Maxwell C. King Center for the performing arts
Eastern Florida State College
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THEATRE FOR YOUTH OUTREACH 2015-2016

STUDY GUIDE

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Theatre for Youth & Outreach Program

Let Your Imagination Take You Places!

Live Wire! The Electricty Tour

Tues., Nov. 17, 2015, 10:30 am

For additional copies visit **kingcenter.com** click Theatre For Youth section & proceed to Study Guides & Resources.

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Season 2015-2016

Dear Friends and Patrons of the Arts,

Thank you for your interest in the King Center Theatre For Youth Program. The mission of the program is to inspire, nurture and sustain a lifelong appreciation for the performing arts among our youth theatre patrons. This is accomplished by the diverse array of entertaining and educational arts offerings.

Study resource materials made possible by each artist and their management teams, is being provided to augment the live theatre experience. We hope you find the materials useful.

A live theatrical experience can leave a memorable impact even after the show is over….so, *Let Your Imagination Take You Places!*

We are looking forward to your attendance at the show.

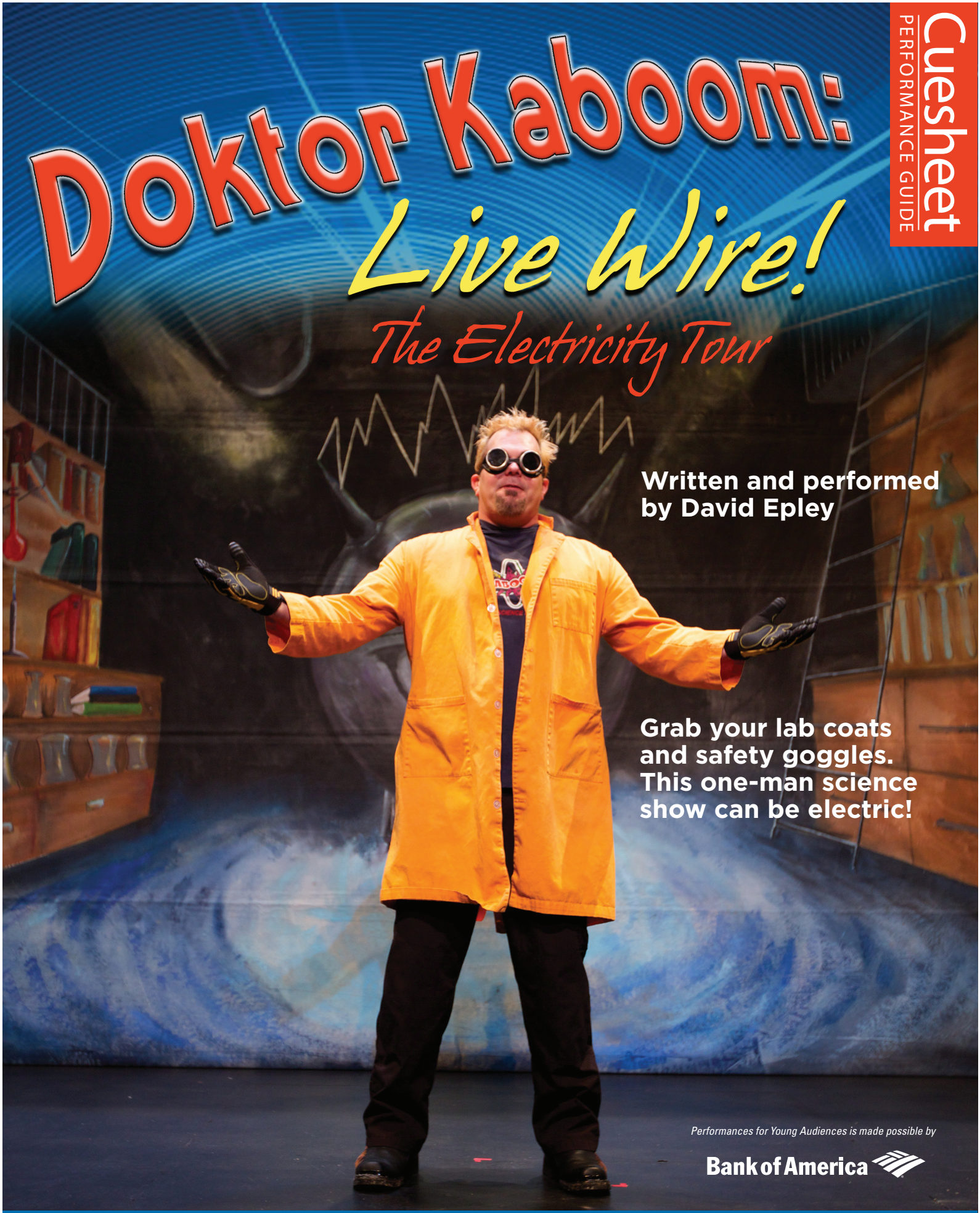
Yours in the arts,

Karen

Karen Wilson
Director
Theatre For Youth and Outreach Program

Doktor Kaboom: Live Wire!

The Electricity Tour



Written and performed by David Epley

Grab your lab coats and safety goggles. This one-man science show can be electric!

Get Ready

This photo and cover photo by Martin Albert

One Man and the Power (and Fun!) of Electricity

Science is a blast, and nothing says scientific discovery quite like "*kaboom*." Get ready for a hilarious hour of electrical entertainment with Doktor Kaboom. Although this may be a "one-man show," Doktor Kaboom will ask for your help in this fun and funny exploration of electricity. Learn more here, and pay special attention to the bolded words, which you will hear on stage.

