

EDUCATIONAL TOOLKIT

WELCOME!

EXPERIENCE THE
a.r.t.

Welcome to ***The Tempest***! The A.R.T. production of Shakespeare's fantastical romance is a co-production with the Smith Center for the Performing Arts in Las Vegas, Nevada, and marks a collaboration "such stuff as dreams are made on." Aaron Posner and Teller, of the legendary magic duo Penn & Teller, have created a spectacular show featuring music from Tom Waits and Kathleen Brennan and choreography from modern dance troupe Pilobolus. The production team's vision re-frames the narrative of *The Tempest* as a play performed by a traveling magic troupe in 1930s America. This "play within a play" concept draws from the history of stage magic in America to highlight one of the central themes of ***The Tempest***—the role of illusion in our world and in our lives. What kind of people make their lives conjuring illusions?

In this Toolkit, you'll find everything you need to complement a viewing of ***The Tempest*** at the A.R.T., plus some ideas for taking the experience further. Though it may seem daunting, we recommend reading the play in your classroom prior to attending a performance. We have included a scene study in the Toolkit to kickstart an exploration of Shakespeare's language and characters.

Inside, you will also find articles, historical features, a character guide, and tons of questions to frame a conversation with students before and after the show. If you have any questions or comments, don't hesitate to contact the A.R.T. Education and Community Programs department.

As always, thank you for joining the experience at the A.R.T.!

See you at the theater!

The A.R.T. Education Staff





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The Tempest Toolkit

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Thank you for participating in the A.R.T. Education Experience!

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Shakespeare's Sorcerous Story

Prospero is the Duke of Milan, but he and his daughter, **Miranda**, have been stranded on an island for 12 years. They ended up there because Prospero's brother, **Antonio**, and **Alonso**, the King of Naples, overthrew Prospero and banished Miranda and him at sea. A lady of the court, **Gonzala** (in the original text, this character was a man named Gonzalo), aided their survival by secretly supplying their boat with food, water, and Prospero's most valued possessions: his books. Prospero's passion for books and knowledge has led him to learn magic, which he has used to enslave two of the island's inhabitants. One is a spirit, **Ariel**, who was trapped in a tree by the witch, **Sycorax**, then freed by Prospero. The other is Sycorax's son, **Caliban**, a deformed man who was adopted and raised by Prospero, but then forced into servitude after attempting to rape Miranda.

When the play opens, Prospero has learned through his magical powers that his brother Antonio is on a ship near the island, so he conjures a storm (the tempest of the play's title) which makes the ship run aground on the shore. The survivors of the wreck are Antonio, King Alonso of Naples, the king's brother **Sebastian** and the king's son **Ferdinand**, the king's advisor Gonzala, the king's jester **Trinculo**, and the king's servant **Stephano**. Prospero uses magic to separate the survivors into small groups throughout the island, each believing the others are dead.

Following the shipwreck, three plots play out. Attempting to regain his title and return to Milan, Prospero tries to make Ferdinand and Miranda fall in love—but when it happens too quickly, he accuses Ferdinand of being a spy and forces to become his servant. Caliban encounters Stephano and Trinculo. They try to overthrow Prospero but fail. Elsewhere, Antonio and Sebastian plot to kill Alonso and Gonzala so that Sebastian can become king—but Ariel, under Prospero's orders, stops them and reprimands them for betraying Prospero years before.

Prospero's magic brings everyone to his home, where he forgives Alonso, Antonio, and Sebastian, and pardons Caliban. Ariel is tasked with making perfect sailing weather so that all can return to Naples, where Ferdinand and Miranda will be married, after which Ariel will be free. Prospero breaks his magic wand, severing his connection to magic.

In Other Words...

"The Tempest is a story about a magician using his power to create nightmares, from the terrifying sea-storm that opens the show to a demonic banquet to phantom hounds. Prospero can't forget that his brother and co-conspirators ousted him and abandoned him with his infant daughter on the high seas. So he uses his magic to create shows to terrify and punish those who wronged him." -Co-Creator Teller

WHO IS ON THIS ISLAND?

