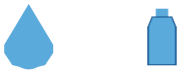
FREE EDUCATIONAL RESOURCE

The Clean Water at Home Guide

PFAS, Microplastics, Filters, Bottled Water, and What Actually Matters

A practical Ed2S guide to understanding your drinking water, choosing the right filter, and avoiding fear-based marketing.



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ABOUT THIS GUIDE

Created by Education2Success (Ed2S).

This guide is for educational purposes only.

This guide does not replace guidance from your water utility, local health department, medical provider, certified water testing laboratory, or government agencies.

Water quality varies by location, plumbing, water source, and household conditions.

PFAS regulations and emerging contaminant research are changing. Always check the latest EPA, state, and local guidance.

How to Read This Guide

This guide is meant to help readers understand what is actually in their water before spending money on products. It is designed as a step-by-step decision-making tool, not as a textbook to be read cover to cover in one sitting.

Each chapter builds on the last: first you will learn the basics of where your water comes from, then you will learn about specific contaminants of interest such as PFAS and microplastics, then you will learn how to read your own water report, and finally you will learn how to match a certified filter to your actual concern. Worksheets near the end let you apply each step to your own home.

You do not need to read every page before taking action. If you already know your top concern, feel free to jump directly to the related chapter.

A Welcome Letter from Education2Success

Clean water is one of the most important parts of everyday life, but many people feel overwhelmed by confusing headlines, product advertisements, unfamiliar chemical names, and social media claims. The goal of this guide is not to scare you. The goal is to help you understand your water and make practical choices.

Most people do not need to panic about their water. But everyone should know how to find their water report, understand basic contaminants, and choose the right solution if a concern actually exists. That is the purpose of everything that follows in these pages.

We built this guide the way we build everything at Education2Success: starting from credible sources, written in plain language, and organized so you can act on it immediately. You will not find fear-based marketing language here. You will find a process you can follow, whether you rent an apartment, own a home with older plumbing, rely on a private well, or simply want to know whether your tap water is something to think twice about.

> **WHAT ACTUALLY MATTERS**
> Clean water starts with information, not fear.

With gratitude,

The Education2Success Team

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CHAPTER 1

Start Here: What Actually Matters

The single biggest mistake consumers make with water.

The biggest mistake consumers make is buying a filter before understanding their water. Advertising is built to create urgency, but your decisions should be built on your own water source, your own report, and your own household's actual needs.

The Four-Step Process

Step	Action	Detail
1	Identify your water source.	Public water system, private well, or bottled water.
2	Find your local water report or test your water.	Your Consumer Confidence Report or a certified lab test.
3	Identify your actual concern.	Taste, lead, PFAS, microplastics, microbes, or something else.
4	Choose a certified solution that matches that concern.	Match the certification to the exact contaminant claim.

WHAT ACTUALLY MATTERS

Buy the filter for the contaminant, not the marketing claim.

No single home filter is automatically best for everyone. A renter dealing with chlorine taste, a family concerned about lead in older plumbing, a private well owner, and a household whose water report shows PFAS all need different solutions. The rest of this guide will help you figure out which path applies to you.

Quick Start: What Should I Do First?

Pick the path below that matches your situation right now.

If you use city or public tap water:

- Find your Consumer Confidence Report.
- Check detected contaminants and any violations.
- Check whether lead service line information is available.
- Decide if a filter is needed based on your actual concerns.

If you use private well water:

- Schedule annual testing.
- Test for total coliform bacteria, nitrates, total dissolved solids, and pH.
- Ask your local health department about additional local concerns.

If you mostly drink bottled water:

- Understand how bottled water is regulated.
- Compare cost, plastic waste, storage, and microplastic concerns.
- Consider safe tap water plus a certified filter if appropriate.

If you are shopping for a filter right now:

- Stop and identify the contaminant first.
- Check the NSF/ANSI standard and the exact contaminant claim.
- Verify the claim through a certification database or manufacturer documentation.

Fear vs. Fact: Clean Water Edition

Before going further, let's clear up some of the most common myths.

FEAR	*All tap water is toxic.*
FACT	Many public water systems meet federal standards, but water quality varies by location and household plumbing. Check your local report.

FEAR	*Bottled water is always safer.*
FACT	Bottled water is regulated, but it is not automatically better for every contaminant and may involve cost, plastic waste, and storage concerns.

FEAR	*Any expensive filter removes everything.*
FACT	Filters remove different things. Certification and the exact contaminant claim matter more than price.

FEAR	*Detected means dangerous.*
FACT	Detection means a substance was found. Risk depends on concentration, exposure, toxicity, and the current state of scientific evidence.

FEAR	*Microplastics are fully understood.*
FACT	They are actively studied, but health risk at typical food and water exposure levels is still being researched.

CHAPTER 2

Clean Water Basics

Where your water comes from and how it gets to your glass.

Where Your Water Comes From

Drinking water in the United States generally comes from one of a few major sources:

- Surface water: rivers, lakes, and reservoirs.
- Groundwater: aquifers and wells.
- Public water systems, which may draw from surface water, groundwater, or both.
- Private wells, drawing directly from groundwater on an individual property.
- Bottled water, which can be sourced from springs, municipal supplies, or treated groundwater, depending on the brand.

Water travels through several stages before it reaches your glass. Public water is treated and monitored, but the quality of water at your faucet can also be affected by the distribution system and your own household plumbing.

The Path Your Water Takes

Source Water → Treatment Plant → Distribution System → Home Plumbing → Faucet

GOOD TO KNOW

Private wells are different because the homeowner, not a utility, is responsible for testing and maintenance.

