Hack a Toilet for free water.

by gregorylavoie on August 19, 2007

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Intro: Hack a Toilet for free water.

This Instructable is a step by step description of the process of adding a sink to the top of a toilet allowing the use of the clean water before it goes into the bowl.

Motivation

Water is a precious resource and our everyday lives are immersed in consuming it. The average toilet uses excessive amounts of water. This hack allows you to minimize some of that water consumption.

I wanted this instructable to be simple enough that anyone could build it with basic tools and materials. I also tried to be material conscious with this project in that: many of the materials are recycled from other things (sheet wood and copper tubing) or second hand (metal bowl), and that it is put together using screws and friction fittings so when the sink has finished serving its purpose it can easily be taken apart and the parts can be recycled.



step 1: Materials

Materials

9inchx20inch piece of sheet wood Small plastic funnel Copper tubing half inch outside diameter Metal bowl approximately 8 inch diameter 4 feet of Vinyl tubing 1/8 inch inside diameter 4 "L" brackets and small wood screws Scrap paper Silicone latex caulking glue Steel binding wire

Tools Hand drill Jig saw 1/2inch spade drill bit 1/8inch drill bit Center punch Sharpie Hole saw 3 inch Exacto knife

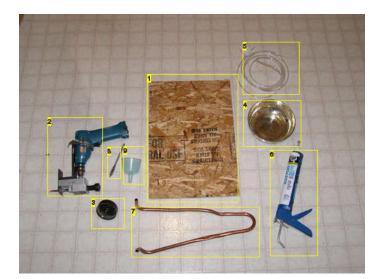


Image Notes

- 1. Wood sheet
- 2. Drill and jig saw 3. Hole saw
- 4. Metal bowl
- 5. Vinyl tubing6. Silicone latex caulk and gun
- 7. Copper tubing
- 8. Spade drill bit 9. Funnel

step 2: Locate the parts and trace

Remove the lid from the toilet tank. Locate the over flow tube, gently remove the rubber tube going into the top of it. Take the small plastic funnel and stick it in the tube. Now take a straight edge and span it across the walls of the tank next to the funnel, and mark the edge on the funnel. Now remove the funnel and lay a piece of paper of the tank and trace out the walls and the location of the over flow pipe in relation to them. Next take the lid from the tank and trace it onto the sheet wood.





- Image Notes 1. Over flow tube
- 2. Rubber tube
- 3. Float valve

Image Notes 1. Mark the height of the wall

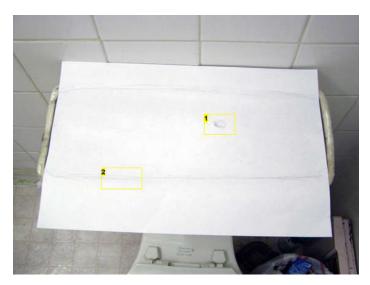




Image Notes 1. Over flow tube location 2. Inside of tank wall

Image Notes 1. Trace lid

step 3: Cut out the lid

Cut out the shape of the lid with a jig saw from the wood and clean up as necessary with sand paper. Now take the paper tracing of the tank and cut on inside wall line with scissors. Now center the tracing on the new wood lid, and take the center punch and mark the center of over flow tube on the wood lid. Using this mark as center drill a 3 inch diameter hole with the hole saw.



Image Notes 1. Cut out new lid

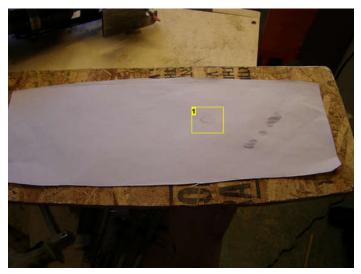


Image Notes
1. Over flow tube location



Image Notes 1. Cut out over flow tube location

step 4: Making the sink With a marker extend the line on the funnel so that it goes all the way around, cut on the line with an Exacto knife. Now take the metal bowl and create drain holes in the center with a small drill bit, making sure the final drain is no bigger than the top of the freshly cut funnel. Next place the funnel on the bottom of the metal bowl and apply liberal amounts of caulking glue on the crack between the bowl and funnel.

