**Virtual Lab! Single Displacement Reactions**

**Website:** <http://www.chem.iastate.edu/group/Greenbowe/sections/projectfolder/flashfiles/redox/home.html>

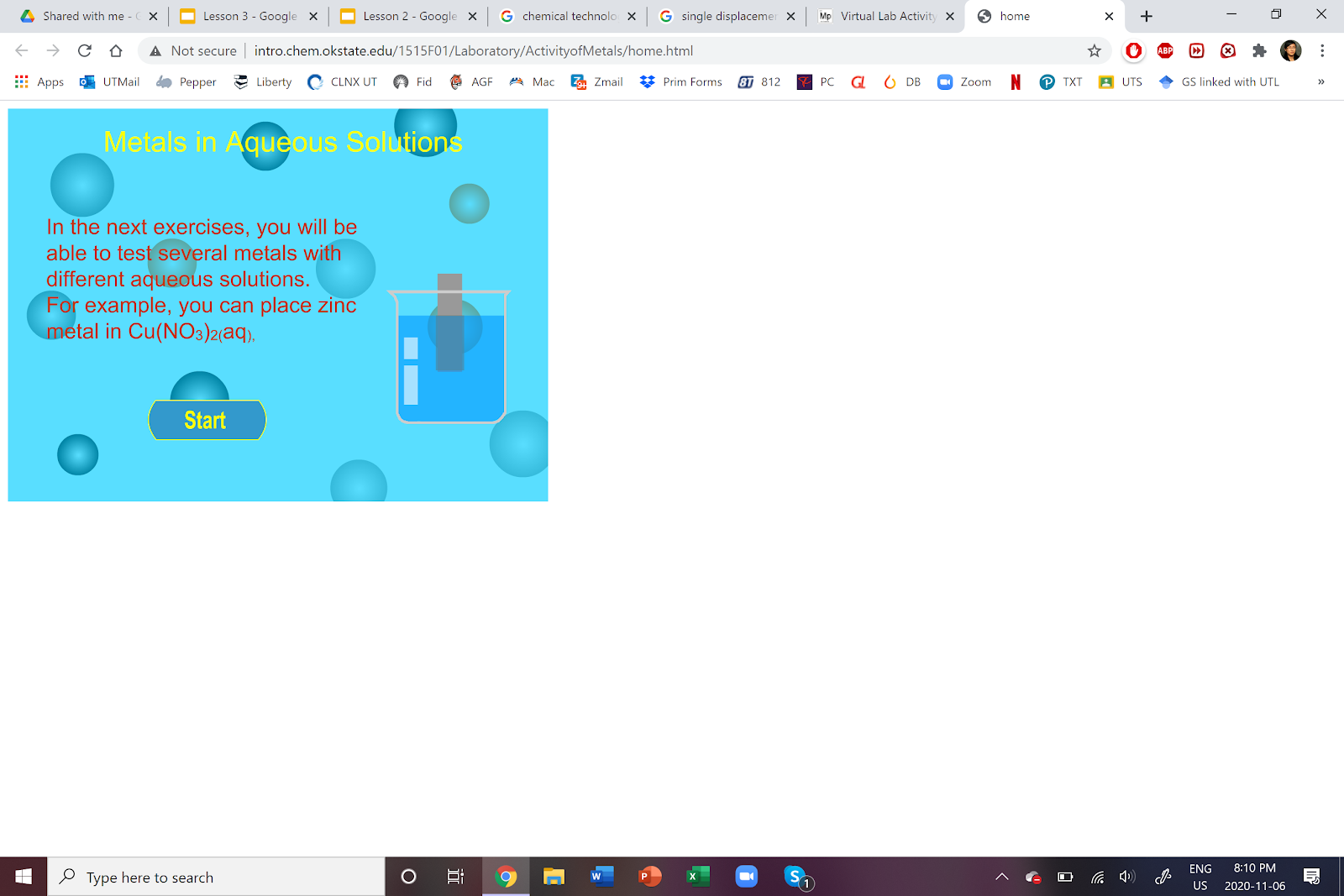
**Learning Objectives:**

* To explore the reactivity of metals
* To practice writing single replacement reactions
* To practice using the activity series chart in your reference table