Prospero

the exiled Duke of Milan (northern Italy), lives on an island and is a sorcerer

Miranda

Prospero's daughter, who falls in love with Ferdinand

Ferdinand

Alonso's son, falls in love with Miranda

Ariel

a mischievous spirit of the island who is enslaved by Prospero

Caliban

island native, slave of Prospero, deformed son of the witch Sycorax, who ruled the island before Prospero

Gonzala

lady of the Neapolitan court, helped Prospero before he was forced out to sea

Inhabitants of the island

The shipwrecked party

Sebastian

Alonso's brother, wants to betray him

Trinculo

the king's jester tries to help Caliban overthrow his master, with Stephano

Alonso

King of Naples

Antonio

Prospero's brother, seized his position as Duke of Milan, plots with Sebastian to kill Alonso and Ferdinand and seize the throne

Stephano

the king's drunken servant

Notice that there are different kinds of circles around different groups of characters. After reading or seeing the play, think about why certain characters are grouped together.

A Letter from Teller



*Teller is the co-creator of the A.R.T.'s production of **The Tempest**, and one half of the famous magic duo Penn & Teller. This is an excerpt of his program note for the show.*

One morning in the late 1970s I woke from a dream in which I was Prospero, the great magician of **The Tempest**. As Prospero I was fighting “mine enemies” not by stabbing them with a sword, but by driving them mad with illusions.

I had read **The Tempest** many times, but prior to this dream I had never realized how different Prospero is from typical fairy tale wizards. He doesn't use spells and potions to affect the physical world. He creates shows, and those shows—“that insubstantial pageant”—are his weapons. That makes him less like a warlock than like a stage magician who shocks an audience by apparently sawing an assistant in half, but never spilling a drop of real blood.

Stage magic seems to have been part of Shakespeare's own production of **The Tempest**: The surviving stage directions of Act III, Scene One contain the phrase, “with a quaint device, the banquet vanishes.” That's Shakespearean lingo for what magicians call a “gaffus” or “gimmick...” For only when spectators gasp at a magic trick, can they understand viscerally the jitters which **The Tempest**'s characters feel on encountering the “subtleties of the isle.”

I may have dreamed I was Prospero, but I could never be.

For at the end of **The Tempest** Prospero swears off magic. It's not easy for him. After all the reconciliation and forgiveness, Prospero tells us how he feels: “Every third thought will be my grave.”

I can understand that. I've been a magician for sixty-one years. I have in a glass case at home a first edition of the first book in English to describe magic tricks, Reginald Scot's *Discoverie of Witchcraft*—and the Howdy Doody magic set I got at the age of five...I have felt the giddy joy of rolling quarters in paper sleeves after collecting tips from a street performance of magic. I won the heart of the love of my life doing magic in a tiny Los Angeles theater. When I leave rehearsals of **The Tempest** each evening, I drive to the Penn & Teller Theater at the Rio All-Suites Hotel and do a magic show—and my heart races with joy. When I need to fall asleep after a tense day, I read a magic book. To give up magic would be to be not me.

So what titanic power enables Prospero to do it?

*Why do YOU think Prospero gives up magic? Read Teller's answer in the official A.R.T. program for **The Tempest**.*

Director Aaron Posner on Shipwrecks & Sorcery

by Morgan C. Goldstein



The world of ***The Tempest*** is fantastical: Shakespeare's play is set on an island inhabited by spirits, and ruled over by the exiled magician Prospero. The A.R.T.'s new production, led by Aaron Posner in partnership with world-famous magician Teller, creates this enchanted world with a traveling tent show-inspired set, songs by singer-songwriter Tom Waits and his wife and partner Kathleen Brennan, movement by modern dance company Pilobolus, and magic by Teller.

"The production takes place in a Dust Bowl, traveling tent show, magician world à la carnival circus," Posner said. This Dust Bowl setting was especially inspired by Willard the Wizard, who was assisted by his young daughter, Frances. ***The Tempest*** even has its own father-daughter duo, Prospero and Miranda. Also, Posner says "the phrase 'shipwrecked magic show' has guided us in the design." With wooden planks, multiple levels, and strings of lights, the set calls to mind the quick construction of a traveling production and the decay of a ship destroyed by a storm.

