

# How much do you know about Water?

So you think you know a lot about water? Take a few minutes and test yourself. Check off the items you didn't already know, and see how your score ranks at the end of the article.



The overall amount of water on our planet has remained the same for centuries and as far back as scientists can calculate. However, the human population on our planet grows exponentially. The world's population grew from 5.3 billion in 1990 to 6.9 billion in 2010, an increase of 30%. Human intervention in its various forms represents the biggest threat to water quality throughout the earth.

## *Water as a Substance*

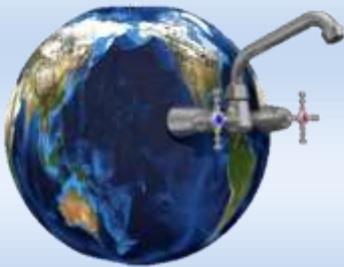
- Water is the only substance found on earth naturally in three forms: solid, liquid and gas.
- Water consists of three atoms, two Hydrogen atoms and an Oxygen atom, bound together due to electrical charges.
- Water vaporizes at 212 degrees F, 100 degrees C.
- In its solid form, water (ice) is less dense than the liquid form, which is why ice floats.
- Water regulates the earth's temperature.
- Water moves around the earth in a five-part cycle: evaporation, condensation, precipitation, infiltration and surface run-off.
- The earth's water is always in movement, and the natural water cycle, also known as the hydrologic cycle, describes the continuous movement of water on, above, and below the surface of the Earth. Water is always changing states between liquid, vapor, and ice, with these processes happening in the blink of an eye and over millions of years.
- Water covers roughly 70.9% of the earth's surface. Although there is much more water than there is land, 97% of the earth's water is salt water. Only 3% is fresh water.
- Of the 3% fresh water, about 68.7% is trapped in glaciers, 1.7% is frozen and unusable, 30% is in the ground, and only 0.3% is found in rivers, lakes, streams, ponds and swamps.
- Water can not only be found on the surface of the earth and in the ground, but also in the air. There is more fresh water in the atmosphere than in all the rivers on the planet combined.
- Each day the sun evaporates a trillion tons of water. A single tree gives 70 gallons of water per day in evaporation. An acre of corn will give off 4,000 gallons of water per day in evaporation.

## Water and the Human Body

- 💧 A person can live about a month without food but only a few days without water.
- 💧 Approximately 66% of the human body consists of water. It exists within all our organs and it is transported throughout our body to assist in physical functions.
- 💧 Water regulates the temperature of the human body.
- 💧 Water removes waste from the human body.
- 💧 Water leaves the stomach five minutes after consumption.
- 💧 An average healthy person consumes about 20,000 gallons in a lifetime.



Humans should consume about two quarts of water each day to maintain good health.



In an average year, Americans use about 100 gallons of water per day. Americans use three to five times more water than Europeans use.

Products with the *WaterSense* label help save water, energy and money.

## Water Consumption

- 💧 A small drip from a faucet can waste as much as 20 gallons of water per day. At one drip per second, a faucet can leak 3,000 gallons per year.
- 💧 A running toilet can waste up to 200 gallons of water per day.
- 💧 A five-minute shower uses about 25 gallons of water. A bath requires up to 70 gallons of water.
- 💧 Brushing your teeth uses two gallons of water per minute. It can save up to four gallons of water each morning by turning off the faucet while brushing your teeth.
- 💧 An automatic dishwasher uses 9 to 12 gallons of water per load.
- 💧 It takes 1,500 gallons of water to process one barrel of beer, 120 gallons of water to produce one egg, 9.3 gallons of water to process one can of fruit or vegetables.
- 💧 To manufacture a new car, 39,000 gallons of water are used per car. Refining crude oil requires 1,850 gallons of water per barrel of oil.
- 💧 Nearly one-half of the water used in the U.S. is used for thermoelectric power generation.
- 💧 Farmers use 70% of the world's water for agriculture.

# Water Treatment

- 💧 The first water pipes in the U.S. were made from wood (bored logs that were charred with fire).
- 💧 Approximately 85 percent of U.S. residents receive their water from water facilities. The remaining 15 percent supply their own water from private wells or other sources.
- 💧 In most U.S. cities and towns, drinking water from the tap is treated so that people don't get sick with diseases such as cholera and typhoid, which are caused by bacteria, viruses or parasites found naturally in the water. Drinking water may also be fluoridated to help prevent dental cavities.
- 💧 There are approximately one million miles of water pipeline and aqueducts in the U.S. and Canada, enough to circle the earth 40 times.
- 💧 Today drinking water meets over a hundred different standards for drinking water quality in the U.S. Many public water suppliers consistently provide water that is much better than the minimum standards.
- 💧 Each country has its own water quality standards that determine to which degree water should be purified, depending upon the purpose for which it will be used.
- 💧 Humans largely influence the factors that determine water quality, as they dispose of their waste in water and add all kinds of substances and contaminants that are not naturally present. We now know more than 70,000 water pollutants.
- 💧 The principal sources of contamination are associated with the post World War II chemical age. There are 12,000 different toxic chemical compounds in industrial use today, and more than 500 new chemicals are developed each year.
- 💧 If all new sources of contamination could be eliminated, in 10 years, 98% of all available groundwater would then be free of pollution.
- 💧 Because water is such an excellent solvent it can contain many dissolved chemicals. And since groundwater moves through rocks and subsurface soil, it has a lot of opportunity to dissolve substances as it moves. For that reason, groundwater will often have more dissolved substances than surface water will.
- 💧 Old houses with lead pipes can present a real danger to homeowners. Weathered pipelines can contaminate pure water with toxic lead.
- 💧 In the U.S., public water is regulated by the Environmental Protection Agency (EPA), which requires multiple daily tests for bacteria and makes results available to the public. The Food and Drug Administration, which regulates bottled water, only requires weekly testing and does not share its findings with the EPA or the public. Bottled water can be up to 1,000 times more expensive than tap water and it may not be as safe.



The first water works system in Peru, Indiana was constructed in 1879 at the corner of Wayne and Canal Streets. Shortly thereafter, the first sewer system was constructed.

The first treatment plant for wastewater in Peru was constructed in the late 1930's.

There is more detailed information specific to Peru's Water system including photographs under History.



## Water Scarcity

According to the USGS, 38% of the United States has been designated a water shortage area (defined as a region where consumption exceeds the natural replenishment of water supply for a period of at least four years).

- The majority of the world's population must walk at least three hours to fetch water.
- Over 1.1 billion people around the world do not have access to a safe supply of water.
- Freshwater animals are disappearing five times faster than land animals.
- Each day, 10,000 children under the age of five in third world countries die as a result of illnesses contracted by use of unclean water.
- It is estimated that more than 840,000 people die each year globally from water-related diseases.
- Today, in many countries whose primary terrain is desert land, water is a far more precious resource than oil.

### How did you score?

Count the number of items you missed and see how you rank below:

Less than 5	Wow! You're a true Water Whiz!
Between 6 – 15	You can still be proud of yourself. This is still a great score!
Between 16 – 25	Don't be disappointed. You're probably in the majority of readers. We're glad you took the time to read these facts and educate yourself about this precious resource that so many of us take for granted. Now that you know, please help us spread the word!
More than 26	

For some more water science facts and statistics, visit the USGS Water Science school:  
<http://water.usgs.gov/edu/>.

For more information on water conservation, visit [http://www.epa.gov/watersense/about\\_us/index.html](http://www.epa.gov/watersense/about_us/index.html).