

BILLAGG'S
The
SCIENCE
of Magic



OCTOBER 8-9, 2018

**CURRICULUM
GUIDE**

 **DES MOINES
PERFORMING ARTS**

Dear Teachers,

Thank you for joining us for the Applause Series presentation of *The Science of Magic*. Illusionist Bill Blagg has spent his career turning heads with his grand-scale tricks and illusions. It is clear, however, that the audience he is most enthusiastic about is young people. He loves igniting their imaginations and curiosity about the world of magic – and in the process, the magicians’ greatest tool: science!

We thank you for sharing this special experience with your students and hope that this study guide helps you connect the performance to your in-classroom curriculum in ways that you find valuable. In the following pages, you will find contextual information about the performance and related subjects, as well as a variety of discussion questions and activities. Some pages are appropriate to reproduce for your students; others are designed more specifically with you, their teacher, in mind. As such, we hope that you are able to “pick and choose” material and ideas from the study guide to meet your class’s unique needs.

See you at the theater,
Des Moines Performing Arts Education Team

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THANK YOU TO OUR DONORS

**SUPPORT FOR DES MOINES PERFORMING ARTS EDUCATION PROGRAMS
AND THE APPLAUSE SERIES IS PROVIDED BY:**

Anderson Erickson Dairy • Arts Midwest • Bradford and Sally Austin • Bravo Greater Des Moines • Clive Community Foundation • DuPont Pioneer • Ernest & Florence Sargent Family Foundation • Gannett Foundation/The Des Moines Register Hy-Vee, Inc. • Iowa Department of Cultural Affairs • John Deere • Judith A. Lindquist Scholarship Fund • Maytag Family Foundation • Richard and Deborah McConnell • McKee • Voorhees and Sease • Meredith Corporation Foundation MidAmerican Energy Foundation • Nationwide • Polk County • Prairie Meadows • Principal • SVPA Architects, Inc. • U.S. Bank • Union Pacific Foundation • Wells Fargo & Co. • West Bancorporation Foundation • Windsor Charitable Foundation and more than 300 individual donors.

Guide content adapted from Fox Cities Performing Arts Center Educator Guide | Cover image: Straz Center



DES MOINES PERFORMING ARTS

BY THE NUMBERS

300,000

More than 300,000 guests attend performances and events in our four venues each year

75,000

DMPA education programs serve more than 75,000 Iowans annually.

500,000

More than half a million students and teachers have attended school-time performances as part of the Applause Series since its launch in 1996.

DMPA is central Iowa's premier not-for-profit performing arts organization.

Guests experience a wide variety of art forms and cultural activities, with presentations ranging from Broadway, comedy, professional dance, to family programming.

DMPA is more than the Civic Center! 

You can find us at the following spaces:

- Civic Center, 2744 seats
- Stoner Theater, 200 seats
- Temple Theater, 299 seats
- Cowles Commons (outdoor plaza)



Take thousands of Iowa students out of their classrooms, place them in a theater, sprinkle the stage with world-class performers,



AND WHAT DO YOU HAVE?

A recipe for learning that reaches new levels of possibility — for students and teachers.

APPLAUSE SERIES

MAKING A DIFFERENCE

Each year, 50,000 students and teachers attend an Applause Series performance. The actual cost per person is \$8, but thanks to the caring contributions of donors, schools pay just \$1 per ticket. By removing the financial barriers to participation, donors introduce a whole new generation to the power of arts in action. That means stronger schools and communities now and in the future.



TICKET TO IMAGINATION

The Applause Series annually delivers 60 age-appropriate performances for pre-school to high school students. The impact stretches far beyond the Des Moines metro, reaching schools in over 35 Iowa counties. The theater becomes the classroom. One-hour matinees energize students to imagine new ways of creative expression, cultural diversity and even career opportunities.

BEYOND THE STAGE

For many Applause Series performances, we offer the opportunity for schools to go deeper by exploring an art form or theme that connects with what is seen on stage. Invite a professional teaching artist into the classroom or visit another cultural destination in Des Moines to help students make more meaning of a piece of theater.



BRINGING ARTS EDUCATION TO LIFE

The Applause Series is a flagship education program of Des Moines Performing Arts. Since its launch in 1996, more than a half million students and teachers have attended school-time performances as part of the series. You are joining us for the 23rd season of school performances!



FIELD TRIP INFORMATION

TEACHER GUIDE

WE WANT YOUR FIELD TRIP TO BE SAFE AND SUCCESSFUL!

Please read below for important tips and details to ensure a great day.

GET ORGANIZED

Double-check that all students, teachers, and chaperones were included in your ticket order. Request an adjustment if your numbers have increased. We want to make sure we have enough seats for you!

Tickets are not issued. Bring a copy of your invoice, which will serve as your group's "ticket".

Schedule arrival for 30 minutes prior to the start of the performance. This allows time to park, cross streets, find your seats, and go to the restroom.

Let drivers know that Applause performances are approximately 60 minutes, unless otherwise noted.

Remind chaperones that children under the age of three are not permitted in the theater for Applause Series events.

