**Penny Lab: Teacher Notes**

Curricular tie-in:   
 -Measurements with uncertainty.  
 -Managing uncertainties and sig figs in calculations

-Sources of error

**Pre-lab group work:**  
Before giving the handout:

Describe a penny as a Zn core with a Cu coating.   
Question: figure out the % Cu and % Zn.

In Chemistry, % composition is the percent by mass.

What does this calculation look like?

What will we need to measure, to answer this question?

mass of penny – easy

mass of copper, mass of zinc – but they are connected. How do we separate them?

Students generate ideas.

Refer back to Zn/HCl demo.   
 Give chemical properties: Zn reacts with acid, Cu does not.

So, what is our procedure?

(put penny in acid?)

How will Zn react if it is covered in Cu?

(can we cut it open? Yes – with tin snips)

How will we get mass of Zn if the Zn is in solution as zinc chloride?

(we don’t have to. We can find the mass by difference).

With this information:

Sketch out a procedure with the group.

What real-world considerations might interfere with our mass measurements?

-penny is wet?

Give student handout. Ask students to generate a pre-lab including data table before the lab.

**Required skills for lab analysis:**

Before students do calculations, you should have talked about adding uncertainties and about multiplication and division with significant figures.