Experiment	Fire	Chemicals	Electricity	Short Description of the Activity	Safety Considerations	Preparation	Student Write Up?	Demo Manual	Website
Total Internal Reflection	no	no	no	A red or green laser beam is passed through a leaking bottle to demonstrate how light is bent by the water stream	no chemicals	only practice			
Smoke Rings	no	no	yes	A fog machine is used to fill a trash can with smoke and a smoke ring is generated by tapping the base of the trash can	no chemicals	only practice		p. 75, 79	
Seltzer Freeze	no	no	no	Club soda is cooled in an ice-salt bath and, when opened, the contents of the bottle instantly freeze	no chemicals (rock salt and ice)	only practice	yes	p. 157	
Alka Selzer Rockets	no	no	no	Students explore a chemical reaction--the reaction of Alka Selzer tablets with water and perform an experiment regarding the effect of the amount of alka selzer and water temperature on the rate of the reaction	no chemicals	only practice			http://www.stevespanglerscience.com/experiment/film-canister-roc
Make your own soft drink	no	no	no	Compressed carbon dioxide is admitted to a chilled water bottle to a pressure of approximately 40 - 50 psi resulting in dissolution of the gas in the water and carbonation of the drink	you will work with a compressed carbon dioxide tank	only practice			http://www.truetex.com/carbonation.htm
Magic Pitcher	no	yes	no	Solutions of phenolphthaline, dilute sodium hydroxide, and vinegar are mixed resulting in the appearance and disappearance of a pink color.	household ammonia, vinegar, phenolphthalein in ethanol	50 mL of 1% phenolphthalein in ethanol		p. 197	
Dry Ice Acidity Change	no	yes	no	Pieces of dry ice are added to a flask containing various pH indicators and sodium hydroxide resulting in color changes as the carbon dioxide causes the solution to gradually become more acidic.	0.1 M sodium hydroxide, crushed dry ice, 1% phenolphthalein and universal indicator	50 mL of 1% phenolphthalein in ethanol and universal indicator in water	yes	p. 205	
Traffic Light	no	yes	no	A mixture of glucose, potassium hydroxide, and indigo carmine indicator are mixed; as the flask is stirred color changes occur as a result of reduction of the indicator by the glucose followed by air-oxidation of the indicator. Same experiment can be conducted with methylene blue	Dextrose, potassium hydroxide, indigo carmine indicator, methylene blue	only practice	yes	p. 215	
Elephant Tooth Paste	no	yes	yes	Three concentrations of hydrogen peroxide (3%, 12%, and 30%) are mixed in a large graduated cylinder with liquid detergent and either yeast or sodium iodide to cause oxygen gas to be released. A column of foam exits the cylinder which resembles toothpaste on a giant scale.	3%, 12%, and 30% hydrogen peroxide, sodium iodide solution	1 L of 2 M sodium iodide solution	yes	p. 107	
Glowing Pickle	no	no	yes	A large pickle is placed across the electrodes of an isolation transformer resulting in the pickle glowing from sparks within the pickle.	high voltages	only practice	yes	p. 69	
Pig Lungs	no	no	no	Pig lungs are inflated and deflated using a hand pump and a balloon demonstration is provided as a comparison to the lungs.	no chemicals	only practice			
Muticolored Electrolysis	no	no	yes	A petri dish containing an acid-base indicator has electricity passed through it leading to swirls of color from one of the electrodes	universal indicator solution	25 mL universal indicator solution		p. 239	
Giant bubbles	no	no	no	Kids make various bubbles using speciality bubble solution mixtures. Includes standing in a large bubble.	glycerine	super bubble solution per websites	yes		
Boo Bubbles	no	no	yes	Bubbles are generated using carbon dioxide from dry ice leading to bubbles that one can hold using gloves the pop to form a white cloud	dry ice	only practice	yes		
Bed of Nails	no	no	no	A CI student volunteer lies down on a bed of nails with an apple between the nail bed and themselves; participants can attempt to pop a balloon on a mini-bed of nails.	no chemicals	only practice			
Mentos	no	no	no	Mentos candies are placed in a 2L soda bottle leading to a jet of soda being blasted out of a hole in the lid	no chemicals	pre-drilled soda bottle caps with "loads" of mentos on paperclips	yes	p. 159	
Liquid nitrogen effects: including ballon shrinkage, coldness and hardness, ping pong flong, supercold candy bars, and dragon's breath	no	no	no	Various activities including shrinking of long balloons, spinning of ping pong balls,and freezing candy bars	liquid nitrogen	only practice	yes	p. 228 - 231	