DIRECTIONS/PARKING

The Des Moines Civic Center is located at
221 WALNUT STREET, DES MOINES, IOWA

DIRECTIONS FROM I-235: take Exit 8A (Downtown Exits) and the ramp toward 3rd St and 2nd Ave. Turn onto 3rd Street and head south.

Police officers stationed at the corner of 3rd & Locust Streets will direct buses to reserved street parking near the Civic Center.

Buses are not allowed to drop groups off in front of the theater. Contact us in advance if there is a special circumstance.

Buses remain parked for the duration of the show. Drivers must be available to move the bus immediately following the performance.

Personal vehicles are responsible for securing their own parking on a nearby street or in a downtown parking ramp.

ARRIVAL/SEATING

An usher will greet you at the door and ask for your school name.

Adults will be asked to show proper identification (such as school IDs or visitor badges as applicable) at the door.

Each group will be assigned a specific location in the theater based on various factors. An usher will escort you to your section.

Your school may be seated in multiple rows. Adults should position themselves throughout the group.

Allow ushers to seat your entire group before rearranging student seats or taking groups to the restroom. This helps us seat efficiently and better start the show on time.

IN THE THEATER

Adults are asked to handle any disruptive behavior in their group. If the behavior persists, an usher may request your group to exit the theater.

Please wait for your group to be dismissed by DMPA staff prior to exiting the theater.

QUESTIONS?

We are happy to help!

Please contact us at:
education@dmpa.org
515.246.2355



AUDIENCE REMINDERS

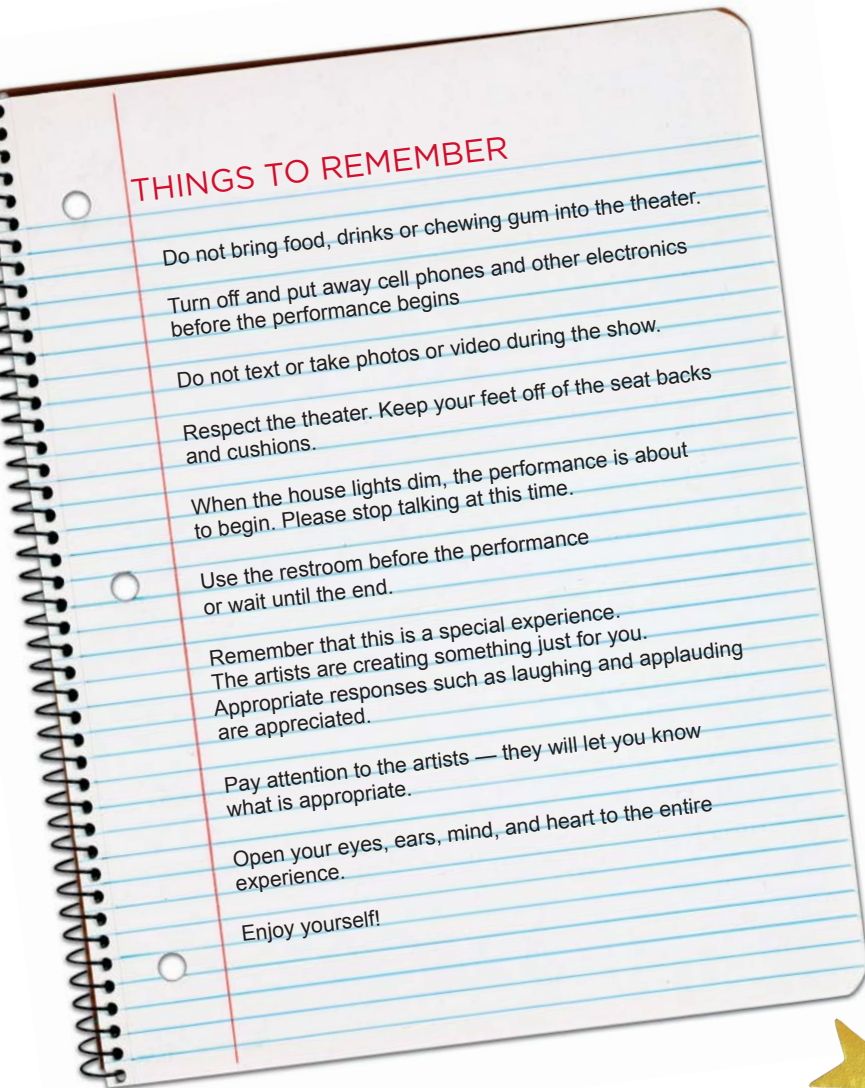
ATTENDING A LIVE PERFORMANCE IS A UNIQUE AND EXCITING OPPORTUNITY!
UNLIKE THE PASSIVE EXPERIENCE OF WATCHING A MOVIE, AUDIENCE MEMBERS
PLAY AN IMPORTANT ROLE IN EVERY LIVE PERFORMANCE.

YOUR ROLE AS AN AUDIENCE MEMBER

Artists on stage are very aware of the mood and level of engagement of the audience.
As such, each performance calls for a different response from audience members.



THE THEATER IS DESIGNED TO MAGNIFY
SOUND. EVEN WHISPERS CAN BE HEARD!



As you experience the performance, consider the following questions:

What kind of live performance is this?