**Procedure:**

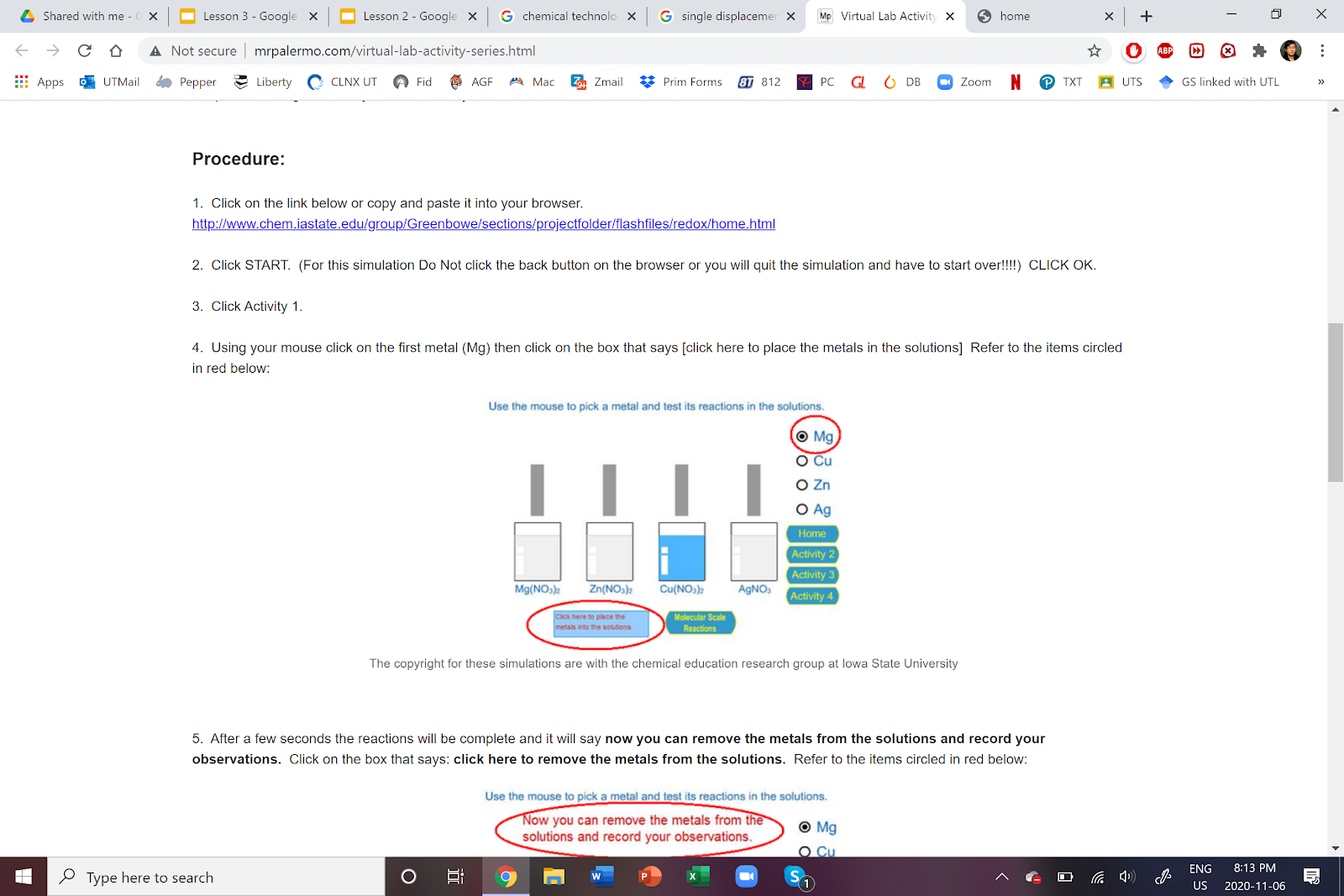
1.  Click on the link above or copy and paste it into your browser.

2.  Click START.  (For this simulation Do Not click the back button on the browser or you will quit the simulation and have to start over!!!!)  CLICK OK.

