

Lemon clean

4th grade

# PURPOSE & HYPOTHESIS

- *The purpose is to know if lemon juice can clean an object better than soap.*
- *My hypothesis is that the lemon juice will work because lemon juice is acidic. This is why you put sugar into the mix when you make lemonade! Since lemon juice is high in citric acid it also makes a good natural cleaner.*

# RESEARCH

*Also that Different materials get dirty in different ways. Your sink and bathtub gets covered in soap and toothpaste scum. Your pans get deposits of fatty grease. As metals react with the air, they form dull-looking oxides. Different cleaners work for these different types of "dirt." When you're choosing a cleaner, it's good to know whether the substance you're trying to remove is acidic or alkaline. Choose a cleaner that's the opposite, and it will react with the "dirt" on your object and will remove it most effectively like Acids and lemon juice works best on alkaline*

# MATERIALS

- *Strainer*
- *3 ripe lemons*
- *Lemon juicer*
- *Knife*
- *3 pennies made before 1982*
- *Cup*
- *Faucet*
- *Greasy pan*
- *Sink with metal plug*
- *Paintbrush*
- *Bathtub*
- *1/8 cup measuring cup*
- *4 dry cleaning rags*

# EXPERIMENT

1. Take a ripe lemon and cut it in half.
2. Squeeze out the juice, and then put the juice through the strainer to make sure that there is no pulp left. Do the same with the other lemons. Make sure that you have about half a cup of lemon juice.
3. Divide the lemon juice into four parts, about  $\frac{1}{8}$  of a cup each.
4. Now, place three pennies into a cup with  $\frac{1}{8}$  cup of lemon juice. Set this aside.
5. Plug your sink and place another  $\frac{1}{8}$  of a cup of lemon juice into the sink.
6. Dip the brush into another  $\frac{1}{8}$  cup of lemon juice and paint it onto part of a dirty bathtub.
7. Get a small greasy pan and place another  $\frac{1}{8}$  of a cup of lemon juice into the pan.
8. After 10 minutes, use a cloth to rub at each of these materials. What happens to each of these materials when they're exposed to lemon juice?
- 9.

# ANALYSIS

*I chose this project because i thought i could have fun and it would help me know if lemon cleans better than soap. When lemon juice interacts with oxidized metal, it reacts with the dark oxides and the penny looks shiny and new again. This is especially noticeable with copper pennies. Since most pennies made after 1982 are made out of zinc with a thin copper coating, you used real copper pennies to get the true effect. If you're cleaning metals like copper or brass with lemon juice over the long term, this can react with the metals and can cause corrosion, damaging the metal.*

# REAL WORLD CONNECTION

*The connection to the world is that it can help to clean better and it can be a new way to clean. and and Since soap is alkaline, lemon juice and vinegar are both great at removing soap scum. They are less effective at removing grease. Alkaline cleaners like soap are better at removing grease by emulsifying it, or spreading it out into the dishwasher. Solvents actually dissolve the grease. By understanding the chemistry behind cleaning, you can choose the best cleaners for the job.*

# CONCLUSION

*I did it with lemon juice and it worked i also did it with baking soda and vinegar. Baking soda does not work it worked a little but not that much. I chose baking soda because it whitens your teeth. Vinegar works.*

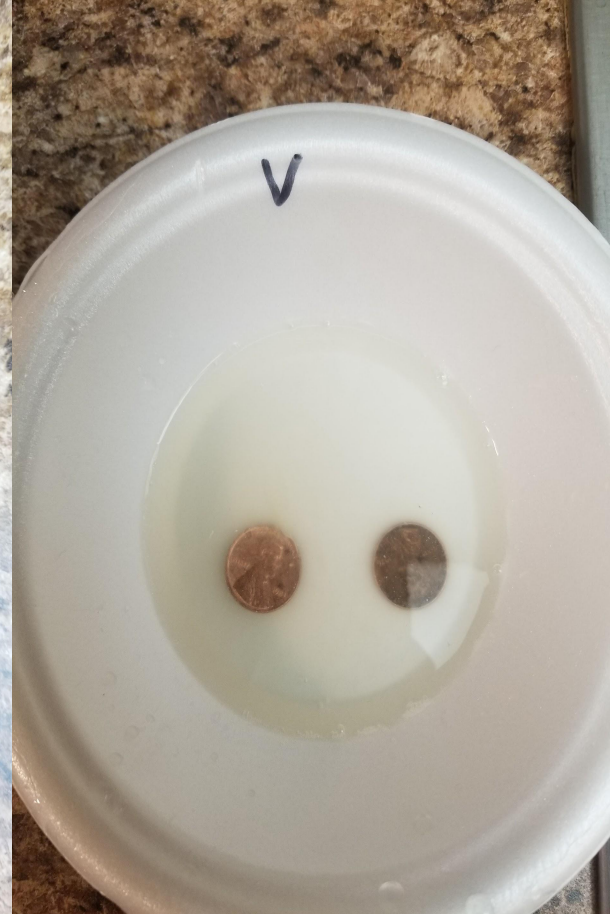
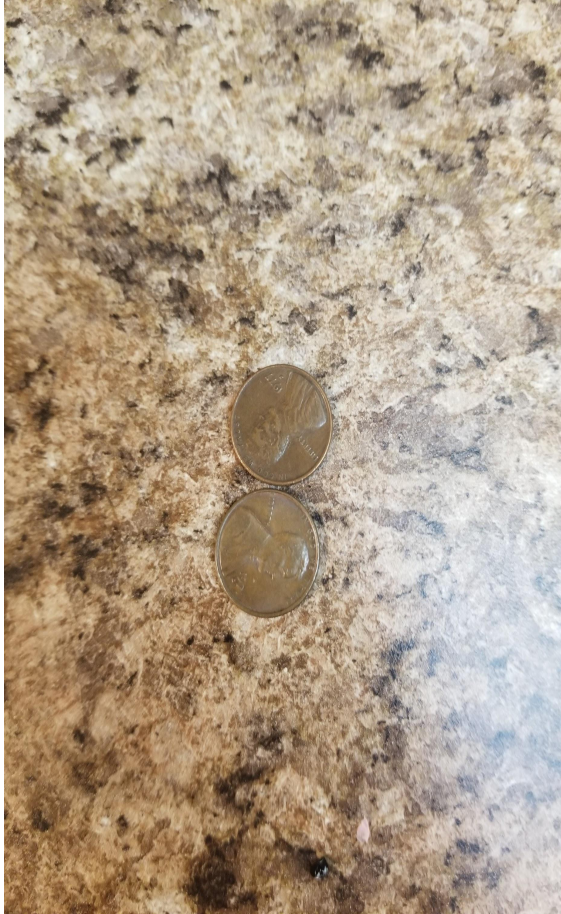


# WORKS CITED

- My mom
- Me
- [1000 experiments for kids](#)
- My sister

# Vinegar

To make the experiment more fun I added Vinegar and lemon juice. Vinegar and lemon juice works. It cleaned the pennie really good



# Baking Soda

I am adding baking soda and lemon juice for fun. Baking soda did not work that much. The penny was still dirty and rusty.





# Lemon juice

Lemon juice works if you leave it for 3 hours. The penny turned out very clean almost like new.