- musical
- dance
- concert

What is the mood of the performance?

Is the subject matter serious or lighthearted?

What is the mood of the artists?
Are they happy and smiling or somber and reserved?

Are the artists encouraging the audience to clap to the music, move to the beat, or participate in some other way?

Are there natural breaks in the performance where applause seems appropriate?



ABOUT THE PERFORMER

To say that Bill Blagg has had a magical life would be no exaggeration. From the moment he received his first magic kit at age 5, his world was never the same.

HOW IT BEGAN

Bill professionally launched his magic performing career in 1996, at sixteen. Bill became a stand-out in the magic community, due in part to his off-the-cuff personality and his high-energy performance style. After graduating college, Bill hit the road to perform magic full-time. Having a love for both magic and science, Bill combined the two to create his one-of-a-kind, educational show called *The Science of Magic*.



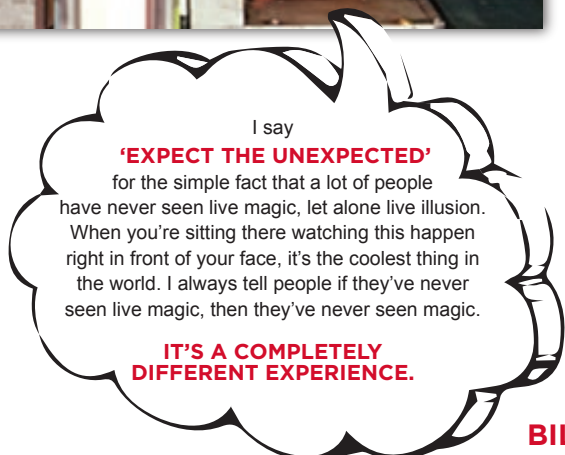
BILLBLAGG.COM



Bill is known for instantly teleporting across theaters, squishing his body from 6 feet to 6 inches tall, bringing ordinary objects to life with a simple wave of his hands and much more!

His theatrical brand of magic and illusion thrills thousands of people every single year. One of Bill's best magic tricks is his ability to connect with and engage an audience of any size. He has been featured on NBC, CBS and FOX television and has captured the attention of kids (and their teachers!) with his educational magical performances around the United States for over 15 years.

Bill lives in Milwaukee, WI, with his wife. When he's not performing he can be found in his workshop, working with his dad to create new illusions to thrill his audiences. Bill's live performances showcase his mind-blowing magical talents to take you on a magical journey you'll never forget!



BILL BLAGG, *Argus Leader*

ABOUT THE PERFORMANCE

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



MAKING THE IMPOSSIBLE POSSIBLE!

For centuries magicians have used scientific principles to make people see impossible things and even appear to 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 journey “behind the scenes” of the magic world. Students will discover firsthand how magicians use science to create the impossible!

SCIENTIFIC METHOD + MAGIC!

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 performs some of his mind-blowing, grand-scale illusions with a scientific twist! Bill will present an incredible display of the water cycle by making it snow from his bare hands. Students will be amazed as science creates magic right before their very eyes.



Chicago Tribune



USA Today



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PRE-SHOW EXPLORATION

CONNECTING ART

LESSON 1:

Objective: Students will be able to name and illustrate each of the steps in the scientific method.

Materials: Paper and drawing supplies, computer, connection to internet

Discussion: The simplest answer is: **THE STEPS SCIENTISTS USE TO SOLVE PROBLEMS**

Watch this video for a quick introduction



The scientific method is used to make observations and answer questions. You can think of each step of the scientific method as a puzzle piece with the eventual answer as the finished puzzle.

Warm Up: Have students think about the process that they go through when they are trying to find answers to something that they don't know. Do they google it? Do they ask their peers? Do they go to a book or the library? What about when they aren't able to find the information that they are looking for? What is their next step? Connect that process's similarities to the steps in the scientific method.

Activity: Divide the class into 6 groups and give each group a step of the scientific method. Tell them that they need to create a picture that represents that step of the scientific method.

1. Ask **Questions** based on your observations
2. Make your **Hypothesis** (your best guess about what will happen)
3. Run the **Experiment**
4. Collect **Data** (the information about your experiment)
5. Share your **Conclusion**

Give 10-15 minutes of time to each group for them to formulate their pictures. Talk with each group about their plan and facilitate discussion that will get them thinking about their step. At the end, go through the pictures with the class in order to help them draw the connections between the pictures and the scientific method.

Extension: Have each group display their picture for the class without telling the entire class what step it is and have the class guess at the end of each presentation. Keep each picture up on the board as a reminder.

PRE-SHOW EXPLORATION

CONNECTING TO LANGUAGE ARTS: SOLVING MYSTERIES WITH THE SCIENTIFIC METHOD

OBJECTIVE: Students will use the steps in the scientific method in order to understand the way in which science might be used in everyday problem solving.

MATERIALS: Paper or whiteboards, printable organizers ([see page i](#)), computer with internet and Adobe Flash for extension activity.

DISCUSSION: When something is a mystery it means there is something that you don't understand. The scientific method can be useful in helping you to eliminate possibilities and get closer to an answer. Even on your walk or drive to school you probably saw something that you might wonder about. This is how the scientific method begins, by observing (seeing something) and wondering why and how.