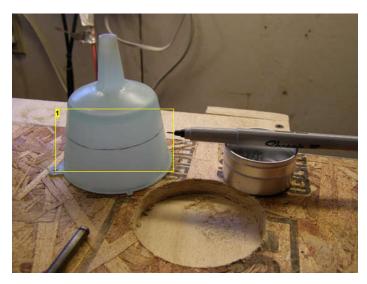


Image Notes 1. Extend Mark around funnel

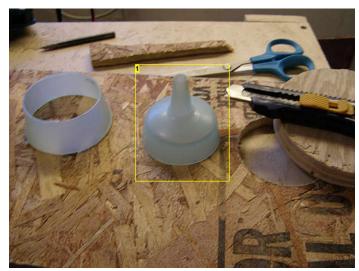


Image Notes 1. Cut off top

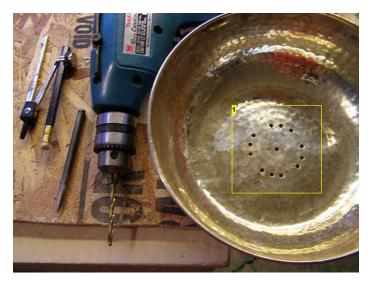


Image Notes 1. Holes drilled for drain

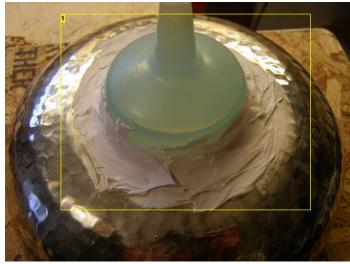


Image Notes 1. Funnel glued in place

step 5: Faucet

The faucet is made from copper tubing bent into an upside down "J". To bend the tubing without kinking it, tightly wrap the wire around the section to be bent and carefully bend it with your hands, retightening the wire occasionally. Trim off the extra tubing with a tubing cutter. Drill a half inch hole with a spade bit, 3 inches away from the large hole in the wood lid. Force the long end of the copper "J" into the hole, friction should hold it in place.



Image Notes 1. Start of the bend



Image Notes 1. Finished bend and extra material 2. pipe cutter





Image Notes 1. Finished faucet

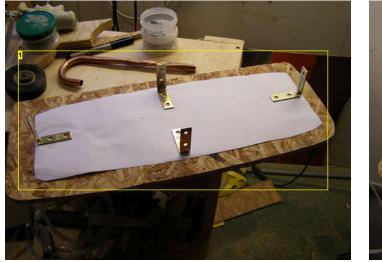
Image Notes 1. Hole for faucet



Image Notes 1. Faucet installed

step 6: Bracket in place

To keep the wood lid from sliding around on the tank you can attach brackets. To figure out where the brackets need to be, flip over the lid and center the paper tracing of the tank on it. The brackets should be against the outer edge and attach with small wood screws.



http://www.instructables.com/id/Hack-a-Toilet-for-free-water./

Image Notes 1. Locations for L brackets

step 7: Installation

Back inside the toilet tank locate the rubber tube that was inside the over flow tube and follow it back to the float valve, and pull it off. Now attach the 4 foot vinyl tubing. Push the other end of the vinyl tube through the bottom of the wood lid half inch hole and up though the copper tube until just before it sticks out the other end of the copper tube.

Now lower the new lid onto the tank making sure the vinyl tubing does not interfere with the internal mechanisms in the tank. Take the metal bowl with the funnel attached and make sure the glue is dry. Now look down the 3 inch hole in the lid and you should see the over flow tube. Take the bowl and funnel and lower it onto the hole, the funnel needs to go into the over flow tube.





Image Notes 1. Remove rubber tube from here

Image Notes 1. Attach vinyl tube



Image Notes 1. 1 Push vinyl tube though lid 2. 2 Push vinyl tube through copper pipe



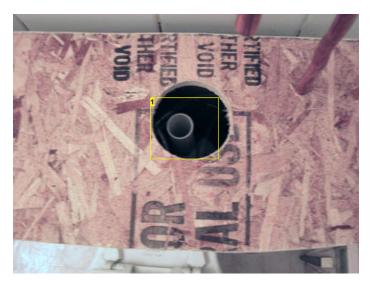


Image Notes 1. Line up funnel with over flow tube

step 8: Finished The sink is now complete. I would recommend putting some kind of water proofing on the lid to protect the wood. Check out the video of the sink in action. Thanks for viewing my instructable.





