



Making Your Own Sanitizing or Disinfecting Solution

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Introduction

While you can buy ready-to-use chemical sanitizers or disinfectants for your household, you may prefer to make your own. Before you buy any chemicals (e.g., bleach), make sure to read the label to see if it can be used for sanitizing or disinfecting purposes. If the label does not have specific instructions for using as a sanitizer or disinfectant, or in the way you intend to use it, then it is recommended you select another product. The label also provides instructions on how to make the solution (e.g., how much to dilute with water), what surfaces the solution can be applied to, what is the contact time, how to use it safely, among other key information. This guide will provide an overview of how to make chemical solutions and key tips to be safe and successful.

Set-Up & Supplies

For this example, we will use bleach to make a sanitizer and disinfectant solution.

We recommend that you get all supplies together before getting started. For safety, you should mix and use your solution in a well-ventilated area while also wearing gloves and glasses to prevent unintended contact and irritation. It is also important to read the label and see how long solutions will remain effective once mixed. Lastly, use separate supplies than you would use for preparing food. Here is a list of our supplies needed to make our example solution:

- Clean water (e.g., safe for drinking) to dilute the chemical

- Unexpired, unscented bleach (between 4 and 9% bleach concentration)
- Disposable clean gloves, for handling the bleach
- Spray Bottle (32 fl. oz/1Qt) or bigger container (quart, gallon) to dispense the solution
- Clean, 1 quart measuring cup with spout to mix and pour
- Funnel to pour the solution into the bottle
- Small bowl or cup to hold your chemical (for example, a disposable cup in case you cannot measure directly from the bottle)
- Measuring spoons (TSP/TBSP) or cups to measure the amount of chemical you will need
- Tape and pen to create a label for your bottle
- Rimmed tray and/or disposable towels to contain/clean up any spills

Making a sanitizer or disinfectant solution

Determine how much chemical you need to mix with water to create the appropriate solution. Often, this will be on the label of the chemical.

For a 4.5% sodium hypochlorite bleach, we will need ½ tsp. for every quart (32 fl. oz) of water for a sanitizer, and ½ cup for every gallon of water for a disinfectant. If your bleach is a different percentage of sodium hypochlorite, use this [Chlorine Dilution Calculator](#) to determine the necessary amount to use. The desired concentration for a sanitizing solution is 100 ppm; a disinfecting solution is typically a greater concentration.

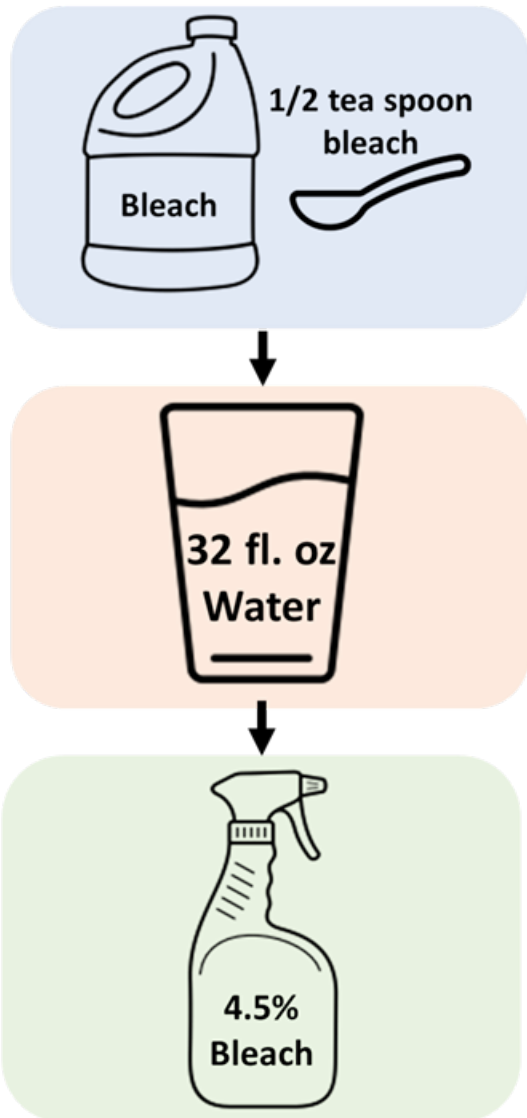


Figure 1. Preparation of 4.5% sanitizer solution.

