

## ABOUT BILL BLAGG'S THE SCIENCE OF MAGIC

For centuries magicians have used scientific principles to make people levitate in mid-air and vanish in the blink of an eye. Illusionist Bill Blagg's one-of-a-kind educational experience, *The Science of Magic*, takes students on a rare, never-before-seen journey "behind the scenes" of the magic world. Students will discover firsthand how magicians use science to create the impossible!

Bill's comedy-filled, action-packed presentation is highly interactive and makes science fun and exciting! Students will use the Scientific Method to levitate one of their teachers in mid-air and even learn how the science of reflection can make their homework magically disappear! In addition, Bill even performs some of his mind-blowing, grand-scale illusions with a scientific twist! Bill will even present an incredible display of the water cycle by making it snow from his bare hands! Students will watch in amazement as science creates magic right before their very eyes!

*The Science of Magic* is designed to excite, educate, intrigue, and promote students to think "outside the box" and spawn their curiosity about how science and the Scientific Method are used by magicians to create the impossible!

## ABOUT BILL BLAGG

To say that Bill Blagg has had a magical life would be no exaggeration. From the moment he received his first magic kit in 1986, his world was never the same. After years of endless practice and persistence, Bill professionally launched his magic performing career in 1996, at the ripe age of sixteen. In just two short years of professional performance, Bill developed a stage presence that made him a stand out in the magic community, due in part to his off-the-cuff personality and his high-energy performance style.

He chose to put his skills to the test in 1998 by entering the adult stage competition at the Abbott Magic Get Together in Colon, Michigan, which is also hailed as the magic capital of the world. Magic had been Bill's life for over twelve years; he had performed hundreds of shows, and it all hinged on a single, five minute routine: his dancing handkerchief. He had just turned eighteen, barely old enough to enter the competition, and he was about to make magic history by becoming the youngest contestant ever to win the prestigious event.

Following his win, Bill never looked back. While intensely studying to earn a degree in performing arts and communications at Carthage College in Kenosha, Wisconsin, Bill was busy planning and staging his next big venture: his own ninety-minute, grand-scale magic and illusion show he called "Beyond Imagination." After graduating with honors, Bill took his illusion production on the road to select cities throughout the Midwest. He virtually sold out all of the shows, with his unique brand of grand-scale magic and illusion. *Entertainment Weekly* summed up Bill's appeal by saying, "Bill Blagg has a charm and style all his own - he's definitely the best kept secret in magic!"

Bill prides himself with being able to consistently create and stage new illusions to thrill his audiences year after year. Through his countless stage appearances, Bill consistently draws standing ovations from audiences who have experienced his unique talents and performing arts ability.

## BEFORE THE PERFORMANCE

Prepare your students for the performance prior to getting on the school bus with the following arts-based activities! Activities are in order from least to greatest amount of time required.

### ACTIVITY 1 | “UNPOPPABLE” BALLOON

The occurrences that we consider “magic” are often defined as such because they defy the “natural order” of how we perceive the world to work. Through this activity, students distinguish that magic often uses elements of science to create a performance.

**CURRICULUM CONNECTIONS** | Science, Theatre, STEAM

**TIME** | 20 minutes

#### YOU WILL NEED

- Barbecue skewers
- Balloons
- Vegetable oil or body lotion

1. Prior to the beginning of instruction, prepare your materials. Blow up two balloons. Coat one skewer in vegetable oil or lotion to make it easier to insert into the balloon. You may wish to practice several times before presenting to your class.
2. To begin the activity, discuss the materials of a balloon (rubber or similar) and what happens when an inflated balloon is poked with a sharp object. You may wish to demonstrate by poking the thinner walls of the sides of the balloon with a skewer to pop.
3. Inform the class that you have the ability to put a sharp object through a balloon without popping it. Be sure to add showmanship to the presentation of this activity as a stage magician performs his or her magic tricks.
4. Holding the remaining balloon in one hand, use your other hand to push the skewer into the thick rubber “button” at the top of the balloon. Twist the skewer as you push it slowly toward the thick rubber neck opposite the top of the balloon. Firmly push the skewer through the neck. The skewer should be securely through the balloon without popping it!
5. Have your students brainstorm how you were able to achieve this action. Share ideas as a class before presenting the scientific explanation (below).
6. To conclude the activity, have students work in partners to name the “unpoppable balloon” magic trick and design other elements that will enhance the performance of the experiment.

**EXPLANATION** Rubber balloons are made of long, springy chains of molecules (form when atoms, tiny particles of matter, bond or link together). In a balloon, the skewer pushes the rubber’s long molecules aside while flexing to accommodate for the skewer, creating a tight seal. It is important for magicians to understand their materials and how scientific elements can work to their advantage in creating a magic trick!

