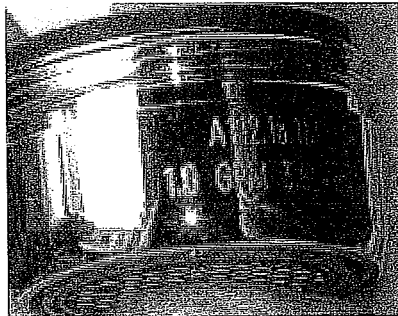


## Water Questions & Answers

### How much water does the average person use at home per day?

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Estimates vary, but each person uses about 80-140 gallons of water per day. Now multiply that by 30 days!! ( $140 \times 30 = 4,200$  gallons per day) Are you surprised that the largest use of household water is to flush the toilet, and after that, to take showers and baths? That is why, in these days of water conservation, we are starting to see toilets and showers that use less water than before.

#### Typical water use at home

Bath	A full tub is about 36 gallons.
Shower	2 gallons per minute. Old shower heads use as much as 5 gallons per minute.
Teeth brushing	<1 gallon, especially if water is turned off while brushing. Newer bath faucets use about 1 gallon per minute, whereas older models use over 2 gallons.
Hands/face washing	1 gallon
Face/leg shaving	1 gallon

### Typical water use at home

Bath	A full tub is about 36 gallons.
Dishwasher	4 to 10 gallons/load, depending of efficiency of dishwasher
Dishwashing by hand:	20 gallons. Newer kitchen faucets use about 2.2 gallons per minutes, whereas older faucets use more.
Clothes washer	25 gallons/load for newer washers. Older models use about 40 gallons per load.
Toilet flush	3 gallons. Most all new toilets use 1.6 gallons per flush, but many older toilets used about 4 gallons.
Glasses of water drunk	8 oz. per glass (did you remember to drink your 8 glasses of water today?)
Outdoor watering	5 to 10 gallons per minute

## Frugal Flushing

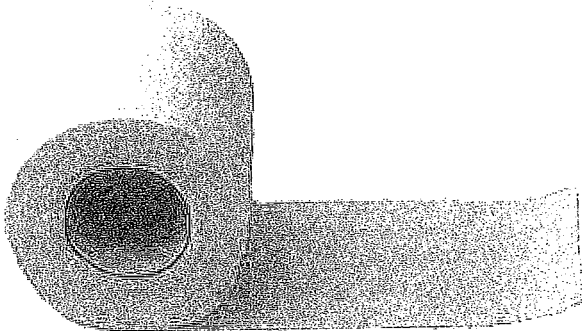
Toilet flushing is the single highest use of water in the average home, so it also presents a prime opportunity for water conservation. With the average person flushing five times a day, toilets make up about 31% of overall household water consumption. Each flush uses 2 to 6 gallons of water.

There are lots of ways to conserve toilet water use, from habit changes and mechanical adjustments to replacement.

An average family of four uses 881 gallons of water per week just by flushing the toilet!

## Toilet Water Saving Tips

1. Install a new WaterSense labeled high efficiency toilet (HET) model to save water.
2. Do not use the toilet as a trash can. Trash should be discarded in the garbage.
3. If you hear the water running in the toilet tank for an unusual length of time, a **simple adjustment** can return it to normal operation.
4. If your toilet has a water line indicator on the tank, make sure the water is at or below this line when the toilet refills.



## Potty Smarts: Know Your Toilet

In a home with older toilets, an average flush uses about 3.6 gallons (13.6 liters), and the daily use is 18.8 gallons (71.2 liters) per person per day. In a home with ultra-low-flow (ULF) toilets, with an average flush volume of 1.6 gallons (6 liters), the daily use is 9.1 gallons (34.4 liters) per person per day. A family of four using an older toilet will use approximately 26,000 gallons (98.4 m<sup>3</sup>) per year in toilet flushes, while a family with a ULF toilet will use approximately 11,000 gallons (41.6 m<sup>3</sup>) per year in toilet flushes, achieving a savings of 15,000 gallons (56.7 m<sup>3</sup>) per year.