To make a sanitizing solution:

- Create a label for the spray bottle, with the name of the chemical as well as the date and time.
- Put the label on your spray bottle. Remove the nozzle/top and set aside. **Important: this bleach solution is usable for 24 hours from when it is mixed. We recommend making enough for when you need it and/or making it fresh every day.**
- Fill a measuring cup with 1 quart of water.

- Wash your hands and put on a clean pair of gloves.
- If using, pour enough chemical into a small bowl or cup to then measure into the water. **Important: Do not pour unused bleach back into the bottle, instead pour it down the drain with running water.**
- Using the measuring spoons, measure and pour out the amount of chemical you need into the water. **Remember: Use separate measuring spoons than those you use for preparing food.**
- Mix the water and chemicals together using the measuring spoons or cups.
- Pour the prepared sanitizer solution into the spray bottle using the funnel.
- Place the nozzle/top back onto the bottle and tighten.
- Use sanitizer as directed on the chemical label.
- Keep the bottle in a secure place, away from those who might accidentally consume it (for example, children and pets). If this happens, call poison control. It is also a good idea to keep in a secondary container to contain accidental leaks or spills.
- If you have any extra solution after 24 hours, dispose of it by pouring down your sink with running water. If you are worried about wasting unused solution, try making in smaller batches (you can half the recipe and use smaller spray bottles).

Why can't I use expired chemicals?

Chemicals such as bleach can expire. Even in its original bottle, these chemicals can start to degrade after a shelf life of six months. There may be a date on the label/bottle to tell you either when the chemical was manufactured or when it is no longer as effective and not recommended to use. Typically, an expiration date will come with a statement like "Use by." If there is none, keep in mind that chemicals may lose their effectiveness after 6 months.

If you have expired chemicals, follow the instructions on the label for how to dispose of it safely while also checking local and state laws for

your area. If you cannot find instructions, contact the manufacturer and/or your local/state waste disposal authority for more guidance (normally this number is located on the label of the chemical).

What happens if I spill the chemical?

Spills happen, but you can be prepared! There are a few ways you can be ready. You can make your sanitizer solution in the sink (or bathtub) so if a spill happens it is contained, and you can run water to dilute the sanitizer as it flows down the drain.

Alternatively, consider preparing the solution on something with raised edges (e.g., a tray or using a gallon size bucket) to contain any chemicals. If either of those are not an option, have some paper towels ready to contain the spill and throw away in the garbage.

How should I store my undiluted chemicals when not using them?

We recommend you keep them off the ground, in a room somewhere between 50F-70F, and out of direct sunlight. Make sure to keep them out of reach of children and pets to prevent accidental exposures. Do not reuse the bottle once it's empty - residue left behind could react with whatever else you put into the bottle. Instead, dispose of the bottle according to your local waste authority.

Is this process the same for other chemicals?

It depends. Always read and follow the chemical label. All chemicals will have instructions for how to make, use, and handle them safely. The label is a wealth of information. Make sure the chemical is labeled for use on surfaces (e.g., food contact surfaces). Many chemicals require different concentrations or contact times depending on a surface, but the overall process of gathering your supplies and preparing to mix the solution will be the same. Specific details will vary and will be stated on the chemical label.

Your local Virginia Cooperative Extension office is available to offer assistance. Find your local office [here](https://ext.vt.edu/offices.html) (<https://ext.vt.edu/offices.html>).

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References

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<https://www.cdc.gov/flu/school/cleaning.htm>

CDC. 2021. Cleaning and Disinfecting Your Home. Available at:

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/disinfecting-your-home.html>

Public Health Ontario. 2020. Chlorine Dilution Calculator. Available at:

<https://www.publichealthontario.ca/en/health-topics/environmental-occupational-health/water-quality/chlorine-dilution-calculator>

Additional Resources

Cleaning, Sanitizing, Disinfecting, and Sterilizing. What is the difference? FST 386NP. Available at:

<https://resources.ext.vt.edu/contentdetail?contentid=3198&contentname=Cleaning,%20Sanitizing,%20Disinfecting,%20and%20Sterilizing.%20What%27s%20the%20difference%3F>

How to Clean, Sanitize, and Disinfect Surfaces. FST

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