Your task is to design a water filter that can clean and recycle dirty water used to wash cars!

A **water filter** is a device that can remove unwanted particles from water such as dirt, lead, chlorine, etc. Water filters are used in a variety of settings to create clean water for washing cars, watering plants, and for drinking water. **Your challenge is to create a water filter device that can catch and clean 1 cup of water that you will use to clean a toy car covered in dirt. Your filter must use two types of materials to capture the dirt.**

Step One: Get inspired!

California's freshwater supply is very limited in 2022 because it was the driest year ever recorded. Given the extreme drought conditions in California, residents of California are going to have to get very creative about not wasting fresh water.

Did you know that a little over half of the water used to wash a car at a commercial car wash has to be recycled and reused so that we don't waste the limited freshwater that we have. How can you design a water filter device that can catch and clean the 1 cup of water you use to wash a dirty toy car? It might help to think about how a screen door can let fresh air in but keep flies out. Your water filter will need to let water through but keep the dirt particles out, leaving you with crystal clear water.

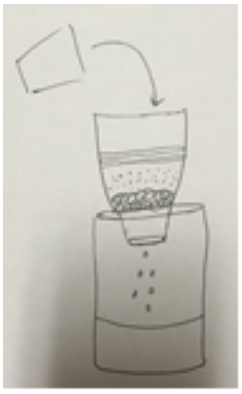
For this engineering challenge, NEVER drink the water – even after it has been filtered.

Step Two: Choose your Materials to make your water filter

- You can make your water filter using a variety of materials. Remember that your water filter device must be able to catch AND clean the 1 cup of water that you use to wash your dirty toy car.
- Water Collection: Think about what you might use to catch the water. Would you wash your car on a platform? Does it have a drain to collect the water?
- Water filter: How will your water filter clean the dirty water? What kind of materials have big enough holes to allow water to pass through but small enough holes to catch the dirt? Use two different materials to filter out different sized particles.
- Will your water catcher and filter be connected? What type of materials will you need to connect them?

Step Three: Designing your water filter

First draw a sketch of your water filter! Think of materials you have at your house that you can make a water filter with. Design it so that it uses at least two different types of filter media (materials).



Step Four: Building your water filter

Next start building your water filter! Even if your filter does not work right away, keep at it!

Once you have successfully created your car wash water filter, test it out. Did your water ever become crystal clear? Try and think of new ways that you can make the water even cleaner by modifying the design of your filter. You may want to consider redesigning your filter to use different types of filter media to filter out different types of particles.

For more inspiration click the link below:

- ☐ National Geographic: Failure & Persistence

If you liked this challenge, click the links below to find out more!

Watch and find out why water filtration is important for Space Travel!

- STEM Water filtration about the international space station
- Water Recycling about the international space station

- Check out this PBS video on how we treat and filter drinking water that is stored in a reservoir.

Step 5: Sharing your water filter on Instagram or email.

We want to see your water filter! With permission from your parent, or guardian, share a picture of your water filter for our instagram page. Direct messaging or emailing an image of your challenge gives us the written consent to redistribute the image on our website and official instagram page.

Instagram: @sciencecircuswhittier **Email:** sciencecircuswhittier@gmail.com