From our season sponsor

Regions

For 135 years Regions has been proud to be a part of the Middle Tennessee community, growing and thriving as has our region. From the opening of our doors on September 1, 1883, we have committed to this community and our customers.

One area that we are especially dedicated to is the education of our students. We are proud to sponsor TPAC's Humanities Outreach in Tennessee (HOT). What an important program this is—reaching over 30,000 students, many of whom would never get to see a performing arts production without this local resource. Regions continues to reinforce its commitment to the communities it serves, and in addition to supporting programs such as HOT, we have close to 200 associates teaching financial literacy in classrooms this year.

Thank you, teachers,

for giving your students this wonderful experience. You are creating memories of a lifetime, and Regions is proud to be able to help make this opportunity possible.
Welcome to the Wacky World of Doktor Kaboom!

*Doktor Kaboom* offers your students a riotous romp through the varied regions of science. Actor David Epley has created a fun and engaging character, but don't be fooled by the spiky hair, goofy goggles, and extravagant German accent. Science is the real star of this show.

Rare indeed is the student that is not totally pumped up and energized about science after this hour long, one-man, scientific extravaganza. Utilizing catapult flung bananas, overflowing five foot high test tubes, eye-spinning optical illusions, and a smoke-ring blowing air cannon, Dr. Kaboom grabs students by their t-shirts boldly exclaiming, "Mein Gott! Science is fun!"

Your students will be so caught up in the fun and jokes, they might not even realize that they are learning along the way. There is real science going on under the surface of the show. *Doktor Kaboom* introduces concepts in physics, optics, and chemistry. Epley, in the guise of the crazy character he has created, promotes science safety and self-esteem. Above all, he encourages students to dive head first into their scientific studies.
The Wheel of Science

So much science, so little time... Doktor Kaboom is having trouble picking his favorite science demonstrations, so he’s bringing them all! Unfortunately, there are way too many to do them all in one show. The solution: The Wheel of Science! Doktor Kaboom has built a great big spinning wheel and labeled it with everything from optical illusions to chemical reactions to a homemade hovercraft, and more! At least a dozen fantastic demonstrations ready to go. Wherever the wheel stops, that’s what’s next! Will we turn a water bottle into a rocket or catapult bananas across the stage? Electrocute a pickle or create artificial gravity? Who knows? No two shows will be the same. So, step right up, and let’s spin that wheel!

Doktor Kaboom is the creation of Actor/Comedian David Epley

David has been fortunate enough to discover two passions in his life. Science, his first, took him to studies at the North Carolina School of Science and Mathematics. His second, performing, become his career, and for 20 years David has made his living writing, performing, and directing original interactive comedy across the US and Canada.

Since creating the character of Doktor Kaboom, science education has become David’s life, taking him to theaters, festivals, and schools all over the world. Recent performances of note include the John F. Kennedy Center, the Singapore Science Festival, and the World Science Festival.

Visit Doktor Kaboom’s Website: www.doktorkaboom.com
Classroom Activities
Before and After the Performance

Move and Talk (Quick Questions)

This activity is an interactive way to introduce the upcoming performance. Introduce students to the information on page 2 about this performance, then prompt them to consider and discuss what they can expect to see.

Have students select a partner. Tell students they will change partners after every question. An open space is ideal for this activity. Read the first question and give students two minutes to discuss with their partner (one minute each). Have a signal ready for students to know when it is time to move to a new partner. (Questions below are examples:)

- What are some of your favorite topics in science? Why?
- Dr. Kaboom uses a spinning wheel to help make tough decisions. How do you make tough decisions?
- What do you wonder about the show? What makes you excited about the show?
- What demonstration do you hope to see during the show?
- Is there anything you need to know before we go that I have not told you?

Ice Breaker (Abstract thought)

This activity starts by tossing a bean bag but then transforms to tossing an imaginary object, allowing students to consider an object’s weight, shape, force, and the “body language” required to react to the imaginary object. Begin with the class standing in a circle. Start a bean bag around the circle. Ask the students to just look at the object and notice its physical characters then hand it to the person next to them.

Once the object makes its way back to the teacher gently toss it to a student. Ask the student how they knew the correct way to catch a bean bag? Had they caught a bean bag before? Seen someone else catch a bean bag? The goal is for students to understand that this object is something we are familiar with. Toss the bean bag to a few students and then bring it back to the teacher.

Put the bean bag down and toss a pretend bean bag to a student. How did that student know when to catch the bean bag? Explain that the student used a combination of their experience and their imagination to “catch the bag”.

