



Project Exploration creates transformative learning opportunities for youth underrepresented in the sciences –particularly students of color and girls – by equipping them with the skills, practices, and mindset needed for a lifelong pursuit of learning. STEM@Home makes activities around science, technology, engineering, and math accessible and fun to do at home. This STEMbook activity, resources, and more are available at [www.projectexploration.org/stemathome](http://www.projectexploration.org/stemathome).

## In this activity, you will:

Learn more about pH and acid/base reactions, this time in pennies!



## Supplies Required:

- Dirty Pennies
- Salt
- Vinegar
- Ketchup
- Hot Sauce
- Citric juice
- 4 bowls/cups

## Video

The cleaning power of eggs! <https://tinyurl.com/ycsa2p6d>

## Overview

Review the pH and Stinky Stuff One activity! pH is a measure of how acidic or alkaline/basic something is. It has a scale of 1 to 14. Water has a pH of 7 because it is neutral! The gunk on pennies is Copper Oxide, which is a base. Weak acids will neutralize the Copper Oxide. Vinegar and salt, which is in ketchup and hot sauce, is a weak acid that will clean your pennies!



## Instructions

1. Pour some of each solution (ketchup, hot sauce, juice, vinegar and salt) in each bowl/cup. For the vinegar and salt, pour equal parts vinegar and salt.
2. Place a penny in each bowl. Rub the solution around the penny, then let it soak for five minutes.
3. Once the time is up, wash the pennies off in the sink.
4. Compare the pennies. Did some solutions work better than others? Which ones did?

## Additional Resources

**Think About It!** What are other some other reactions that you've witnessed before? Do you know any other reactions that use vinegar? Try out the volcano activities on the STEM@home site and see what happens!

1. More household items you can use for cleaning: <https://tinyurl.com/y8grrey3>
2. How is ketchup made? <https://tinyurl.com/zu2gzmh>

## Share It Out

**Share on social media:** Take a before and after photo of your pennies to share on social media. Look at the list of other household items you can use to clean things. Take a before and after using those! Use the hashtags:

#ShinyPennies  
#ProjectExploration  
#StemAtHome

**Share via PE's website:** Students who complete STEM@home activities and share what they learned with the PE team via our website will earn points which can be traded in for cash prizes at the Explore Store. Your project number is 231. Learn more at [www.projectexploration.org/explore-store](http://www.projectexploration.org/explore-store)

### Join PE's character contest!

Design a STEM character who will lead kids through activities and be featured on our website and in our STEMbooks. Cash prizes will be awarded to the top 3 finalists. Learn more at: [www.projectexploration.org/character-contest](http://www.projectexploration.org/character-contest).



Call or text us for help: 312-772-6634



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