This hilarious show gets kids excited about Science, Technology, Engineering, Art, and Math!

PageTurnerAdventures.com
Kenny and Page discover a trunk owned by Baldy the Magnificent Humble Clown Extraordinaire—a 1920’s circus performer who was so inspired by creative, innovative thinkers (Edison, Tesla, Da Vinci, Curie, and more) that he built his show around some of their most notable inventions and ideas. Until...the day he vanished in 1927 never to be seen again. The trunk is filled with juggling props, strange inventions, a mysterious book, and...Harry Houdini’s hat. With help from the audience Kenny and Page must decipher clues, conduct experiments, and solve the mystery of The STEAM Trunk Circus.

A grand spectacle as well as a captivating story, The STEAM Trunk Circus is full of magic, juggling, unicycling and tons of physical comedy. This unique storytheater show features action-packed slapstick and mesmerizing mystery while exciting kids about STEAM.

The greatest scientific minds of all – Da Vinci, Einstein, Edison, Curie - weren’t just scientists. They were artists, innovators, and above all, creative thinkers. What if we could go back to that moment of discovery...to see what they were thinking and marvel at their creative processes, to feel the emotion and witness that spark of inspiration, and to hear their stories? It just might ignite a passion for discovery in today’s kids. That’s what the STEAM Trunk Circus is all about!

STEAM people mentioned in the show:
Sir Francis Bacon  Thomas Edison
Philo T. Farnsworth  Marie Curie
Lewis Latimer  Leonardo Da Vinci
Albert Einstein  Sir Isaac Newton
Salvador Dali  Margaret Knight
Harry Houdini  Nikola Tesla

Sparking imagination, curiosity and wonder through story and laughter is Page Turner Adventures’ mission. With innovative, multi-media productions, they stretch the bounds of the storytelling experience and bring new meaning to the word participation!

Founded by the daring duo of Riley Roam and Kenny Mikey, Page Turner Adventures combines story + comedy + live theater + technology to create out-of-the-box productions that are a total engagement experience. Riley plays the intrepid Storyologist, Page Turner. Kenny is her Slap-Stick-Side-Kick. Together, they transform children into a storyologists and send them on comical quests of craziness.
“Since new developments are the products of a creative mind, we must therefore stimulate and encourage that type of mind in every way possible.”
George Washington Carver

STEAM = Science & Technology interpreted through Engineering & the Arts, all based in Mathematical elements.

You’ve probably heard of STEM – Science, Technology, Engineering and Math. Well, add ART to that, and you have STEAM. STEAM focuses on how all these subjects relate to each other in real life. This is the definition of STEAM, developed in 2007, by Georgette Yakman - the founding researcher of STEAM education. STEAM also includes language arts, social studies even physical arts (PE) to the mix.

Go to the following link to see a video we created for Georgette about STEAM and to see the first STEAM school in the country in action. [http://www.youtube.com/watch?v=JqOgav7GtNw](http://www.youtube.com/watch?v=JqOgav7GtNw)

In their book STEM to STEAM: Using Brain-Compatible Strategies to Integrated the Arts, authors Thomas J. Pilecki and David A. Sousa have this to say about arts integration….

“National science organizations developing the Next Generation Science Standards (NGSS) to better prepare k-12 students in the sciences for careers and college. Regardless of how good the NGSS are, they will do little to improve student learning unless curriculum becomes more meaningful, and unless science and mathematics instruction concentrate more on creative and real-world problem solving-in other words, what working scientists and mathematicians really do. The question is how do we do this? What type of activities would increase student engagement, raise motivation, focus on relevant issues, and most importantly develop creativity? Oh, wait a minute, that’s what the arts do.”

“After all, the main objective of both art and science is discovery.”
-Thomas J. Pilecki and David A. Sousa
“To invent, you need a good imagination and a pile of junk.”
- Thomas Edison

A STEAM Project: The Cardboard Carnival
Baldy the Magnificent loved to invent new things out of old stuff. As a clown, I’m sure he would have enjoyed this cardboard carnival inspired by Cain’s Arcade. You can watch the video about a little boy who created an arcade started an entire phenomenon with his imagination at the link below.