Liquid nitrogen Dippin Dots	no	no	yes	Liquid nitrogen is used to make homemade ice cream.	liquid nitrogen	2L soda bottles with a hole drilled in the lid; on the day before the Science Carnival you will need to prepare ice cream mixes in containers that can be brought to the Science Carnival site.			http://chemistry.about.com/od/icecreamprojects/a/Homemade-Dip
Critter Microscopy	no	no	yes	Mosquito larvae, other interesting micro-organisms are observed using a microscope	no chemicals	collect samples of pond water, mosquito larvae, prepared slides from Biology			
Rocks Rock!	no	no	yes	Various rocks are displayed along with their properties	no chemicals	only practice			
Dry ice crystal ball	no	no	yes	A bowl is filled with soapy water and dry ice is added leading to a large bubble forming that resembles a crystal ball	dry ice pellets	only practice	yes		http://www.stevespanglerscience.com/experiment/dry-ice-crystal-b
Its electrifying	no	no	yes	A van de Graaf generator and plasma globe are used to light neon bulbs and fluorescent light bulbs.	high voltages	only practice			
Adventures in Archaeology	no	no	yes	Students perform a dig for artifacts by sifting soil and analyzing what they found in the soil	no chemicals	only practice			
Math Fun	no	no	no	Mathematical curiousities	no chemicals	only practice			

Dr. Glow & Dr. Lumos	no	no	yes	Fluorescent dyes are displayed under a black light to show the different colors of light given off, a solution of TCPO (glow stick chemical) reacts with bleach, and luminol reacts with hydrogen peroxide	depending on the exact approach used, this activity will involve several fluorescent dyes [9,10-bis(phenylethynl)anthracene, 9,10-diphenylanthracene, rhodamine B, fluorescein] as well as luminol, sodium hydroxide, and bleach	solutions of fluorescent dyes, sodium hydroxide solution as per instructions	yes		
Haunted Suitcase	no	no	yes	A suitcase containing a spinning wheel (a gyroscope) is moved by students leading to the demonstration of the gyroscope effect.	no chemicals	only practice			
Feats of Strength/ PHSC 170	no	no	yes	Various physics activities related to strength and force conducted by the Physical Science class students	no chemicals	only practice			
Magnetic Floating Top	no	no	no	A magnetic top is spun above a magnet leading to a levitating top.	no chemicals	only practice			
Film canister pop	no	yes	no	Hair spray is sprayed into a film cannister containing a piezoelectric ignitor; on clicking of the ignitor, the lid pops off of the film cannister resulting in a "pop".	no chemicals	construction of the film cannister "poppers"			
Laserpointer Mazes	no	no	no	Mirrors are used to direct a laser pointer beam around obstacles on a table.	no chemicals	only practice	yes		
Colorful Gases	no	no	yes	Gas discharge tubes are excited using a high voltage source leading to different colors of light being given off	high voltages	only practice			
Physics of Sailing	no	no	yes	The physics behind sailing is demonstrated by the CI sailing team	no chemicals	construction of a trough for the sailboats, cutting out of polystyrene boats, cutting out of sails			
DNA extraction from bananas/ strawberries	no	yes	yes	DNA is extracted by blending a banana or strawberry and combining the mash with detergent and rubbing alcohol	95% ethanol	only practice			
Punch carbonation/ cauldron	no	no	no	Dry ice is added to punch leading to a bubbly cauldron of carbonated punch.	dry ice pieces	only practice			
Dark Knight Radar	no	no	no	Participants attempt to locate a Robin	no chemicals	only practice			
Science of Midway Games	no	no	no	Various midway carnival games are displayed and the science/ physics behind them is discussed	no chemicals	only practice			
Air-ball bowling	no	no	no	An air cannon is used to knock down plastic cup.	no chemicals	only practice			
Mechanical Pencil Lead Light Bulb	no	no	yes	Electricity is run through a pencil lead using a variable voltage/ current power supply and the effect of different gases in a glass chamber on the longevity of the light source is examined.	high voltages	creation of light bulb assembly			http://www.stevespanglerscience.com/experiment/build-a-light-bul