How Drinking Water Is Treated

Most public water systems use a multi-step treatment process before water reaches the distribution system:

Step	Process	What It Does
1	Screening	Removes large debris from source water.
2	Coagulation / flocculation	Chemicals cause small particles to clump together.
3	Sedimentation	Clumped particles settle out of the water.
4	Filtration	Remaining particles are filtered out.
5	Disinfection	Treatment (commonly chlorine or chloramine) reduces microbes.
6	Distribution	Treated water travels through pipes to homes and businesses.

Treatment is designed to meet legal requirements and protect public health, but treatment systems vary across the country. Emerging contaminants, including some discussed later in this guide, may not all have enforceable limits yet.

WHAT ACTUALLY MATTERS

Safe drinking water does not mean “zero substances.” It means regulated contaminants are controlled according to standards, treatment rules, and monitoring requirements.

What Can Be in Drinking Water?

Water quality reports can list many contaminant categories. Here is a plain-language overview:

Category	Description
Microbes	Bacteria, viruses, and parasites.
Metals	Lead, copper, arsenic, and others.
Nutrients	Nitrate and nitrite, often from agricultural runoff.
Disinfection byproducts	Formed when disinfectants react with organic matter.
Industrial chemicals	Compounds linked to manufacturing or industrial sites.
PFAS	A large family of human-made “forever chemicals.” Covered in Chapter 3.
Microplastics and nanoplastics	Tiny plastic particles. Covered in Chapter 4.
Pharmaceuticals	Trace medication residues from various sources.
Pesticides and herbicides	Compounds used in agriculture or landscaping.
Minerals and hardness	Naturally occurring calcium, magnesium, and similar minerals.
Chlorine / chloramine	Common disinfectants that can affect taste and odor.

Not every contaminant on this list is present in every home. The point of this guide is not to fear the list. The point is to learn which categories actually matter for your specific water source.

Detection vs. Risk

This is one of the most important ideas in this entire guide. Modern laboratory tools can detect extremely small amounts of substances, sometimes down to parts per trillion. Detection alone does not automatically mean the water is dangerous.

Risk Depends On:

- How much of the substance is present
- How often someone is exposed
- How long the exposure continues
- The toxicity of the substance
- The age and health of the person exposed
- Whether the science is settled or still developing
- Whether a legal limit or health advisory exists

Example: Microplastics

Microplastics and nanoplastics have been detected in food and water. The U.S. Food and Drug Administration currently states that the scientific evidence does not demonstrate that the levels detected in foods pose a risk to human health, while also acknowledging that more research and standardized testing methods are needed.

WHAT ACTUALLY MATTERS

Detected does not automatically mean dangerous. But repeated exposure to certain contaminants over a long period of time can still matter, which is why this guide focuses on practical, proportionate steps rather than alarm.

CHAPTER 3

PFAS: Forever Chemicals in Context

What they are, why they matter, and what homeowners can actually do.

What Are PFAS?

PLAIN-ENGLISH DEFINITION

PFAS stands for per- and polyfluoroalkyl substances. They are a large family of human-made chemicals used because they can resist water, oil, grease, stains, and heat.

Why Are They Called "Forever Chemicals"?

Many PFAS do not break down easily in the environment. Some can persist in water, soil, wildlife, and the human body for long periods of time, which is the origin of the nickname.

Common Use and Source Categories

- Firefighting foams
- Industrial sites
- Stain-resistant products
- Water-resistant textiles
- Some grease-resistant food packaging, historically
- Nonstick and chemical-resistant applications
- Landfills and waste streams
- Contaminated groundwater near certain sites

Not all PFAS are the same. There are thousands of different PFAS compounds, and some, such as PFOA and PFOS, are far more studied than others.

Why PFAS Matter for Health

The U.S. Environmental Protection Agency states that current scientific research suggests exposure to certain PFAS may be associated with adverse health outcomes. Research is ongoing to understand how different PFAS, exposure levels, and exposure durations affect human health.

Potential Health Concern Categories

Research has examined possible associations in several areas, including:

- Immune system effects
- Developmental concerns
- Pregnancy and early childhood concerns
- Liver effects
- Cholesterol changes
- Thyroid-related concerns
- Certain cancer concerns

It is important to use careful language here. Not every PFAS exposure causes illness. Certain PFAS are associated with health concerns, and long-term, repeated exposure is the main focus of ongoing research and regulation, not a single glass of water.

WHAT ACTUALLY MATTERS

PFAS concern is mostly about repeated exposure over time, not panic over one glass of water.

PFAS Drinking-Water Rules: As of 2026

> ⚠ **WATCH FOR THIS**
>
> PFAS regulation is active and changing. The information below reflects the situation as of 2026. Always check the latest EPA and state guidance before making decisions.

EPA finalized the first national drinking-water regulation for certain PFAS in 2024. The rule included enforceable Maximum Contaminant Levels for PFOA and PFOS of 4.0 parts per trillion.

As of 2026, EPA has proposed changes related to compliance timing and the regulation of some PFAS. Some implementation details may change, and readers should check the latest EPA and state guidance for current requirements.

What This Means in Practice

- PFAS regulation is active and changing, not fixed in place.
- State rules may differ from federal rules.
- Water utilities may be in different monitoring or compliance phases.
- A Consumer Confidence Report may include PFAS information if testing has been conducted or required.

Timeline

Year	What Happened
2024	EPA finalizes the first national PFAS drinking-water regulation, including limits for PFOA and PFOS.
2026	EPA proposes updates related to compliance timing and some PFAS limits.
Ongoing	Compliance and monitoring continue. Check the latest EPA and state guidance.

