

Cleaning coins with different liquids

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What liquids?
What coins?



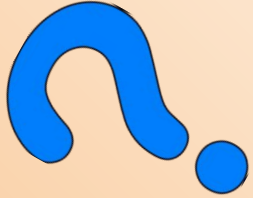
Oh my god, we
need to read to
find out.

Our question:

Do different liquids clean coins the same or not? If they do, what causes the liquids to clean coins better than other liquids?

Our hypothesis

We think liquids that have sugar in them will eat away the dirt and clean the coins better.



Materials and setup:

Our materials:

- 1 3 cups
- 2 Orange juice, water, and milk
- 3 3 dirty coins
- 4 Camera / phone



Setup:

- 1 We put the same amount of each liquid in three different cups.
- 2 Then we took before pictures of the coins before they sat in the liquid for one week.
- 3 Then we put the coins in the cup.
- 4 Then we put the cups with the liquids and coins on the porch for one week.
- 5 Then we took out the coins after one week and took after pictures.

I wonder what's gonna happen to the coins.



Stop wondering and just keep reading!



Before pictures



Water before



Milk before



Orange juice before



Eww that looks gross



Why is it so dirty?

We tried hard to find pennies that are very close to the same amount of dirtiness. So then we would be able to really see which liquid cleans pennies better. Because if we did not find ones that had the same amount of dirt on them, then we would think that one of the liquids cleans coins better than others, but really it would just be that the coin was just cleaner to begin with.

After pictures:



Water,
After



Milk, after



Orange
juice, after

Oh for
heaven's
sake.



Now, how
are they
clean?

The coin that was in the milk and the coin that was in the water did not change very much over the course of the week. The coin that changed the most, was the coin that was in orange juice. It was clean and even shiny after the course of a week. We did some research to find out why the orange juice cleaned the coin much better than the other liquids (on next slide.)

Research:

We found out that we got the right answer but for the wrong reason. We did see that the coin that was in the orange juice was a lot cleaner than the other coins, but our hypothesis that it was because of the sugar contained in the juice was wrong. We found out it's because of the acid NOT the sugar that's in the orange juice that cleans the coins. This also means that lemon juice and other acidic liquids like vinegar would work really well too, even better than orange juice as they contain more acid..

Oh! That makes sense!



What makes sense??? What is happening??



Research:

We figured out that the coins (pennies) are made of copper. Copper is a metal. It can react with the oxygen of the air over time to form copper-oxide at the surface of the coins. This is what makes the coins dirty. So in order to remove the dirt from the coins, we have to remove the layer of copper-oxide that is on the outside of the coins. This is done using an acidic solution. It will dissolve the copper-oxide and leave only the copper, which is shinny. So it seems that it has nothing to do with sugar after all...

Because not everyone is as smart as me



So why did you think it was sugar

Conclusion:

The orange juice cleaned the coin the best out of all three of the liquids that we tested. Our hypothesis was verified, but our reasoning was not correct. What cleans the coins is the acid in the orange juice, but not the sugar.