Related Instructables



Save the bottle, save water! by aohster



Easy Greywater System by wkilbour



Gallons of H20 Per Year (video) by leevonk



Save TONS of Gallons of Water Flushing the Toilet!! by Green Geek



Save gallons of water every day! by WildBuh

by

How to use a

how to save water in a toilet bidet by anthondanthony

laminterious



save water with your toilet by fang113

Comments

50 comments Add Comment



supra9710 says:

Aug 10, 2009. 5:22 PM REPLY

removing the "supply line" from the toilet in this example is dangerous the tube keeps the trap in the toilet from siphoning dry after the flush, preventing (methane, a poisonious gas and hydrogen sulfide, a deadly gas) from entering the home from the sewer system. unfortunately a hotel in texas in the late 60's suffered 68 or so deaths overnight due to improperly functioning refill tubes on the toilets. i am also a licensed plumber and seen results of this type of malfuntion you would be purposly causing by using this idiodic hack. they put that tube on the toilet for a reason. think about this before attempting.



Rozarius says:

So from a plumber's point of view, how would one be able to work around this problem? I like this idea and would like to make something similar in my own home, but I don't like the idea of poisoning everyone in my home including myself.

http://www.instructables.com/id/Hack-a-Toilet-for-free-water./

Sep 5, 2009. 2:29 PM REPLY

view all 228 comments



supra9710 says:

theres not really ne way in this situation sometimes things are just best left alone, now if you can ensure that enough water is getting back into the overflow tube you would probably be okay, but theres not really any way to ensure that due to the concealment of the waterways in the toilet.

Jollyrgr says: This is so PRISON! Aug 23, 2007. 8:49 PM REPLY

Sep 9, 2009. 3:25 PM REPLY

A toilet uses about 3 gallons per flush. Washing your hands less than one gallon. City water costs about \$1.50 per 1000 gallons; or \$0.0015 per gallon. This translates to 0.45 CENTS per flush. NOTE: THIS IS NOT 0.45 DOLLARS but less than HALF A CENT PER FLUSH!

Build one if you must, but this is SO not needed.

(Reference: http://www.irwd.com/WaterEducation/story_of_water/html/costs.htm)



gunsintransit says:

this would be helpful in places where you have to haul your own water...

Jul 17, 2009. 12:21 AM **REPLY**

Jul 10, 2009. 6:14 AM REPLY

Aug 10, 2008. 11:11 AM REPLY

Mar 12, 2009. 9:58 AM REPLY

May 9, 2008. 3:49 PM REPLY

Mar 22, 2008, 10:31 PM REPLY

May 9, 2008, 8:14 AM REPLY

Mar 21, 2008. 12:47 AM REPLY



Javin007 says:

More important than the payback (let's assume you go all-out and build a nice sink next to the toilet that uses this method for drainage.) There's still that much less water going down the drain. Using the 1 gallon per hand washing, assuming you wash your hands an average of 5 times a day, that's 1,825 gallons of water used per year (roughly a 10' by 10' by 3' deep kid's pool) PER PERSON. All of this water will be flushed into your septic system in the best case scenario, but in most cases, will be flushed into the city's waste water supply which will require that it be chemically treated and recycled.

A project like this is flat-out "good" for everyone involved. So what if it only saves you a few pennies? Is it HURTING anyone to do this? No. It is, however, making a fairly significant difference in the long-run. Can you imagine if every single person in a city reduced their water usage per year by 1,825 gallons? How is this not a *requirement* in cities that often have summer water usage restrictions?



