



04737 Fuller Road, East Jordan, MI 49727  
(231) 536-3369 | [www.miravenhill.org](http://www.miravenhill.org)  
[info@miravenhill.org](mailto:info@miravenhill.org)

*Raven Hill Discovery Center is a 501(c)(3) tax-exempt corporation.*

**Mission:** Raven Hill provides a place that enhances hands-on and lifelong learning for all ages by connecting science, history & the arts.

## Copper plating

Gather about 25 pennies (the older the better—before 1985, if possible); a nail, dime, paper clips, washers and/or safety pin; a piece of sand paper, a small clear glass or bowl, 1 tablespoon of salt and about ½ cup of vinegar. Use the sand paper on the nails or whatever you are using. Get all the oxidation off and make them nice and shiny. Put the pennies in the glass. Pour in 1 tablespoon of salt and pour in the vinegar. Stir. Put the nails or dimes in, making sure they are under the vinegar. What do you see happening? The bubbles are hydrogen gas. The salt and vinegar dissolves some of the copper off the pennies and some of the iron off the nails. The particles are called ions and are in the salt/vinegar solution. The copper ions have a positive charge and are attracted to the iron in the steel nails or washers, which has a negative charge. Opposites attract, but the copper ions are more strongly attracted than the iron ions, so the copper ions coat or plate the nails or whatever you are using, giving them a copper coating. Be careful not to get any of the liquid in your eyes. Let nails sit for 15-20 minutes. After 15-20 minutes take the nails out and observe both the nails and the pennies. Leave another 15-20 minutes and check again. Observe the copper coating that is forming. Return the nails to the solution each time. It is best, if the nails can be left overnight. Check it over a couple of days to see that happens to both the nails and the pennies.

