Name of Scribe _____ Block____
Name of Spokesperson_____ Date_____
Name of Runner_____
Water Hardness Engineering Challenge

A. Brainstorm
Where does our school tap water come from?

B. The Design Brief for the Engineering Challenge
Background Statement
The "hardness" of water is determined by the concentration of dissolved ions. When water flows through minerals, ions such as Ca^{2+} and Mg^{2+} get dissolved in the water.

Challenge Statement
Design a procedure to compare two samples of water for the presence of Ca^{2+} and Mg^{2+}.

Criteria
The procedure must provide a way to determine:
- if the sample contains Ca^{2+} and/or Mg^{2+}
- which sample is the "harder" water

Available Materials
- Samples of tap water to be tested
- Microplate
- All solutions from "Precipitation and Solubility" lab.
- All data & resources from "Precipitation and Solubility" lab
- Test tubes
- Liquid soap

Complete the Challenge!
Work collaboratively with your group. Fill in the table on the back of this page.
1. Write the procedure.
2. Get approval from the teacher.
3. Obtain the materials.
4. Perform the procedure.
5. Record results.
6. Report back to whole class.

Evaluation/Assessment
See rubrics for design process and teamwork skills.

Name of Scribe _____ Block____
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Name of Runner_____

1. Write Procedure	
2. Get Teacher Approval	
3. Obtain Materials	
4. Perform Procedure & Record Data	
5. Results	Sample _____is the harder water.
6. Report Back to Class	Did your procedure meet the design criteria?_____ Explain. Is a procedure re-design necessary?_____Explain.