

2. PRESENTATION

a. PERFORMING TIPS

Chemical demonstrations are very similar to magic; they can be amazingly simple to perform. The basis of performing cheMagic involves the creation of an effect with the purpose of engaging, convincing and entertaining the audience. For cheMagic, the chemicals and your knowledge of Chemistry are your gimmicks. The basis of any demonstration or performance is the effect. There is no one standard as to what defines an effect since any demonstration, no matter how simple, can be a powerful routine. Using **R.E.A.M.**, you will truly be a star!

1. Revelations

The audience reacts in a most predictable manner after a trick has been successfully performed. People are curious and they want to know how you made the demonstration work. From experience, revealing the method or technique almost always nullifies the effect of the trick. Therefore, weigh between suspense and concept of Chemistry when explaining the trick. The audience will always remember the magical moments.

2. Expectations

One of the biggest mistakes made by performers is the inclusion of expectations as part of their patter. Focus on hinting to the audience that something may happen but do not explicitly tell them what is going to happen. cheMagic tricks are designed to make full use of the five senses and it will be to your advantage to develop your patter to exceed the audience expectations.

3. Actuation

Every performer fears making mistakes on stage. Practicing your flow before any performance is a milestone on the path to a successful performance. Engaging and ensuring the viewing angle of the audience is key to ensuring your success. In the section "**ROUTINES**" you will learn about these common mistakes, how to avoid them, and if you encounter one, "**RECOVERING FROM BLUNDERS**" will have you covered.

4. Manipulation

Magic from the point of the performer is different from that of the spectator. To the spectator, it is something amazing and supernatural. When showing your trick for the first time, spectators will not know what to expect and they will be impressed. Never repeat the same trick a second time to the same group as they will now be watching your every move intently in the hope of finding out how you performed the trick. Their attention is no longer on the outcome, but on the process. Thus as the performer, if this happens, you must divert their attention to your apparatus, props or gimmicks to ensure continued suspense.

b. UNDERSTANDING THE AUDIENCE AND THE ENVIRONMENT

You have the materials needed to perform and you know the steps to carry out the Chemistry demonstrations. But, are you ready to blow your audience off their seats with your material? A successful Chemistry demonstration needs more than the appropriate materials and methods; it requires understanding the audience you are performing for, and the environment you are working in. You may wonder why you are unable to engage your audience, or perhaps why your Chemistry demonstrations did not turn out the same way it did while you tested it earlier.

This section covers the essentials of understanding your audience and the environment you are working in, enabling you to make your Chemistry demonstrations successful. Not only will your audience be treated to a wonderful show of immersive Chemistry demonstrations, you will also gain immense satisfaction knowing you have done your part as a performer.

1. Indoors vs. Outdoors

Tom has a performance scheduled in a week's time at the Town Hall. He knows that he will be lighting fires in the course of his performance, and minimal amounts of smoke may be produced. He runs through his list of planned demonstrations and carefully thinks about any safety issues that might result from the environment he is performing in, and arranges to visit the venue a few days before his performance. At the venue, Tom stands on the stage to get a feel of the magnitude, and notes that he has to set up tables a safe distance away from the audience. Tom also notices smoke stays in the area, possibly causing problems for himself and the audience. Tom decides to substitute that demonstration with another that does not produce smoke. Lastly, Tom asks that he be shown the positions of the fire safety equipment in the area so that he will not be unprepared if anything goes wrong on the day of his performance.

Arguably one of the major contributing factors to the success of your show is where it is held. Make it a habit of visiting your performance area at least

a week before your actual performance so that you have time to tailor your demonstrations to the setting.

Indoor environments impose one major restriction on your performance – it cannot involve a lot of smoke. Certain demonstrations like “Fireworks” produce copious amounts of smoke because the reaction is very exothermic. If you conduct such a demonstration indoors, the smoke must go somewhere. Certain venues have air conditioning units that can blow in reverse or large fans, allowing you to push the smoke high up where it will not suffocate the audience.