How PFAS Get Into Water

PFAS can enter water supplies through several pathways:

- Industrial discharge
- Firefighting foam use near airports, military bases, and training sites
- Landfill leachate
- Wastewater pathways
- Biosolids and contaminated soil
- Groundwater movement
- Surface water contamination

PFAS Use → Waste, Soil, or Water Release → Groundwater / Surface Water → Drinking Water Source → Household Tap

> **LOCAL RISK NOTE**
>
> PFAS concerns can be more relevant near industrial sites, airports, military installations, landfills, firefighting training areas, and some manufacturing regions.

How to Reduce PFAS Exposure at Home

If PFAS are a concern in your area, here is a practical sequence of steps:

1. Check your Consumer Confidence Report for PFAS testing or results.
2. Search your state environmental agency's PFAS map or water data, if available.
3. If you use a private well near a potential PFAS source, consider certified lab testing.
4. If PFAS are detected or strongly suspected, use a filter certified for PFAS reduction.
5. Look for NSF/ANSI 53 or NSF/ANSI 58 certification with a specific PFAS reduction claim.
6. Verify that the product is certified for the exact claim, not just generally “tested.”
7. Maintain filters on the manufacturer's recommended schedule.
8. Reduce unnecessary use of PFAS-containing products where practical, especially items marketed for stain resistance, grease resistance, or water resistance.

WATCH FOR THIS

Do not assume every carbon filter removes PFAS. Look for a specific, certified PFAS reduction claim before you buy.

CHAPTER 4

Microplastics and Nanoplastics

What we know, what we do not know yet, and practical ways to reduce exposure.

What Are Microplastics and Nanoplastics?

PLAIN-ENGLISH DEFINITION

Microplastics are tiny plastic particles generally less than 5 millimeters in size.

Nanoplastics are even smaller, often less than 1 micron.

Microplastics and nanoplastics can vary considerably by:

- Size
- Shape
- Plastic type, or polymer
- Color
- Surface chemistry
- Additives
- Weathering and degradation

Common Sources

- Plastic bottles
- Packaging
- Synthetic clothing fibers
- Tire wear particles
- Household dust
- Degraded plastic waste
- Industrial plastic pellets
- Plastic-based materials in the broader environment

A Sense of Scale

Rice Grain → Sand Grain → Microplastic → Nanoplastic

Each step in this scale represents a significant decrease in size, illustrating how much smaller nanoplastics are compared to particles visible to the naked eye.

Microplastics in Water: What We Know

Microplastics have been found in tap water, bottled water, food, air, and the broader environment. Research in this area is expanding quickly, but testing methods are still being standardized across labs and studies.

Bottled Water Research

> **RESEARCH FINDING**
>
> The National Institutes of Health summarized a study finding that, in the bottled water samples studied, one liter contained about 240,000 tiny plastic particles on average, with about 90% identified as nanoplastics.

This is a study finding, not proof of a specific health outcome. It does not mean bottled water should never be used. Bottled water can be important during emergencies, boil water advisories, travel, or contamination events. But it does mean bottled water is not automatically "cleaner" from a plastic particle perspective compared to tap water.

Microplastics and Health: Known vs. Still Studying

Known

- Microplastics and nanoplastics are present in the environment.
- They have been detected in foods and water.
- Exposure is difficult to measure consistently across studies.
- Particle size and plastic type matter for how particles behave.
- Regulators and researchers are prioritizing further study.

Still Studying

- Long-term health effects at typical exposure levels
- Which particle sizes matter most for human health
- How different polymers behave once inside the body
- How to standardize detection methods across labs
- How to compare findings across studies that use different methods

FDA'S CURRENT POSITION

FDA currently states that the scientific evidence does not demonstrate that the levels of microplastics or nanoplastics detected in foods pose a risk to human health, while also acknowledging research gaps and ongoing monitoring.

WHAT ACTUALLY MATTERS

Microplastics are worth reducing where practical, but fear-based claims are not the same as settled science.

Practical Ways to Reduce Microplastic Exposure

There is no need to obsess over eliminating every possible exposure. Instead, consider a tiered approach based on your own effort level.

LOW EFFORT

Do not heat food in plastic containers.

Do not leave plastic water bottles in hot cars.

Store water in cool, dark places.

MEDIUM EFFORT

Switch to a reusable stainless steel or glass bottle.

Use glass or ceramic containers for hot foods and liquids.

Replace heavily scratched plastic containers.

HIGHER EFFORT

Research and install a certified filtration system if testing or specific concerns justify it.

Reduce synthetic clothing shedding where practical (full loads, gentler wash cycles).

Additional everyday habits worth considering:

- Use tap water when it is safe and acceptable for your household.
- Use a certified filter if microplastics are a specific concern for you.
- Avoid microwaving food in plastic containers.
- Wash synthetic clothing less aggressively when possible.
- Reduce single-use plastics where practical, without treating it as an emergency.

CHAPTER 5

Tap Water, Bottled Water, and Private Wells

The best choice depends on your source, your local report, and your household needs.

Tap Water: Strengths and Limits

Strengths	Limits
Public water systems are regulated.	Water quality varies by location.
Community water systems provide annual water quality reports.	Household plumbing can affect final faucet water.
Tap water is usually much cheaper than bottled water.	Some emerging contaminants may not be fully regulated yet.
Tap water produces less packaging waste.	Lead can come from service lines or household plumbing.
Tap water can be filtered at home if needed.	Taste and odor issues may occur even when water meets legal standards.

WHAT ACTUALLY MATTERS

EPA requires community water systems to provide Consumer Confidence Reports each year by July 1.

Bottled Water: Strengths and Limits

Strengths	Limits
Useful in emergencies.	More expensive than tap water.
Useful during boil water advisories.	Creates plastic waste.
Useful when local officials advise avoiding tap water.	May contain microplastics or nanoplastics.
Useful for travel.	Can be contaminated during collection, treatment, bottling, shipping, storage, or after purchase.
Useful as a temporary solution after a failed well test or contamination event.	Not automatically safer than tap water for every contaminant.
	Labels can be confusing for consumers.