Performed by a live band, Waits and Brennan's songs evoke the Dust Bowl era and the otherworldly island. And there are thematic connections between Waits and Shakespeare, says Posner: "Tom Waits is able to live on all the planes that Shakespeare lives on: the rough groundlings, the middle class, and the aristocracy. His music cuts across all of those boundaries—from working class, feet-in-the-dirt sensibilities to...esoteric poetry."

Movement by Pilobolus brings the island, and specifically the character of Caliban, to life. The child of the witch Sycorax and also a bondsman to Prospero, Caliban has been interpreted as a monster, an animal, and a mistreated and misunderstood man over the past four centuries. Inspired by the tent show setting, this Caliban will be what Posner describes as a pair of "esoterically conjoined twins." Posner notes that with two actors working as one unit, Caliban suggests "the conjoined twins of the sideshow and the energy of vaudeville duo acts," while simultaneously capturing the dual nature of this tragic and comic being.

Posner explains that in many productions of ***The Tempest***, "Prospero's magic is dealt with in purely metaphorical, theatrical ways." However, the magic in this production is tangible. Teller's tricks are performed throughout the show, bringing to life not only the illusions mentioned in the text, but also other, unexpected ones. The audience has the opportunity both to witness and to experience the characters' shock and awe at Prospero's magic, or, as the character himself puts it, his "art."

The Tempest: His

The Tempest dates to around 1610-11 and may be Shakespeare's last solo play. Clues in the play text hint that the island is in the Mediterranean Sea, near Sicily and between Spain and Italy.

The inspiration for the story is probably a survivor's account of a shipwreck off the coast of Bermuda (see below). At the time, the ocean was a major barrier to exploration. Northern European expeditions had only been seriously exploring the Atlantic in the past century, and in the late 1500s, England began establishing permanent settlements in North America.

The people and places settlers might encounter were both alluring and threatening: would explorers find treasure or terrible beasts? Would they meet friendly or hostile people? **The Tempest's** island inhabitants reflect

The Wreck of the Sea Venture

Shakespeare's inspiration for the storm and shipwreck that kick off the action of **The Tempest** may have come from a real shipwreck off the coast of Bermuda in 1609. At the time, English stock companies were sending ships out to establish settlement in America, with approval from King James I. In 1607, the London Company founded one of the early English settlements at Jamestown in present-day Virginia (the settlement was named after the king, and the state was named for the previous ruler, Elizabeth, "the Virgin Queen").

After delivering supplies and more settlers to the settlement in 1608, the leader of Jamestown, Captain John Smith, told the leadership of the Company that many more skilled colonists and supplies were needed, or the settlement might not survive. In response, the Company assembled its largest, best equipped supply mission yet. Its flagship was the Sea Venture.

The Sea Venture set sail from Plymouth, England in June of 1609, with six other ships. In late July, the fleet encountered a major storm. The Sea Venture began to leak. The admiral of the company deliberately ran the ship onto a reef once he spotted a nearby island, so as to avoid sinking into the ocean. All 150 people aboard were able to land safely.

The island turned out to be Bermuda, several hundred miles east of Jamestown. Following the wreck, the ship was stripped of its parts and materials by its former passengers. They

used Bermuda cedar and parts of Sea Venture to build two new ships. Eventually the Sea Venture disappeared into the waves. A survivor of the wreck, William Strachey, published an account of his nine months on Bermuda, *True Repertory of the Wrack*, which Shakespeare may have read.

Strachey's prose describes a nightmarish storm. Can you see similarities between his description (to the right) and Shakespeare's tempest?



Bermuda's coat of arms depicts the Sea Venture wreck

Historical Context

and comment on those fears, particularly in the character of Caliban. On the outside, he is unattractive and even dangerous (he admits that he tried to rape Miranda), but he also seems intelligent, delivering beautiful speeches. Before Prospero and Miranda came to the island, Caliban's mother Sycorax ruled, and Caliban still sees the island as his rightful property. To him, Prospero is a usurper who has enslaved him—an interesting commentary on England's colonization of other lands.