Ask the question “what if the bean bag turned into a football?” and have the student pass the football to someone else. Ask this question using different items after each “catch”. Examples are (basketball, Frisbee, beachball).

Then move to items that the students may know but could never pass around a circle (the sun, an atom, the Empire State building etc…). Encourage students to use their bodies to show actions related to each item. The sun would be very heavy while an atom would be very small. What does that look like? Can the other people in the circle read your actions and imagine what you are passing?

Teacher Alter Ego

What is an alter ego? How does the use of character impact how the audience responds?

Introduce students to character acting by teaching a class in character. Create your own alter ego for delivering instructions. Pick a day and teach class in character, complete with costume and props. Even better, encourage your teaching team to join you! Leave time at the end of class or the end of the day to discuss character with your students.
After the Performance

Notable

Give each student two note cards. On the first card have the students respond to the prompt “My favorite demonstration was ___________. Because__________________”.

On the second card have students respond to the following prompt.

“I wonder _______________?” Remind the students to stay focused on the science demonstrations they saw on stage.

After students have finished, find a creative way to share student responses. You could use the first card as a class poll and show the data as a graph. This also gives you great student feedback to share with TPAC on your performance survey!

Video Shorts

Have students create fifteen second videos telling about their performance experience. Watch them together as a class and select a few to be featured on the school’s social media pages.
Review and Reflect

- What science demonstrations did you see during the performance?
- Did any remind you of demonstrations we have done in class?
- What stood out to you or surprised you in the performance?
- How would you describe the performance to a friend thinking of seeing the show?
- Is Doktor Kaboom similar to your friends and teachers? In what ways?
- What is the most memorable part of Doktor Kaboom’s show?
- Have you tried creating a science demonstration or video as an alter ego character? How might that work for you?

Gratitude

Help students understand the importance of showing gratitude to those that make events possible. Every performance has people working behind the scenes from ushers to bus drivers, corporate sponsors and dedicated teachers and administrators. Encourage students to think about who made a difference for them and write a letter of gratitude. Their letter should include information about the performance and its impact on the student. (TPAC will forward any letters addressed to Dr. Kaboom!)

TENNESSEE PERFORMING ARTS CENTER
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What is your mission?
As a teacher? A learner? A classroom? What are your core values?

Doktor Kaboom strives to empower, excite, educate, and entertain the people of Earth.

THE MISSION:

Through interactive character-driven science comedy we improve society's understanding and retention of basic scientific principles, build upon those basics, demonstrate that all science is for everyone, and remove the cultural stigma that scientific awareness is something to fear.

CORE VALUES:

- Science is for everyone, not just the guy in the labcoat, or the girl who wins the science fair every year.
- Science is not hard, but it does take effort. That's not hard, that's just work, and that's just life.
- Every child is intelligent, creative, valuable, and should know that about themselves.

From: https://www.doktorkaboom.com/the-mission
Science Demonstrations with Theatrical Style!

Introduction
Explain to students: Doktor Kaboom is a character created by actor/comedian David Epley. In his shows, David combines his love of science with his performing abilities to create shows that educate and entertain on a grand scale.

Brainstorm
Discuss with students: What are some techniques David Epley uses to make Science so much fun?

Humor * A Strong Character * Audience Participation * Good Storytelling * Demonstrations * Respect * Safety * Confidence

Choose a Science Demonstration
There are many simple scientific demonstrations* available online and suggested in this guidebook. Guide students to select one or two to consider or offer a predetermined set of options.

For this project, give students the opportunity to develop their own live mini show or create a video featuring a real science demonstration. They can work individually or in teams to take their presentation to the next level. The demonstration “Roll a Soda Can with Static Electricity” is used as an example for the steps below.

Choose a Character
As a class, practice “getting into” different character types…. old man, young girl, body builder, business person, cowboy, minion, etc. With students standing in a circle, call out a character type. Students respond by moving in ways that show: What is this character’s posture? How does he/she walk? How would this character brush teeth? Toss a ball? Eat an ice cream cone? Walk on a hot beach? Add more attributes to your characters: very enthusiastic like a sports fan, impatient, absent minded, distracted by cell phone, very strict, etc. Practice as a group and then individually until students really know and understand their character.

Problem Solved
In most plays and stories, there is a problem that characters have to solve. Your science demonstration can be made more interesting for the audience if there is a problem that can be solved through your demonstration. The problem can be real or wacky, as long as the storytelling convinces the audience that it is important! (For example: On planet Dirigible, the balloons have an annual contest to prove their power! Watch as our hero, Mr. Red Balloon, attempts to move a soda can without even touching it! Oh no – his competition is spoiling the contest by putting drops of water in the can! Who will win!?)

