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Any Theme Goes

Backstage Magic: A Science Spectacular

Classroom photo by Rich Sofranko

STUDY GUIDE

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Artists on Tour

About the Artist

For Ohio native Matthew Brian Taylor, following in the footsteps of his father, Michael, an accomplished entertainer in his own right, seemed like an obvious choice. Matthew first experienced the thrill of the stage at age seven, as part of his father's magic show. "From the first moment I heard the audience laugh, I was hooked." He was performing professionally on his own by age ten. Matthew's versatility and myriad talents, which run the gamut from acting and grand illusion magic to such important behind-the-scenes aspects of production as writing and design, have earned him a place as one of the top entertainers and entertainment consultants in the Midwest. An eleven-year veteran of the professional staff at The Cincinnati Playhouse in the Park, Matthew holds a B.F.A. in Theatre Arts from Wright State University where he studied acting and design technology. Matthew has worked as a Magic Effects designer and consultant for numerous theatrical companies, including The Cincinnati Playhouse, Actors Theatre of Louisville, St. Louis Repertory Theatre, Long Wharf Theatre in New Haven, Connecticut, and Arena Stage in Washington D.C. He is associated with The International Brotherhood of Magicians, The Cincinnati Arts Association, The International Association of Theatrical Stage Employees, The Society for Creative Anachronism, and the Coxcomb Academy for the Performing Arts where he serves as the Dean of the College of Conjuring. Matthew has spent the last eight years teaching street performing. He has appeared over the years at local entertainment venues: Kings Island, The Beach Waterpark, Coney Island and The Ohio Renaissance Festival. Matthew is the Producing Artistic Director of the Midwest's premiere corporate theatre company Any THEME Goes llc, specializing in motivational and team building events and interactive presentations.

The Presentation

The Premise

Throughout Queen Victoria's reign in England, there were 212 licensed public halls and theaters in London alone, all of them caught fire at least once during her reign and many burned to the ground. It was a rough period in theatre history as the transition from under the sky to under roofs was completed and the birth of theatre effects began to show audiences places and situations that had never been represented in detail before. Devils in Hades and angels in clouds were only the beginning of the marvels represented to the theater going public. These were primitive times and dangerous for not only the buildings but the actors and audiences as well. Modern theatrical effects rely on science and technology to give audiences a safe and thrilling time in the theater.

The three important rules in theatre effects are:

1. Do not harm the theater.
2. Do not harm the actor.
3. Do not harm the audience.

On average, a play is performed eight times a week or more and sometimes twice in the same day, which means everything must be reset and used again and again.

To demonstrate some of the principles of theatre effects, both old and new, we will take a single moment from a very recognizable play and see how the miracles get accomplished.

The Text From A Christmas Carol by Charles Dickens

"Suddenly in a flash, Jacob Marley's ghost appears surrounded by a thick fog. He carries a great chain and appears very frightening in the flickering candlelight held in Scrooge's shaky hand."

The Effects

1) Fire "Candlelight held in Scrooge's shaky hand"

Why no live flame?

Whenever possible in modern theatre we try not to have any live flame on stage (see the three rules above).

- Gunpowder: Saltpeter, Sulfur, and Charcoal the miracle special effect of 1898
- False Candle and Firelight

Fake flame, how does it work?

Most modern fake flames either work through some form of projection or with the use of multiple light sources flashing in sequence. The larger the flame you see the more likely that it is somehow projected.

2) Flash "Suddenly in a flash"

- Flash Powder: still requires fire
- Flashbulbs: the old way
- The Modern Strobe

Modern strobe lights are a kind of instant on/instant off light bulb. A large amount of electrons are stored up in a capacitor (a kind of holding tank), when they are released they leap all at once from one side of the bulb to the other. The byproduct of this leap is the huge release of photoelectric energy or flash that you see.

- Nitrocellulose: "How about a little fire scarecrow"

There is really only one way to create a convincing fireball in the theater and that is with flash paper. Flash paper leaves no residue when it burns so it is very magical in appearance it burns so quickly that it does not set other objects around it on fire. It is still very dangerous if handled improperly and can burn the person igniting it.