Because it is considered his last play, Prospero's magical rule over the island may be a metaphor for Shakespeare's control of his stories (see Teller's note on page 4). Many scholars group ***The Tempest*** with *Pericles*, *Cymbeline*, and *The Winter's Tale*, arguing that they were written in the same period, and putting them in a special category: romance.

"...clouds gathering thick upon us, and the winds singing and whistling most unusually, which made us to cast off our pinnace, towing the same until then astern—a dreadful storm and hideous began to blow from out the northeast, which swelling and roaring, as it were, by fits, some hours with more violence than others, at length did beat all light from heaven, which like an hell of darkness turned black upon us, so much the more fuller of horror, as in such cases horror and fear use to overrun the troubled and overmastered senses of all, which, taken up with amazement, the ears lay so sensible to the terrible cries and murmurs of the winds and distraction of our company, as who was most armed and best prepared was not a little shaken. For surely...as death comes not so sudden nor apparent, so he comes not so elvish and painful to men...as at sea."

-William Strachey

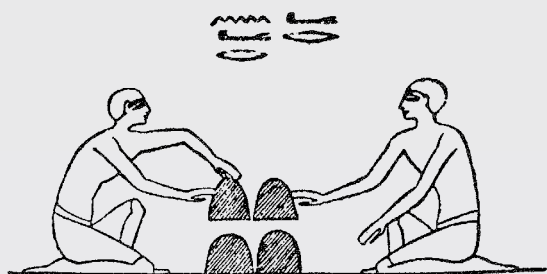


Prospero (Tom Nelis) and Ariel (Nate Dendy)

A Brief History of Magic

by Caitlin Niles

An important component of any production of ***The Tempest*** is the attention it pays to the stagecraft of magic. In many ways, the history of stage magic runs parallel to the history of theater. From a king's throne room to the stage, magicians have created illusions to amaze, entertain, question, and illuminate mysteries for audiences—much like in theater. At the same time, magic and illusion have also been used to misdirect, disorient, and exert power over audiences. In ***The Tempest***, magic and theater come together to engage audiences in Shakespeare's story.



Cup-and-ball trick, ancient Egypt.

Ancient Origins

Stage magic is believed to have originated in ancient Egypt with the god Thōth, who was credited with inventing magic. A cave painting in Beni Hasan, Egypt is the earliest-known representation of conjuring. It dates to around 2500 B.C and portrays a cup-and-ball trick. This trick uses sleight of hand and misdirection to disguise the location of a ball under a series of cups, and is still performed today.

An Egyptian story describes the earliest-known court magic. According to hieroglyphics from 1700 B.C., in the 26th century B.C., a 110-year-old man named Dedi decapitated and reattached the heads of a goose, a pelican, and an ox for King Cheops. It is likely that similar feats were being performed at the time in Assyria, the Indus Valley, and early Chinese dynasties.

