloodboy says: Jul 29, 2009. 3:18 PM **REPLY**

Does that spigot have testicles?

Thinkenstein says: Jul 29, 2009. 5:55 PM **REPLY**

I guess you are the first to notice. The first to mention it, anyway. Yes. I thought they were appropriate in that context.

Derin says: Jul 31, 2009. 1:02 PM **REPLY**

I just noticed those testicles on the tap too...

spamhaterbloodboy says: Jul 29, 2009. 6:11 PM **REPLY**

Yeah, that's pretty funny. Nice work. Are there any pictures of your house online? It looks interesting.

I built a 12x16 plywood cabin (with hardwood floors and electric and water pumped from the pond) to live in myself and had thought of making a PVC urinal on the second floor, so it's great to see it done with a little extra thought adding the barrel at the bottom and the s-curve rather than just an outside drain spot. I haven't implimented the urinal yet, so I'm glad I stumbled on this.

Thinkenstein says: Jul 29, 2009. 8:25 PM **REPLY**

Check out my website, www.angelfire.com/in2/manythings . I was living in a 12 X 16 ft. plywood cabin also in my first years here. I think a picture is among the old house photos online.

Good luck with your project.

Mr.Pug says: Jul 23, 2009. 12:26 AM **REPLY**

Smart, I like the 1st one

Thinkenstein says: Jul 23, 2009. 4:12 AM **REPLY**

Thanks. Yes, it is a little more stylish.

Mr.Pug says: Jul 24, 2009. 11:35 PM **REPLY**

the one you first made, I mean, the simple piping one

Thinkenstein says: Jul 25, 2009. 6:32 AM **REPLY**

The one that is more flat against the wall? It does have that advantage, especially in cramped quarters.

Ev says: Jul 17, 2009. 2:33 PM **REPLY**

I've seen urinals that had a light oil in them, probably mineral oil. The denser urine would flow under the oil and out the trap! No odors and the oil doesn't dry out.

Thinkenstein says: Jul 17, 2009. 6:57 PM **REPLY**

Interesting. It must use the minimum amount of water for flushing.

Ev says: Jul 18, 2009. 10:09 AM **REPLY**

Look up "waterless urinals"!

Thinkenstein says: Jul 18, 2009. 5:28 PM **REPLY**

Yep. A good idea.

PKM says: Jul 6, 2009. 4:22 AM **REPLY**

Kudos for tackling a subject people would rather ignore, and writing an informative instructable. We (by "we" I mean the West) would waste a lot less water of people would have urinals in their houses, but for whatever reason they don't. Perhaps it's the association with the grotty smelly ones in public toilets?

Thinkenstein says: Jul 6, 2009. 6:58 PM **REPLY**

The association may be part of it. Maybe another part is space available. Many private bathrooms are pretty cramped. Ideally the urinals should be there. If space is a problem, the bathrooms should just be a little larger.