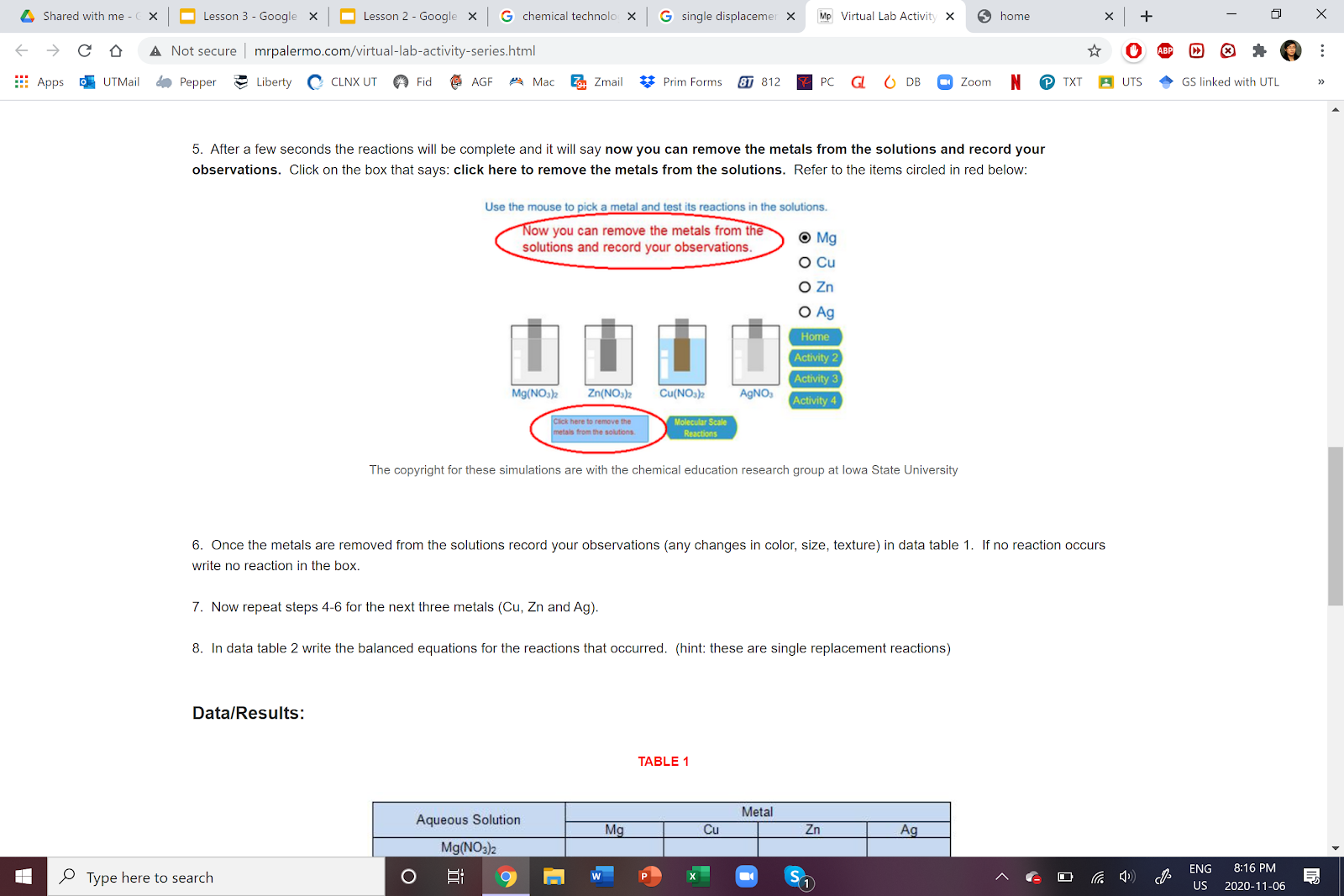


3.  Click Activity 1.

4.  Using your mouse click on the first metal (Mg) then click on the box that says. Refer to the items circled in red here:



5.  After a few seconds the reactions will be complete and it will say **now you can remove the metals from the solutions and record your observations.** Click on the box that says: **click here to remove the metals from the solutions.**  Refer to the items circled in red here:



6.  Once the metals are removed from the solutions record your observations (any changes in color, size, texture etc.) in **Data Table 1**. If no reaction occurs write NO REACTION (NR) in the box.

7.  Now repeat steps 4-6 for the next three metals (Cu, Zn and Ag).

8.  In **Data Table 2** write the balanced equations for the reactions that occurred (hint: these are single replacement reactions).

**Results:**

**Data table 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Aqueous solutions** | **Metals** | | | |
| Mg | Cu | Zn | Ag |
| Mg(NO3)2 |  |  |  |  |
| Zn(NO3)2 |  |  |  |  |
| Cu(NO3)2 |  |  |  |  |
| Ag(NO3) |  |  |  |  |

**Data table 2**

|  |  |
| --- | --- |
| **Reaction #** | **Equations** |
| **1** | Mg + Zn(NO3)2🡪 \_\_\_\_\_\_ + \_\_\_\_\_\_ (NO3)2 |
| **2** | Mg + Cu(NO3)2🡪 \_\_\_\_\_\_ + \_\_\_\_\_\_ (NO3)2 |
| **3** | Mg + 2Ag(NO3)🡪 2\_\_\_\_\_\_ + \_\_\_\_\_\_ (NO3)2 |
| **4** | Cu + 2Ag(NO3)🡪 2\_\_\_\_\_\_ + \_\_\_\_\_\_ (NO3)2 |
| **5** | Zn + Cu(NO3)2🡪 \_\_\_\_\_\_ + \_\_\_\_\_\_ (NO3)2 |
| **6** | Zn +2Ag(NO3)🡪 2\_\_\_\_\_\_ + \_\_\_\_\_\_ (NO3)2 |