WHAT ACTUALLY MATTERS

FDA regulates bottled water as a food product and requires bottled-water companies to follow safety, labeling, and processing requirements.

WHEN BOTTLED WATER MAKES SENSE

During boil water advisories, after a confirmed contamination event, while traveling, or as part of an emergency preparedness plan.

Bottled Water Label Decoder

Bottled water labels use a range of terms. Here is what they generally mean:

Label Term	What It Generally Means
Purified water	Treated to remove minerals, chemicals, and other substances to a defined standard.
Spring water	Collected from an underground spring source.
Mineral water	Contains a defined minimum level of naturally occurring minerals.
Artesian water	Drawn from a confined aquifer under pressure.
Distilled water	Produced by condensing steam from boiled water.
Reverse osmosis water	Treated using a reverse osmosis membrane process.
Alkaline water	Water with a higher pH; marketing claims about benefits vary in evidence.
Electrolyte water	Water with added minerals/electrolytes for taste or marketing purposes.

Words like “pure,” “natural,” “mountain,” “premium,” “alkaline,” and “electrolyte” do not automatically mean the water is safer from PFAS, lead, microplastics, or other contaminants.

WATCH FOR THIS

If a bottled water brand makes safety claims, look for actual water quality reports, testing information, or credible certification rather than relying on branding alone.

Private Wells: What Every Household Should Know

Private wells are different from public water systems. Private well owners are responsible for testing and maintaining their own water. Federal public drinking-water regulations do not apply to private wells in the same way they apply to public water systems.

CDC ANNUAL TESTING RECOMMENDATION

Test your private well water at least once per year for total coliform bacteria, nitrates, total dissolved solids, and pH.

Also contact your local health department about additional testing based on local geology, agriculture, industry, flooding, fires, or known contamination in your area.

Private Well Annual Checklist

- ☐ Total coliform bacteria
- ☐ Nitrates
- ☐ Total dissolved solids
- ☐ pH
- ☐ Any additional tests recommended by my local health department

When Should You Test Your Water?

Consider testing your water if any of the following apply to your household:

- You use a private well.
- Water changes color, taste, or smell.
- A local contamination notice is issued.
- There has been flooding near your well or water source.
- There is wildfire runoff or nearby environmental damage.
- You have older plumbing or possible lead service lines.
- Someone in the home is pregnant.
- An infant or young child lives in the home.
- Someone in the household is immunocompromised.
- You are buying a home.
- You are considering an expensive filtration system and want data first.
- You live near industrial sites, landfills, airports, military bases, or agricultural areas and have a specific concern.

WHAT ACTUALLY MATTERS

Testing should be done through certified labs when health decisions are involved.

CHAPTER 6

How to Read Your Water Quality Report

Your local water report is the starting point for smarter decisions.

What Is a Consumer Confidence Report?

A Consumer Confidence Report, or CCR, is an annual drinking-water quality report from a community water system. It helps customers understand where their water comes from, what regulated contaminants were detected, and whether any standards were violated.

WHAT ACTUALLY MATTERS

EPA requires community water systems to deliver Consumer Confidence Reports annually by July 1.

What CCRs May Include

- Water system information
- Water source
- Detected regulated contaminants
- Measured levels
- Legal limits
- Violations, if any
- Potential health effects language, where violations occurred
- Required educational language
- Contact information for the utility

Water Report Terms You Need to Know

Term	Meaning
MCL	Maximum Contaminant Level: the enforceable legal limit.
MCLG	Maximum Contaminant Level Goal: a non-enforceable, health-based goal.
Action Level	The level that triggers a required action by the water system.
MRDL	Maximum Residual Disinfectant Level.
ND	Not detected.
ppm	Parts per million.
ppb	Parts per billion.
ppt	Parts per trillion.
Range	The lowest and highest detected levels found during testing.
Violation	When a system fails to meet a standard, monitoring rule, treatment technique, or other requirement.

PFAS are often measured in parts per trillion, which is a much smaller unit than parts per billion or parts per million.

ppm → ppb → ppt

(each step to the right represents a 1,000-fold smaller concentration)

How to Read a Contaminant Table

Most CCRs include a contaminant table similar to this simplified example:

Contaminant	MCL/Action Level	MCLG	Detected	Range	Violation?
Total Trihalomethanes	80 ppb	N/A	32 ppb	12-45 ppb	No
Lead	Action Level: 15 ppb	0	ND	ND-3 ppb	No
Nitrate	10 ppm	10 ppm	1.2 ppm	0.8-1.5 ppm	No

As you review your own report, ask yourself these questions for each contaminant listed:

1. Was it detected?
2. What level was found?
3. Is there a legal limit?
4. Was there a violation?
5. Is this a health concern, a taste issue, or a plumbing issue?
6. Does this affect everyone, or specific vulnerable groups?
7. Would a certified filter help?
8. Should I contact the utility or my local health department?

Common Water Report Contaminants

Contaminant	What It Is	Common Source
Lead	Metal; can affect health, especially in children.	Service lines, household plumbing.
Copper	Metal; can affect taste at higher levels.	Household plumbing.
Arsenic	Naturally occurring metal.	Geology, some industrial sources.
Nitrate / nitrite	Nutrient compounds.	Agricultural runoff, fertilizer.
Total coliform / E. coli	Indicator bacteria.	Surface water contamination, well issues.
Chlorine / chloramine	Disinfectant.	Water treatment process.
Total trihalomethanes	Disinfection byproduct.	Reaction of disinfectant with organic matter.
Haloacetic acids	Disinfection byproduct.	Reaction of disinfectant with organic matter.
Fluoride	Naturally occurring or added mineral.	Geology or water treatment additive.
Radium	Naturally occurring radioactive element.	Geology.
PFAS (if tested)	Man-made “forever chemicals.”	Industrial sites, firefighting foam, consumer products.
Total dissolved solids	General mineral/salt content.	Geology, water source.