Creating a cardboard carnival combines all the elements of STEAM:
- **Science** (physics-balancing, speed, etc.)
- **Technology** (cardboard, tape and scissors are technology which is defined as anything created by humans),
- **Engineering** (building their game),
- **Art** (designing and decorating the game, signs, posters, tickets, etc.)
- **Math** (measuring, figuring out point systems, size of the hole vs. size of the ball, etc.).

**Materials:**
Cardboard boxes in various sizes (Ask your grocery store, appliance stores, etc.)
Tape: Try different kinds of tape,
Paper, Pencils
Examples of different types of games: Skee ball, knock hockey, claw, bowling, bean bag toss, fishing, etc.
Copy of Caine’s arcade video here
Other supplies could include: paperclips, magnets, etc.

**Directions:**
Show the video Caine’s arcade to inspire students. Then allow kids to work in groups or alone to brainstorm, develop, design, and create their games. Don’t forget signage and tickets.  
[http://www.youtube.com/watch?v=falFNkdq96U](http://www.youtube.com/watch?v=falFNkdq96U)

**Extended Activity:** Invite younger children to play the carnival games. Create brochures, and ads. Create a video for your morning announcements to advertise your cardboard carnival.  
**Bonus:** Participate in the global day of play sponsored by the Imagination Foundation.  
Language Arts: Based on a True Story

After we perform this show, many children ask us if Baldy, The Magnificent was a real person. Well….yes, he was a real person, but he didn't live in the early 1900's, he wasn't Kenny's Grandpa, and he wasn't bald! His name was really Robert Baldwin but audiences knew him as Baldy the Magnificent, Humble Clown Extraordinaire and he was Kenny's mentor. He taught him about performing and encouraged Kenny to apply to Ringling Brothers Clown College. Baldy became Kenny's good friend and they spent many hours together juggling, unicycling and thinking up funny gags. Baldy passed away several years ago. Kenny was very sad, and he wanted to do something to honor his friend's memory. We decided to write a story based on Baldy' life. We used some real facts from his life and changed others—he really was an inventor, but he didn’t actually know Harry Houdini! We think it's a story Baldy would have liked, and we’re glad we were able to give him a chance to make an audience smile one last time.

Activity:
Have students read The Real Baldy The Magnificent story. Ask them to write an imaginary story based on a real person or real event. What can they change to make it different?
Bonus: Compare and Contrast the true story with the fictionalized account

Activity #2: The Mysterious Trunk
In the STEAM Trunk Circus, Kenny receives a mysterious trunk that gets the (juggling) ball rolling. Ask your students to write a story about their own mysterious trunk. Who is it from? What's does it contain? After writing, they can create their own mysterious trunk (see directions below) and keep their story safe inside for someone else to find some day.
Vocabulary:
Gravity – The force that pulls everything toward the center of Earth; the force of gravitation on Earth.
Center of Gravity - The average location of the weight of an object.
Weight – A measure of the force of gravity upon an object
Balance - An even distribution of weight so that an object will remain upright and steady even if it is resting on a very small point

Materials
Masking Tape
Tea Box (We used a Celestial Seasonings-type of box but any box can be used)
Brown Shoe Polish
(use the kind in a tin, NOT the liquid)
Paper Towels
Black Paint (optional)
Metal Brads (optional)
Button (optional)
Markers (optional)
Scissors (optional)
Glue (optional)
Velcro (optional)

Directions
1. Cover the box in masking tape. You will probably need several layers. The top layer should be made from little pieces of tape.
2. Apply small amounts of shoe polish to the box using the paper towel. Cover the box with the shoe polish until it resembles leather.
3. You can use black paint to create “straps” on the box. (You can also color more tape with a marker and attach it to the box).
4. Decorate the box with metal brads and button.
5. Use markers and scissors to create travel stickers from the masking tape and attach them to the box.
6. Optional: Attach Velcro to the box so it stays closed.