Outdoor environments are good for performing demonstrations such as “Sweet Volcano” without any worry of causing damage to the allotted venue. If you are doing any demonstrations involving fire, there will be less of a chance of you accidentally setting off smoke or fire alarms and violating fire safety regulations. Evidently, outdoor environments are the way to go. The only shortcoming is the fact that you would not be able to patter as well and you will be scrutinized from every angle. This can be important when you are performing certain demonstrations, so make sure you choose your venue well.

2. The Audience

Tom is about to start his performance, but before he does so, he surveys the audience quickly. He notes that there are young children standing at the front and that the audience has curled around to his side. While the demonstration that he is intending to perform is not directly dangerous, he decides that it will be safer to put the audience in front of him. Tom takes a few steps back and puts himself a safe distance away from the audience. Next, he informs them of any risks involved and asks that parents kindly keep their children by their sides. When the members of the audience are fully aware and have their attention on him, he begins.

As a rule of thumb, always have your audience in front of you and a distance of 10 feet or 3 meters away. This is both for safety and for the benefit of your performance. You will find from time to time that your audience varies from adults to young children. We always make it a point to let the audience know when a certain demonstration is going to involve fire and there may be certain proximity risks, and tell them explicitly to take five steps back. This gives you more room to work and ensures that a young child not in the know might not run up to the front and put him or herself at risk.

If you are performing a demonstration that produces a lot of smoke, make sure that it does not blow directly into your audience. Some members of the audience might have respiratory ailments and may not appreciate a mouthful of Permanganate smoke. If you are doing this outdoors, you can channel the smoke away from the audience by placing a clear plastic barrier in front of your demonstration.

When your audience is in front of you, you will not need to worry about checking your angles. Certain sleights look marvelous from the front but the effect will be spoilt when a person sees it from the back. Try to keep your audience in the shape of a funnel, with the tip of the funnel pointing towards you. This is the best arrangement for you since everyone will see you from the front and you can address everyone.

3. Audience Age Groups

Tom is an avid Chemist and aspiring magician who is intending to put up a small performance on Chemistry magic. He knows that many members of the public will be present and families will be there with their children. When rehearsing his patter, Tom realizes that young members of the audience may not understand his tricks if he is too abstract; hence he opts for something simple and visual. For the older members of the audience he prepares tricks that are more thoughtful and revolve around a central theme that everyone can associate with.

On the day of the performance, Tom weaves through the crowd cheerfully. He spots an elderly couple and proceeds to make light conversation with them. He engages both persons in the trick and speaks slowly, using the silence to build suspense. The mood is light hearted but sentimental, and when Tom has finished his trick he garners a round of laughter and applause. Tom moves on to a young boy looking rather lonely. Once again he talks genially to the boy, addressing the boy by his name and proceeding to show him a simple colour change, a trick that needs no explanation. The boy is amazed, and it is with such a great memory that the boy leaves the venue.

As a performer you will find yourself facing a diverse audience, and it is rare that you will perform to an audience comprised solely of a single age group. In other words, your patter and your level of engagement with the audience must adapt depending on your audience. This is important because children

have a shorter attention span than their older counterparts. What might be an attempt to build suspense on the part of the performer might end up as a dreary moment for the young spectator. For an older group, the key to performing successfully is to show respect for their opinion and reach out to common beliefs. The reader and performer will find many traces of this in the sample patters that are provided.

c. ROUTINES

Routines are an integral part of every performer's arsenal. When used correctly, routines minimize preparation time and form a complete performance that has been tried and tested. In a nutshell, a routine is a prearranged list of demonstrations and patters that are known to flow well. The most important thing to remember about a routine is that every demonstration is no longer alone. Performed by itself, a demonstration may have a particular effect, but when it is placed amongst others, the whole set of demonstrations have to be taken into consideration. Chosen correctly, the effect is amplified, but if chosen wrongly, the flow of the performance will be lost. The structure of any routine however, is the same:

1. The Opener

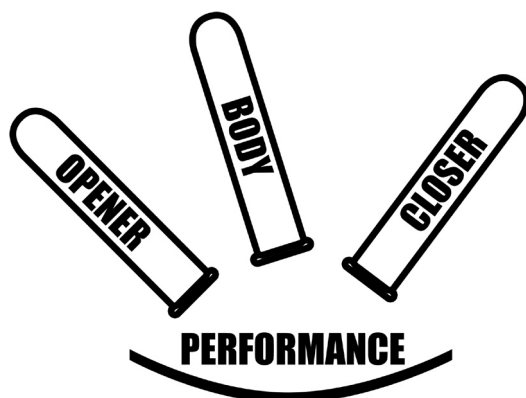
The performer faces a huge challenge at the start of every performance, and that is to enliven the audience and remove any barriers that might exist because of their unfamiliarity. The performer may have various objectives, for example the show may need to be introduced, or the audience must be informed about any safety concerns that might arise. These are things that have to be tackled in the opener. As a rule of thumb, long or large scale performances are rarely done at the start of a performance, whether it is on the streets or on stage. Often, the aim is to interest the audience with something short but impactful.

2. The Body

This is the main part of the performance, and easily takes up 80% of the performance time. If there is a storyline, it should be advanced in this section. If you are intending to invite volunteers up on stage to assist you, this is a good time. If a long demonstration is going to be performed, place it at the end of this section, such that the finale will once again, enliven the audience. For example if you are intending to perform "*Confinement*", a novel touch would be to place the piece of paper in the box and open it at the end of the performance to reveal the hidden message. Schedule your time wisely for this section.

3. The Closer

There are many names for this; a finale, an ending, but they all have the same meaning and purpose. This is where the performer bids farewell to his audience, and it is critical that a good impression is made. Naturally, there are many ways the performer can achieve this. Some endings like "*Sunset*" are simple and emotional, but others like "*Fireworks*" are loud and joyful. Regardless of your choice, the closer is a focal point for the performance, and should be carefully selected based on your patter for the opening and body of your performance.



d. SUGGESTED ROUTINES

ON THE STREETS

Vortex

1. Anti-Gravity (B08-SM)
 - a. Borrow a mineral water bottle from a spectator and covertly affix the wire mesh gimmick to the mouth of the bottle. Alternatively, prepare a mineral water bottle with the gimmick affixed prior to the performance.
 - b. Proceed with the demonstration, keeping the bottle slightly below eye-level.
 - c. Insert a toothpick through the holes in the wire mesh. As the toothpick will float upwards, move the toothpick to eye level.
2. Coagulate (B07-SM)
 - a. Allow the spectators to take in the effect, then place a small paper cup under the mouth of the bottle. Under the pretext of "willing" the water to flow once more, give the bottle a slight jerk.
 - b. Collect a small amount of water in the paper cup and remove the gimmick from the mineral water bottle. Confidently hand the mineral water bottle back to the spectators and direct your attention to the paper cups. You should have, prior to the performance, prepared three other paper cups, one of which contains the hydro gel.
 - c. Pour the water from one cup to another before showing that it disappears at the final cup. If you are performing on the street you may not have the liberty of swapping the cups before they can be examined. A simple variation will be to perform this next to a rubbish bin, throwing away the cups as you pour the water from one to another. This prevents the spectators from asking to examine the cup.