If a contaminant on your report concerns you, the right next step is usually to identify whether it is a certified-filter issue, a plumbing issue, or a question for your water utility or local health department.

Household Plumbing: Why Your Faucet Can Differ from the City Report

The city water report tells you about the public water system, but your faucet water can also be affected by service lines, home plumbing, fixtures, and water sitting in pipes.

What to Consider

- Lead service lines
- Older homes with legacy plumbing materials
- Brass fixtures
- Copper pipes
- Corrosion within the plumbing system
- Stagnant water sitting in pipes overnight
- First-draw samples (the first water out of the tap)
- Flushing taps before use
- Certified lead-reduction filters

WHAT ACTUALLY MATTERS

EPA's Lead and Copper Rule Improvements require water systems to identify and replace lead pipes within 10 years and improve testing and public communication.

Water main → Service line → Home plumbing → Faucet

CHAPTER 7

Filters: What Works, What Does Not, and What to Buy

Match the filter to the contaminant.

Do You Actually Need a Filter?

This is a balanced decision, not an automatic "yes."

You may NOT need a filter if:	You may WANT a filter if:
Your water report shows no concerning issues.	You dislike chlorine taste or odor.
You like the taste and odor of your water.	Your report shows a contaminant of concern.
You do not have specific plumbing, well, or contamination concerns.	You have older plumbing or possible lead concerns.
Local authorities have not issued any warnings.	PFAS are detected or suspected in your area.
You are not dealing with a specific identified contaminant.	You use private well water.
	You want to reduce microplastics as a precaution.
	Your household includes infants, pregnancy, or immuno-compromised members.
	You want better-tasting water to help you drink more of it.

WHAT ACTUALLY MATTERS

CDC notes that different water filters have different functions. Some improve taste, some reduce certain chemicals, and some reduce certain germs.

Filter Types at a Glance

Use this table as a quick-reference comparison before researching specific products.

Filter Type	Best For	Cost	Install	Renter OK?	Certification to Check
Pitcher filter	Taste/odor, basic reduction	Low	Easy	Yes	NSF/ANSI 42 or 53
Faucet-mounted filter	Taste/odor, some contaminants	Low-Med	Easy	Yes	NSF/ANSI 42 or 53
Refrigerator filter	Taste/odor	Low-Med	Easy	N/A	NSF/ANSI 42 (check 53)
Countertop filter	Taste/odor, higher capacity	Med	Easy	Yes	NSF/ANSI 42 or 53
Under-sink carbon filter	Broader contaminant reduction	Med	Moderate	Limited	NSF/ANSI 53
Reverse osmosis system	PFAS, lead, salts (certified)	Med-High	Moderate	Limited	NSF/ANSI 58
Whole-house filter	Sediment, some taste/odor	Med-High	Higher	No	Varies by claim
UV system	Certain microbes	Med-High	Moderate	No	NSF/ANSI 55
Water softener	Hardness minerals	Med-High	Moderate	No	NSF/ANSI 44
Distiller	Some dissolved contaminants	Med	Moderate	Yes	Check manufacturer claims

Cost and maintenance levels are general guidance and vary by brand and model.

Filter Certification Cheat Sheet

This may be one of the most valuable pages in the entire guide. Certification standards tell you what a filter is actually proven to do.

NSF/ANSI 42

Aesthetic effects, such as chlorine taste and odor reduction.

NSF/ANSI 53

Health-related contaminant reduction. May include contaminants such as lead or certain PFAS, but only when the specific product carries that specific certified claim.

NSF/ANSI 58

Reverse osmosis systems. May be relevant for PFAS, lead, nitrate, fluoride, and other contaminants, again only when the product carries the specific certified claim.

NSF/ANSI 401

Covers emerging compounds and incidental contaminants, which may include certain pharmaceuticals. Do not assume this automatically means PFAS reduction; verify the exact PFAS claim separately, commonly under NSF/ANSI 53 or 58.

WATCH FOR THIS

A product simply saying “NSF certified” is not enough information. Before buying, check:

Which NSF/ANSI standard applies? Which exact contaminant claim is certified? Which model number and replacement cartridge? Is the claim verified in a certification database?

Activated Carbon Filters

Activated carbon filters use a process called adsorption, where contaminants stick to the surface of the carbon material as water passes through.

Best For

- Chlorine taste and odor
- Some organic chemicals
- Some pesticides or VOCs, depending on certification
- Some PFAS, only if specifically certified for PFAS reduction
- General taste improvement

Limitations

- Not all carbon filters remove lead.
- Not all carbon filters remove PFAS.
- Not ideal for nitrate, salts, hardness, many minerals, or microbes unless paired with other treatment.
- Performance depends on contact time, design, water chemistry, and filter condition.
- Expired filters may not work properly and can even contribute to bacterial growth.

> **WHAT ACTUALLY MATTERS**
>
> CDC notes that pitcher and refrigerator filters often use activated carbon and are typically used to improve taste and smell unless specifically certified for additional contaminants.

Reverse Osmosis Filters

Reverse osmosis (RO) systems push water through a semi-permeable membrane to reduce many dissolved and suspended substances.