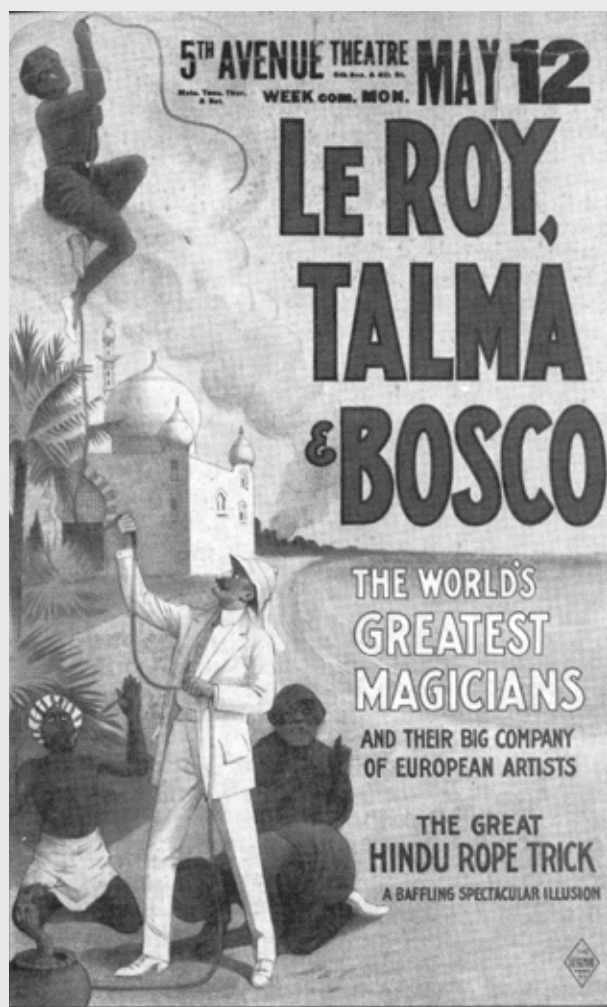
Connection to Religion

Magic has also been closely linked to humanity's attempt to understand and master the unknown, so it is not surprising that stage magic has also



Watch Penn & Teller teach you how the cup and ball trick works.

been linked to religious rites in the past. Some practitioners of stage magic billed themselves as performers, but others asserted that they intermediaries of the gods and used stage magic to attempt to prove their claims. In some religious practice (for example, the Shinto practice in Japan), priests and others may perform complicated rites in order to honor and appease deities. This use of stage magic can also be seen in modern times in the form of psychics and mediums who claim to have metaphysical powers, such as the ability to channel and communicate with the spirits of the dead.



The Hindu Rope Trick, an “exotic” magic trick.

Mystification of the Other

As far-flung societies began to encounter each other, humanity’s attempt to understand the mysteries of the world began to include encounters with people from other cultures. This included stage magic where performances were often marketed to European and American audiences using the “exotic” identity of the magician or the country of origin of the illusion as enticement to attend. In the late eighteenth and early nineteenth centuries. For example, from 1770 to 1854, the magician Baron von Kempelen built and exhibited a fake chess-playing machine known as The Turk for its Turkish robes, turban, and black beard. This was also seen in the naming of magic tricks, such as “The Indian Rope Trick,” and how certain tricks came to be seen as a traditional feat for an entire culture of people. By portraying magicians from non-Western cultures as representations of their cultures, fear, mysticism, and colonialist attitudes towards Eastern cultures were reinforced in the popular imagination of the West.

Stage Magic as Science

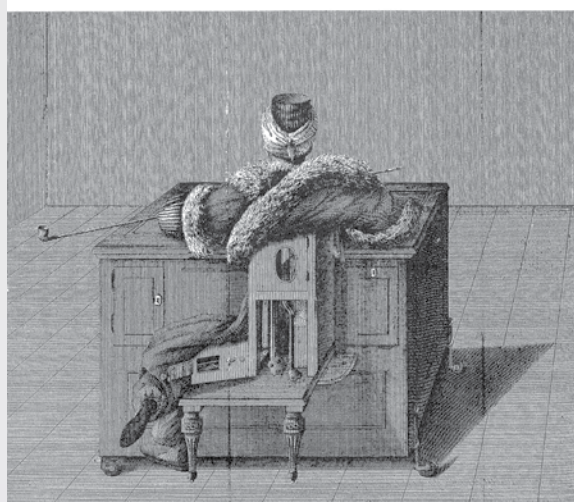
While stage magic involves sleight of hand and diversion techniques, stage magic can also require science, and especially physics. Some magicians, like Giovanni Giuseppe Pinetti (1750-1800), used the claim of science-based tricks to attract an audience, though all they had done was restage old tricks. But lots of stage magic does rely on the use of optics, mechanics, sound, and electricity. Imagine the precision it must take to use mirrors and light to make something appear as though it has disappeared. What about the creation of the inner workings of Baron von Kempelen’s automaton Turk chess player? The careful lighting, placement of reflective surfaces, and use of mechanics, sound, and

electricity play an important role in stage magic and require scientific knowledge in order to succeed.