UltraMagnus says:

lets work this out, say you flush your toilet 10 times a day (its probably more in real life)

10 x 365 = 3650

3650 x 0.45 = 1642.5 cents

or \$16.43 a year.

so, basically you pay for the materials in one year. for an energy saving device that is a great payback time



nolte919 says:

Excellent response to the naysayer. I actually pay \$3.04 per 1000 gallons so the savings for me would be closer to \$33 a year. A 6 month payback time.



mikemmcmeans says:

it prompts people to wash their hands "hey! wow! wtf! the water turned itself on" "i guess i should wash my hands"



craigh says:

I think you missed the point. It's not about the money. It's about the water.



patricksanford says:

yeah, but the money savings is a nice side effect. the money savings isnt probably very much, but hey, i could almost see installing this just for the money savings alone.



Full Frontal Graphic says:

To paraphrase Phineas Phreak (for you younger folk, P. Phreak was a comic book superhero from the 60's)

"Water will get you through times of no money better than money will get you through times of no water.

International conflicts over water are already a part of recent history. Water is the next oil... look into it just a bit and you will see that fresh water, drinkable water, is being privatised fast, and major corporations are paying insanely small prices to pump the water out from under your feet, depleting your aquifer.

In some places it is illegal to use graywater, even treated graywater, or to install a graywater system in your home.

If you use a real soap, and not some chemical perfume-y soap substitute, it shouldn't at all harm your toilet to wash your hands in the water. It isn't going to hurt the poop you put in there either.

Speaking of which, isn't is strange that two of the most precious things we have, our manure, and our drinking water, are mixed together so that neither one is as valuable before mixing?



chuckr44 says:

"International conflicts over water are already a part of recent history. Water is the next oil... "

Apr 29, 2009. 5:26 AM REPLY

Mar 21, 2008. 12:52 AM REPLY

Feb 21, 2008. 6:23 AM REPLY

Only in areas where water is scares, like Africa, Middle East, and the southwest US. Look at all the legal fights that go on in Arizona, farmers (heavy water users) vs. city dwellers getting charged high amounts for water.

Even in Michigan (where I live) which is surrounded by fresh water on 3 sides, water is a problem. We get no rain in July and August. This causes major problems with watering crops. Which is why I have a rain barrel. It holds 6 weeks worth of water if I use it carefully.



Full Frontal Graphic says:

Oh yeah, nice instructable, very stylish result, kudos for the use of secondhand and recycled parts and for making it easily recycled.

And it's pretty.



zetacool says:

Maybe when the author said "Motivation Water is a precious resource..." he wasn't talking about money dude.

By the way, what means "This is so PRISON! ?" Sorry I donÂ't have a tv so IÂ'm outdated from MtvÂ's cool suburbia slang.



Jollyrgr says:

jawga says:

Toilets in prison/jails are part sink, part toilet. The top of prison toilets are sinks. See this: http://www.acorneng.com/acorn_catalog/PDF/catalogpdf/p/1440.pdf Feb 22, 2008. 2:05 AM REPLY

Oct 28, 2007. 6:35 PM REPLY

One problem-O to properly wash your hands you must use hot water. Sorry but you just wont kill that Shigella, e. Coli and other stuff if you don't use hot water.

This is a fact see ServSafe.com, the FDA Food Code and you local health dept for details. Great idea though if you are building you house or adding a bath it could be done. Just pipe hot water thru a mixing valve of cold and fill you potty from that and you will be all set. Jawga



daisybelle says:

also a great idea if you live in Australia, and for half of the year you get hot water coming out of the cold taps for the first couple of litres!

Mar 21, 2008. 9:14 PM REPLY

Apr 11, 2008. 2:02 PM REPLY

Jan 1, 2009. 4:28 PM REPLY



ledzep567 says:

thats why you use anti-bacterial soap ...



blodefood says:

Antibacterial soap is the worst thing for your health and the worst thing for the environment. Plain soap like a hundred years ago is just fine if you lather it up for a full minute and rinse off. And, yes hot water is preferable, but don't put that into the toilet tank or bowl as the sudden temp change could crack the fixture.



nachobobs says:

E Coli and Staph bacteria are only harmed when they hit at least 63 degrees Celius. (even boiling for an hour might not kill 100% of bacteria) If you washed your hands in this temperature water I'm sure you would know about when they turn bright red and feel like they are burning. As long as you use soap and clean water, your hands will be clean.