Polymer Snow	no	no	no	Kids examine the expansion of a water-swelling polymer, polyacrylic acid, in the presence of water resulting in artificial "snow" and the effect of added water and salt on the snow.	polyacrylate	only practice	yes		
Make Your Own Stress Ball/ Juggling Ball	no	no	no	Kids fill a balloon with sand using a vacuum chamber to inflate the balloon/ demonstrating how the lungs work.	no chemicals	a substantial amount of play sand needs to be dried in an oven			
Glue Gak	no	yes	no	White glue is mixed with laundry borax leading to the formation of gak	household borax	a solution of borax needs to be prepared (saturated)	yes	p. 244 - 245	
Machines and Elements	no	yes	yes	Sterling Engine, Crooke's tube, Hoffmann apparatus, and a small collection of element samples	no chemicals	only practice			
PVA Slime	no	yes	no	A solution of polyvinyl alcohol in water is mixed with laundry borax leading to the formation of slime	polyvinyl alcohol, household borax	Need to prepare 6 x 4L of 4% solution of polyvinyl alcohol, household borax	yes	p. 247	
Glow powder drawings	no	no	yes	Kids use glue to create a drawing which is then sprinkled with glow powder; the resulting art created will glow in the dark.	commercial glow powder (doped zinc sulfide)	glow powder needs to be placed in salt/ pepper shakers, black construction paper needs to be cut on a paper cutter	yes		
Screaming Balloon/ Helium balloons	no	no	no	A hex nut is placed in a balloon which leads to a loud noise as the balloon is twirled.	no chemicals	only practice			
Sodium Alginate Gel Beads and Worms	no	yes	no	A solution of sodium alginate is added to calcium ions resulting in beads or worms, depending on the mode of mixture of the two solutions	commercial solution of 2% sodium alginate, 2% calcium chloride, 2% sodium chloride	solutions of sodium alginate and calcium chloride need to be prepared. For the molecular gastronomy activity, a set of food grade solutions need to be prepared.			http://www.cmu.edu/gelfand/k12-teachers/polymers/polymer-arch
Tye-dye magic markers	no	no	no	Water-soluble magic markers are used to draw on filter paper and then the dye components separate as the filter paper is placed in a glass containing water/ as the water wicks up the filter paper.	commercial rubbing alcohol	only practice			http://www.teachervision.fen.com/chemistry/lesson-plan/63857.htr
Make Your Own Lotion	no	yes	yes	Students combine stearic acid, glycerine, fragrances, and cetyl alcohol to make their own lotion	stearic acid, glycerol, cetyl alcohol, triethanolamine, ethanol, lanolin	only practice			
Prints of the Past	no	no	no	Kids get to make their own cast of a fossil mold using plaster	no chemicals	only practice			
Roving with Robotics	no	no	no	Kids interact with a LegoMindstorms robot	no chemicals	only practice			
CSI @ CI	no	no	yes	Various activities related to crime scenes including making giant glowing fingerprint helium balloons and observing fake blood stains using luminol	compressed gas cylinder of helium	Luminol solution in spray bottles prepared the day before, cardboard squares, iron sulfate or iron chloride solution, cut-out paper squares			
Dissecting a Cow Eyeball/ Sheep Heart	no	no	yes	Dissection of sheep/ cow eyeballs	no chemicals	only practice	yes		
Marshmallow Cannon	no	no	yes	Air compressors are used to compress air in a marshmallow shooters and students examine the effect of the angle of trajectory and air pressure on the distance that the marshmallow is shot	no chemicals	only practice			
Rocket Launchers	no	no	yes	Air compressors are used to pressurize a PVC manifold and used to launch a student-built rocket made from cardboard	no chemicals	squares of cardboard cut-out for rocket tubes, nose cone half-circles cut-out	yes (article)		
Telescope	no	no	no	Telescope focused on Jupiter and the moon	no chemicals	only practice			

Spinning Can (Hero's engine)	yes	no	no	A soda can partially filled with water and having a hole on one side is heated over a butane torch resulting in a stream of steam vapor exiting through the hole and causing the can to spin.	no chemicals, flames	create the spinning can assembly		p. 177	
Colored Flames	yes	yes	no	Various metal salts are dissolved in ethanol and sprayed into the flame of a butane torch	methanol, strontium chloride, sodium chloride, potassium chloride, copper nitrate, copper chloride, lithium chloride, magnesium sulfate, flames	prepare methanol/ water solutions of strontium chloride, sodium chloride, potassium chloride, copper nitrate, copper chloride, lithium chloride, and magnesium sulfate	yes	p. 61	