Best For

- PFAS, when certified for that specific claim
- Lead, when certified for that specific claim
- Some metals
- Some salts and dissolved solids
- Nitrate, depending on the system
- Fluoride, depending on the system
- Some microplastics and particles, depending on system and certification

Limitations

- Higher upfront cost than most other filter types
- Slower flow rate
- Requires regular maintenance
- Replacement cartridges and membranes add ongoing cost
- Produces some wastewater during the filtration process
- May reduce beneficial minerals along with contaminants
- Usually installed at one drinking-water location, not whole-house

WHAT ACTUALLY MATTERS

RO systems are not automatically perfect. Certification and ongoing maintenance still matter just as much as the technology itself.

Pitcher, Fridge, Faucet, Countertop, and Under-Sink Filters

Beyond the filtration technology itself, the physical format affects convenience, cost, and suitability for renters.

Pitcher

Affordable, simple, and renter-friendly, but limited in capacity and slower to filter.

Refrigerator

Convenient since it's already built in but often focused mainly on taste and odor unless certified for more.

Faucet-Mounted

Easy to install, moderate cost, convenient for renters, though flow rate is limited.

Countertop

A good renter option with higher capacity than a pitcher, though it takes up visible counter space.

Under-Sink

Convenient for long-term use and can support stronger filtration systems but may require professional or DIY installation.

WHAT ACTUALLY MATTERS

The format matters less than the certification, the contaminant claim, and the maintenance schedule. A simple pitcher filter certified for your specific concern beats an impressive-looking system with no matching certification.

Whole-House Filters

Whole-house filters treat water entering the home, but they are not always necessary for drinking-water concerns specifically.

Good For

- Sediment
- Some taste and odor issues
- Chlorine or chloramine, depending on the system
- Some well-water problems
- Protecting appliances from sediment buildup
- Treating all water used for showers and laundry

Not Always Ideal For

- Lead that comes from plumbing located after the filter
- PFAS, unless the system is specifically designed and certified for it
- Renters who cannot install permanent equipment
- People who only need kitchen drinking water treatment
- Cost-conscious households on a tighter budget

WHAT ACTUALLY MATTERS

For many drinking-water concerns, a point-of-use filter at the kitchen sink can be more practical and cost-effective than filtering the entire house.

UV, Distillation, and Water Softeners

UV Treatment

Useful for certain microbes, but does not remove chemicals like PFAS, lead, or nitrate.

Distillation

Can reduce some contaminants by boiling and re-condensing water, but the process is slow and energy intensive.

Water Softeners

Reduce hardness minerals such as calcium and magnesium. They are not general-purpose drinking-water contaminant filters.

> ⚠ **WATCH FOR THIS**
>
> Do not buy a water softener thinking it removes PFAS, lead, microplastics, or microbes unless there is a specific, credible, certified claim for that purpose, which standard softeners generally do not provide.

What Filters Cannot Do

It helps to be just as clear about the limits of filtration as the benefits. Filters cannot:

- Work forever without replacement
- Remove every contaminant
- Prove water is safe without testing
- Fix every private well problem automatically
- Remove contaminants they are not certified for
- Replace a boil-water advisory unless specifically designed and approved for microbial treatment during such events
- Work properly if installed incorrectly
- Perform reliably with expired cartridges
- Turn unsafe water into safe water in every emergency

WHAT ACTUALLY MATTERS

Different systems remove different contaminants. The label and certification must match your actual concern.

Filter Maintenance: The Part Everyone Forgets

A filter is only as useful as its maintenance schedule. Even the best-certified filter stops working as intended once it is past its replacement interval.

- Replace cartridges on schedule.
- Track gallons used or months elapsed, whichever your system specifies.
- Clean pitcher reservoirs and reusable bottles regularly.
- Replace RO membranes as directed by the manufacturer.
- Use the correct replacement cartridge for your exact model.
- Avoid counterfeit or unknown replacement filters.
- Check periodically for leaks.
- Mark installation and replacement dates somewhere visible.
- Retest your water when needed, especially for private wells or serious contaminants.

Filter Maintenance Log

Filter/System	Model #	Installed	Certified For	Replace Every	Next Date

CHAPTER 8

Safer Water Habits at Home

Simple habits that reduce risk without panic.

Safer Water Storage Habits

These are practical, precautionary habits, not panic rules. None of them require special equipment or significant cost.

Best Practice	Try to Avoid
Use stainless steel or glass reusable bottles	Reusing single-use plastic bottles long-term
Store emergency bottled water in a cool, dark place	Leaving plastic water bottles in hot cars
Wash reusable bottles regularly	Using heavily scratched or damaged plastic bottles
Use food-grade containers for emergency water storage	Forgetting to rotate emergency water supplies

Additional habits worth building into your routine:

- Replace scratched or damaged plastic bottles.
- Rotate emergency water according to storage recommendations on the label.

Food Storage and Plastic Habits

Water safety connects to broader plastic habits, because plastics can interact with food and beverages, especially with heat and long storage times.

- Use glass or ceramic containers for microwaving.
- Avoid heating oily foods in plastic containers.
- Let hot foods cool before placing them in plastic.
- Replace heavily scratched containers.
- Use reusable containers instead of disposable bags when practical.
- Use plastic when it makes practical sense but avoid unnecessary heat exposure.
- Do not obsess over eliminating every plastic item from your kitchen.

FDA NUANCE

FDA currently states that the scientific evidence does not demonstrate that the levels of microplastics or nanoplastics detected in foods pose a risk to human health, while also noting that research gaps remain and monitoring continues.

Low-Stress Swaps

Instead Of	Try
Heating leftovers in plastic	Transfer to glass or ceramic first
Storing water bottles in a hot car	Store in a cool pantry or shaded area
Using scratched plastic containers	Replace with glass, stainless, or undamaged alternatives

Pharmaceuticals and Water

Pharmaceuticals can enter water through human excretion, improper disposal, flushing medications, and wastewater pathways. EPA's emerging contaminant work includes pharmaceuticals as a priority group for further research.