Note: The shoe polish can stain clothing. We suggest wearing smocks.
MAKE YOUR OWN STEAM!

The Steam that comes out of the trunk is actually dry ice. Kenny engineered a special system so the dry ice falls into hot water when we need it! (photo)

What is dry ice?

Dry ice is frozen carbon dioxide. Instead of melting, dry ice turns directly into carbon dioxide gas but does not melt like real ice. When you drop a piece of dry ice in a bucket of water, the gas that you see is a combination of carbon dioxide and water vapor. The gas that you see is actually a cloud of tiny water droplets. Dry ice must be handled with gloves or tongues as it is -110 degrees F ( -78 degrees C) and will cause severe burns if it comes in contact with your skin. Never put dry ice into your mouth.

**These experiments must be done with a teacher or adult!

Materials

Dry ice (can often be found at your local grocery store)
Regular ice
Tongs or Heavy duty gloves
Warm Water
Tall Glass
Liquid dish soap (Dawn works well)
2 paper or plastic plates
Food coloring (optional)
Small fish aquarium or large glass bowl
Activity #1:
Place one ice cube and one piece of dry ice on a paper plate. Ask the students what they think will happen to the ice. Allow the children to view the plates after one hour. There should be a puddle of water on the plate where the real ice was, but the dry ice plate will be "dry."
Where did the dry ice go? The dry ice turned into invisible carbon dioxide gas that disappears into the air like magic!

Activity #2:
Use the tongs or gloves to place a piece of dry ice in a glass of warm water. The dry ice will begin to turn into carbon dioxide gas and water vapor, forming a really cool cloud! This cloud is perfectly safe for the children to touch and feel as long as they do not put their fingers far enough down into the water to accidentally touch the dry ice. To create the best effect, be sure to use warm water. Over time, the dry ice will make the water cold and the "smoking" will slow down. Replace the cold water with warm water and you'll move “full STEAM ahead.”

Activity #3:
Fill a tall glass or plastic cylinder with warm water and add a squirt of liquid dish soap like Dawn or Joy. Use gloves or the tongs to place a piece of dry ice into the soapy water. Instead of the dry ice just bubbling in the water to make a cloud, the soap in the water traps the carbon dioxide and water vapor in the form of a bubble. The bubbles will explode with a burst of steam. Add some food coloring to the water to make the demonstration more colorful.
Magic is the sole science not accepted by scientists, because they can't understand it.
   -Harry Houdini

Magic, Math and Harry Houdini
When Kenny puts on Harry Houdini’s hat, he’s able to do tricks like the great magician himself. While magicians never tell how they do tricks, we will give you the names of the tricks performed in the show so you can research them yourself.

Tricks in the Show:
The Fire Book    The Dove Pan
Flash Paper      Torn and Restored
Newspaper

Safety notes: The fire in the show is REAL! Children should not attempt to do any of the fire tricks without an adults help. The flip Kenny does (called a 108) is also REAL and DANGEROUS! It should not be tried without proper training.

MATH MAGIC Card Trick
What You Need:
   Deck of cards
   A Volunteer
   Flat Surface (table or desk)

What You Do:
1. Ask your volunteer to shuffle the deck of cards. Explain that for this trick Aces=1. Have your volunteer look at the bottom card and memorize it.

2. Tell the volunteer to place the deck on the center of the table and turn over the top 3 cards.

3. Ask the volunteer to figure out how many cards to deal below each of the 3 turned-over cards. To do this, the volunteer must subtract the number amount on the face up card from 15. For example: If the card is 5, he or she should deal 10 cards under it. 15 - 5 = 10.

4. Ask the volunteer to collect all the cards dealt in step 4, and put them on the bottom of the deck. The three original face-up cards should remain on the table.
5. Ask the volunteer to find the sum of the three face-up cards and deal out that many cards. For example: If the 3 face-up cards are 2, Ace, and 5, perform this addition operation $2 + 1 + 5 = 8$. Place those cards on the bottom of the deck.