3) Smoke "surrounded by a thick fog"

- Gun Powder, Dirty smoke
- Smoke Powder, to flame or not to flame
- Smoke Machines

Any kind of oil will smoke when heated, cooking oil, car oil even mineral oil used in suntan lotion. The more refined and cleaner the oil, the whiter and cleaner the smoke will be. This is the premise behind most theatrical smoke machines. This smoke is created with heat so it rises when made. It is used for creating atmosphere and in areas for heavy lighting effects.

- Ceramic Heaters
- Dry Ice, Frozen CO^2 at -109^O F

The point at which a warm air mass meets a cold air mass is where clouds form. Water vapor in both air masses condenses rapidly to form fog or a cloud. This can happen very slowly as the sun warms the land in the morning or very quickly like plunging dry ice into boiling water. Dry ice is frozen carbon dioxide. It's mean temperature is -109^O F; water boils at +212^O F. The rapid condensation that occurs during the violent transition between the two temperatures forms the puffy clouds. This smoke is cold and so it hugs the ground and quickly disappears as it warms.

4) Misdirection "Jacob Marley's ghost appears"

- Spot Card
- Cut and Restored Rope
- Square circle production (appearing to appear)

Describes the use of optical illusion in theatre effects.

A Final Thought

Magicians were some of the first people asked to create effects for plays. The art of live special effects and the art of magic are nearly inseparable from each other. Both arts operate in secret and very often do not reveal the tricks of the trade. I hope you've enjoyed this quick tour behind the footlights.

A Final Warning

All lab experiments have a risk factor whether harmful chemicals are used or not. With every experiment there is always a danger that you may expose yourself to injury. The chemicals and equipment that you use and the way that you use them are very important, not only for your safety but for the safety of those working around you. Please observe all school rules and restrictions at all times. Failure to do so increases your risk of accident. Please let common sense be your sixth sense!

Activities

1. Read a play (or scene of a play). Have students decide what would require a theatre effect. How do they think the effect would be achieved on stage?
2. See a play. Have students identify the theatre effects and say how they think the effects were achieved.

   Suggested play to see or read: *A Christmas Carol*, Cincinnati Playhouse in the Park

Additional Reading

Magic Tricks, Science Facts by Robert Friedhoffer (Franklin Watts)

Jr. Boom Academy by Hixson & Kralik (Wild Goose)

Science Magic for Kids by William Wellnitz (Tab Books)

Vocabulary

Appear — to be or come in sight; to show up

Capacitor — a device that stores energy; it consists of conducting plates or foils separated by thin layers of non-conducting materials (as air or mica) with the plates alternately charged (-, +, -, +) by a source of voltage and the electrical energy of the charged system is stored in the polarized air or mica

Gravity — a fundamental physical force that is responsible for interactions which occur because of mass between particles, between aggregations of matter (as stars and planets), and between particles (as photons) and aggregations of matter

Solid — a substance that does not flow under moderate stress, has a definite size and shape

Osmosis — movement of a solvent through a semipermeable membrane (as of a living cell) into a solution of higher concentration that tends to equalize the concentrations of solute on the two sides of the membrane

Gas — a fluid (as air) that has neither independent shape nor volume but tends to expand indefinitely

Oxidize — to combine with oxygen; to dehydrogenate especially by the action of oxygen

Disappear — to pass from view; to cease to be; pass out of existence or notice

Optical — of or relating to vision; of, relating to, or being objects that emit light in the visible range; using the properties of light to aid vision

Strobe — a device that utilizes a flashtube for high-speed illumination

Illusion — a misleading image presented to the vision; perception of something objectively existing in such a way as to cause misinterpretation of its actual nature

Condensation — a chemical reaction involving union between molecules often with elimination of a simple molecule (as water) to form a new more complex compound of often greater molecular weight; the conversion of a substance (as water) from the vapor state to a denser liquid or solid state usually initiated by a reduction in temperature of the vapor