QUESTION: What do you wonder about how or why something works? How did you begin your wondering? Have students share with a partner a wondering they have and how that interest was sparked (likely via observation). Have students write their wondering as a question. "I wonder . . . ?" and note some examples on the board.

FOR EXAMPLE: Why do leaves on trees in many parts of the world turn from green to red, orange, or yellow and fall to the ground when winter comes? How does a spider move around their web without getting stuck like its victims?

Next, we'll try to solve an everyday problem with the scientific method.

ACTIVITY:

The Flashlight Mystery: For example, let's say you were on a camping trip and your flashlight suddenly stopped working. Or you were in the middle of playing the last level of your favorite video game and – poof – the screen goes black! Select an example of anything that might be interesting to your group of students. You might wonder, "Why did my flashlight/video game stop working?" The next step is to create a hypothesis that you can test.

QUESTION: What are some possible causes that you could test? What might be your hypothesis (or your best guess) about how to solve your problem?

Examples: batteries are dead, lightbulb is broken, batteries in the wrong way or rusty, the switch is broken.

Have students list possible hypothesis (a solution to the problem) and how they might test them individually or in small groups. Create a list of possibilities in discussion. What if your first hypothesis is wrong? The flashlight still doesn't work! Maybe you haven't tried enough guesses yet!?

We can use the Scientific Method to solve our mysteries by writing down the results of the tests and working to create a conclusion to your experiment that you could share with others. Model for students the graphic organizer using the flashlight or video game problem have them complete their own scientific process sheet.

Use the organizers individually or in a small group to consider your own mystery. What are you curious about in nature, in your home or at school!? Students may prefer to work on solving one of the wonderings from the class brainstorm or may prefer to tackle the project independently with a new question.

EXTENSION: Now that you have the basics of the scientific method, why not test your skills? [The Science Detectives Training Room](#) will test your problem solving ability. Step inside and see if you can escape the room. While you are there, look around and see what other interesting things might be waiting. We think you will find this game a great way to learn the scientific method. In fact, we bet you will discover that you already use the scientific method and didn't even know it.

PRE-SHOW EXPLORATION

CONNECTING TO SOCIAL STUDIES AND RESEARCH

OBJECTIVE: Learn about the life and magic of Harry Houdini and Nicolas Flamel and then conduct some internet research on a magical concept, magician or a scientist who does “magic” with their research.

MATERIALS: Computer with internet connection, access to Houdini article ([page ii](#)), and research sheet ([page iii](#))

DISCUSSION: Read the following information about Harry Houdini with students or in small groups.

ACTIVITY: After reading ask students to summarize the information about Houdini using the article. If working in small groups students might use a highlighter to mark main idea and details.

CONNECTING TO RESEARCH

Students can learn more about Houdini, explore alchemy and Harry Potter or learn about the real magic of scientific research. Choose one of the options below or divide the class into groups to explore.

OPTION 1 BASIC RESEARCH

Following the summary, students may consider what questions they still have about Houdini. What do they still wonder about? How might they answer their questions?

Students may use the research sheet ([page iii](#)) to keep track of their questions and answers

Using kiddle.co students may research answers to their questions using internet resources available via their “Houdini” internet search.

OPTION 2 DEVELOPING RESEARCHER

Read the passage about Nicolas Flamel and then consider what questions the article has you wondering about. Write down a few of your questions of the research sheet ([page iii](#)) and then look for answers. Students may use the pottermore.com website to find additional information or research “Alchemy” on kiddle.co

OPTION 3: EXPERIENCED RESEARCHER

• Speaking of magical, Nina Tandon is the CEO and co-founder of a company that grows human bone from cells! EpiBone is the first company in the world to ever grow human bones for skeletal reconstruction. This company is revolutionary because it allows EpiBone’s patients to “grow their own bone”. It’s almost like a magic trick since Nina and her team take cells and grow something entirely new from them!

• Nina received her B.A. in Electrical Engineering from Copper Union, a Master’s from MIT, and an MBA and PhD from Columbia University. She is a biomedical engineer who was named a senior TED fellow in 2012—a part of TED Ideas Worth Spreading,



Nina Tandon

Watch Nina’s Ted talk by [clicking here](#)

or

[click here](#) to visit her website for more information.

Learn about more Inventors and Scientists in the Newsela text set, by [clicking here](#)

Note: Allow extra time for creating a free account if you don’t yet have one.

EXTENSION: Students may wish to expand their question and answer sheets into short reports about the magician, scientists or concept they learned about. The last step is an important part of the process – sharing your work!

AFTER THE PERFORMANCE

WRITING AND DISCUSSION

Thank you for coming to see Bill Blagg and The Science of Magic!

We love to hear from students about their experience at Applause performances.

Send your class letter or email to:

Des Moines Performing Arts Education

221 Walnut Street

Des Moines, Iowa 50309

Or email education@desmoinesperformingarts.org

Consider the following questions and chose a few to include in a letter to Des Moines Performing Arts.

