

IT'S NOT
MAGIC
IT'S
SCIENCE

**THE INVISIBLE FIREFIGHTER
EXPERIMENT GUIDE**

EXPERIMENT

Fun experiments disguised as
a magic tricks!

EXPLANATION

Discover the science behind
the magic!

EXPLORATION

Bring the "magic" to life with
real world applications!

IN PARTNERSHIP WITH

SHPE
NOCHE de
CIENCIAS™

Interactive “family science nights” for high school students and families bring STEM to life. Imagine yourself in different STEM careers and discover what excites you. All the while, your parents learn how to support you in achieving these new found ambitions.



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This is everything you will need in order to make the "magic" happen!

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Now that you've gathered all your materials we will guide you through the process to bring the science magic to life!

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Wow that was cool! Now let's learn how it works.

EXPLORATION - PAGE 6

Now that you know the science behind the magic it's your turn to share cool ideas of how we can use it to make the world a better or cooler place!



EXPERIMENT

The Invisible Firefighter

MATERIALS

Cup or "It's Not Magic, It's Science" Mug

Candle

Lighter

Vinegar

Baking Soda

Adult Assistant



SAFETY

- Make sure to handle the lighter and candle with caution
- Always ask for adult permission before starting

WATCH (OPTIONAL)

Scan the QR Code below or visit www.jayfloresinspires.com/blog/magicsciencekit to watch "It's Not Magic, It's Science" hosts Jay Flores and Diana Mogen conduct the Invisible Firefighter experiment!



EXPERIMENT

The Invisible Firefighter

INSTRUCTIONS

1. Gather all of your materials from the equipment list and set up a safe space to conduct the experiment
2. Pour 1 TBSP (15 ml) of baking soda into your cup
3. Carefully light your candlestick
4. Pour 1 TBSP (15 ml) of vinegar into your cup (you will notice some foam rising from the reaction)
5. Bring your cup about an inch from the flame and slowly tilt it sideways until the flame is extinguished
6. Remind everyone that "It's Not Magic, It's Science!"

Tip: Try to keep the cup steady as you move it towards the flame. Keep it upright until you are about an inch from the flame and then you can slowly tilt it.



EXPLANATION

The Invisible Firefighter

"MAGIC" REVEAL - HOW IT WORKS

We hope you enjoyed our Invisible Firefighter experiment! You were able to light a candle and then "magically" blow it out. To someone who isn't aware of your invisible firefighter it appears that nothing came out of the cup.

So how do we do it? Remember, it's not magic, it's science! It looks like there is nothing in the cup but at the bottom is your invisible firefighter.

Your invisible firefighter is a mixture of vinegar and baking soda. When you mix vinegar and baking soda they react and create carbon dioxide gas. Carbon dioxide molecules are heavier than oxygen molecules so when you pour the carbon dioxide molecules over the flame they push away the lighter oxygen molecules. This extinguishes the flame because fire can't burn without oxygen.

BRING THE "MAGIC" TO LIFE

Now that you know the science behind the magic how do you think we can apply this science to solve real life problems? Use the following exploration pages to start bringing your ideas to life!



ABOUT SHPE

Organization Overview

SHPE is the nation's largest association dedicated to fostering Hispanic leadership in the STEM field.

Mission

SHPE changes lives by empowering the Hispanic community to realize its fullest potential and to impact the world through STEM awareness, access, support, and development.

Vision

SHPE's vision is a world where Hispanics are highly valued and influential as the leading innovators, scientists, mathematicians, and engineers.

SHPE Jr.

Starting early is the key to successfully exploring a future in Science, Technology, Engineering or Mathematics. If you're a high school student, and you think STEM might be the path for you, join a SHPE Jr. Chapter today. If your school doesn't have one, let's start one together!