The Scientific Method
Plan your presentation using the scientific method and test variables. For example, in the “Roll a Soda Can” demonstration, there is an opportunity for audience participation, or for a team of students with different hair lengths (or wigs!) to get involved investigating “does the length of the person’s hair effect the power of the static electricity?”

Encourage students to create their own live or video science demonstrations with a dose of Dr. Kaboom’s style - keeping in mind his values of respect, safety and confidence.

*sciencebob.com/category/science-fair-ideas
Roll a Soda Can with Static Electricity

You will need
* An empty soda can
* A blown-up balloon
* A head of hair

What to do
1. Place the can on its side on a flat smooth surface like a table or a smooth floor.
2. Rub the blown-up balloon back and forth through your hair really fast.
3. Hold the balloon close to the can without actually touching the can. The can will start to roll towards the balloon without you even touching it!

Try This Too: While you’ve got the balloon out, tear up part of a tissue into tiny pieces about 1/4 inch (.5 cm) big. Rub the balloon in your hair again and bring it close to the tissue pieces. They will be attracted to the balloon and then jump away.

How does it work?
When you rub the balloon through your hair, invisible electrons (with a negative charge) build up on the surface of the balloon. This is called static electricity, which means “non-moving electricity.” The electrons have the power to pull very light objects (with a positive charge) toward them – like the soda can.

MAKE IT AN EXPERIMENT
The project above is a DEMONSTRATION. To make it a true experiment, you can try to answer these questions:
1. How does the size of the balloon effect the power of the pull?
2. Does the length of the person’s hair effect the power of the static electricity?
3. How much water can you put in the can until the balloon can’t pull it anymore?

Find this demonstration and more like it at: sciencebob.com
The Pressure is On!

Try a demonstration with air pressure! Also known as atmospheric pressure, air pressure measures the force exerted by the weight of air molecules. Although air pressure is different at various elevations -- the higher you go, the lower the pressure -- or due to changes in atmospheric conditions, the air pressure on an object is generally accepted as 14.7 pounds of pressure per square inch. Air pressure is not just a downward force, but it completely surrounds us.

Here are several activities that you can do with your students to continue to explore air pressure. The final activity works best when set up as a demonstration as there is a bit of a trick involved.

**Grudge Match: Air vs. Water**

In this simple, but really amazing, activity, your students pit air pressure against water weight. They will love astounding their families with this activity when they get home.

Materials:
- Small glass or cup
- Index card
- Water
- Sink or tub

Fill the glass about one third full of water. Completely cover the mouth of the glass with the index card. While holding the card over the mouth, quickly turn the glass upside down. Remove your hand from the card. You students will be thrilled to see that the card remains in place, holding the water in the glass. It is best to do this activity over a sink or tub, just in case!

The reason the activity works is that the weight of the water is less than the pressure of the air. The downward push of the water is about one pound and is greatly overwhelmed by the superior 14.7 pound upward-push of the air pressure. This is a good activity to illustrate that air pressure completely surrounds us.

Warning: It doesn't take too long for the paper card to become saturated with water and lose its structural integrity. When that happens, look out -- hence the sink or tub.

**Old Faithful**

This is another activity that is best done in a sink or tub. Outside would be good, too.

Materials:
- Two-liter soda bottle
- Water
- Straw
- Lump of Clay

Fill the bottle about half-full of water. Insert the straw into the mouth of the bottle. While holding the straw so it sticks a short distance outside of the bottle, wrap the clay around the straw so it forms a seal at the bottle's mouth. Place the bottle in the tub or sink. Blow hard into the straw and then stand back. Thar she blows!

When you blow into the straw it increases the air pressure inside the sealed bottle. The higher pressure forces the water to shoot up and out of the straw.

Please note: This activity does not replicate the way geysers like Old Faithful work. Geo-thermal activity creates the pressure that causes geysers to erupt. "Old Faithful" is just a catchy name for the activity.
You're Full of Hot Air

This demonstration is a trick. A little secret preparation is needed.

Materials:
- 2 plastic water or soda bottles of the same size
- 2+ balloons
- Push pin or tack

Out of sight, make an 1/8 inch in the bottom of one of the bottles. Give a balloon and a bottle to each of two volunteers. Instruct them to feed most of their balloon into the bottle. Next they should stretch the opening of their balloon over the edge of the mouth of the bottle. Challenge them to see which student can blow-up their balloon the fastest.

The student that has the bottle with the hole in the bottom will be able to blow up their balloon with little difficulty. The student with the non-holed bottle will not be able to blow up their balloon at all, no matter how hard they try.