Traveling Magicians, “Willard the Wizard”

Willard the Wizard, (James Maroney Willard) lived in the late 19th and early 20th centuries, and was one of the most famous touring tent magicians in America. Inspired by John Henry Anderson, the Wizard of the North (United Kingdom), Willard presented his show in his own tent theater and toured mostly in Louisiana, Texas, Arkansas, and Oklahoma—areas heavily affected by the Dust Bowl storms of the 1930s. When Willard died, he passed on the title of Willard the Wizard to his two sons, who, at the height of their careers, had two tents, seventeen trucks, and six different two-hour shows touring around America. At the time, it was one of the largest touring magic shows in the world. Willard the Wizard serves as the chief inspiration for this production’s depiction of the character Prospero.

Caitlin Niles is an Ed.M candidate in Arts in Education at the Harvard Graduate School of Education



The Mechanical Turk chess-playing machine.



Discussion Questions

1. Where do you see elements of science in this production?
2. How does the use of magic affect the story?
3. How does the character of Caliban relate to the other characters? How does the concept of magic relate to the story?
4. What do you think of this production based on Willard the Wizard? What are your thoughts on the production?
5. What is the connection between the Mechanical Turk and the production?

"Rough Magic" in Shakespeare's Time

The general perception of magic in Elizabethan England reflected a society emerging from the Dark Ages—expanding its explorations and understanding of the world while still clinging to old superstitions. Scientific theory at the time was heavily influenced by the concept of "sympathetic magic," the idea that an item with a shared physical quality to an ailment or object could affect that object. For instance, one might believe that consuming beet juice will strengthen the blood, because both are red.

There were also believed to be two distinct types of magic: occult/dark magic or folk magic, and learned magic practiced by scholars. In ***The Tempest***, Caliban's mother Sycorax is characterized as a witch who dealt with dark forces and may have made a deal with the devil in exchange for her magical power, whereas Prospero is a nobleman who got his magical knowledge from his books.

In society, those who practiced folk magic were more likely to be commoners—particularly those known as "cunning folk," who used spells and herbs to drive away evil spirits and heal the sick in their

communities. Though people came to them for help, their place in society was precarious. Magic was hard to explain, and those performing it could be accused of witchcraft, defined as practicing magic to cause harm. Without money and powerful social connections, these cunning folk lacked protection from the superstitious authorities.

Men with greater wealth or social standing were more likely to acquire their magical understanding from books, which tied their practice more closely to science. One of the best-remembered learned magicians is John Dee, adviser to Queen Elizabeth I, who was a mathematician and astronomer who also studied alchemy (the scientific pursuit of transforming ordinary metals into precious materials like gold) and divination (the practice of gaining insight into a question through rituals).

Magic on the Elizabethan stage

Magic's strong presence in Elizabethan life gave it a dual role on stage. First there was the use of stagecraft techniques—stage

ions...

stage magic in the world today?

ect the relationships between characters in ***The Tempest***?

oan connect to the idea of magic being used to "mystify" other cultures or
f being an outsider connect to Prospero?

uction's interpretation of Prospero as a traveling magician from the Dust Bowl
at do you think was the intention was behind this adaptation?

n magic and power in ***The Tempest***?





Ariel (Nate Dendy), Ferdinand (Joby Earle), Prospero (Tom Nelis) and Miranda (Charlotte Graham)

magic—to create illusions, and second was the depiction of magical powers on stage.

In A.R.T.'s production of ***The Tempest***, Aaron Posner and Teller are using magicians' illusions to create Prospero's magic—magic for magic. In Shakespeare's time, stagecraft created magical effects or evoked supernatural settings or actions.

So what stage magic did Elizabethan theater makers have at their disposal?

Animals, for one—both alive and dead. Certainly, plays occasionally called for the appearance of animals on stage (and live animals may have been used for this purpose). Animal blood was used for everything from a red-soaked handkerchief to bladder of liquid hidden beneath the costume of an actor, who would convincingly “bleed” when wounded in a fight, and animal parts might be used to enhance the effects of a particularly vicious stabbing or to dress up a stuffed, blood-drenched dummy used as a corpse.