### ACTIVITY 2 | SCIENTIFIC METHOD TABLEAUX

*Bill Blagg’s The Science of Magic presents the entertainment of magic from a whole new perspective - through the innovative processes of science. Introduce the similarities of science and magic to your students before seeing Bill Blagg live!*

**CURRICULUM CONNECTIONS** | Science, Dance, STEAM

**TIME** | 30 minutes

#### YOU WILL NEED

- Space in classroom for movement
- White board or equivalent (SMART board)
- Student paper and writing implements

1. Divide your class into groups of 4 or 5 (depending on class size and number of scientific method steps included) and inform the groups that they are each to create a tableau (frozen picture) representing one step in the scientific method. You may include all of the following steps or simplify for younger grades:

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|---------------|----------------|
| 1. Question   | 4. Observation |
| 2. Hypothesis | 5. Analysis    |
| 3. Experiment | 6. Conclusion  |

2. Assign each group a step of the scientific method (teacher assignment, drawing from a hat, etc.). Provide time for brainstorming and rehearsal of group tableaux. Facilitate discussion with groups of how best to convey their step through a physical image created with their bodies. In each tableau, encourage that groups utilize no props, execute different levels of their bodies (low to the ground – high), and that students use good facial expressions.
3. Have each group perform their tableau for the class. Randomize the order of performance and have remaining groups guess which step is being portrayed. Once all groups have presented, work as a class to sequence the scientific method.
4. To conclude, engage students in a conversation about how they would conduct an experiment using the scientific method. Similarly, what steps of the scientific method might you need to create a magic trick? Based on their brainstorming, how are science and magic related?

**EXTENSION** For older students, have groups add movement into their tableaux. Have your students think about what actions someone might be doing during their stage of the scientific method. How can they translate that movement into their frozen picture?

### ACTIVITY 3 | CLASS MAGIC SHOW

*Give your students the opportunity to engage first-hand with imaginative science experiments while providing the opportunity to perform for the class! For the class magic show, students will predict the outcomes of science activities using the steps of the scientific method.*

#### CURRICULUM CONNECTIONS | Science, Theatre, STEAM

**TIME** | 60+ minutes

#### YOU WILL NEED

- Printed procedures and scientific explanations for experiments
- Materials for each experiment:

##### DISAPPEARING COIN

- Clear glass filled with water
- Small coin, such as a penny

##### THE UNBROKEN PENCIL

- Clear glass filled with water
- Pencil

##### SUPER STRENGTH STRAW

- Potatoes (3 or 4)
- Drinking straws that do not bend

##### MYSTERIOUSLY DRY TOWEL

- Cup
- Paper towels
- Tub filled with water (prior to activity)

1. Have all materials available prior to beginning of instruction. Divide the class into four groups and assign each group a “magic experiment” (pg. 7).
2. In their groups, have students predict what will happen with their assigned experiment. Have each group follow the directions for executing their assigned magic experiment and observe and record the results.
3. Provide the explanations on a print-out for the group to read and discuss the scientific basis behind the magic experiment. (If time permits, allow students to research the explanation on their own with available technology). Ensure comprehension through observation of groups and facilitation of discussion with each group.
4. After each group executes their experiment, allow time for students to plan the presentation of their magic trick! Discuss with students the importance of showmanship when performing and encourage them to implement hand gestures or magic words in their presentations.

## ACTIVITY 3 EXPERIMENT PROCEDURES

### DISAPPEARING COIN

1. Place the small coin (preferably a penny) on the table.
2. Take the jar filled with water and place it on top of the penny. Where did the penny go?

**EXPLANATION** Light travels in straight lines, but when it travels from a more dense substance like water to a less dense substance like air, the light bends. Traveling from water to air causes the light to bend in the opposite way from normal, causing the light to reflect rather than *refract*. When the image of the coin comes through the side surface of the jar at too great of an angle, reflection occurs rather than refraction, causing it to look as though the coin has “disappeared!”

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### MYSTERIOUSLY DRY TOWEL

1. Crumple the paper towel and stuff it in the bottom of the glass. Turn the glass over to make sure the paper towel will not fall out.
2. Slowly lower the upside-down glass into the tub of water. Keep the glass as straight up and down as possible until the glass is immersed in the water.
3. Take the glass out of the water.
4. Turn the glass over and take out the paper towel. The paper towel will be dry!

**EXPLANATION** Air takes up space, including the inside of the glass. When you turn the glass over and slowly place it down in the water, air remains in the glass. As such, the water cannot enter the glass. The air creates pressure that is greater than the pressure of the water trying to get in. If you turn the glass to the side, the air will be able to escape, releasing that pressure and allowing water to enter and soak the paper towel.

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### SUPER STRENGTH STRAW

1. Hold the potato between your thumb and fingers. Make sure your hand isn't behind the potato.
2. Hold the straw about two thirds of the way up, so there's lots of straw to go into the potato. It's easiest if you hold the straw in the hand that you write with. Place your thumb over the end of the straw.
3. Hold the straw firmly and quickly stab the straw into the narrow end of the potato. You should be able to get the straw out of the other end! You need to be quick and confident

**EXPLANATION** The secret is inside the straw – it's air! Placing your thumb over the end of the straw traps the air inside. When you trap the air inside the straw, the air molecules compress and give the straw strength, which in turn keeps the sides from bending as you jam the straw through the potato. The trapped, compressed air makes the straw strong enough to cut through the skin, pass through the potato, and exit out the other side. Without your thumb covering the hole, the air is simply pushed out of the straw and the straw crumples and breaks as it hits the hard potato surface.

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### THE UNBROKEN PENCIL

1. Fill the glass two-thirds full of water.
2. Hold the pencil upright in the water so the tip is halfway between the surface of the water and the bottom of the glass.
3. Move the pencil back and forth in the water, keeping it upright. It will appear as though the pencil is broken when in the water.

**EXPLANATION** The pencil appears broken because of the concept of refraction. Refraction is the change in direction of light as it moves from one transparent substance to another. Light travels in straight lines, but when it travels from one transparent substance such as air through another transparent surface, such as water, the light rays bend. Since water is more dense than air, the light refracts, and the pencil appears broken.