Activity Title

***Teacher name,*** *School, location, etc.*

Recommended Grade Level(s):

Appropriate for: Please provide grade levels

Teaching Topics & Concepts:

Overview of topics covered in activity

Standards:

NGSS, specific state standards etc.

Time Requirements:

Prep Time: X minutes

Activity Time: X minutes

Safety

Text here is sample safety text, please customize for your activity.

Read the SDS sheets for all chemicals before using them.

Wear safety glasses, gloves, and lab coat.

Alcohol is highly volatile and flammable. Ensure no open flames are present (candle, Bunsen burner).

Avoid inhalation of alcohol vapors.

Burning drops of alcohol may fall from the bill to ensure the audience is at least 1 meter away.

Materials:

Text here is sample text, please customize for your activity.

Paper ($20.00 or piece of white paper towel)

Isopropyl alcohol, 99%

Crucible tongs

Container of water (to extinguish the burning paper)

Background Information, Activity Setup:

Provide information for activity and set-up

Step-by-Step Procedure:

Sample text, please provide detailed instructions.

1. Pour 100 mL of water into a 400 mL beaker.
2. Add 100 mL of isopropyl alcohol to the beaker. Stir.
3. Soak the bill or paper towel in the solution and then remove with crucible tongs.
4. Light the bill.
5. Extinguish the paper by waving it in the air or submerging it into a container of water.

Expected Results:

Results may vary based on materials used, setup, procedure, and other factors, however, here are a few examples on what to expect:

Sample text, please customize for your activity.

Soaked paper ignites into a blue flame but paper does not burn.



Teaching Notes:

Sample text, please customize for your activity.

Soaked paper ignites into a blue flame but the paper does not burn due to its combustion temperature, 232°C.

Ethanol and water in a 2 to 1 ratio by volume works well.

Test Your Understanding

These questions and answers are provided as sample, please customize to your activity.

What is the difference between an allergen and an antigen?

An antigen is a substance that causes the immune system to produce specific antibodies against it. An allergen is a type of antigen that produces an exaggerated physiologic response in animals, including humans.

**Critical Thinking:** In medicine, the hygiene hypothesis posits that hygienic conditions—such as requiring children to frequently use hand sanitizers—create more allergies, because exposure to allergens can "train" the body's immune system to better manage allergic responses. Choose a side and present an argument for or against the hygiene hypothesis.

Sample answer: I agree with the hygiene hypothesis, because people in developed countries tend to have more allergies—especially food allergies and bronchial asthma—than people in underdeveloped or developing countries, where hygienic conditions are less prevalent. By removing natural "germs" and "dirt" in the environment, you potential disallow a child's developing immune system the ability to naturally desensitize to potential allergens.

