



Mad Science Workshops feature hands-on, inquiry-based learning methodology, standards-based pre and post assessment tools, teacher resource packages and take home cards with at-home family science experiments. We provide all class materials and each student receives a take-home project that relates directly to each topic. Workshops are correlated to Next Generation Science Standards and Maine State Science Standards.

## PHYSICAL SCIENCES

CLASS	DESCRIPTION	GRADE
<b>Che-mystery!</b>	Che-mystery introduces children to chemistry with mysterious mixtures and surprising solutions. They learn that physical changes are different from chemical reactions because chemical reactions create new products. Crystals, colloid suspensions, solutions, and indicators are all part of this fun, information-packed class.	This class is easily adapted for K-5 <sup>th</sup> grade. <b>K-2:</b> More emphasis on lab safety and tools. <b>3-5<sup>th</sup>:</b> More in depth exploration of physical and chemical changes.
<b>Energy Burst!</b>	Children are introduced to the law of conservation of energy. Several energy forms are explored with a focus on potential (stored) energy and kinetic (motion) energy. Children do hands-on experiments to learn that elastic objects store potential energy when stressed and release kinetic energy when returned to their original shape. Children lift balls against the force of gravity to learn about gravitational potential energy. They build and take home a catapult that stores energy in a wound string.	<b>K-2<sup>nd</sup>:</b> Most exploration pertains to the energy of motion.  <b>3<sup>rd</sup>-5<sup>th</sup>:</b> More emphasis placed on understanding of the Law of Conservation of Energy and other forms of energy conversion.
<b>Fundamental Forces</b>	Fun-damental Forces introduces children to the pushes and pulls that make the universe tick. Gravity, inertia, and centripetal force are some key concepts they discover along the way. Some exciting, hands-on investigations into forces include the bike wheel gyroscope, a coin-spinning vortex, and the balloon centrifuge.	Concepts adapted for K-5 <sup>th</sup> Grade. Activities vary depending on grade.

<p><b>Fantastic Flyers</b></p>	<p>Students learn that lift, thrust, gravity, and drag affect an aircraft's flight. Children construct various paper airplanes to observe these forces at work. The Delta Dart, Rotor Kite and Twirling Dirigible are a few designs children fold, fling, and drop. Adjusting the Stunt Flier's control surfaces allows children to send the planes flying in different directions. Children make, test, and take home a rubber band powered plane that cuts through air with ease.</p>	<p><b>K-2<sup>nd</sup></b>: More focus on the practical experiences and basic principles of aerodynamics and an introduction to Bernoulli's Principle.</p> <p><b>3<sup>rd</sup>-6<sup>th</sup></b>: Children will learn more about theoretical knowledge in aerodynamics and experiment with a wind tunnel.</p>
<p><b>Under Pressure</b></p>	<p>Under Pressure introduces children to the exciting science of air pressure and a host of associated scientific concepts including aerodynamics, the science of flight, thermodynamics, and Bernoulli's principle. Children learn that air is all around us, and vital to life on Earth.</p>	<p><b>K-2<sup>nd</sup></b>: Please refer to the <b>"Where's the Air"</b> Program for younger learners.</p> <p><b>3<sup>rd</sup>-6<sup>th</sup></b>: Great emphasis placed on the concept of atmospheric pressure and aerodynamics.</p>
<p><b>Where's the Air?</b></p>	<p>This dynamic class explores the concepts of air pressure and buoyancy through hands-on experimentation and thought-provoking demonstrations. Air is all around us, it has mass and it takes up space. Discover how Bernoulli's principle can keep things in the air and how we can use air pressure to move things.</p>	<p>Recommended for K-2<sup>nd</sup> Grade.</p>
<p><b>Planets and Moons</b></p> <p><i>***Developed in Partnership with NASA</i></p>	<p>Students set off on a voyage to discover the Solar System. Students impersonate the planets to compare their sizes and distances from the Sun, recreate a solar and lunar eclipse, and become particles on a voyage into a planet's core. Children learn about the forces needed to escape gravity, study moon rocks and view the planets through micro-slides, and build a Mad Science Gravity Assisted Launcher set to send a metal sphere across a model solar system.</p>	<p><b>K-2<sup>nd</sup></b>: Children use models and scaling in order to understand the relative size and distance of objects in our Solar System.</p> <p><b>3-5<sup>th</sup></b>: More in depth explorations using planetariums to learn about Earth, sun, planet and lunar relationships.</p>
<p><b>Sun and Stars</b></p> <p><i>***Developed in Partnership with NASA</i></p>	<p>This program introduces children to stars (including our own) and the galaxies they form. Children learn about the facts of our sun and examine various stellar life cycles, view a celestial globe, and observe the birth of a star through a micro-slide viewer. They construct a three dimensional constellation to understand the location of stars in our and other galaxies. Children build a chart on a Mad Science Cosmic Disk to encourage their stargazing studies.</p>	<p>Concepts adapted to K-5<sup>th</sup> grade levels.</p>
<p><b>Space Phenomena</b></p> <p><i>***Developed in Partnership</i></p>	<p>Students will explore the phenomenal events that take place in the night sky. Children will create their own impact craters, and observe model meteors fall through a model atmosphere. Children investigate actual meteorite samples and watch a model comet form right before their eyes using the power of dry ice. They learn the physics of telescopes and construct</p>	<p><b>K-3<sup>rd</sup></b>: Children will focus on asteroid impacts and meteors, learn to differentiate the lights of airplanes from those of satellites,</p> <p><b>4<sup>th</sup>-6<sup>th</sup></b>: Children will explore</p>