- What was most surprising to you from the performance?
- Describe a moment in the show when you felt inspired. Why did that inspire you?
- Which moment do you remember most from the performance? What was happening?
- How was this performance different from others shows you have seen?
- Describe your idea of magic before the show and how you think of it now.
- What was your favorite magic trick from the show? Why?
- If you were going to tell a friend about the performance, how would you describe it?

DISCUSS: Have students think about experiments or questions that they would like to test using the scientific method.

How could these steps be similar to the process that magicians use to create magic tricks?

Is science “magic”? Or not?

In what ways are science and magic related?

What do scientists and magicians have in common?

Draft a class list or have students in small groups brainstorm some answers.



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AFTER THE PERFORMANCE

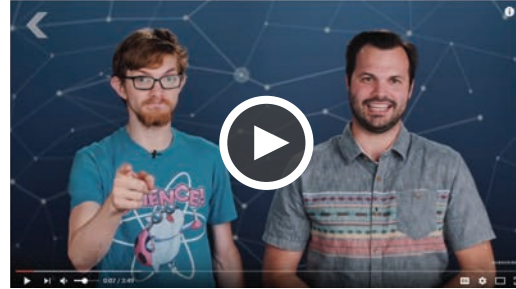
CONNECTING WITH SCIENCE: PLAYING WITH STAGES OF MATTER

Bill Blagg creates magic that relies on the changing nature of matter and the shifts between stages. Learn more about matter in the activities below.

OBJECTIVE: Students will be able to watch and experiment with a few of the different stages of matter.



Simple video about matter



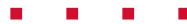
Video about the discovery of Super Solids

MATERIALS: Large bowls, water bottles (filtered, not flavor or mineral), ice, thermometers, rock salt

DISCUSSION: As a class, we are going to brainstorm different materials that change when they are exposed to a different environment (i.e. ice cream, candles, water). There are three common states of matter, but today we are going to experience what happens when water changes from a liquid to a solid. We will then explore what molecules and atoms are doing when they change states.

Have the students think about a time when they were going to do something that they were excited about! How did they act/feel when they were excited?

- Connect this idea to the molecules reacting when temperature changes.
- Explain how matter changes from one state to another and what causes this change.
- Give examples for each of the changes from solid, to liquid, and then to gas.



- ACTIVITY:**
- Fill a bowl almost entirely with ice and then push two water bottles deeply into the bowls.
 - Sprinkle a generous amount of rock salt over the ice and insert a thermometer into the ice between the bottles.
 - Over the next half hour, keep track of the temperature and watch as it slowly falls.
 - As the ice melts, add more ice and salt to keep the water bottles covered.
 - The temperature of the bowl should drop to 17°F (-8°C). At any lower temperature, the water will prematurely freeze. Try to maintain that temperature for 10 minutes.
 - At the 10 minute mark, gently remove the bottles from the ice and salt mixture and strike the bottle against the table. Ice crystals should form at the top of the bottle and continue downwards very quickly towards the bottom.
 - Carefully remove the second bottle and open the cap. The same instant freezing should occur.

Why did this change happen? How did the water freeze like that? Does water always freeze like this?

CLOSING DISCUSSION: When liquids freeze, the molecules organize themselves into tightly knit structures that form crystalline solids (like ice). Because of this change, water molecules have less energy as ice than as a liquid. This means that when a liquid transforms into a solid, the molecules have to lose heat energy. In this experiment, when the water was tapped on the table, it actually warmed up the rest of the water, leading to only 10-20% of the water actually freezing! When an impurity is in the liquid, it actually speeds up the crystallization even faster. Think about how using other liquids would change the outcome of this process.

For photos of the step by step process see: [Steve Spangler Science](#)

AFTER THE PERFORMANCE

CONNECTING WITH ART AND SCIENCE: OPTICAL ILLUSIONS

In *The Science of Magic* Bill uses optical illusions to perform tricks that make audiences question whether they can trust their eyes. Find out more about the science of optical illusions below!

OBJECTIVE: Students will be able to name the three categories of optical illusions and learn about how their minds process the information they see. Students will create their own optical illusion inspired by the examples.

MATERIALS: Computer with internet connection, Pictures ([page iv](#)) or view the google slide show

OPTICAL
ILLUSION
SLIDE SHOW
(CLICK HERE)

DISCUSSION: When we look at the world around us, what do we see? How do we understand what we are looking at? What kinds of factors can change or manipulate the ways we look at the world? What are some everyday instances that change how we look at the world (i.e reflective surfaces, light)? In what ways do they change how we see things (i.e. reflections, refracting light, distortion of pictures)?

ACTIVITY: Watch this short video about how your eyes can be tricked by images into seeing things that aren't really there at all!



POST VIDEO DISCUSSION: Optical illusions are images that manipulate how the eyes perceive reality. There are three kinds of optical illusions: **Literal** Illusions, **Cognitive** Illusions, and **Physiological** Illusions.

