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[Eddie@EddieGoldstein.com](mailto:Eddie@EddieGoldstein.com)

[www.EddieGoldstein.com](http://www.EddieGoldstein.com)

## Eddie Goldstein's Magical Math and Science Show

*The Magical Math and Science Show, originally developed in 1983 and refined over the years, uses magic, comedy, and juggling to demonstrate some amazing topics in math and science. In about half of the tricks, I actually explain the mathematical and scientific secrets, which make the tricks work. The other half are sleight of hand tricks (which I don't tell) which I use to illustrate fascinating math and science concepts.*

***This is a modular show. Before coming to your institution, and in consultation with you, I will select items from the following menu that are best suited to the audience and time constraints. (No single performance includes all of these items. Typically, about 4 or 5 of the modules are included in a performance.)***

### **Spinning Plates – angular momentum warm up**

As audience members come into the theater, I will often perform Spinning Plates. This demonstrates the scientific principle of conservation of angular momentum. The real reason I do it, however, is to warm the crowd up in anticipation of the show they are about to see.



### **Diabolo - physics**

This is a very effective warm-up trick that shows several science principles. Conservation of angular momentum (why the Earth always points to the North Star) and can also be used to show how kinetic energy is transformed into potential energy and back again. I finish with some fancy tricks and some really, really high tosses, while catching the diabolo on a string. You can see a short example of this at [https://youtu.be/Oe4SnZB\\_jf8?t=49s](https://youtu.be/Oe4SnZB_jf8?t=49s)



### **Topology – the mathematics of how things are connected**

After demonstrating some giant topological puzzles, audience members join me on stage in a demonstration of how to escape from rope handcuffs. Using some magic, I illustrate the topological principles involved in the escape. I then conclude with a rarely seen classic of magic, The Thumb Tie, proving that a magician can (seemingly) defy the laws of mathematics.



### **Center of Gravity - physics**

This routine starts with a magic trick where the entire audience helps to knock a block of wood off its pedestal. But how does it work? The secret lies in understanding center of gravity. This is the imaginary point around which an object will spin and on which an object will balance. I explain this while juggling Chinese Devil Sticks, tossing Whacky Wheels into the air, and, finally, displaying a jumbo model of the Earth – Moon system.



### **Probability – mathematics**

What is the probability of choosing a particular card from a deck of cards? Not always what you think. In this comedy magic trick, I seemingly exert my will on a helper from the audience, until everything goes wrong. But, don't worry. Using my magic powers, things work out well in the end.

### **Traveling Soda Bubbles – just for the fun of it**

As the story goes, when I was a kid I used to love to spray my brother with a shaken up can of soda. But I always got into trouble. That is until I came up with a magical way of doing it without getting caught. I would shake up my own can of soda, then magically transfer the bubbles to his can. When he opened it, he'd get sprayed in the face. Now, it is part of my show so everyone can see the fun.

### **Logic – mathematics**

Logic is the basis of all mathematics, and science as well. Can you use logic to deduce how a magic trick works? I will magically transform a handkerchief into an egg using only my bare hands. I then guide the audience in using logic to discover my secret. The last laugh is on them when what they think just happened is not what happened at all.

### **Poi – just for the fun of it**

I often finish my shows with a Poi juggling routine. Poi is the art of spinning balls or streamers on the ends of ropes. It was developed in New Zealand by the Maori people. My version ends with a splash. You can see a short video of this at <http://eddiegoldsteinmagic.com/poi-juggling/>



### **Matrix Mathematics**

The theme is an old-time revival meeting. After dancing around the stage with a jumbo deck of playing cards, I fall into a deep hypnotic trance. I then attempt to read the minds of five members of the audience who are merely thinking of their cards. The truth is that it is all based on a branch of mathematics called matrices. And, after waking from my trance, I explain all to the audience who will be able to do the trick on their friends at home.



### **Momentum and Inertia - physics**

I developed this routine for the Singapore Science Center and have been doing it ever since. It is called the Springy Egg Drop Soup and is based on a classic stunt where a raw egg is balanced on a toilet paper tube, which is on top of a paper plate which is on top of a glass of water. If you do it just right, you can get the egg to drop into the water. In this stage-sized version, I use a pizza pan, two glasses, two eggs, and a volunteer from the audience. It is lots of fun.

### **More Coming . . .**

I am constantly adding more routines to my Magical Math and Science Show suite. So, ask me about any new items that I am working on.

## **Other Related Programs**

### **How Animals Walk – zoology**

In this show, which I wrote while at the Smithsonian National Zoo, I teach a number of members of the audience to walk like different zoo animals. This is extremely entertaining, very participatory, and scientific at the same time. The audience will learn to recognize a taxonomy of walking styles – alternate, simultaneous, same-side, diagonal, and independent – and which animals do which. We end with the human-animal parade.



### **Galileo and the Leaning Tower of Pizza – physics and scientific method**

This is a very funny “street theater” type show where “Galileo” re-enacts his famous heavy and light balls experiment using water balloons! The science is solid. Not only do the visitors see which balloon hits first, they also find out about the value of doing scientific experiments. This routine is done in the middle of the museum floor or outside with no stage necessary. *This show requires two people.* You can see short segments of this show at <http://eddiegoldstein.com/galileo-and-the-leaning-tower-of-pizza-video-2/>



## **Legacy Items**

*(not currently available)*

### ***The Georgia Wonder – physics***

*At the end of the 19<sup>th</sup> Century, a young woman named Lulu Hurst stunned audiences in the United States by appearing to sap away the strength of the biggest and strongest men in each town she visited. How did she do it? Not with the “magnetic powers” she claimed to have, but with a knowledge of forces and vectors. In this part of my show, I will recreate some of what her audiences witnessed, and explain the real workings of her trick. (Not currently available.)*