Invite a new challenger to try to beat the champ (replacing the balloon, of course).

**Explanation:** As the student blows into the balloon-in-the-bottle, they are moving air into a compressed space to inflate the balloon. In the non-holed bottle, the air is trapped and has nowhere to move. The air pressure in the bottle prevents the balloon from inflating. In the bottle with the hole, the air in the bottle can be pushed out of the hole allowing the balloon to expand.
STEAM Suggestions

Tips to integrate STEAM in your classroom

STEAM

Check out these great lessons from Education Closet integrating **Visual Art, Dance & Science**.

- **Holographic Art**
  
educationcloset.com/2016/09/08/hologram-art-steam-lesson/

- **Movement Batteries**
  
  Educationcloset.com/2015/05/21/steam-lesson-movement-batteries/

STEAM

Looking for ways to engage students in Technology through Science?

- **CSI: WEB ADVENTURES**
  
  Forensics.rice.edu/index.html

STEAM

**Art in Engineering-Moving Art**

Here is a great Engineering and Art lesson from the University of Colorado Boulder.

  teachengineering.org/lessons/view/cub_art_lesson01

STEAM

**Op Art and Math Collide**

Optical illusions and Math! What could be better?


STEAM

**PERIODIC VIDEOS**

Do your students need more engagement with the elements? Here is an amazing interactive Periodic Table complete with video lessons for each element.

  ed.ted.com/periodic-videos
Special Thanks

Tennessee Performing Arts Center’s nonprofit mission is to lead with excellence in the performing arts and arts education, creating meaningful and relevant experiences to enrich lives, strengthen communities, and support economic vitality. TPAC education programs are funded by generous contributions, sponsorships, and in-kind gifts from our partners.

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TPAC Education

programs bring exciting arts opportunities and learning to a diverse audience, from pre-school to adult.

Humanities Outreach in Tennessee (HOT) presents an annual season of outstanding professional performances of theater, dance and music to school groups to complement curriculum objectives with a rich variety of artistic and cultural expression. Teachers receive guidebooks with lesson plans and other resources for use in the classroom. Post-show discussions with artists, teacher workshops, and in-school visits also are available. Ticket subsidies and travel grants make the program accessible to all students and school systems.

ArtSmart inspires creative connections with the arts to enrich classroom learning. Educators and teaching artists collaborate to engage students in school-based residencies that cross curriculum and address students of all abilities and learning styles. ArtSmart’s teacher institutes and workshops provide guidance in arts-integration and project-based learning designed to motivate critical and creative thinking for students.

Wolf Trap Early Learning Through the Arts is a nationally affiliated program that utilizes the disciplines of music, dance, theatre, and puppetry as powerful tools for educating pre-school children. Professional performing artists partner with early childhood educators and create activities that target curriculum and developmental goals for 3- to 5-year-olds, including emerging literacy skills, social interaction and self-expression. Wolf Trap residencies and workshops provide training for teachers in arts-based instruction techniques they can employ in their classrooms.

InsideOut is for adults who want to grow in their knowledge and enjoyment of the performing arts. InsideOut events come in many shapes and sizes and in many different places both inside and out of TPAC's downtown theaters. The TPAC Education program offers a series of lunch seminars, performance excerpts, discussions, workshops, and sneak previews behind the scenes.

Disney Musicals in Schools (DMIS) is an extracurricular program that develops sustainable theater programs and enhances classroom learning in Metro Nashville elementary and middle schools. At no cost to them, participating schools receive a performance license for the Disney KIDS or Disney JR. musical of their choice, along with resources and support from TPAC staff and professional teaching artists. Program goals include developing appreciation for musical theatre as a collaborative art, connecting to curriculum standards, and increasing school pride among students, families, faculty, staff, and community partners. After a successful pilot in Nashville, 2011-12, Disney Theatrical Group expanded the program to school systems nationwide.

Spotlight Awards are presented in partnership with Lipscomb University’s College of Entertainment and the Arts to encourage young theatre artists in Middle Tennessee. Through the program, up to 30 applying high school musicals are evaluated by a diverse panel of adjudicators. In May, the program culminates with workshops taught by industry professionals on the Lipscomb campus. That evening, exemplary work is recognized with The Spotlight Awards ceremony at TPAC, where the top 10 contenders for “Outstanding Musical” perform and honors are presented in a variety of categories, including “Outstanding Lead Actor” and “Outstanding Lead Actress.” The winners in those two categories then move on to national consideration for The Jimmy Awards in New York.
Contact us!
TPAC.ORG/Education
education@tpac.org