- **Literal** Optical Illusions are images that are made up of other images to create another object entirely. These can often look like different images depending upon the angle you are looking at them at.
- **Cognitive** Illusions are a phenomenon when your mind looks at an image and relates it to something else that is found in our subconscious (a part of our mind where we process emotions and thoughts without being fully aware of where those feelings are coming from). This process allows our mind to come up with perceptions that don't match what we see in real life so that we can make assumptions based on what we are looking at.
- **Physiological** illusions occur when the eyes and brain are stimulated with excessive light and color. This sometimes results in an afterimage which can happen when you look at a picture for a while and you can still see that image when you look away from the original picture.

ACTIVITY: Using the images in the slide show or handout as inspiration have students consider how they might create their own kind of hand drawn illusion. This might take the form of playing with color or repeating shapes, even word art can be an optical illusion.

EXTENSION: Explore the work of M.C. Escher (<https://www.mcescher.com>) for an artist's perspective on illusion or use the Magic Eye books to introduce students to the 3-D images "hidden" within the drawing.

RESOURCES AND SOURCES

Bill Blagg The Science of Magic Website
www.billblagg.com/

Scientific Method Video
www.youtube.com/watch?v=Q9Qon4wZ37s

A short biography on Harry Houdini:
www.ducksters.com/biography/entertainers/harry_houdini.php

Excellent book with 21 Magic Tricks:
<https://www.amazon.com/Harry-Houdini-Kids-Adventures-Illusions/dp/1556527829>

Matter Video
www.youtube.com/watch?v=ELchwUIIWa8

Super Solids Video
www.youtube.com/watch?v=hEbcYP5o_e0

Steve Spangler Science: Instant Freeze Ice
<https://www.stevespanglerscience.com/lab/experiments/instant-freeze-soda-ice/>

Optical Illusion Slideshow
<https://docs.google.com/presentation/d/1xOAPZMt5levz91OUZPm0zFqXvNachizhkn1Ox1vUkQ/edit?usp=sharing>

Optical Illusion Video
www.youtube.com/watch?v=UfVzDrlypnU

Harry Potter and the real Nicolas Flamel Information:
www.pottermore.com/features/the-real-nicolas-flamel-and-the-philosophers-stone

Nina Tandon Ted Talk
www.ted.com/speakers/nina_tandon

Nina Tandon Website
<http://ninatandon.co>

Inventors and Scientists Newsela Text Set
<https://newsela.com/text-sets/306950>

EXPLORE OUTSIDE THE GUIDE FOR MORE MAGIC

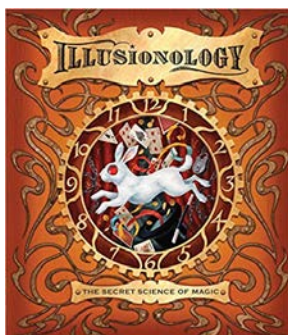
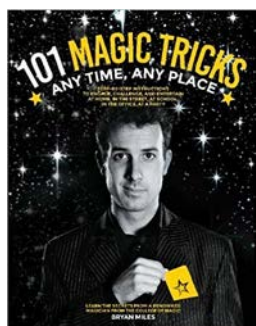
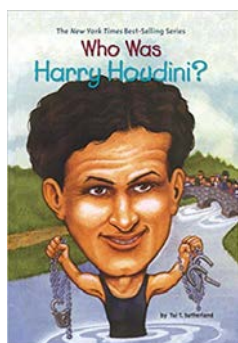
101 Magic Tricks: Any Time. Any Place. By Joshua Jay
<https://www.amazon.com/101-Magic-Tricks-instructions-challenge/dp/1631590723>

Who Was Houdini? By Tui Sutherland and Who HQ
www.amazon.com/Who-Was-Harry-Houdini-Sutherland/dp/0448426862

Illusionology By Albert Schafer and David Wyatt
www.amazon.com/Illusionology-Ologies-Albert-Schafer/dp/0763655880

For some kid friendly magic tricks:
www.thesprucecrafts.com/magic-tricks-for-beginners-and-kids-2267083

Five Amazing Magic Tricks:
www.scienceabc.com/eyeopeners/perform-amazing-magic-tricks-using-science-logic-illusion-levitating.html



SCIENTIFIC PROCESS

CONNECTING TO LANGUAGE ARTS (PAGE 10)

EXPERIMENT NAME:

My Observations



My Question



My Hypothesis



My Experiment



My Results

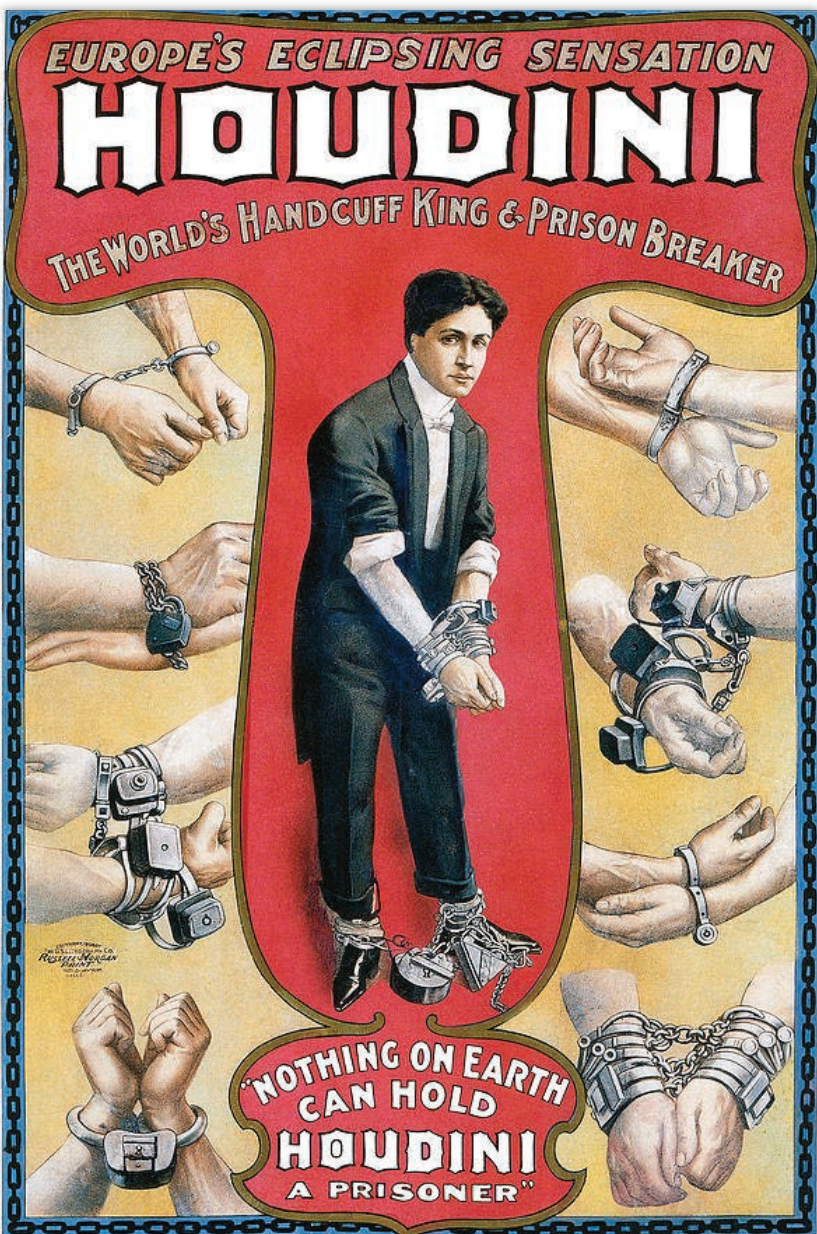


My Conclusion



HARRY HOUDINI ARTICLE

CONNECTING TO SOCIAL STUDIES AND RESEARCH (PAGE 11)



HOW'D HE DO IT?

Harry Houdini is a magician who was famous for escaping sticky situations. He must have had to do lots of experiments to get his dangerous tricks ready to perform. Even though he died many years ago the mystery of his magic is still something that people are interested in trying to solve.

In one magical illusion called the Water Torture Cell Harry was lowered head first into a glass tank filled with water. His feet were chained with locks to a lid that was then locked to the tank. A curtain would cover the front while Houdini worked his escape. Just in case he failed, an assistant stood by with an axe.

In another, called Box in a River, Houdini would be locked up with handcuffs and leg-irons and placed into a crate. The crate would be nailed shut and tied with ropes. It would also be weighed down with around 200 pounds of lead. The crate would then be tossed into the water. After Houdini escaped (sometimes in under a minute), the crate would be pulled to the surface. It would still be nailed together with the handcuffs inside.

DID YOU KNOW?

The study of chemistry as a scientific method has been around since the 9th century, but do you know what came before it? Alchemy! Similar to studying the stages of matter, Alchemy was the Medieval process of transforming matter into something new. Alchemy blended mysticism, spirituality and scientific discovery into one discipline. The goals of the processes of Alchemy included turning base metals into gold or finding the elixir of life to make oneself immortal (the philosopher's stone). Alchemy has been practiced in many places throughout the ancient and modern world including Ancient Egypt, Persia, India, Japan, Classical Greece and Rome, Korea and China. Some famous Alchemists include: Nicolas Flamel, Carl Jung and Isaac Newton. Do you recognize the name Nicolas Flamel from J.K. Rowling's book *Harry Potter and the Sorcerer's Stone*? That's right! The sorcerer's stone in that book is the elixir of life that alchemists from the past tried to create.

Read more about Harry Potter and the real Nicolas Flamel here:

<https://www.pottermore.com/features/the-real-nicolas-flamel-and-the-philosophers-stone>