New, High Efficiency Toilets (HETs) use 1.3 gallons (5 liters) per flush (gpf). With an HET, a family of four will use approximately 9,000 gallons (34 m<sup>3</sup>) per year in total toilet water use. Look for the WaterSense label to ensure your new toilet has maximum efficiency and high performance.

### Older Toilets

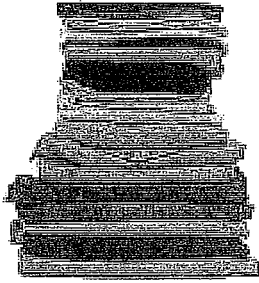
Toilets made from the early 1980s to 1992 typically used 3.5 gallons per flush (13.2 liters) or more. Toilets made prior to 1980 typically used 5.0 to 7.0 or high gallons per flush (18.9 lpf to 26.5 lpf). The oldest toilets can use more than 8 gallons per flush (30 lpf).

### Ultra Low Flush Toilets (ULF)

An Ultra Low Flush toilet flushes at a maximum of 1.6 gallons (6 liters) per flush. Federal law currently mandates that all toilets manufactured in the U.S. must use an average of 1.6 gallons (6 liters) per flush or less. This law was enacted in 1992 and put into place in 1994 in an effort to improve water efficiency nationwide and coordinate various state standards.

### High Efficiency Toilets (HET)

An HET is a toilet that flushes at maximum of 1.3 gallons (5 liters) per flush. There are more than 1,100 models of HET toilet on the market today. New fixture models have been introduced and the performance of HETs has improved dramatically. Today, HETs outperform their ULFT (1.6 gpf/6 liters) predecessors as well as the 3.5 gpf (13.2 liters) toilets that were installed in the 1980s.



## Crisp, Clean Clothes Without the Waste

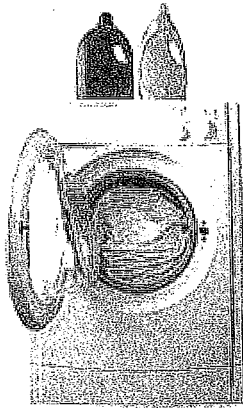
Washing laundry is a significant use of water in the average home; accounting for 15% to 40% of the overall water consumption inside the typical household of four persons. The average American family washes almost 400 loads of laundry each year.

### Water Factor

Because washers come in various sizes and capacity, the water efficiency of clothes washers is rated using the term "Water Factor" to accurately compare water use. Water Factor (WF) is measured by the quantity of water (gallons) used to wash each cubic foot of laundry.

### Older Washers

An old school washer will use approximately 40 to 45 gallons (151.4 L to 170.3 L) of water per load and have a water factor of 10 or higher. A family of four using a standard clothes washer will generate more than 300 loads per year, consuming 12,000 gallons (45.4 m<sup>3</sup>) of water annually.



### High Efficiency Washers

New, High-Efficiency Washers (HEW) (front loading or top loading machines are available) can use 14 to 25 gallons (53 L to 94.6 L) of water per load and will have a water factor of 8 or less. Replacing an old and inefficient clothes washer can reduce this water use by more than 6,000 gallons per year (22.7 m<sup>3</sup>), save energy, clean the clothes better, and reduce fabric wear.

### Clothes Washer Water Saving Tips

1. Run full loads only, even if the washer has an adjustable load setting. A full load is the most efficient way to wash clothes.
2. Replace the old inefficient clothes washer with a new high-efficiency model to save water and energy.

## More Information About Clothes Washers

### Standard Washers

The standard top loading clothes washer, using a vertical-axis drum, has changed little from General Electric's design in 1947. The vertical axis design requires enough water in the drum to suspend the fabric in the soapy water while the agitator churns the clothes to help remove dirt and stains. The large amount of water required to suspend the fabric in the tub limits the ability for this type of washer to efficiently use water. Historically, vertical axis washers consumed 45 gallons per load (170 L), though newer models of the past few years have reduced this to less than 40 gallons per load (151.4 L). Even the best designs manufactured today require more than 9 gallons (34.1 L) of water per cubic foot of capacity (28.31 L).



