


# Lab Activity H20


## Cleaning Cents

### OUTCOMES

After completing this lab activity, the student should be able to

- design an experiment to answer a simple question related to cleaning pennies
  - gather and interpret the data collected in the experiment
  - draw a conclusion and report the results of the experiment
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### DISCUSSION

- In this lab you will conduct a real experiment – one for which the outcome is hypothesized and an experiment is designed to test the hypothesis – in much the same way that scientists conduct experiments. In general, this process includes:
    - Making a statement of hypothesis/hypotheses.
    - Designing the experiment.
    - Gathering data.
    - Interpreting data.
    - Making conclusion(s).
    - Reporting result(s).
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### MATERIALS (Provided By Student)

20 old pennies (not shiny)  
Distilled Water  
Salt  
Vinegar  
Additional materials depend on design

### MATERIALS (From Kit)

Electronic Balance  
Safety Goggles/Glasses  
Additional materials depend on design

## PROCEDURE

SAFETY GOGGLES/GLASSES MUST BE WORN FOR THIS EXPERIMENT!

1. Before beginning, think of and design:
  - an easy experiment that would allow you determine whether a salt solution, vinegar, or proportion of the two mixed together cleans pennies the best.
  - an easy experiment that would allow you determine whether a salt solution, vinegar, or proportion of the two mixed together cleans pennies the fastest.

**REQUIRED PHOTO:** Includes the date clearly shown on a calendar, newspaper, cell phone, or written on a sheet of paper, showing all of the materials and pennies used for your experiment **BEFORE** the pennies are placed into any of the solutions.

2. Prepare enough salt solution to conduct the experiments you designed. The salt solution should contain 1 g salt for every 10 mL water.
3. Sufficient trials should be performed to use all 20 pennies.
4. Record all times, measurements, and observations into two separate **data tables** (not graphs), one for each of the experiments you designed.

**REQUIRED PHOTO:** Includes your face and/or clearly shows a Picture I.D. (with name), showing all of the pennies next to their respective solutions **AFTER** the first experiment has been completed.

5. All of the liquids used in this experiment may be poured down the drain and flushed with water. Materials used from your kit may be washed for reuse in later lab activities.

Name \_\_\_\_\_

Lab Section \_\_\_\_\_

### PRELAB QUESTIONS

1. Do you think vinegar will clean pennies? Why or why not?
2. Do you think a salt solution will clean pennies? Why or why not?
3. Predict whether a salt solution, vinegar, or which proportion of the two cleans pennies the best. State your prediction in the form of a hypothesis.
4. Predict whether a salt solution, vinegar, or which proportion of the two cleans pennies the fastest. State your prediction in the form of a hypothesis.
5. Which safety precautions, if any, must be observed during this lab activity?

## ASSIGNMENT

1. **Write a short report** (2 or 3 paragraphs in length) summarizing your results. Address the following items in your report. Since your assignment is to be written in report form, **do not include the actual questions you are answering in the report**. The questions should not be visible anywhere in the report that is submitted. Except for the data table, the report must be written using **complete sentences**.
  - What were your hypotheses?
  - Write a short summary of the procedure you designed to carry out your experiment.
  - Were the results what you originally expected? Is there any correlation between the solutions or mixtures that cleaned pennies the best and the ones that cleaned pennies the fastest?
  - If you were to recommend a solution or mixture of solutions for cleaning pennies, what would it be?
2. Include a **data table** (not a graph) that shows all of your observations.

**PHOTOS** - Please compress photos and save your file **before** uploading to the dropbox. Photos should come close to filling the boxes below and all required items should be **clearly visible**.

Required Photo 1:

Required Photo 2:

## Lab Report Submission Checklist

Complete the appropriate checklist and **submit this page** along with your lab activity.

### Lab Activity Submitted Via the D2L Dropbox

	Prelab assignment is complete.
	Remainder of lab activity is complete (data, questions, photos. etc.).
	Required photos of the procedure included.
	At least one photo shows face or photo I.D. At least one photo clearly shows the date.
	Document filename in format of <b>Lastname Firstname HX</b> .
	File size is no larger than 10 MB.
	Only one document submitted for this lab activity.
	Lab submitted on time.
	If late, this is your first extension.



### Lab Activity Submitted Via the US Postal Service or In Person

	Prelab assignment is complete.
	Remainder of lab activity is complete (data, questions, photos. etc.).
	Required photos (at least one showing face or photo I.D.; at least one shows the date) of the procedure or a tangible artifact or product from the lab activity is included.
	If return is desired, a self-addressed stamped envelope <b>with sufficient postage</b> is included*.
	Lab submitted on time (postmarked by due date if sent via USPS).
	If late, this is your first extension.

\*You may find a postage calculator at <http://postcalc.usps.gov>. Use the balance in your kit to find the weight.