

# Identifying Ions-Chemistry Lesson Plan

Kurt Rizley

## 1. Student knowledge needed

Students should understand what a confirming test means (that the test confirms the presence of the ion that we are testing for)

Students must understand that if a precipitate or color change appears that they had a confirming test result.

If nothing happens in the test that the ion being tested for is not present.

## 2. Vocabulary

Ion, Cation, Anion, Solution, Compound, Element, Confirming Test, precipitate, claim, evidence, reasoning,

## 3. Goal of Lesson

The main goal of the lesson is to make sure that the students can make an appropriate inference as to what ion is present in there unknown sample.

Also it is important for the students to have a first hand experience in how a scientist would test for different ions in water so that they can ultimately be able to answer the big DL question of what actually was the cause of the riverwood fishkill.

**C1.1E:** Describe a reason for a given conclusion using evidence from an investigation.

**C1.1g:** Based on empirical evidence, explain and critique the reasoning used to draw a scientific conclusion or explanation.

**C1.2D:** Evaluate scientific explanations in a peer review process or discussion format.

**C1.1h:** Design and conduct a systematic scientific investigation that tests a hypothesis. Draw conclusions from data presented in charts or tables.

**C5.2A:** Balance simple chemical equations applying the conservation of matter.

**C1.1B:** Evaluate the uncertainties or validity of scientific conclusions using an understanding of sources of measurement error, the challenges of controlling variables, accuracy of data analysis, logic of argument, logic of experimental design, and/or the dependence on underlying assumptions.

**C1.1C:** Conduct scientific investigations using appropriate tools and techniques (e.g., selecting an instrument that measures the desired quantity—length, volume, weight, time interval, temperature—with the appropriate level of precision).

#### **4. Materials**

Each student needs his or her lab results

White board or overhead projector

#### **5. Procedures**

Question: What unknown solution did your group have? (distilled water, calcium Chloride, sodium chloride, calcium carbonate)

- Teacher will hold a teacher lead discussion and make a list of things that we know and put them on the board. The list will include: 1. Our group has to have distilled water, calcium chloride, sodium chloride, or calcium carbonate. 2. If we had a positive test when testing for a certain ion that confirms the presence of that ion in the unknown solution. 3. If there is not a confirming test when testing for a certain ion than that confirms the absence of that ion.
- Student: students will have three minutes to try and figure out what unknown solution that there group had.
- Student: Students will then have three minutes to share with a group member what unknown solution they had and explain why. Then the other student will have three minutes to explain their position.
- Teacher: The teacher will pull the class together and ask for volunteers. Post their data on the board and ask the student to explain how they came to his or her conclusion. Asking the rest of the students for gaps in their thinking.
- Teacher: Teacher will pass out the rubric for a C.E.R. and explain the parallels to what we had just done as a class and also give an example of a well done C.E.R. and why it received full points. Assignment due the following day stapled to lab results.

## 6. Hands on connections

Students will be turning in their data charts with the C.E.R. In class an exemplary C.E.R. will be posted so that students know exactly what is expected.

For example: My group's unknown sample was calcium carbonate. We had a confirming test for the calcium ion. A confirming test showed the presence of calcium in our unknown so it narrowed our options down to calcium carbonate or calcium chloride. We tested negative for the ion chlorine there for chlorine could not be present in our unknown eliminating calcium chloride as an option. The only option for our unknown then was calcium carbonate because we tested positive for calcium and negative for chlorine.

## 7. Assessment

### Lab Report : Confirming Ion Test

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Teacher Name: **Mr. Rizley**

Student Name: \_\_\_\_\_

CATEGORY	4	3	2	1
<b>Claim</b>	The claim is clearly stated and is correct	The claim is clear but is incorrect or the claim is correct but not clearly stated	The claim is vague or unclear and incorrect	No evidence of clear claim
<b>Evidence</b>	All of the evidence is present that needs to be present to adequately support claim	Not all of the evidence that is necessary is present	Evidence used does not support claim	No evidence present
<b>Reasoning</b>	Explains why each piece of evidence supports the claim	Explains why some of the evidence supports the claim	Does not make the right connection between why evidence supports claim	no reasoning present

Total: \_\_\_\_\_