Nicolas Flamel

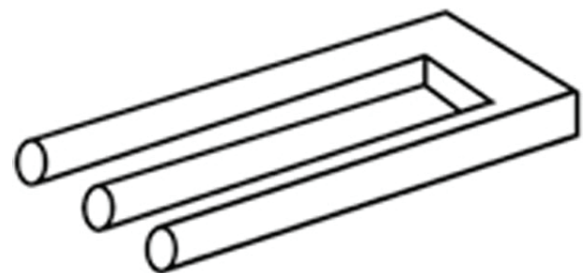
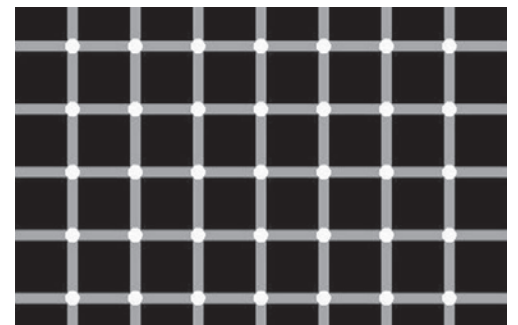
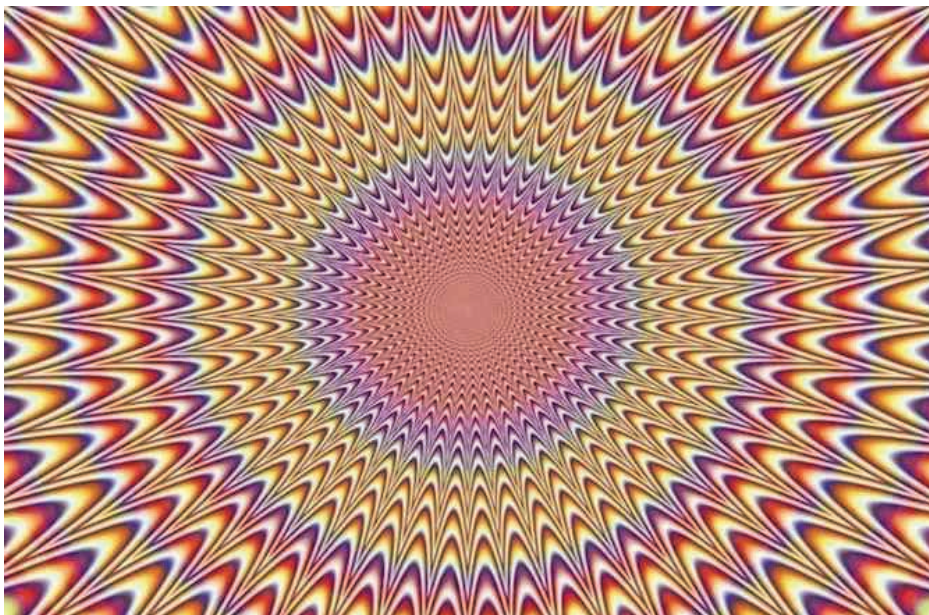
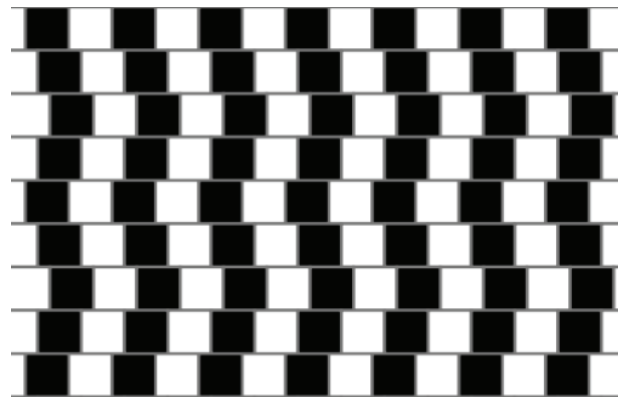
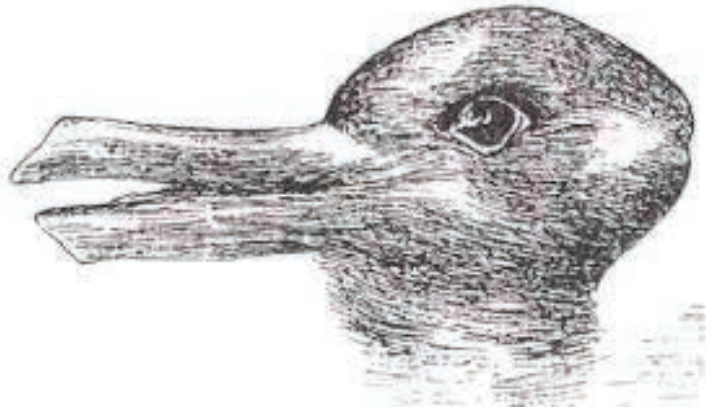
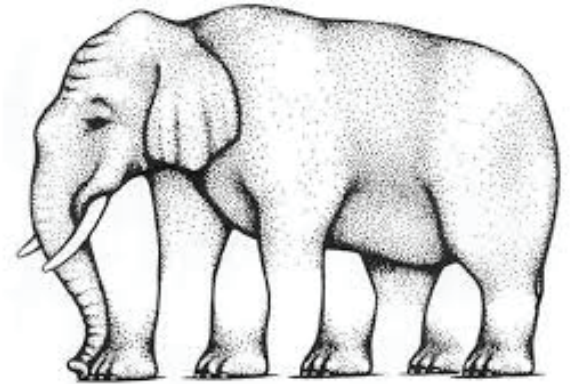
RESEARCH SHEET

CONNECTING TO SOCIAL STUDIES AND RESEARCH (PAGE 11)

QUESTION	SOURCE	ANSWER

OPTICAL ILLUSIONS

CONNECTING WITH ART (PAGE 14)



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