And blood isn't the only mainstay of the battlefield used in the theater: there was a cannon concealed in the roof of Shakespeare's Globe Theatre, above

the Heavens (a roof above the stage, decorated with images of gods, which concealed a space where actors could hide and where ropes and rigging were stored). The cannon, unsurprisingly, was used to create the noise of the battlefield, or to herald important entrances—but it also caused the fire of 1613, which burned the Globe to the ground in two hours.

In addition to the trap door in the Heavens, trap doors in the floor allowed actors and set pieces to appear and disappear, creating the effect of a disappearing or becoming invisible by magic.

Sound effects and music were key effects as well. There was a balcony above the stage where musicians played before and during the performance (***The Tempest*** contains more songs than any other of Shakespeare's plays), and various instruments could be used in strange ways to evoke the sounds of hell. Fireworks were used to imitate the sounds of the battlefield alongside the cannon; a metal sheet or rolling cannonball stood in for thunder; and sometimes actors would use their voices to mimic a howling dog, a crowing rooster, or the wail of a ghost.

Music

You'll notice when you read the entire scene on the next page, that there is the character of a "Singer" who is singing a song in-between lines of dialogue (lyrics are in ALL CAPS). *The Tempest* is actually one of Shakespeare's most musical plays—there are quite a few songs written into the original play, and music plays a vital role in enticing characters, commenting on the action, and immersing audiences in the play's magical island setting.

In this new production, however, the music of Tom Waits and Kathleen Brennan is integrated into Shakespeare's text. If you read ***The Tempest*** in your Shakespeare anthology (we know you have one and you love it), you'll find that there is no song written into Act III, scene i. The Tom Waits song "I'll Shoot the Moon" is part of the adaptation of the text that will be performed on-stage at the A.R.T.

So. The question is: why? What does the presence of this particular song (check it out on YouTube or Spotify), and its lyrics in particular, do to the scene? Does it highlight certain themes or motivations in the scene? What is the *mood* of the song, and how does THAT flavor the scene between Ferdinand and Miranda?

ACTIVITY: Put It All Together On Stage!

On the next page is an excerpt from Act III, scene i of *The Tempest* (adapted by Aaron Posner and Teller).

1. Break into groups of 2 and read the scene together.
2. Play the song **"I'll Shoot the Moon" by Tom Waits**.
3. Together, discuss your understanding of what happens in the scene, what physicality is present, what are the motivations of the characters and themes of the scene. How does the Tom Waits song highlight these themes and motivations?
4. Get on your feet with your partner and perform the scene!
 - a. Try to integrate the music (through a recording or live performance), physicality and motivations of each character in your portrayal. Rehearse it a few times until it feels right.
5. Next, re-write the scene together in your own words. Don't change the themes or plot of the scene—just re-phrase Shakespeare's language.
6. Choose a different song to accompany the scene.
 - a. Perform your new version of the scene with your new song.
7. Get together as a class and discuss the process of adapting ***The Tempest*** yourselves; how did the new song affect the scene? What surprised you as you worked together to re-phrase the scene in your own words?



Prospero (Tom Nelis), Miranda (Charlotte Graham), Ferdinand (Joby Earle) and Ariel (Nate Dendy).



Act III, Scene 1 – Ferdinand and Miranda

(Previously, Ferdinand encounters Miranda and Prospero. Ferdinand and Miranda are entranced by each other, but Prospero casts a spell on Ferdinand, imprisoning him and forcing the prince to do his bidding. In this scene, believing Prospero is busy elsewhere, Miranda speaks with Ferdinand as he struggles to move huge logs – Prospero's punishment. The prince learns Miranda's name for the first time. The song symbolizes the impossible task Ferdinand must complete, and the force that drives him, his love for Miranda.)

[FERDINAND is struggling with a single log... With huge effort, he manages to move it a few feet. When he rests or is distracted, the log slides back across the stage. MIRANDA looks on unseen...]

SINGER
I'LL SHOOT THE MOON
RIGHT OUT OF THE SKY, FOR YOU, BABY
I'LL BE THE PENNIES
ON YOUR EYES, FOR YOU, BABY

FERDINAND Some kinds of baseness* **menial activity*
Are nobly undergone... and most poor matters
Point to rich ends. This my mean task
Would be as heavy to me as odious, but
The mistress which I serve quickens* what's dead **brings to life*
And makes my labours, pleasures.