Consumer Actions

- Use drug take-back programs for unwanted medications when available.
- Do not flush medications unless official guidance specifically instructs it.
- Follow FDA and EPA disposal guidance for household medicines.
- Ask a pharmacy, local health department, or waste agency about local take-back options.

WHAT ACTUALLY MATTERS

EPA encourages pharmaceutical take-back programs for unwanted household medicines.

Medication Disposal Flow

Take-back program available → Use it.

No take-back available → Follow official household disposal guidance.

Flush only if official guidance specifically says to do so.

Don't Fall for Fear-Based Marketing

Marketing language can be one of the biggest obstacles to making a good decision about your water. Watch for these red flags:

⚠ WATCH FOR THIS

"Removes all toxins"

"Makes water alive"

"Doctor recommended" with no credible certification listed

"Lab tested" with no report or certification provided

No model number or cartridge number listed

No certification database listing to verify the claim

"NSF tested" language used instead of "NSF certified"

Claims of hundreds of contaminants reduced, with no exact reduction data shown

Scary headlines used without any local testing data

Claims that tap water is "poison" everywhere

Claims that bottled water is always pure

Claims that one filter solves every possible problem

Vague words like "advanced," "premium," "structured," or "detox" used without evidence

Questions to Ask Before You Buy

1. What contaminant am I trying to reduce?
2. Is this product certified for that exact contaminant?
3. Which standard applies?
4. What is the exact model and cartridge?
5. What is the replacement schedule?
6. What is the cost per year?
7. Does this match my water report or testing results?
8. Can I verify the claim through a credible certification database?

CHAPTER 9

Your Clean Water Action Plan

Turning everything you have learned into a simple plan.

Clean Water Decision Tree

Use this flow to move from “I don't know where to start” to a concrete next action.

1. Do you use public water or a private well?
2. If public water: find your Consumer Confidence Report.
3. If private well: schedule certified testing.
4. Is there any violation or contaminant of concern?
5. Identify the type of concern: taste/odor, lead, PFAS, microplastics, microbes, hardness, nitrate, or unknown.
6. Match the concern to an action (see table below).
7. Maintain your system and retest if needed.

Your Concern	Matching Action
Taste/odor	NSF/ANSI 42, or a certified carbon filter
Lead	NSF/ANSI 53 with a lead claim, or an appropriate certified RO system
PFAS	NSF/ANSI 53 or 58 with a specific PFAS claim
Microplastics	Check specific microplastic/emerging contaminant claims and certification
Microbes	UV, a certified microbiological purifier, boiling, or other guidance depending on the issue
Hardness	Water softener
Nitrate	Certified RO or another treatment verified for nitrate reduction
Unknown	Test first before buying anything

7-Day Clean Water Action Plan

A practical, low-pressure plan you can complete in about a week.

Day	Focus	Details
Day 1	Identify your water source.	Public water, private well, bottled water, or a mix.
Day 2	Find your report or schedule testing.	Locate your Consumer Confidence Report or schedule well testing.
Day 3	Check for lead concerns.	Review service line and plumbing age information.
Day 4	Identify your top concern.	Taste/odor, lead, PFAS, microplastics, microbes, nitrate, hardness, or unknown.
Day 5	Match your concern to an action.	Choose a certified filter, or a testing action, based on Chapter 7.
Day 6	Review your home habits.	Plastic bottle storage, food heating, medication disposal, bottle cleaning.
Day 7	Create your plan.	What to do now, what to test, what to buy if needed, and when to maintain it.

ACTION STEP

Block 15 minutes today for Day 1. Small consistent steps complete this entire plan in under two hours total.

CHAPTER 10

Worksheets, Glossary, and Sources

Practical tools to apply everything you have learned.

WORKSHEET 1: My Water Source

My address / city:

My water source:

- ☐ Public water system
- ☐ Private well
- ☐ Bottled water
- ☐ Mixed

My water utility or well information:

My Consumer Confidence Report link or location:

Date checked:

Main water source listed:

Any violations listed?

Detected contaminants I want to understand:

Questions to ask my water utility / local health department:

WORKSHEET 2: Water Report Decoder

Report year:

Water system name:

Source water:

Contaminants detected:

Any violations?

Contaminants above limits?

Lead/copper information:

PFAS information:

Disinfection byproducts:

Nitrate:

Other notes:

My next step:

- ☐ No action right now
- ☐ Contact water utility
- ☐ Test water
- ☐ Choose certified filter
- ☐ Contact local health department

WORKSHEET 3: Private Well Testing Checklist

Annual tests:

- ☐ Total coliform bacteria
- ☐ Nitrates
- ☐ Total dissolved solids
- ☐ pH

Additional possible tests based on local conditions:

- ☐ Arsenic
- ☐ Lead
- ☐ PFAS
- ☐ Pesticides / herbicides
- ☐ VOCs
- ☐ Iron / manganese
- ☐ Hardness
- ☐ Other local concern: _____

Testing date:

Certified lab used:

Results:

Action needed:

Retest date:

ACTION STEP

Ask your local health department which tests matter most in your specific area.

WORKSHEET 4: Filter Shopping Checklist

Product name:

Model number:

Cartridge model:

Filter type (pitcher / faucet / countertop / under-sink / RO / whole-house / other):

My target contaminant:

Certification body:

NSF/ANSI standard:

Exact contaminant claim:

Filter life:

Replacement cost:

Annual replacement estimate:

Installation needs:

Good for renters?

Verified in certification database?

Matches my water concern?

Final decision:

WORKSHEET 5: Filter Maintenance Log

System/Filter	Installed	Certified For	Replace Every	Next Date	Retest?