6. Time for the magic! Explain that you can force any card to come out of the deck whenever you like. Now, ask the volunteer to name the card he or she chose in step 1.

7. Wave your hand over the deck of cards mysteriously. Ask for his or her card to come forth!

8. Turn over the cards one by one on the top of the deck slowly as you say, "This is the first card, here's the second, this one's the third, and the (name of his card), comes fourth!" The fourth card will be your volunteer's card!

How it Works: Each face up card is equal to the amount of the card subtracted from 15, plus the value of the card = 16. Multiply 16 x 3 and you get 48. And, $48 + 4 = 52$. There are 52 cards in a deck!

“O me, you juggler, you canker-blossom, you thief of love!” –William Shakespeare

The Physics of Juggling

Sir Isaac Newton (1642-1727) was a scientist who is credited with discovering gravity. You would think that gravity would be a well known concept since all of us have been aware of it since we were little kids dropping our spoons on the floor from our high chair just to make mom come and get it. But it wasn't until Newton published his ideas in a book in 1687 that the scientific world had gravity as a defined term. Newton is well known for his Three Laws of Motion which explain how the physical laws direct the motion of objects.
The most important force for jugglers is gravity. Without gravity, juggling would be impossible. Apart from the fact that the juggler would be floating lifeless in the cold emptiness of space without gravity, he would also lose all his props once he threw them (though that would help propel him in the opposite direction). Gravity makes juggling possible, but it also limits what jugglers can realistically accomplish.

With props like clubs, a juggler must be aware of the prop's center of gravity. The center of gravity is the point of average mass distribution of an object. It's also the point around which an object will rotate. Most club tosses include at least one full rotation. Learning how much force to use when tossing and rotating a club becomes second nature for a juggler after a little practice.

Tossed props follow a path called a parabola, meaning acceleration acts in a vertical direction while horizontal velocity remains constant. The accelerative force is gravity pulling downward.

Juggling Through History

How old is juggling? A tomb of an Egyptian prince has hieroglyphs showing a group of women toss juggling. Archeologists believe the tomb was built between 1994 and 1781 B.C. So far, this is the oldest depiction of juggling discovered.

Art from Thebes, Greece, Rome, India and Europe displays jugglers performing complex tricks. Written accounts of jugglers date back to 400 B.C. An ancient reference in the Talmud describes Rabbi Shimon ben Gamaliel, who could juggle eight torches at once. You can find jugglers in ancient Irish and Norse literature as well.

Up through the Roman era, it seems that people held jugglers in high esteem. Shortly thereafter, jugglers fell on hard times. People began to think of jugglers as immoral con artists. Written accounts lumped jugglers in with magicians and witches, citing them as corrupt manipulators.

In the medieval period, jugglers returned to popularity in literature and art. Artists drew jugglers throwing an unlikely number of torches or knives. Beginning in the late 1700s, jugglers also became an important act in circuses. Many circus clowns incorporated juggling into their acts, and the two forms of entertainment began to become entwined in the public consciousness.

Juggling also played a big part in vaudeville entertainment in the late 1800s and early 1900s. As vaudeville declined in popularity and circuses became more rare, jugglers began to develop their own stage shows and/or perform on street corners.

Learn How to Juggle - http://www.wikihow.com/Juggle
Materials
3 nine inch balloons of the SAME color (per ball)
duct tape
bird seed
funnel
water bottle
scissors

Directions (see corresponding pictures on following page)
1. Cut the necks off of TWO of the balloons

2. Mark a line about 1/3 the way up the water bottle. On many water bottles, it’s the 3rd or 4th “ring”.
   Put the funnel in the top of the water bottle. Fill to the line with the birdseed.

3. Blow up a balloon about the size of a big grapefruit. Twist the balloon so that no air gets out.
   DO NOT TIE THE BALLOON.

