~Aqua Fusion~
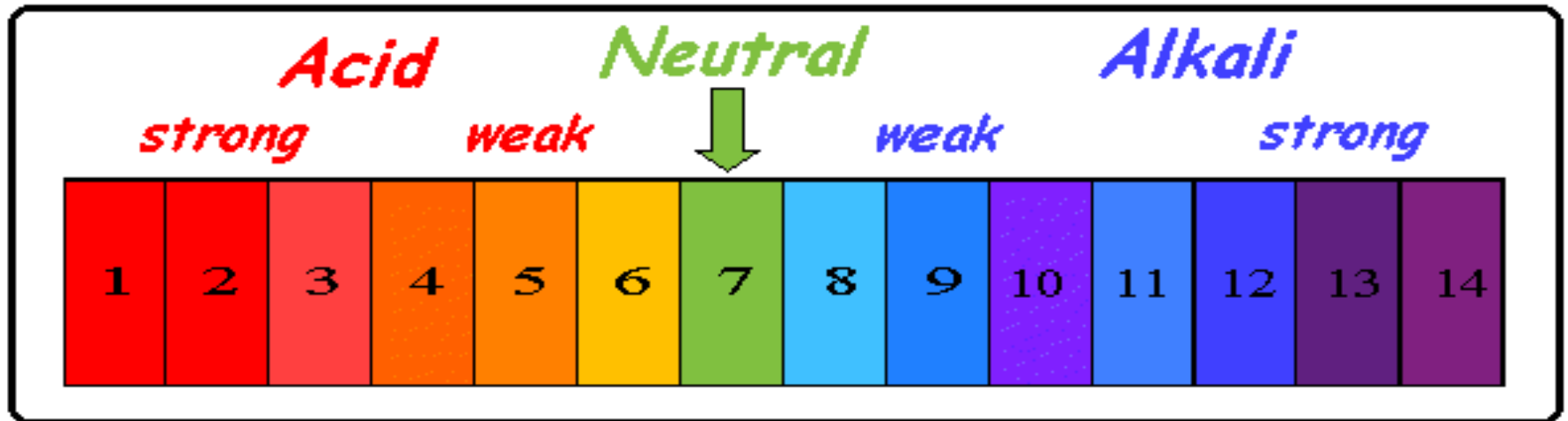
Group: 3~ Aqua Fusion

Title of Project:

Testing Rain Water

~Where is the Chemistry? ~

Our water supply is finite, which means that we do not have an endless supply. We only have the water that we have now. Ninety - seven percent (97%) of all the water on the Earth is salt water which is not suitable for drinking. Only three percent (3%) of all the water is fresh water, and only one percent (1%) is available for drinking. The other two percent (2%) is locked in ice caps and glaciers.

 With all the people on Earth relying on such a small percentage of all the water on Earth, it only makes sense that we must preserve and conserve our water. We must not pollute our water because it is the only water we will ever have.

~Aqua Fusion~

~Research Design ~

Aim: To measure the pH of different types of water.

Hypothesis:

I think that rain water will be slightly acidic and have a pH value of 3.0-6.8. I think so because when it rains the rainwater can wash chemicals out of the air as it falls. If the air has chemicals from factories, car and truck exhaust mixed in, then rainwater becomes acidic. We measure how acidic or alkali a solution is by using the pH scale. Rainwater is usually slightly acidic, with a pH value of 5.5 and above. When pH values are less than 5.0, it is called "acid rain".

~Research Design ~

Equipment:

- ✓ 4 -50 ml beakers
- ✓ pH sensor
- ✓ pH sensor reader
- ✓ Sample of tap water
- ✓ Samples of rain water from groups A and B
- ✓ Sample of distilled water
- ✓ pH Scale

~Research Design ~

Independent variables:
- ✓ Sample of rain water from group A
- ✓ Sample of rain water from group B
- ✓ Tap water
- ✓ Distilled water

Dependent Variable:
- ✓ The pH value of the various samples of waters.

Controlled Variables:
- ✓ The length of time the pH sensor was placed in the beaker.
- ✓ Volume of water tested.
- ✓ Same pH sensor connected to a lap top.

~Research Design ~

Method:
1. Collect a sample of 30 ml of rain water from groups A and B.