ON STAGE

Shadow Pass

1. *Ink Thumb-Tip* (I01-SM)
 - a. Prepare starch under your index finger and a small bowl of tincture of iodine before performing.
 - b. During the performance, bite your finger and pretend to have drawn blood. This gives you an excuse to dip your finger into the bowl. Allow the blue ink to flow for a few moments.
 - c. Gently stir the solution to turn it uniformly blue.
2. *Confinement* (A18-EX)
 - a. Prior to the performance you should have prepared a piece of paper with the number and suit of a card written in Copper (II) Sulfate solution.
 - b. Ask for a volunteer from the audience and have the volunteer sign across the edge of the piece of paper using a normal marker or pen.
 - c. Place the piece of paper in the cardboard box and seal the box.
3. *Blemish* (A13-SM)
 - a. When the spectator is signing on the piece of paper, swap the bowl of tincture of iodine for an identical bowl containing the disappearing ink solution.
 - b. Force a card on the volunteer. The card should have a number and suit identical to that which was written on the piece of paper used in "*Confinement*".
 - c. Dip a small paintbrush into the disappearing ink solution and ask the spectator to write the number and suit of the card on another piece of paper.
 - d. Ask the volunteer to inform you to turn around when done. The volunteer will be unable to do so because the ink will disappear from the paper after a short while.
 - e. After a few attempts, inquire if the volunteer has any problems, hinting that there might be difficulty writing.
4. *Confinement* (A18-EX)
 - a. Assure the volunteer that everything is under control, and draw attention back to the box, emphasizing that it has been sealed all the time.
 - b. Open the box and remove the piece of paper with the volunteer's signature on it. The piece of paper will show the number and suit of the card that the volunteer chose. Show this first to the volunteer, then to the audience.

- c. Comment that the volunteer was unable to write anything on the piece of paper because all the ink was being transferred to the piece of paper in the box.

Nature's Will

1. *Melt* (I10-SP)
 - a. Talk about how nature has its way of ensuring that things are recycled and reused.
 - b. Prior to the performance you should have prepared Acetone in a Petri dish and arranged the dish such that it does not protrude out from the surface of your performance table.
 - c. Stack two Styrofoam cups together and pass them off as one; from a distance it will not be noticeable. Lap one cup and proceed to dissolve the other in Acetone.
 - d. Pull out the lapped cup from the bottom of the table and announce that once again, nature has made plans to recycle items.
2. *Bouncing Ball Production* (A19-EX)
 - a. Announce that the audience does not seem very convinced, and that you shall attempt to buy them over to your point.
 - b. Draw their attention over to a container where you mix two liquids. Announcing once again that with nature's help, things come from nothingness to transcend our world and produce a bouncing ball.
3. *Spectrum* (A23-SP)
 - a. Comment how nature itself is beautiful, yet not everyone has the chance to see its wonders.
 - b. From the pitcher, pour liquid into seven cups to show that the colours of liquids in the cups are different. This is the rainbow that comes after rainfall, itself a work of nature that cannot be replicated by man.
4. *Subzero* (B06-SP)
 - a. Everyone knows that if you place your hands into cold water after dipping them in hot water, your hands will still feel warm. This is one of nature's characteristics, but there is more than meets the eye.
 - b. Produce a sealed glass bottle containing water and add ice cubes to the cap of the bottle. The water will begin boiling, upon which you may ask if ice is truly cold, and boiling water is truly hot.
5. *Instant Ice* (I09-SM)
 - a. Swap the bottle from the previous demonstration for one containing supersaturated Sodium Acetate solution. This may be done under the

pretext of leaving the bottle to cool or drying the water caused by the melting of the ice cubes.