Uru Wolf says:

lol, you could allways add a heater coil to the pipe to warm the water as it rises. You could make it solar powered to save energy -_



mshouppe says:

You don't have to use hot water when you wash your hands. 30 seconds of running water with some type of soap is necessary. I checked my local health department (the hospital I work at).



Justinger says:

In my experience, hot water is mainly good for getting gooey or baked on things to dissolve off of dirty dishes and the like. If anyone is having this problem on their hands while using the biffy though, they may need some lessons.

Feb 20, 2008. 2:19 PM REPLY

Feb 11, 2008. 12:41 PM REPLY

Feb 1, 2008. 7:51 PM REPLY

Jul 15, 2008. 6:42 PM REPLY



yerboyhowdy says:

Seconded. There is no way to wash your hands with water hot enough to kill germs. In fact, hot water might even help the little buggers out. A warm, wet germ is a happy germ.



Damian7 says:

In countries where water is running out like Mexico. it seems like a good idea, you have to think that this website is visited for not only Americans but the rest of the world. In Guadalajara Jalisco the third largest city in Mexico, when it's dry season, the water service it is cut off for days. I don't think it is about the cost, it is about using water with responsability. Good instructable!!!



boocat says:

This will get little kids to wash their hands, though. Add a gel soap bar with a plastic toy frog inside it (I get mine from the local health food store.) Kiddies also love to flush because it turns the "sink" on! (Children often forget to flush, you see.) I like this. I told my hubbie that the next toilet we buy is going to be a model with a sink on the tank top.

h3II says:

(removed by author or community request)

Oct 20, 2007, 5:28 PM REPLY

Sep 24, 2007. 11:17 AM

Feb 18, 2008. 5:25 PM REPLY

Oct 21, 2007. 12:53 PM REPLY

Oct 4, 2007, 4:56 PM REPLY



Jollyrgr says:

I have no idea where you are from but I would not call all of your country men and women morons based on your comments. Do realize that you called me, the person that posted the instructable in question, and all Americans morons. In some areas city water is expensive. It may also be intermittent in many other countries. My biggest problem with my city water is twice in my entire life I've been under a boil order. Other than that water is fairly easy to come by. It takes me one hour of work to pay for two months worth of water and sewer and I'm not a Bill Gates. So when I see a project like this it seems unneeded to me. Even if you read my original comment I even state "Build one if you must, but this is SO not needed."



mtxe says:

tspnews says:

When he used "Kiddies" he was referring to "Children" not cats.

Sep 5, 2007. 3:18 AM REPLY

Sep 20, 2007. 8:45 PM REPLY

Oct 19, 2007. 12:15 PM REPLY

It is unfortunate in this society that people do not recognize that just because something is inexpensive ... or that the alternative is more costly ... that it's ok not to care about what you use. It is that same mentality I think that keeps people that are "well off" driving hummers because the cost of gas does not matter when it's the "Use" that is what really matters.

I love this idea. I think to give it more mass appeal one might need to "pretty it up" and either drill directly through the original lid or go with maybe cabinet grade wood and give it a nice sanding/coating. or even a copper/metal covering?



technodude92 says:

I think what jolly is trying to say, and stated at the end of his comment, is that for some this is unnecessary, but for the environmentalist that has everything... this is great! for them.



gnoodles says:

Aug 23, 2007. 11:46 PM REPLY Not sure about where you live, but the rates you cite are VERY low compared to the rates in Seattle. The Winter water rate in Seattle is \$2.53/100 Cubic feet (~7.5 gallons). On top of that, we pay \$7.45/100 CF for wastewater (Sewer), which is calculated as 100% of you water usage in the Winter. Summer water rates are even higher. So the effective water rate in Seattle is 1.36 cents per gallon or more.

This project probably cost \$50. At Seattle rates, assuming a family of four who each use the toilet 3 times a day (probably a low estimate I'd guess), and assuming 1 gallon of water used per handwashing, you'll pay for such a system in about 10 months.