SINGER
I WANT TO TAKE YOU OUT TO THE FAIR
HERE'S A RED ROSE, RIBBON FOR YOUR HAIR
I WANT TO BUILD A NEST IN YOUR HAIR
I WANT TO KISS YOU AND NEVER BE THERE
I'LL SHOOT THE MOON
RIGHT OUT OF THE SKY, FOR YOU, BABY

FERDINAND I must remove
Some thousands of these logs and pile them up,
Upon a sore injunction*. My sweet mistress **harsh command*
Weeps when she sees me work, and says such baseness
Had never like executor*. **such a person to do it*

Alas now, pray you,
Work not so hard. I would the lightning had
Burnt up those logs that you are enjoined to pile.
Pray, set it down and rest you. When this burns
'Twill weep for having wearied you. My father
Is hard at study. Pray now, rest yourself.
He's safe for these three hours.

O most dear mistress,
The sun will set before I shall discharge
What I must strive to do.

If you'll sit down,
I'll bear your logs the while. Pray, give me that.
I'll carry it to the pile.

No, precious creature,
I had rather crack my sinews, break my back,
Than you should such dishonour undergo
While I sit lazy by.

It would become me
As well as it does you, and I should do it
With much more ease, for my good will is to it,
And yours it is against. You look wearily.

No, noble mistress, 'tis fresh morning with me
When you are by at night. I do beseech you,
Chiefly that I might set it in my prayers,
What is your name?

Miranda. O my father,
I have broke your hest* to say so!



17

Illusion Engineering

STEAM Connection! Have your students experiment with how science, technology, and engineering can be understood through and used in stage magic and theatrical productions.

Objective:

Introduce students to the concept of magic tricks with a basis in science, and prepare them for what they might see in *The Tempest*, by demonstrating one of the physics-based magic tricks below. Follow up your demonstration with time for students to engage in inquiry about the trick and its relationship to science.



Click on the image above to watch some cool physics-based magic tricks from the Institute of Physics!

physics.org/article-interact.asp?id=59

After watching one (or more) of these tricks, talk about it...

How and why do you think these illusions work this way?

What scientific principles do you think might be at play in these tricks? Why?

What examples of stage magic did you see in *The Tempest*?

How do you think Teller crafted these magical feats for the production?



Now, engineer your own Stage Magic Illusion!

Objective:

Use your knowledge of science, engineering, and technology, as well as your experience at **The Tempest** to engineer your own stage magic illusion. Use the engineering design process to investigate the science behind your trick, craft your trick, and share your results by performing your trick!

Identify

What is the problem you want to explore?
Which avenue of stage magic do you want to explore?
What constraints might you have?

Investigate

How have others approached this problem?
What scientific principle(s) do you need to know in order to understand your trick?

Imagine

What are some ways to perform your trick? Brainstorm some ideas!

Plan

Choose an idea, and draft a plan of how to perform your trick.

Create

Enact the plan for your trick and try it out.

Test

Test out your trick on an unsuspecting audience member. Take note of what went well and what could work better. Ask your audience for feedback.

Improve

Take what you learned from your test(s) and improve your trick. Go back through your brainstorming, planning, creating, and testing steps until you find the best version of your trick.

Communicate

Perform your final trick for your classmates. See if they can figure it out! Afterwards, explain the scientific principles that went into the creation of your trick and share with your audience the stages of your design process.

Magic on stage is at its best when it seems unexplainable. As we learn by studying the history of magic, many magicians used principles of science to dazzle and disorient audiences that were unfamiliar with the natural forces at work. Its no wonder that a common refrain when talking about stage magic, “smoke and mirrors,” could also describe a class on chemistry and optics!

More Resources:

- Article about stage magic and optics:
<http://aeon.co/magazine/world-views/optical-illusions-educate-the-mind/>
- Scientific America: Stage Illusions and Scientific Diversions:
<http://www.scientificamerican.com/article/magic-stage-illusions-and-scientifi/>