### High-Efficiency Washers

High-efficiency front or top loading washers facilitate greater efficiency because they use less water and energy. These high-tech machines are proven to be more effective in cleaning the clothes with less water, and is gentler on the fabric when compared to old-school vertical axis washers. Additional benefits of lower water use are: a) less laundry detergent is required; and, b) less water needs to be heated resulting in energy conservation. Most high-efficiency washers use only 15 to 30 gallons of water to wash the same amount of clothes as older washers (29 to 45 gallons per load (109.7 L to 170 L). The most efficient washers use less than 5 gallons (18.9 L) per cubic foot of capacity.

### Water Efficiency of Washers

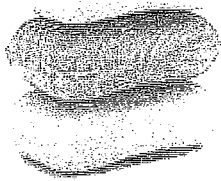
The smaller the water factor rating, the more water efficient the clothes washer. A typical residential clothes washer has a capacity of approximately 3 cubic foot, though sizes range from 1.7 cubic feet (48.13 L) to more than 4.2 cubic feet (118.9 L) for the extra large capacity machines. The Water Factor provides a means to directly compare water efficiency of different sized machines.

### Efficiency Example

Washer A uses 32 gallons of water per load (wash and rinse cycles) with a 4 cubic foot capacity of laundry; thus, has a Water Factor rating of 8 ( $32 \div 4 = 8$ ).

Washer B uses 30 gallons of water (wash and rinse cycles) with a 2.5 cubic foot capacity; thus, has a Water Factor rating of 12 ( $30 \div 2.5 = 12$ ).

Washer A uses water more efficiently ( $WF=8$ ) than Washer B ( $WF=12$ ). While Washer A uses slightly more water per load, it can clean 40% more clothes per load.



## Showering to Savings

In an average home, showers are typically the third largest water use after toilets and clothes washers. The average American shower uses 17.2 gallons (65.1 liters) and lasts for 8.2 minutes at average flow rate of 2.1 gallons per minute (gpm) (7.9 lpm). The average 5 minute shower takes 15-25 gallons of water; around 40 gallons are used in 10 minutes.

## Shower Water Saving Tips

1. Pay attention to the length of time spent in the shower. Try taking a shorter shower of around 5 minutes.
2. If your shower is equipped with an on-off switch use it while you are soaping and shampooing.
3. If you have to wait a period of time for the hot water to reach the shower, try collecting the normally discarded cold water in a bucket for watering plants.

An additional method to reduce water use in showers is to turn off the water while lathering and shampooing, often called a "navy shower". The method requires three steps: 1) turn on water to rinse body and hair; 2) turn off water while shampooing hair and washing body with soap and washcloth; 3) resume water flow and rinse off all shampoo and soap. Using this technique, the total duration of water flow can easily be reduced to 5 minutes or less.

## Other Shower Information

### Shower Heads

Replacing your current showerhead with a new model that uses 2.5 gpm (9.5 lpm) may or may not save water in your home. Many people already have a 2.5 gpm (9.5 lpm) showerhead installed.

Showerheads are inexpensive (starting at less than \$5) and can be a good way to save water in your home. Reducing hot water use saves energy because your hot water heater has less work to do.

### Duration

The **duration** of the shower has a direct effect on water usage. A 20-minute shower will use twice as much water as a 10-minute shower taken at the same flow rate. Many have hypothesized reducing flow rates of showerheads might cause users to take much longer showers. Scientific studies that monitored thousands of homes across the nation have proven the flow rates have little influence on the duration of the shower. A shower timer might be a helpful tool in reducing the length of your showers.

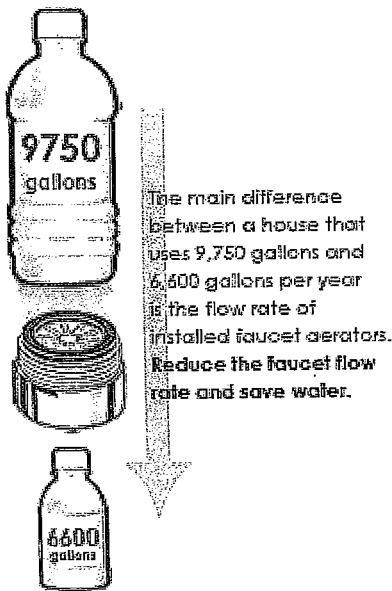
An average bath requires 37 gallons of water.