2. Connect the pH sensor to the PC in order to read the data.

3. Insert the sensor into the sample of rain water.

4. Read and record the data.

5. Repeat steps 1-4 with the samples of distilled water and tap water.

~<u>Data Collection and Analysis</u>~

TYPE OF WATER	pH value of water Trial 1	pH value of water Trial 2	pH value of water Trial 3	Average pH Value of Water
Rain water from group A	6.5	6.4	6.5	6.4
Rain water from group B	8.2	8.1	8.3	8.2
Distilled water	7.1	7.0	7.1	7.0
Tap water	7.2	7.3	7.1	7.2

~Chart Showing Average pH of Values of Samples of water collected ~
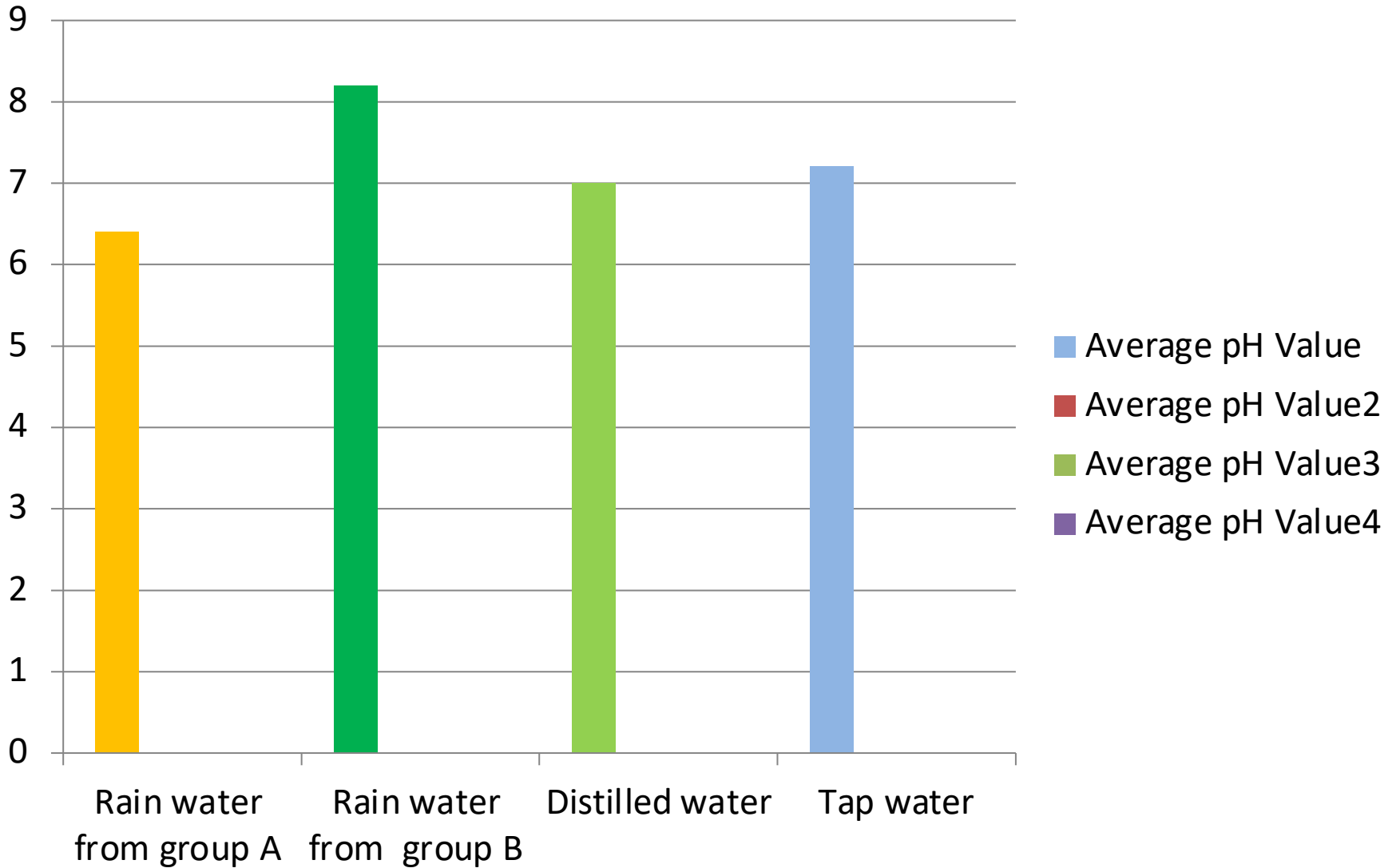
# pH Scale
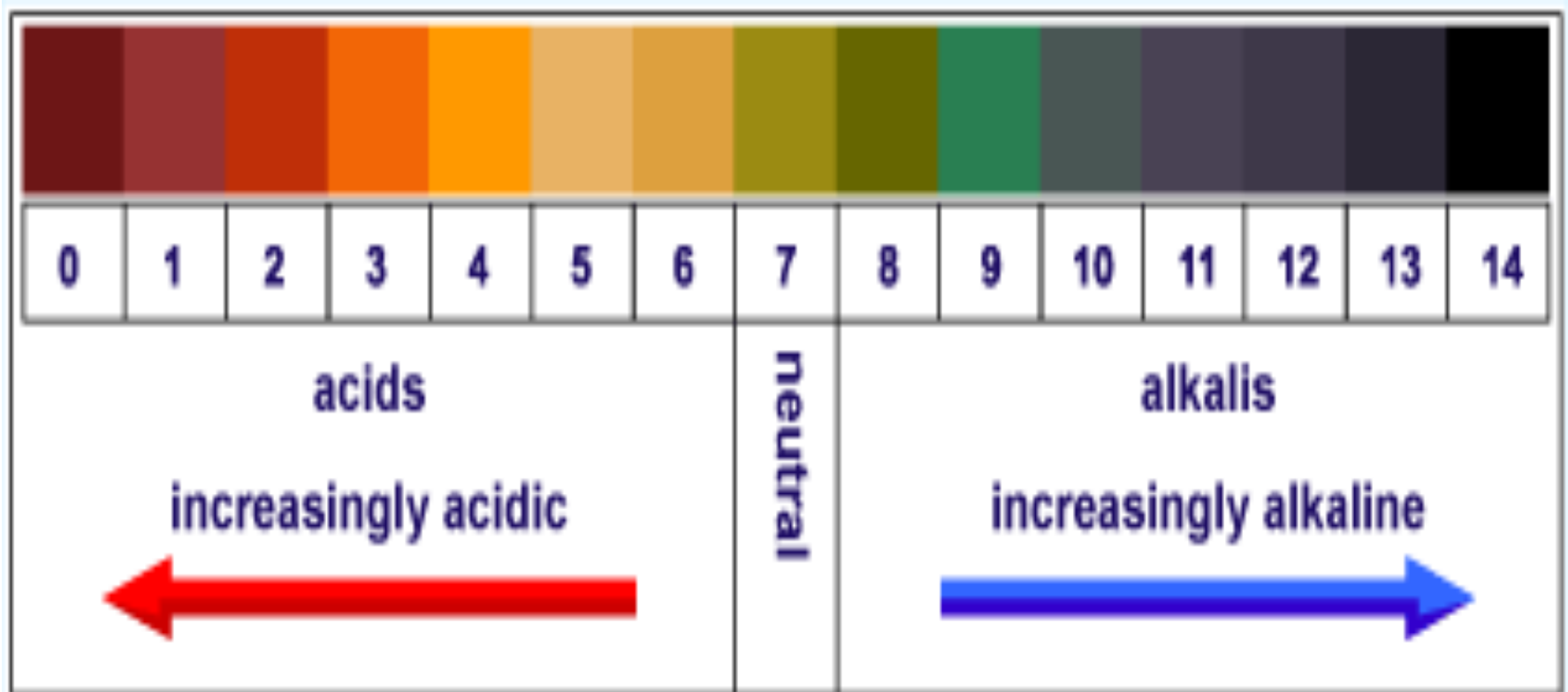
~Interpretation ~