Those Crazy Electrons

Electricity begins with **atoms**. Everything is made of these molecules that are so small millions could fit on a tiny pinhead. **Protons, neutrons,** and **electrons** make up atoms—and how they play together is where things really get interesting. Protons have a positive **charge** and electrons have a negative one (the neutrons have no charge). Because opposite charges are drawn to each other, protons and electrons usually stay in the same atom. But sometimes electrons make a radical move to another atom... and *kaboom!* This is electricity. **Watch...**as Doktor Kaboom and audience volunteers test the idea that opposites attract.

On the Move

Electricity is all about movement. When you rub your shoes on the carpet on a dry winter's day and touch a doorknob, you get a little shock, right? That's because you picked up extra electrons that move when you touch something else. This is called **static electricity**. **Watch...**for Doktor Kaboom's hair-raising demonstration of static electricity.

Conductors (like metals) help electric charges move more easily. **Insulators** (like plastic) prevent charges from moving easily. **Grounding** removes a charge. The flow of electrons is called the **current**. In **direct current**, the charge moves in one direction. In **alternating current**, it moves back and forth. Machines called **generators** turn energy created by movement (such as wind turbines) to electricity. **Watch...**how Doktor Kaboom and friends turn riding a bike into a *power*-full experience.

It's a Gas!

Substances have four states—solid, liquid, gas (think ice, water, steam), and another gas-like state called **plasma** that conducts electricity (think lightning). **Watch...**when Doktor Kaboom tries a device that will use a flow of electric charge—called **electric discharge**—to make an **arc** (or current) of plasma in the air. As Doktor Kaboom says, what could possibly go wrong?

to Be Electrified

Electro-magnet-ificent!

Magnets (materials that can attract other items) have two opposite points—north and south **magnetic poles**—where the magnet's force is the strongest. This creates a magnetic field that can create electricity. **Neodymium** (pronounced nee-oh-DIM-ee-uhm) magnets are among the strongest available. **Is it magic or...** electromagnetic? Watch how Doktor Kaboom lights a lamp without touching it!

Know Your Electrical Measurements

You may hear Doktor Kaboom use these words as he performs his experiments:

amps the number of electrons moving in a circuit (a closed loop)

voltage the pressure pushing electrons along an electrical current

watt a unit for measuring electric power

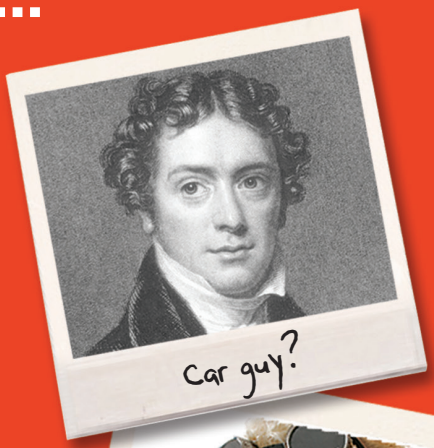
frequency how fast sound or electromagnetic waves travel

resistance how much a conductor slows the passage of current

Get to Know a Scientist... or Two

Michael Faraday

You can thank this man and his endless curiosity if you enjoy riding in cars. He discovered how to generate electricity using magnetic effects and this became the first generator. From there, his experiments led to electric motors and many other devices we use every day.



What's His Name? Doktor Kaboom!

But his real name is David Epley, and he's a comedian who loves science. When he performs, he plays the role of a scientist from Germany. To show that you agree with Doktor Kaboom, remember to say "ja" ("yah"), which is German for "yes." David performs "improvisational comedy," which means he "improvises" (changes) his jokes depending on what's happening on stage.

Practicing Safe Science

As Doktor Kaboom says, "Science can hurt you, especially if I'm the one doing the science." In working with electricity, he has to watch out for sparks, burns, and fires. Even an expert experimenter can face unexpected dangers, so Doktor Kaboom suits up even if there's only the tiniest chance that it'll be necessary—and you should, too. And remember, you should only experiment with electricity with the help of a responsible adult.

Let's look at the gear that Doktor Kaboom wears to protect his body.

Goggles protect his eyes.

Lab coat with long sleeves covers his clothing and skin.

Gloves—you guessed it—protect his hands.

Do Try This at Home

After the performance, try these activities with your friends and family.

Bonzo Balloons

Use balloons to explore static electricity. You'll need: a dry winter's day, two balloons, two long pieces of string, and a piece of fur or wool clothing. Blow up and tie closed one balloon. Press it against the wall. Does it stick? Now quickly rub the balloon back and forth against the fur or wool. Try the wall again. What happens, and why? Next, blow up and tie closed a second balloon. Tie a piece of long string to each balloon. Rub both as before. Holding each by the string, try bringing them together. What happens? Why?

Heads Up for Electricity

Make a list of all the electricity you use in one day of your life. Include things around your home like lights (and don't forget things that run on batteries!). Also include things outside your house like traffic lights. What would life be like if electricity hadn't been discovered?

And remember...

being a good audience member isn't rocket science—just stay seated and quiet, don't eat, and remember to watch, listen, and clap.

Explore More!

Go to KC Connections on ARTSEDGE
artsedge.kennedy-center.org/kc-connections

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The Kennedy Center ARTSEDGE
www.kennedy-center.org/artsedge

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