# Kitchen and Bathroom Faucets are Among the Easiest Places to Save Water

## There are two basic rules to follow:

1. Shut off faucets whenever possible; and
2. Make sure your faucets don't drip or leak.

Faucet water use accounts for 15-18% of the overall water consumption inside the typical household of four persons. An average American household of 3 uses between 18.1 and 26.7 gallons per day for all faucets (bathroom, kitchen, and utility sink). This amounts to between 6,600 and 9,750 gallons per household per year for faucet use. The main difference between a house that uses 9,750 gallons and 6,600 gallons per year is the flow rate of installed faucet aerators. Reduce the faucet flow rate; save water.



## Reduce Flows, Save Water and Energy

The aerator (the screw-on tip of the faucet nozzle) restricts the maximum flow rate of water from the faucet. New kitchen faucets are usually equipped with a 2.2 gpm aerator. Bathroom faucets can have aerators that restrict flow to 1.5, 1.2, 1.0, or 0.5 gallons per minute (gpm). Basic bathroom faucet aerators start at about \$1 each and prices go up depending on the features you select. Because hot water is frequently drawn from faucets, reducing flows also reduces hot water use which means energy savings.

## Low Flow Bathroom Aerators = Water and Energy Savings

A basic bathroom faucet aerator is inexpensive and one of the most cost-effective water efficiency measures. It is always a good idea to bring your old aerator (and any associated washers) to the store with you when you purchase a new one to ensure that the new aerator will fit on your faucet fixture.

The water, wastewater, and energy saving benefits you get from installing new faucet aerators is primarily determined by your current aerators. But since faucet aerators are cheap and the water savings are well documented, it's a safe bet that you will pay for your aerator investment in less than two years.



## **Take Care in the Kitchen**

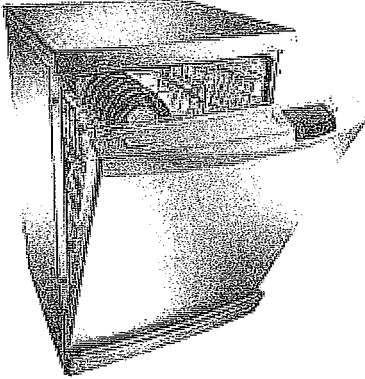
Reducing the faucet flow rate in the kitchen below 2.2 gpm is easily accomplished by replacing the aerator, but the water savings may be somewhat limited. Many faucet uses in the kitchen are not discretionary. For example, filling a pot with water to make pasta. Regardless of the faucet flow rate, the volume of water needed to fill the pot is the same. Reducing the flow rate of the kitchen faucet saves water and energy, but also results in longer wait times to fill fixed volumes and can also reduce effectiveness for hand-washing to dishes.

## **Consider the Utility Sink**

If your home has a utility sink in the laundry room or garage, you may have an excellent opportunity for easy water and energy savings by simply replacing the aerator. Like the kitchen sink, it's important to consider the frequent uses of water in the sink when selecting an aerator. If you use the utility sink frequently to fill up buckets or tubs with water, it may make sense to use a higher flow aerator. If the utility sink is mostly used for hand washing or cleaning, a lower flow rate will probably be just fine. The lower the faucet flow rate the greater the water and energy savings.

## Sparkling Dishes with Less Gallons

Washing dishes in an automatic dishwashing machine is a relatively small use of water in the average home; accounting for 1% and 2% of the overall water consumption inside the typical household of four persons. The average American family washes approximately 110 loads of dishes each year.



An older model dishwasher will use approximately 10 to 15 gallons (37.8 L to 56.7 L) of water per load. A family of four using a standard dishwasher will generate about 150 loads per year, consuming 1,800 gallons (6,800 liters) of water annually.

New, ENERGY STAR® dishwasher will use less than 5.5 gallons (20.8 L) of water per load. Replacing an old and inefficient dishwasher can reduce this water use by nearly 1,000 gallons per year (3,790 L), and save energy through the efficient operation of the machine and by using less hot water.