The results showed that tap water had a pH value of 7.2 which was slightly above neutral. Distilled water with a pH value of 7.1 was the closest to neutral (pH value 7.0). Our results also showed that the sample of rain water from group A was slightly acidic with a pH value of 6.4. This result was not surprising because it supports our hypothesis. Our school is located near to a very busy high street and we expected that any rain water collected in that area would be slightly acidic.

However I think we had one anomaly with our second sample of rain water from group B. The results showed that the average pH value was 8.2 which does not support our hypothesis. This proves that rain water contains other chemicals which could have affected the pH. Some factors that could have caused this anomaly could be the position that the bucket was placed in. It may have been close to an area which was surrounded by trees or plants. The water may also have been collected and mixed with other chemicals which made the water more alkaline.

~Conclusion~

Our experiment showed that students were willing to change their behaviour as a result of our campaign. Testing the samples from groups A and B showed that students actually participated in the experiment and collected their own samples of rainwater.

The pH value of group A was expected but the pH value seen in group B was not expected. One sample of rainwater collected was slightly acidic which showed there was a great deal of pollution in the air.   Our campaign was not just to make students aware of the importance of saving water but to measure how acidic the rain water was near our school. Some of the things that students can do to help reduce acid rain is by walking, biking, or taking public transportation.
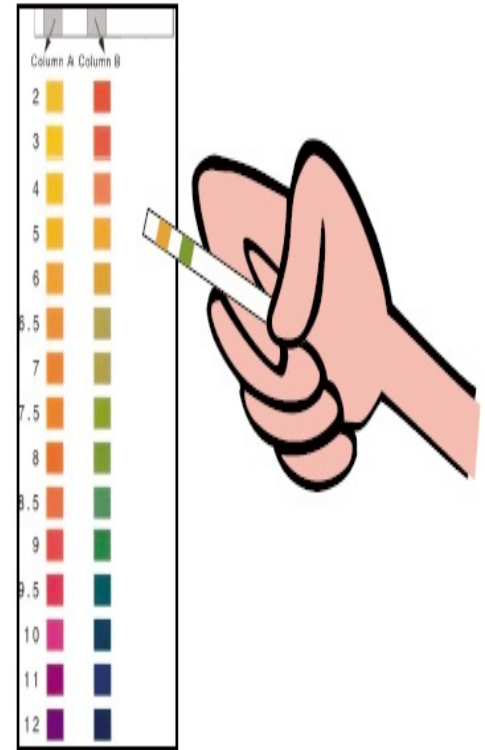
~Group Members ~

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