Alcohol Jug Jet	yes	yes	yes(?)	Isopropanol is placed in a large polycarbonate water bottle and ignited with a spark source leading to a jet of flames exiting the bottle and propelling a Nerf ball out of the mouth of the bottle.	methanol, flames	only practice, locate a ball that will fit into the mouth of the water bottle and equip with a gas grill ignitor (provided)		p. 253	
Egg in a Bottle	yes	yes	yes	A hard-boiled egg is placed over the opening of a flash into which a flaming, isopropanol soaked cotton ball is dropped; as the flame extinguishes a vacuum is generated that pulls the egg into the flask. Heating of the flask with a hair dryer causes the egg to come back out of the flask	rubbing alcohol, flames	hard boil 4 dozen eggs		p. 175	
Money burning	yes	yes	no	A dollar bill is soaked in rubbing alcohol containing water and set on fire to demonstrate that the bill does not burn	rubbing alcohol, flames	only practice	yes	p. 15	
Amazing Feats of Fire	yes	no	no	A water-filled balloon and a cup filled with water are heated to boiling over a butane torch	no chemicals, flames	set-up ring stand for boiling water in a cup and boiling a water balloon, fill water balloons		p. 4	http://www.education.com/science-fair/article/boiling-water-paper
Ruben's Tube	yes	no	no	A metal tube is filled with propane gas and music is played in one end leading to the formation of a standing wave of flame across the tube.	flames	work on Ruben's tube assembly, need to have sound source that does not put out fire		p. 277	
Gold and Silver Pennies	yes	yes	yes	A penny is soaked in a mixture of zinc powder and sodium hydroxide and then heated on a hot plate leading to silver and gold pennies	zinc powder, sodium hydroxide, flames	prepare 500 mL of sodium hydroxide			http://www.digitaldapp.org/demos/documents/goldandsilverpennie
Acetylene Rockets	yes	yes	yes (?)	A cup is placed over a piece of calcium carbide in a water trough and a spark source/ flame is used to ignite the acetylene gas in the cup causing the cup to launch into the air	calcium carbide, acetylene, flames	calcium carbide small pieces needed (prepared on-site with a hammer)		p. 133	
Gummy Bear Sacrifice	yes	yes	no	Potassium chlorate is melted in a large test tube using butane torch and a gummy bear is added; a dramatic release of purple flames, heat, and smoke occurs along with a roar of sound	potassium chlorate, flames	ring stand set-up		p. 32	
Sugar Pyrotechnics	yes	yes	no	A mixture of sugar and potassium chlorate is placed on a fireproof mat and a drop of concentrated sulfuric acid is added to the mixture resulting in dramatic flames and smoke	potassium chlorate, concentrated sulfuric acid	dropper bottle with sulfuric acid		p. 37	
Hydrogen Balloon Explosion	yes	yes	yes	A balloon is filled with hydrogen gas and exploded with a hot filament/ flame leading to a loud bang	sodium hydroxide, hydrogen gas, flames, explosion	2 L of 1 M sodium hydroxide solution			
Butane Mamba	yes	yes	no	Butane gas is bubbled through a soap solution resulting in flammable bubbles that are ignited on the demonstrator's hands	flames	only practice		p. 182	
Dry Ice/ Magnesium Lantern	yes	yes	no	Magnesium turnings are ignited between two blocks of dry ice resulting in a dramatic display of light and smoke	magnesium metal turnings, dry ice blocks, flames	only practice		p. 226	
Eerie Green Glow	yes	yes	no	Boric acid and methanol react in the presence of sulfuric acid resulting in trimethylborate which burns with a green flame	boric acid, concentrated sulfuric acid, methanol, flames	only practice		p. 237	
Simulated Grain Silo Explosion	yes	no	no	Lycopodium powder or coffee creamer are ignited in a large coffee can resulting in popping of the lid off of the coffee can	no chemicals, flames	set-up needs to be "just right" to ensure reproducibility of pop	yes	p. 259	
Self-Carving Pumpkin	yes	yes	yes	A carved pumpkin (removed face pieces still intact) is filled with hydrogen gas and a spark source/ flame causes a minor explosion that propels the face pieces out of the pumpkin	calcium carbide, acetylene, flames	approx. 15 pumpkins need to be carved with faces and pieces retained on the day of the Science Carnival, set-up for ensuring that "pop" blows out the face pieces with light glowing through the open holes			
Popcorn, Cotton Candy	no	no	yes	Food court items	no chemicals	show up			