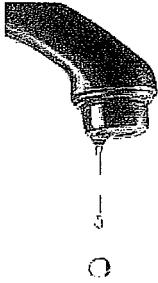
### Energy Savings from Dishwashers

Was your dishwasher made before 1994? If so, you're paying an extra \$40 a year on your utility bills compared to owning a new ENERGY STAR qualified model.

Dishwashers use energy for heating water and for circulating the water through the machine. If the amount of water used by the machine can be reduced, the energy consumption will also be reduced. New high efficiency dishwashers' effective washing action, energy efficient motors and other advanced technology such as sensors that determine the length of the wash cycle and the temperature of the water necessary to clean the dishes.

### Dishwasher Water Saving Tips

1. Run full loads of dishes only. It will use the same amount of water regardless of how many dishes are inside, so get the most bang for your buck!!
2. Install a new ENERGY STAR high-efficiency model to save water and energy.
3. Don't rinse the dishes. Pre-rinsing is not required with many new dishwashers. Read the instruction manual for your machine to determine if you can minimize rinse water usage.
4. Dishwashers actually use less water than handwashing, particularly if you limit pre rinsing.

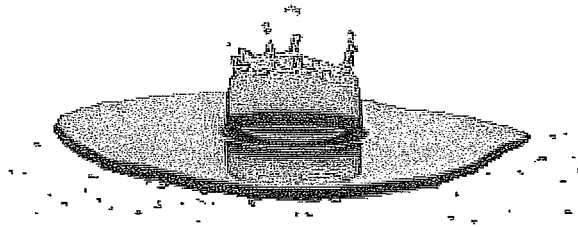


## Drip, Drip, Drip

Leaks from pipes, plumbing fixtures and fittings are a significant source of water waste for many households. Research has shown that the typical home can lose 2,000 to 20,000 gallons (7.6 m<sup>3</sup> to 76 m<sup>3</sup>) of water per year due to leaks. Some leaks are obvious, such as dripping faucets and leaking water heaters. Unfortunately, many leaks go undetected for years because the source of the leak is not visible.

Fix leaky faucets immediately! A faucet leaking 60 drops per minute will waste 192 gallons per month. That is equal to 2,304 gallons per year!! A leaky faucet can waste 100 gallons a day!!

If every household in America had a faucet that dripped once each second, 928 million gallons of water a day would leak away!!



## Whole House Meter Check for Leaks

Larger leaks or a combination of small leaks can often be detected by your water meter. Using your water meter you can perform a simple leak check with the following steps:

1. Make sure all water is turned off inside and outside the home. This test must be performed when no automatic water equipment is used, such as irrigation controllers, clothes washers, dishwashers, etc.
2. Record the reading of the water meter, and wait 15 minutes. Be certain no one uses any water during this time.
3. Record the reading of the meter again. If the meter has recorded water use during the test, it might be due to a leak. Verify that the water use is not due to small appliances such as water filters, water softeners, or whole house humidifiers.

The meter test only verifies large leaks. Using this test you cannot verify that small leaks do not exist within the home. Even when leaks are detected, this test does not indicate the location of the leaks. Further investigation is needed to detect and locate all significant leaks.

## Water Supply Line Leaks

There are sometimes leaks between the meter and the home, in the water supply line. These leaks are often difficult to detect because the supply pipe is usually buried at least 3 feet (.91 m) below the ground surface. Sometimes the

leaking water will travel along the pipe, back to the meter. If the meter box contains water, and the water is not due to rain or irrigation run-off, this may indicate a leak in the supply line. Another common exit point for the leaking water might be where the supply line rises above the ground and/or enters the house. If the soil is constantly damp at these locations this might indicate a leak. In cases of severe leaks, the water will seep up towards the ground surface, usually directly above the path of the underground pipe. Most often, leaks between the meter and the house are the responsibility of the homeowner; leaks from the meter or pipes leading from the main to the meter are the responsibility of the water utility. The water utility should be contacted before any attempt to repair the water supply pipe. If the utility deems the leak to be the responsibility of the homeowner, a professional plumber should perform all repair work. This repair should never be attempted by a homeowner.