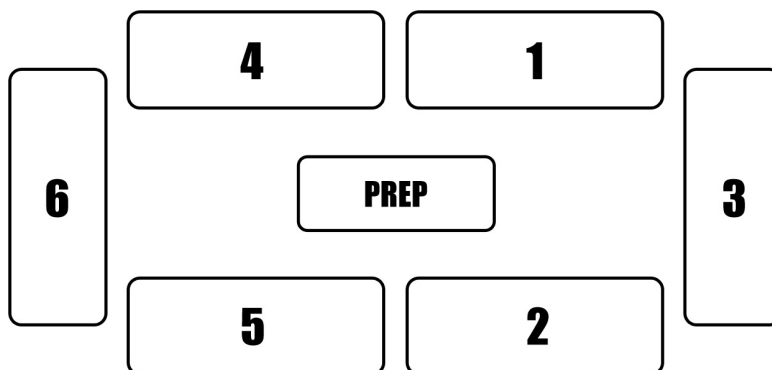
- b. Uncap the bottle and pour the solution onto a ceramic tile. The Sodium Acetate solution will crystallize onto the tile, forming a small block of ice.
 - c. From the perspective of the audience, what was just boiling has now frozen into ice in a split second. No patter is needed for this part of the performance, as your previous point has been proven.
6. *Sunset* (A26-SP)
- a. Another aspect of nature that mankind cannot predict or influence is the weather. There are times when the land is barren and the sky is overcast, yet there are times when snowflakes litter the ground and stars shine above us.
 - b. Turn on a digital projector and place the flask in front of the projector. Should you wish to show a video interlude as part of your performance, this would be the best time to do so.
 - c. Dim the lights and add Sodium Thiosulfate to the solution. The colour of the screen will go from white to orange, then red and finally black. This is how erratic day and night can be, but everything follows a rhythm, the rhythm of life.
7. *Boric Ester Flame* (I04-SP)
- a. Light a Boric ester flame and tell a story of campers who would gather round a campfire every night, telling stories of their adventures. These were people who appreciated nature, who understood the beauty it held in its diversity.
 - b. Maintain the silence for a while this point, allowing the patter to reach the audience.
8. *Snowstorm* (A20-SP)
- a. Extinguish the Boric Ester flame and place the saturated Benzoic acid solution over a strong white light source.
 - b. Solemnly, talk about the lights that shine in the cities every night. Snow falls in the night but we only see its work in the morning, and every snowflake is unique.
 - c. Blow into the solution, causing the Benzoic acid crystals to form.

AT AN EXHIBITION

Static Demonstrations

Table Setup

- a. Arrange six tables in the shape of a rectangle, with two tables forming the long side of the rectangle and one table forming the short side of the rectangle.



- b. In the middle of this rectangle, place a small table and distinctly label it as your preparation or wet work table. This ensures that visitors to your booth will not come into contact with any dangerous chemicals. In addition, have a member of your team be present at that table at all times, and place your preparation chemicals only on that table.
- c. Beautify the tables by attaching table skirting and laying table cloths. While this is optional it is always advantageous to do so if you have the materials. Table skirting allows you to place items under the table for easy access and a table cloth offers you a uniform background to work on.

Table 1: *Spectra II* (A09-SM)

- d. Prepare two to three sets of the Glucose/Sodium Hydroxide solution and place them in normal bottles.
- e. To these bottles, add Methylene Blue indicator to give blue or Resazurin Red to give red. Seal the bottles with Parafilm to ensure that they cannot be opened.
- f. Place the bottles on the table with simple instructions to "Shake till colour changes and observe".

Table 2: *Spectre* (A21-EX)

- g. Prepare two measuring cylinders containing the necessary chemicals for the demonstration. To one cylinder, add Bromothymol Blue indicator, and to the other add Phenolphthalein indicator.
- h. Place both measuring cylinders against a white background and allow the reaction to proceed.

Table 3: *Fluid Drag* (B01-SP)

- i. Prepare the Saline solution and the egg floating in the cylinder.
- j. Once in a while, pour in small quantities of vinegar into the cylinder and draw attention to the rising egg.
- k. Add in small amounts of aqueous ammonia, and occasionally change the egg when the outer layer of shell is observed to be dissolving.

Table 4: *Marshmallow* (I05-EX)

- l. String five to six marshmallows together with a piece of wire to form a humanoid shape. Alternatively, marshmallow figures may be used if they are available.
- m. Place these marshmallow figures in a vacuum bell jar and alternate the vacuum pumping action.
- n. The marshmallows will expand and contract. Occasionally replace the marshmallows for optimal results.