Regardless, the reason to use a system like this isn't to save money, it's to conserve water. The reason that Wastewater is so expensive in Seattle is that we've outgrown our wastewater treatment capabilities, so we're having to spend millions of dollars on a new wastewater treatment plant. By washing your hands with water that would otherwise be 'wasted' you can help delay such a plant being needed in your area.

(Reference: http://cityofseattle.gov/html/CITIZEN/utility.htm)



sensoryhouse says:

I live in the Seattle area also. I just moved from Queen Anne and Bell Town before that. I never conserved water and I never paid what you would have called an effective rate of 1.36 per gallon. Considering I can buy a purified gallon of water at Fred Meyer for 99 cents your statement sounds quite ridiculous.



gnoodles says:

Oct 28, 2007. 10:43 PM REPLY

Oct 28, 2007, 9:35 PM REPLY

Umm... I assume that you didn't see my follow up clarifying that 100 CF is 750 gallons, not 7.5, right? Scroll down a bit. If you still think it's ridiculous, go here to see Seattle's residential water rates, and go here to see the wastewater rates. You'll note that with the exception of that typo, the rates are exactly what I stated, and if you do the math, the rate per gallon is \$.0136, exactly as I stated.



Prometheus says:

To re-iterate, this is a method of washing your hands using water that would otherwise be wastewater anyway. Wash your hands and let that water be re-Oused to flush your bodily waste, and you technically save water, since you are effectively recycling that amount of water. The typical toilet tank consumes 3 gallons per flush, and the refill cycle to the bowl adds another gallon or so to that. The typical hand-washing session uses more than 2 gallons of water, so recycling the handwash-water to be used to flush your "deposit" does, in fact, save water.....

However the best way to save water is in the timeless advice of a former seattle mayor who said the immortal words, "If it's yellow, let it mellow, if it's brown, flush it down"...No ecological disaster was prevented by not flushing on every use, since more than 60% of usage is "#1"....

This instructable is a great way to make dual-use from a single-use device, but simply-put, to save water, don't flush when all you have to contribute is a mere sprinkle that could barely put out a match-flame....Oddly enough this also makes the bowl easier to clean due to the resultant alkali pH in the bowl.

I live in seattle and even though I have unlimited water use, I flush only when needed to save water. This discipline comes from being a Hawaii expat, where water is ironically far cheaper (\$0.009 a gallon) last I checked...

Also remember that wastewater treatment plants may return more than 90% of the water back, but the refining process consumes energy, which is part of your "coÂ² footprint", hence making this method of recycling worthy for the environment either way you look at it.



maka savs:

Sep 4, 2007. 10:24 PM REPLY

Sep 5, 2007. 7:16 PM REPLY

Sep 5, 2007. 8:06 PM REPLY

the "if it's yellow" rule is in effect at my house. we go a step further than this in recycling water, though...we have the valve for the water inlet to the toilet turned off, and we keep the plug in the bathtub drain when we shower in the morning, and then with a pitcher, we use that water to fill the toilet tank, which causes the toilet to flush. it's a little clumsy for folks to get used to at first, but it certainly reduces the amount of water we use



I live in the land of sun and fun

and never flush for number one



incorrigible packrat says:

What if you're like me, and suffer from especially smelly pee? (When asparagus is in season, the ol' "lemonade" has an unbearable stank.)

Actually, I do have a water saving solution for this, called "pissin' in the sink". Washing your hands afterwards, (I am not a complete barbarian) puts enough water down the drain to flush the pee out of the p trap, or s bend, or whatever the hell that thing under the sink is that holds some water in it, to deny the entry of deadly poo gas from the sewer, into your happy home.

btw # 1 I wouldn't do this in other people's houses btw # 2 I am not posting drunk



killerjackalope says:

Apr 5, 2008. 10:44 AM REPLY I skip that whole sewer bit and go onsies in the flowerbeds, my mum still wonders why one end was always alive even when she forgot about watering, truth is I can hit the bed from my little window roof...