**Discussion:**

Questions to reflect on:

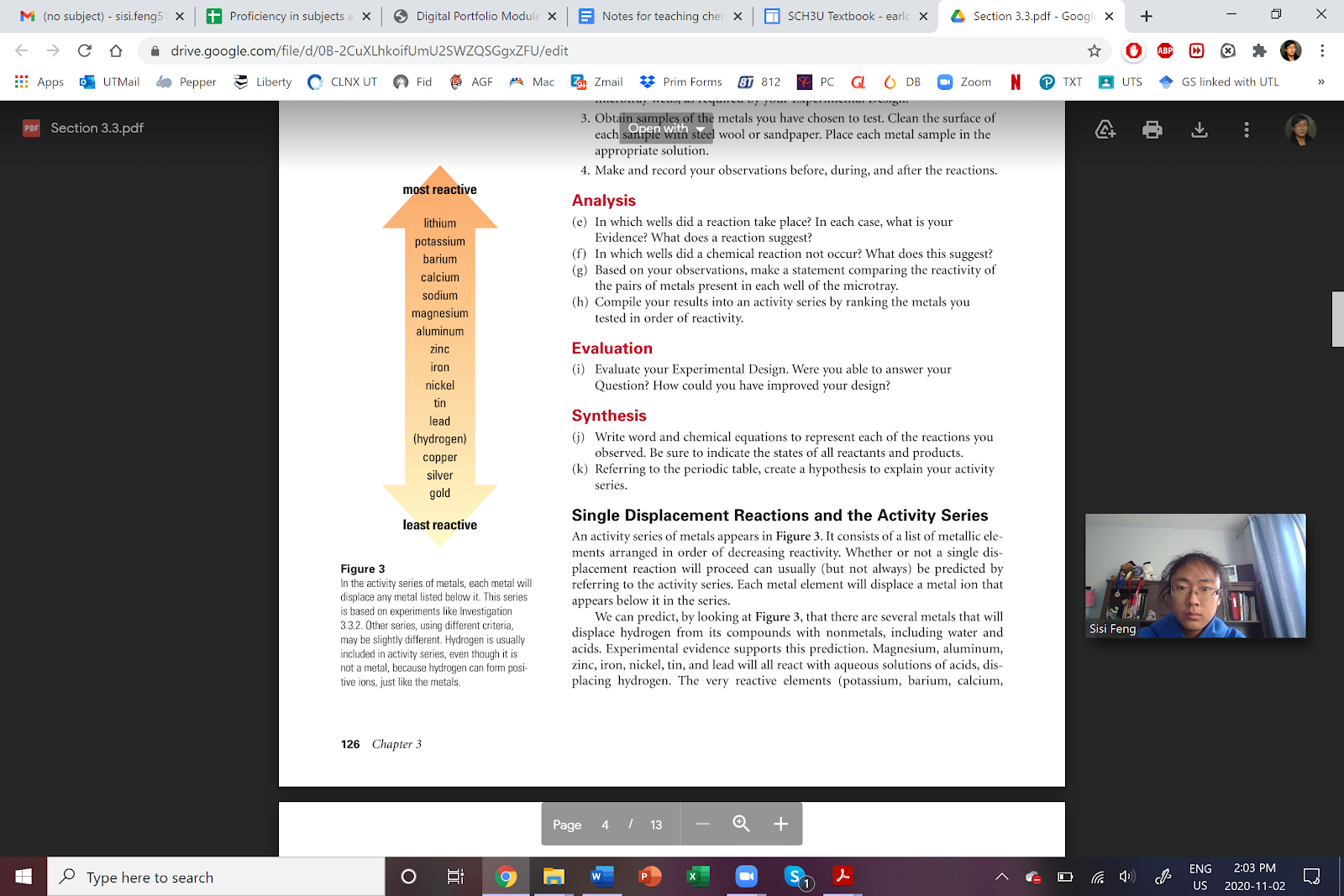
1.  Which of the metals reacted with the most solutions?

2.  Which of the metals reacted with the fewest solutions?

3.  List the 4 Metals in order from the most reactive to the least reactive.

4.  Refer to the table below. This is the activity series which lists the most reactive metals on top and the least reactive on the bottom. Compare your answer to question #3 with the activity series. Are your results in the same order? Why?

5.  If we added Pb (lead) to the list, which of the solutions would you expect it to react with? What if we added Ca (calcium)?



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<http://www.mrpalermo.com/virtual-lab-activity-series.html>