



Creating Cleaning Wipes Design Challenge

DESIGN CHALLENGE Notes:

This design challenge explores how cleaning wipes help us in biology, health and sanitation. For a better understanding in the biophysics of [how Isopropyl alcohol works](#), go [here](#).

Problem: We need the cleaning wipes to make sure surfaces are sterile

Challenge: Alcohol is a very simple solvent that we can use to destroy germs

So to create a cleaning wipe we need a solvent that can be mixed with a liquid that can be diluted and still be effective. IPA or Isopropyl Alcohol pulls things apart and oxidizes like chlorine bleach does.

Materials:

We need a few microfiber towels
We need a container to mix our solvents and dilutes
We need an oxidizer solvent like Isopropyl Alcohol
We need water
We need plastic bags with zip tight tops

Brainstorm:

1. How does IPA work on destroying germs?
2. What does IPA do that makes it so powerful?
3. Why is IPA so strong smelling?
4. Should we dilute IPA? Are there warnings?
5. How diluted is the IPA we have on hand right now?

Design/Build:

1. In a nonreactive bowl (glass or stainless steel) mix the three ingredients.
2. Determine the best way to add materials together so that they are roughly equal
3. You must leave enough material to properly soak the towels
4. You must put the towels in a container to keep the solvent from evaporating

Test:

Now you need to see if the cleaning wipe towel is working
How could you determine if the cleaning wipe towel is destroying pathogens or dissolving dirt?

Evaluate:

- How will you record your results?
- How will you know how much of each component you have is doing what?
- Can you create different types of dirty materials and test them?
- What would you do differently?

Share:

- Record your cleaning wipe tests on a chart.
- Which combination or ratio of water to solvent worked best?
- How did you know?