## Faucet, Shower, and Tub Leaks

Faucet leaks are a common occurrence and usually simple to repair. A faucet dripping slowly at only one drop every two seconds will waste more than 1,000 gallons (3.7 m<sup>3</sup>) per year. The repairs necessary to stop the leak depends on the type of faucet, and there are four basic types found in most homes: compression valve, ball types, cartridge types, and ceramic discs. Each type of faucet has unique methods of repair. If you are accustomed to using tools and making minor home repairs you should be able to repair minor faucet leaks.

## Toilet Leaks

Toilets are one the most common sources of leaks in the home, and usually go unnoticed because the leaks are often silent and out of view. Several research studies have found 20% to 35% of all residential toilets leak to some degree. Large toilet leaks can be detected when the valve constantly emits a hissing or gurgling sound when the toilet is not in use.

To begin looking for leaks remove the tank lid and inspect the flush mechanisms. The water level in the tank should be no higher than 1 inch below the top of the overflow tube. If the water level is to the very top of the overflow tube, water is slowly leaking into the overflow tube and down the drain. The problem has one of three causes: 1) the water level is adjusted too high; 2) the float is damaged and not shutting off the refill valve; or, 3) the refill valve (ball-cock assembly) is worn and needs replacement.

### Replace a Flapper Valve

You can perform a simple dye test to check for leaks in the flapper valve. Place dye tablets or a couple drops of food coloring into the tank water to give the water color. If the colored water appears in the bowl within 15 minutes, there is a leak in the flapper valve. Leaks occur when the flapper valve does not create a watertight seal. The seal can be compromised due to several reasons: a) the chain snagging, not allowing the flapper to drop completely onto the valve seat; b) the valve seat is worn; or c) the flapper is worn or warped. A worn flapper is the most common cause by far, and can be easily replaced.

### Check water bills for any instances of high water use, as this may be an indication of a leak.

- Leaking faucets, leaking toilets, and leaking pipes all have something in common, they waste a lot of water! Your water bill will often show abnormal water consumption if there is a leak. **Composting food wastes saves water by reducing the water needed to run a garbage disposal.**

**Pool owners can use a cover to reduce water loss through evaporation. A pool cover can also save energy and reduce the need for chemicals.**

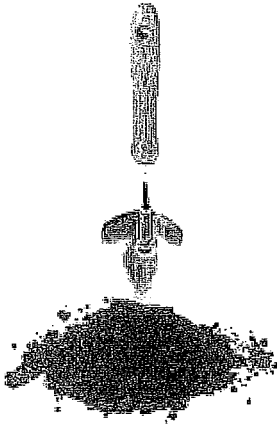
**Sweep outdoor surfaces with a broom instead of using a hose.**

**Wash vehicles at a carwash that recycles its water. If washing at home, make sure the hose has a shutoff valve.**

## Landscaping

**If an irrigation system is used, make sure it is properly set up and maintained.**

- Irrigate hydrozones based upon the plants' water needs. Most lawns require only 1 inch of water each week once established.
- Install a weather-based SMART irrigation controller. It is essential that SMART controllers are properly programmed and maintained.
- Regularly inspect the sprinkler heads to make sure they are not damaged or malfunctioning.
- Adjust sprinklers so they are not spraying water on paved surfaces such as the sidewalk or driveway.



**Landscape with water-wise landscaping principles.**

- Use native plants or plants that require little water to thrive in your region.
- Plant turf grass only in areas where people will use it actively for recreation.
- Organize your landscape into hydro-zones. Hydro-zones are areas of landscape with plant and vegetation that have similar water requirements. This prevents over-watering some plants and under-watering others.
- Keep soil healthy and add mulch to prevent water loss through evaporation.
- If watering with a hose, make sure it has a shut-off nozzle.
- Water in the morning to prevent water loss due to evaporation. Avoid watering when it is windy.
- Don't water unless your lawn needs it! Use a screwdriver to test the moisture of your soil. Push the blade of the screwdriver into the ground; it will become difficult to push when the soil is dry. If this happens less than six inches into the ground, then it is time to water!
- Water less often but for longer periods of time. Watering every day for just a few minutes actually reduces the health of your lawn. Deep soaks encourage deep roots which makes your plants more drought tolerant.
- Use a rain barrel to collect water for use in the landscape.
- Add a graywater system to collect water from your washing machine or shower and bath, and use it in the landscape.

