

# RAINING ON OUR PARADE

STUDENT WORKBOOK



# CHANGES OF LAND AND SEA

Many things on our planet seem to have always been there or will always be there, like famous, historic statues and our oceans. Is that really true? In this activity, let's take a look at these assumptions.

## I BEAUTIFUL BEFORE, DAMAGED AFTER

BEFORE

TIME  
LAPSED

AFTER



2 years



Thomas Jefferson Memorial



7 years



The Sphinx in Giza



6 months



Fire coral in French Polynesia



2 years



Coral reefs in Indonesia



# HYDRANGEA FUN

Did you know that the color of hydrangea flowers is a result of their soil's pH?

Blue - pH < 6



In general, acidic soil with a pH lower than 6 will result in blue blooms.

Purple - pH 6-7



In situations, where the soil is between pH 6-7, the flowers will turn purple.

Pink - pH 7+



If a hydrangea is planted in soil with a pH above 7, the blooms will be pink and red.

If you are in an area where hydrangeas grow well, you can test out the pH of your soil using extra pH strips from this kit, or you can make your own hypothesis based on the color of the blooms. A **hypothesis** is a prediction of what will happen during a scientific experiment.

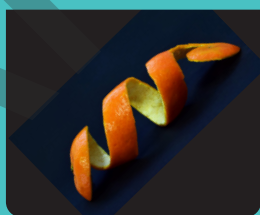
Do you already have hydrangeas at your house? Do you want to change their color? Here's how!

If you have pink hydrangeas and want them to turn blue, add coffee grounds, fruit and vegetable peels, or grass clippings to the soil. This lowers the pH of the soil, making it more acidic.

coffee grounds



fruit peels



grass clippings



If you have blue hydrangeas and want to turn them pink, add wood ashes or limestone to the soil. This raises the pH, making it more basic.

wood ashes



limestone



## SAFETY:

**WARNING!** Contains hazardous chemicals. Corrosive liquid and poison; read warning label carefully. Do not eat or drink. Wash your hands after use.



**STEP 4** After it has dried, put on a pair of gloves and your safety glasses.

**STEP 5** Use the pipet to drop hydrochloric acid on your statue and observe what happens.



## REFLECT

1. What happened to your statue once you dropped the hydrochloric acid on it?
2. How is what happened to your statue similar to what happened in the images from Activity 1?

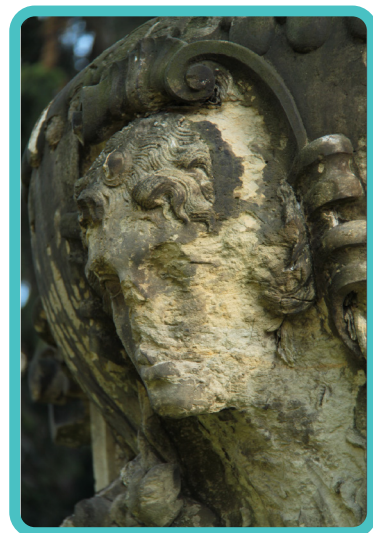
## HISTORICAL PROBLEMS?

7

Your experiment models the impacts of  $\text{SO}_2$  and  $\text{NO}_2$  on marble and limestone statues and structures found around the world, like the Thomas Jefferson Memorial and the Sphinx. While the hydrochloric acid ( $\text{HCl}$ ) from your experiment is not the same chemical as  $\text{SO}_2$  or  $\text{NO}_2$ , it does have a low pH. This means that it is very acidic and allows us to model what occurs when acid rain comes in contact with marble and limestone statues.

A **model** is a smaller version of a process that can be used to help people better understand that process. Often, we use a model to test our hypothesis on how a phenomenon occurs.

You may have developed a hypothesis in a different kit or science course for an experiment you tested. Scientists have developed and tested hypotheses for years, including those surrounding the phenomena of acid rain and ocean acidification.





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Kit	SU-RAINON
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