4. Stretch the neck of the balloon over the nozzle of the water bottle. Let the balloon untwist.

5. Turn the bottle over so that the birdseed empties into the balloon.

6. DO NOT TIE THE BALLOON. Lay the nozzle flat and put a piece of duct tape over the nozzle.

7. Stretch one of the other balloons (with the neck cut off) over the ball.

8. When you’ve stretched a balloon about halfway over the ball, pick up the ball with your other fingers and push the ball into the other balloon to complete covering the ball with the balloon more easily.

9. Now 90% of your ball will have 2 layers of balloon, but there is still a small hole with only 1 balloon layer. Put that side up and repeat steps 7-8 with the final balloon, making sure to cover that spot so that you have 3 layers of balloons on most of your juggling ball.

10. If desired, cut holes in another balloon (of a different color) into designs and place over entire ball for a fun, multicolored look.
The Science of Balance

One of Baldy the Magnificent's greatest tricks is The Six Foot Unicycle. To ride a unicycle you must first find your center of gravity or balancing point.

Balancing Point Experiment

Purpose: To locate an object’s center of gravity

Materials
Scissors
washer
Manila folder
pushpin
Paper hole-punch
bulletin board
12 inch piece of ruler
string
pen

Procedure
1. Cut one side of the manila folder into an irregular shape.
2. Punch five randomly spaced holes in the edge of the paper with the paper hole punch.
3. Tie one end of the string to the washer and the other end to the pushpin.
4. Stick the pushpin through one of the holes in the paper and into the bulletin board.
5. Allow the paper and string to swing freely.
6. Use the ruler and pen to mark a line on the paper next to the string.
7. Move the pushpin to the other holes and mark the position of the hanging string each time. Do this for the remaining four holes.
8. Place the paper on the end of your finger. Your finger should be on the point where the lines cross.

Results
The paper balances on your finger.

Why?
Center of gravity is the balancing point of an object. The center of gravity of the paper is the point where the lines cross.

“If you think you can fall, you’re more likely to.” Nik Wallenda (walked the high wire across Niagara Falls)
BOOKS

From STEM to STEAM: Using Brain-Compatible Strategies to Integrate the Arts
by David A. Sousa and Thomas J. Pilecki

Nick and Tesla's High-Voltage Danger Lab: A Mystery with Electromagnets, Burglar Alarms, and Other Gadgets
by Bob Pflugfelder and Steve Hockensmith

The Boy Who Invented TV: The Story of Philo Farnsworth
by Kathleen Krull and Greg Couch

Marvelous Mattie: How Margaret E. Knight Became an Inventor
by Emily Arnold McCully

Lewis Howard Latimer: An Inventive Mind!
by Akimi Gibson

Marie Curie (Kids Can Read)
by Elizabeth MacLeod and John Mantha

Who Was Thomas Alva Edison?
by Margaret Frith and John O'Brien

History for Kids: An Illustrated Biography of Nikola Tesla for Children
by Charles River Editors

Isaac Newton and Physics for Kids: His Life and Ideas with 21 Activities
by Kerrie Logan Hollihan

Leonardo da Vinci for Kids: His Life and Ideas, 21 Activities
by Janis Herbert
Harry Houdini for Kids: His Life and Adventures with 21 Magic Tricks and Illusions
by Laurie Carlson

Kids' Magic Secrets: Simple Magic Tricks & Why They Work
by Loris Bree and Marlin Bree

Juggling for the Complete Klutz
by John Cassidy and B.C. Rimbeaux

WEBSITES

About STEAM
STEAM: A Framework for teaching across the disciplines. Website of Georgette Yakman, founding researcher for STEAM.
www.steamedu.com

Science Experiments
Bill Nye The Science Guy
Nyelabs.com

Science Bob Pflugfelder
www.ScienceBob.com

Steve Spangler Science
www.stevespanglerscience.com

Inventions and Inventors
African American Inventors
http://teacher.scholastic.com/activities/bhistory/inventors/

Female Inventors
http://www.women-inventors.com/

Kid Inventors
http://www.womansday.com/life/7-things-you-didnt-know-were-invented-by-kids-107168

OTHER STUFF
Caine’s Arcade, Imagination Foundation, Global Day of Play
http://www.imagination.is/