



## Curiosity Guide #801

### Fruit Science

Accompanies Curious Crew, Season 8, Episode 1 (#801)

#### Make Orange Concentrate Cleaner

STEM Challenge

##### Description

Did you know that chemists, engineers, and product designers make cleaning products? Try your hand at making your own!

##### Materials

- Large orange
- Knife
- Cutting board
- Distilled white vinegar
- Jar with lid
- Permanent Marker
- Wide-mouth pitcher
- Strainer
- Liquid measuring cup
- Water
- Spray bottle
- Rag

##### Procedure

- 1) Peel the orange, eat the segments, and save the rind.
- 2) Cut the rind into small pieces of about 1 square inch.
- 3) Fill the jar about  $\frac{3}{4}$  full of vinegar. Drop the peel segments into the liquid.

- 4) Put the lid on the jar, write the date on the jar, and refrigerate for two weeks.
- 5) Once the rind pieces are cured, after 2 weeks, pour the orange and vinegar through the strainer and into a wide-mouthed pitcher.
- 6) Remove the orange peels from the strainer and discard. The liquid left in the pitcher is your concentrate.
- 7) Use a measuring cup to measure and pour 1 part orange concentrate cleaner with 2 parts water. This will dilute the cleaner and make the cleaner ready to use. An example would be to use  $\frac{1}{4}$  cup concentrate with  $\frac{1}{2}$  cup water.
- 8) Combine the liquids into a spray bottle.
- 9) Spray the household cleaner onto the appliances, counter, sink, etc., and wipe the surfaces with a sponge or rag.
- 10) What do you notice?

## My Results

## Explanation

Orange Concentrate Cleaner is a safe cleaner to use on all kinds of surfaces. Vinegar is already a good cleaner, and when the oils of an orange are added, vinegar becomes an even more effective solvent and degreaser. Because vinegar and orange are natural, this cleaner is environmentally friendly. When the orange peels are soaked in the vinegar, the essential oils leave the peel and mix in with the vinegar. The primary oil found in the rind of citrus fruits is limonene. Not only is limonene an excellent cleaning solvent, but limonene also provides the wonderful aroma of oranges or lemons. This cleaner will clean and freshen the air at the same time.

**Try this!** We had great success making a fragrant cleaner with orange peels and vinegar. You can also make a furniture polish out of lemons. Just combine 2 parts vinegar, 2 parts olive oil, and 1 part fresh squeezed lemon juice. A small amount will be plenty. Now dip a clean rag in the solution. Wipe the rag with the grain of the wood. After a moment, wipe in the same direction with a dry cloth to soak up the leftover cleaner. Look at that, polished wood, and a lemony scent!

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