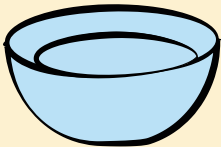




# Pirate's treasure

When you discover a treasure under the sea, it is often made up of old coins that are worn and green. Today we're going to make one just for you and experiment with « **oxidation** ». Are you ready to find a treasure for your collection ?

## What material do you need ?



A bowl



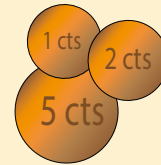
A teaspoon



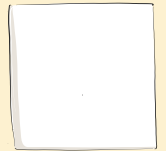
Salt



5 cl  
vinegar



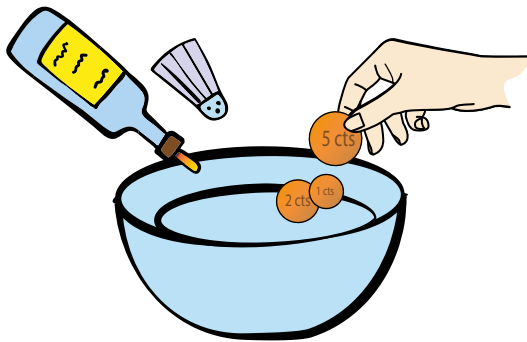
Copper coins



A paper towel

## Ready ? Let's experiment !

1

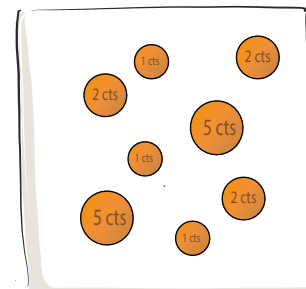


Put the coins in the empty bowl.  
Add the vinegar and a teaspoon of salt.  
Let the preparation stand for 20 minutes.  
What do you observe ?

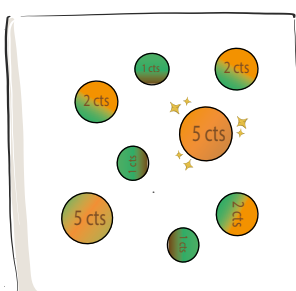


2

Then take back the coins one by one and place them on the paper towel without drying them. Over time, observe the result. What do you notice?



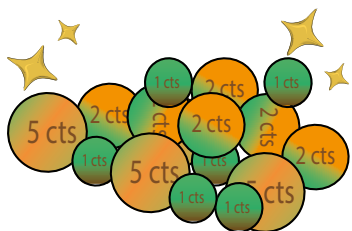
3



To go a step further, when you take your coins out of the bowl, dry a couple of them carefully and remove any leftover salt and vinegar.  
What difference do you see over time?

# Pirate's treasure (end)

4



*Well done !*

*You have pirate coins like the ones that can be found under the sea! You now just have to quickly find a stash for your treasure !*

*Have you noticed how brand new the coins look when you take them out of the vinegar and how quickly they darken when exposed to air and finally turn green ?*

## *Why does it work ?*

*Coins are made of metal : steel in the center with a red copper coating. In vinegar, the surface of your coins is perfectly clean. This is what makes them shiny and increases their red color.*

*When you let the coins air dry, they get darker and darker and a green crust forms. It is called malachite.*

*This is made from a mixture of salt and oxidized copper.*

## *Why does oxidation appear ?*

**Oxidation** is a natural slow chemical reaction that is caused by the combination of oxygen and water. During this process, a small electric current is created between copper and oxygen in the air. As a result copper oxidizes. It slowly changes color to blue-green.

*Passing through the vinegar and salt bath greatly accelerates this process. Thanks to salt and vinegar, the electric current flows faster on the surface of the copper.*

*So the coins turn green faster. But if you dry them before placing them on the paper towel, the oxidation slows down strongly because the air is an insulator. This means that electric current can hardly be formed and your coins take longer to change color. Likewise, tap water is not a good conductor of electricity.*