ACTION STEP

Set a calendar reminder the same day you install any new filter.

WORKSHEET 6: Bottled Water vs. Tap Water Cost Check

How many bottles does my household drink per day?

Cost per bottle:

Monthly bottled water cost:

Yearly bottled water cost:

Cost of reusable bottles:

Cost of filter system:

Replacement filter cost per year:

Estimated first-year cost:

Estimated second-year cost:

Plastic waste reduction goal:

Emergency bottled water plan:

A NOTE ON THIS WORKSHEET

This worksheet is not meant to shame bottled water use. Bottled water can be important during emergencies or contamination events. It is meant to help you compare everyday cost and waste.

WORKSHEET 7: Microplastics Practical Reduction Checklist

Low-effort actions:

- ☐ Do not leave plastic water bottles in hot cars.
- ☐ Avoid microwaving food in plastic.
- ☐ Use a reusable bottle.
- ☐ Replace heavily scratched plastic containers.
- ☐ Store water in cool, dark places.
- ☐ Wash reusable bottles regularly.

Medium-effort actions:

- ☐ Use glass/ceramic for hot foods.
- ☐ Use stainless steel or glass bottles.
- ☐ Reduce single-use bottled water where tap water is safe.
- ☐ Choose reusable containers.

Higher-effort actions:

- ☐ Research certified filters.
- ☐ Test water if needed.
- ☐ Reduce synthetic clothing shedding where practical.

WORKSHEET 8: PFAS Concern Action Plan

Did my Consumer Confidence Report mention PFAS?

Which PFAS were listed?

Detected level:

Is my water source near a possible PFAS source?

Possible local sources:

- ☐ Airport
- ☐ Military base
- ☐ Firefighting training area
- ☐ Industrial site
- ☐ Landfill
- ☐ Wastewater / biosolids area
- ☐ Unknown

Next step:

- ☐ Contact water utility
- ☐ Check state PFAS data
- ☐ Test private well
- ☐ Choose PFAS-certified filter
- ☐ Maintain existing filter
- ☐ No action right now

Filter certification checked:

NSF/ANSI 53 or 58 with PFAS claim?

Exact claim verified?

Replacement schedule set?

Glossary

Term	Definition
Activated carbon	A filtration material that removes some contaminants through adsorption.
Adsorption	The process of particles sticking to the surface, such as carbon.
Arsenic	A naturally occurring metal sometimes found in groundwater.
Bottled water	Water packaged for sale, regulated by FDA as a food product.
Boil water advisory	An official notice instructing residents to boil water before use.
Chloramine	A disinfectant formed from chlorine and ammonia.
Chlorine	A common water disinfectant.
Consumer Confidence Report	An annual water quality report from a community water system.
Disinfection byproducts	Compounds form when disinfectants react with organic matter.
Emerging contaminants	Substances of growing scientific or regulatory interest that may not yet be regulated.
Lead service line	The pipe connecting a home to the water main, sometimes made of lead in older systems.
MCL	Maximum Contaminant Level: an enforceable legal limit.
MCLG	Maximum Contaminant Level Goal: a non-enforceable, health-based goal.
Microplastics	Plastic particles generally smaller than 5 millimeters.
Nanoplastics	Plastic particles generally smaller than 1 micron.
NSF/ANSI	Certification standards used to verify filter performance claims.
PFAS	Per- and polyfluoroalkyl substances; a large family of human-made chemicals.
PFOA	A specific, well-studied PFAS compound.
PFOS	A specific, well-studied PFAS compound.
Private well	A water source owned and maintained by an individual property owner.
Reverse osmosis	A filtration method using a membrane to remove dissolved substances.
Total dissolved solids	A measure of dissolved minerals and salts in water.
UV treatment	Disinfection using ultraviolet light to target certain microbes.
Water softener	A system that reduces hardness minerals such as calcium and magnesium.

Sources Used

This guide draws on official and credible sources. Where regulations are actively changing, this guide notes "as of 2026" and encourages readers to check current guidance.

U.S. Environmental Protection Agency (EPA)

- PFAS National Primary Drinking Water Regulation
- PFAS Health and Environmental Risk information
- Consumer Confidence Report (CCR) information for consumers
- Final Fifth Contaminant Candidate List and Draft Sixth Contaminant Candidate List materials
- Identifying Drinking Water Filters Certified to Reduce PFAS
- Household Medication Disposal guidance
- Lead and Copper Rule Improvements

U.S. Food and Drug Administration (FDA)

- Microplastics and Nanoplastics in Foods
- Bottled Water Everywhere: Keeping It Safe

Centers for Disease Control and Prevention (CDC)

- Guidelines for Testing Private Well Water
- Choosing Home Water Filters and Other Water Treatment Systems — accessed 2026
- Bottled Water Safety information

National Sanitation Foundation (NSF)

- Water Filter FAQs
- Drinking Water Treatment Unit Standards (NSF/ANSI 42, 53, 58, 401)

National Institutes of Health (NIH)

- Research summary on plastic particles in bottled water

World Health Organization (WHO)

- Microplastics in Drinking Water report

If exact publication dates were uncertain at the time of writing, this guide uses "accessed 2026" rather than an invented date. Regulatory details, especially those related to PFAS, are subject to change; always confirm current requirements directly with EPA, your state environmental agency, or your local water utility.

A Final Message from Education2Success

Clean water is not about panic. It is about understanding your local water, knowing what questions to ask, and choosing practical solutions that match real concerns. You do not need to buy the most expensive system or fear every glass of water. You need information, a plan, and confidence to make better choices.

ACTION STEP

Visit Ed2S.org for more free sustainability resources.

Share this guide with a student, parent, renter, homeowner, or family member.

Revisit your water plan once a year when your new water report is released.

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