Table 5: *Mini Lava Lamp* (B02-EX)

- o. Prepare three to four bottles containing the mixture required for the lava lamps. For variation, different food colouring may be added to each of the lamps, producing a spectrum of colours.
- p. Add an Effervescent Tablet to start the reaction and seal the bottle with Parafilm to ensure they cannot be opened. Occasionally add another tablet to restart the reaction.

Table 6: *PK Liquid* (I03-EX)

- q. Prepare a few samples of ferrofluid in small Petri dishes. Cover these dishes and seal them with Parafilm to ensure that they cannot be opened.
- r. Place a few magnets on the table and include simple instructions to bring the magnets near the Petri dish and observe the results.

Hands-On Demonstrations

Table Setup

- a. Arrange three tables in a straight line with your preparation or wet work table at the back.

- b. All other arrangements remain similar to the Static Demonstration setup.

Table 1: *Solid Flow* (I07-EX)

- c. In small cups, separately prepare measured amounts of Borax and PVA glue in water. Also prepare food colouring in drop bottles.
- d. Invite members of the audience to add the Borax to PVA glue and their desired food colouring. Tell them to stir vigorously till the mixture solidifies, after which they may pick it up and pass it from hand to hand.
- e. Place the polymer gel in a small plastic bag and hand it out to them. The item is safe to be brought home but should not be consumed.

Table 2: *Amalgam* (B04-EX)

- f. Place two to three pans of milk on the table, with a variety of food colourings at the side.
- g. Invite members of the audience to drop in a few drops of food colouring of their choice onto the milk, and request that they wait while more colours are being added.
- h. When you deem that there are enough drops of colour, slowly add the detergent and draw your audiences' attention to the swirling colours.

Table 3: *Instant Snow* (I08-SM)

- i. Prepare a large measuring cylinder or glass column by the side of the table.
- j. Prepare small cups of Sodium Polyacrylate, pitchers of water and food colouring. Invite members of the audience to add food colouring to the Sodium Polyacrylate, then pour water into the cup. Tell them to observe what happens.
- k. Once they have seen the snow, invite them to contribute their snow creation to the measuring cylinder. Numerous people pouring artificial snow of various colours into the measuring cylinder will create a beautiful design of undulating colours, and can serve as a good gift to an important guest of an event. This also prevents the audience from taking the snow away from the booth.

e. RECOVERING FROM BLUNDERS

As a well-rehearsed magician, everything should flow smoothly during your performance, but there are times when things do not always go right. Something does not catch fire, a reaction takes too long to occur, or the colours just do not change. So what do you do when you blunder?

These are some of the effective methods to mitigate when unexpected events occur during a performance.

1. Change the Patter

To ensure maximum surprise, you should never tell your audience what to expect for the next part of the trick. However, this also serves as a way out for you if something goes wrong. If a chemical reaction fails to work because some of your chemicals got contaminated. Make a joke out of the demonstration and comment that it is strange why Chemistry does not work all the time. Tidy up that area and immediately move on to the next demonstration. It is crucial that you do not dwell on why the performance failed. If you move on, the audience will not even notice that the performance failed.

2. Plan B

Always have a backup plan ready. The backup plan may be a totally different demonstration or a fail-safe. For example, if you are doing an oscillating reaction and the colours do not change, it will not be too late to replace that bottle with another that you have on standby. Chemistry magic setups, especially big ones, are easily affected by environmental conditions. If you find that something goes wrong in the middle of your performance, use your patter to buy yourself some time to change focus. Another possible alternative is what magicians call "misdirection" – making the audience look on one hand while you do another thing altogether. If you were originally intending to have an ethanol flame burn through a piece of string but the flame did not light, quickly use a pair of scissors to cut the string. At that moment when you are presenting the demonstration the audience will be wowed by their own expectations and may not notice your actions.

3. Admitting your Failure

Murphy tends to visit even when all preparations are complete. Learn to recognize a situation in which the demonstration did not proceed well, and end off simply by acknowledging that it did not work and do another trick. Remember, the spectators want you to succeed, and they want to see your marvelous magic.