Btw I am drunk while doing this mostly but it has been proven as a way of saving the plants...



incorrigible packrat says:

HeHeHe. I do that too. Doesn't work too well in an apartment though. I could pee in the potted plants, but you can get problems with buildup of urine salts. Also, wifey might object to such practice. (She didn't much like it when the cats was at that...)

I find that the best place to have a slash, is on the compost pile. Helps with the compostification and provides valuable nutrimentaries.

btw # 1347 I am only moderately high at present, will only repeat "the cats was at that" a few more times, before seeking other amusement...



killerjackalope says:

Ah try the cats was at thats the little 's' helps ...

Maybe off the balcony? if there are lots of window plants you could alternate them... people will be grateful of the great urine giver above, the ones above will be mildy grateful of the great urine giver from below



incorrigible packrat says: Nuts! Don't got no balcony!

I do live downtown, and could pee out the window on those who make rowdy at 2 A.M. on the sidewalk below said window, usually on days when I have to go to work, and then I'll be all gripey, not having had enough beauty sleep, then wifey will criticise when I get home, then... what was I talking about?

Apr 10, 2008. 10:45 AM REPLY

Apr 10, 2008, 7:39 PM REPLY

Apr 9, 2008. 6:15 PM REPLY



killerjackalope says: Peeing offa stuff...

You could rig up a sorta navy shower system with a bucket just below the window, keep going in there until they make rowdy, pull the chain and listen...



incorrigible packrat says: I like the cut of your jib, Admiral... Apr 10, 2008. 8:21 PM REPLY

Apr 10, 2008. 8:05 PM REPLY

We did, on one occasion, dump a glass of water on some. My, but they did bleat at that.

I'd hate to think of the splutter that a bucket of skanky old piss would cause...



killerjackalope says:

Apr 10, 2008. 9:14 PM REPLY

Nov 2, 2007. 12:39 PM REPLY

Nov 4, 2007. 4:29 AM REPLY

I reckon by that point they'd just go away. There's only so far before they give in and go home or more likely a park bench.



sugarego says:

incorrigible packrat, this is an awesome idea. i like your spirit. and if this is relatively easy for folks to do (that is, if you're a boy), i think we should consider this a first alternative, as this can use less total water than a toilet flush (assuming you don't use tons of soap and spend a long time washing your hands).



incorrigible packrat says:

Here's a little joke I thought might be vaguely relevant.

A man is eating soup at a restaurant and drops his spoon on the floor. He beckons the waiter over. The waiter notices the dropped spoon and rapidly produces a clean spoon from his back pocket. The man says "Thank You" in a somewhat faraway and puzzled tone, as he has just noticed a piece of string sticking out of the waiter's pants. He stares for several moments. Waiter: "Something wrong sir?"

Man: "No, I was just wondering ..."

Waiter: "...about the spoon?"

Man: "Well, that too, I suppose"

Waiter: "Oh we had this efficiency consultant come in a few months ago. He found that, if a customer dropped their spoon, we waiters would spend up to two minutes going to the kitchen and fetching a fresh spoon. He recommended that all the waiters keep spoons in their back pockets."

Man: "That's interesting, but I was really wondering about the string"

Waiter: "Oh that, yeah, the same consultant found that the waiters would take up to a minute and a half, washing their hands after ,excuse my language, peeing. So he recommended that we all tie a string around our, excuse my language again, dinks, so that we could fetch them out of our pants. That way we don't touch them, so we don't have to wash our hands. Saves a lot of time, really."

Man: "That seems pretty efficient, but how do you get your dinks back in your pants?" Waiter: "Oh, generally we use the spoon!"



gnoodles says:

Oops... To clarify, \$2.53 is the price for 750 gallons (748.051945, technically), not 7.5.



Aug 30, 2007. 8:56 PM REPLY



Jollyrgr says:

Using your 1.36 cents per gallon means a flush costs you 4 cents per flush; almost ten times my rate.

Let's say a very good hand washing uses a gallon of water. If you were to save that 1.36 cents per hand washing and invest the \$50 to make this, it works out to be 3676 flush/handwashings before you see a savings.

I'm not making a judgement here, just running some numbers.

view all 228 comments