Acid Rain

When rain falls through clean air, it picks up some carbon dioxide and becomes more acidic (pH 5.5) than regular water (pH 7). When air is polluted, rain that falls through the air picks up pollution and becomes even more acidic. Slightly acidic rain has a pH of about 5 and severely acidic rain has a pH of about 4.

For example, this factory puts off pollution into the air. When it rains, the rain becomes more acidic. The acidic rain, then, kills the trees.

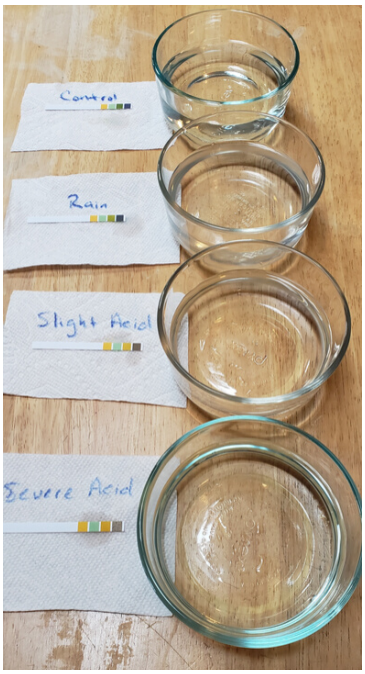
Testing Steel

Follow the steps below to test the effects of acid rain on steel.

Step One: Prepare Containers

Follow the steps below to prepare your containers for testing:

- Add 1 cup of water to 4 identical containers.
- Label each container with the following:
  - Control
  - Regular Rain Water
  - Slightly Acidic Rain Water
  - Very Acidic Rain Water
- Add the following to each container respectively:
  - Control - do not add anything to this container
  - Regular rain water - add 1/3 teaspoon of vinegar
  - Slightly acidic rain - add 1 teaspoon of vinegar
  - Severely acidic rain - add 2 teaspoons of vinegar



Step Two: Testing pH

Follow the steps below to test the pH of your samples.

- Test the pH of each sample. To do this:
  - Quickly dip one pH strip into liquid for about 1/2 second
  - Blot extra water on paper towel
  - Compare pH strip to chart that came with pH strips to read pH value
  - Record the name of the liquid and the pH in the table below

Step 3: Measure Temperature

Follow the steps below to measure temperature to decide whether the steel is rusting. If there is an increase in temperature, it means that the steel is rusting!

Record starting temperature on thermometer.

- Read and record the temperature shown on the thermometer before you start testing. Record this as the starting temperature at 0 minutes for all water samples in the chart below.

- Test each sample to see how it causes steel to corrode or rust.
- To do this:Cut a strip of steel wool that is approximately 1“ wide.

- Place the strip of steel wool into the control sample. Let it soak in the water for about 1 minute.
- Remove the steel wool from the sample and squeeze out any extra water.

- Push the end of the thermometer into the steel wool. To do this, separate the layers, place the end of the thermometer in between the layers and push the layers back together.

- Wrap plastic wrap around the steel wool and the end of the thermometer to keep moisture and heat in.

Corrosion of Bridges

- Wrap a towel around the plastic wrap and the end of the thermometer to keep heat in.

- Read and record the temperature on the thermometer every 1 minute for 5 minutes.
- Subtract the starting temperature (at 0 minutes) from the final temperature (at 15 minutes) to calculate the change in temperature.
- Record this change in the table below.Repeat this process with regular rain, slightly acidic rain and very acidic rain samples.

Repeat this process with regular rain, slightly acidic rain and very acidic rain samples.

Sample	pH	0 minutes	1 minute	2 minutes	3 minutes	4 minutes	5 minutes	Change in Temp.
Control								
Rain								
Slightly Acidic Rain								
Severely Acidic Rain								

Creating a Youtube Video

Follow the steps on this handout to write the script for your Youtube video.

Step One: Create an Introduction

- The introduction for your video should explain the purpose for recording the video. Example: "We are here today to explain acid rain and its effects on steel structures."

Step Two: Discuss the Results of Your Experiment

- Write what you will say to explain the results of your experiment.
- Make sure to explain the effect that acid rain has on steel.

Step Three: Write a Closing

- Write a catchy closing for your video.
- The closing should wrap up everything that you discussed in the video.