<b>with NASA</b>	a Mad Science Space Telescope model to take home. ***This class uses Dry Ice. All Safety equipment and supplies are provided, as well as an elaborate safety talk.	the composition and nature of comets using Dry Ice.
<b>Mix It Up</b>	Children identify mixtures in bottles as solutions, suspensions, or physical mixtures. The instructor demonstrates the difference in molecular movement between hot and cold water and uses a pH indicator to show an acid-base-buffering Children separate mixtures with mechanical and chemical techniques. They take home a Super Sorter kit to continue collecting their chemical knowledge.	<b>K-2:</b> Focus mostly on the difference between solutions and mixtures and techniques for making and separating mixtures.  <b>3-5<sup>th</sup>:</b> More of a focus on discrepant events involving immiscible liquids and beads with different densities and be tasked with a mixture separation challenge.
<b>Chem in a Flash</b>	This class introduces the factors which determine chemical rates of reaction. Several fields of chemistry will be presented, and students will explore the many ways in which different chemical processes can be sped up through the use of catalysts. The concepts demonstrated in this class will encourage students to link experimental factors with a chemical rate of reaction. Students receive a Take-Home Action Flask kit to perform more experiments.	Adapted for entire K-5 <sup>th</sup> grade levels. 4 <sup>th</sup> and 5 <sup>th</sup> grades will go investigate in greater depth the concepts of oxidation, precipitation, and electrolysis.
<b>pH Phactor</b>	Children are introduced to the concept of pH, acids, and bases through a series of engaging, inquiry-based experiments and exciting demonstrations. The pH Phactors <i>hydrogen</i> and <i>hydroxide</i> give a colorful introduction, and the Phantastic pH test is applied to common household chemicals. These concepts are applied using household items to improve children's understanding of the nature and purpose of the chemicals they often encounter. The Phestival ends with a Stopper-Popper reaction!	Concepts adapted for k-5 <sup>th</sup> grade levels.
<b>The Glow Show</b>	This class concentrates on how we perceive light and its effect on objects. This class introduces children to the luminescent properties of natural and synthetic materials. These concepts will be presented through a hands-on exploration of household objects, paper products, and earth minerals. The children will be given a brief history of fluorescence followed by a demonstration of chemiluminescence, the chemical aspect of luminescence. This program wraps up with a thought-provoking discussion and an activity on the applications of the science of light.	Concepts adapted for K-5 <sup>th</sup> Grades.
<b>Harnessing Heat</b>	This class introduces children to the physic facts on heat. Children learn how molecules move at different temperatures and how thermometers work. The	<b>K-2<sup>nd</sup>:</b> More focus on concept of Heat Energy, a form of energy with a very concrete

	<p>instructor uses various tools like a heat gun and thawing blocks to demonstrate how we use temperature sensitive equipment in our everyday lives. A series of interactive heat-induced experiments show how the hot and cold we feel is relative. Children explore materials that transfer heat at different rates. The Heat Sheet is a temperature-sensitive card that children take home to extend their learning experience.</p>	<p>manifestation.</p> <p><b>3<sup>rd</sup>-6<sup>th</sup>:</b> More in depth exploration of thermodynamics and experiments pertaining to the thermal expansion of solids.</p>
<p><b>Lights... Color... Action!</b></p>	<p>In this class, children enter the world of light and color. Exciting experiments on white light including color-wheel blending and prism-splitting spectrums introduce Newton's color theory concepts. Children learn the differences between mixing colored light and mixing colored paint. Activities involving spectrosopes, ultraviolet light, and chromatography provide entertaining lessons on scientific techniques used to study the physics of light. Children build Technicolor Blenders to demonstrate Newton's color wheel at home.</p>	<p><b>K-2<sup>nd</sup>:</b> More focused on the 3 basics ways to control light.</p> <p><b>3<sup>rd</sup>-6<sup>th</sup>:</b> More emphasis on the electromagnetic spectrum, diffraction, refraction, and light frequencies.</p> <p><i>Laser Light programing available.</i></p>
<p><b>Moving Motion</b></p>	<p>Moving Motion introduces children to Sir Isaac Newton's three laws of motion. Performing hands-on experiments helps them learn that objects tend to stay in motion or remain at rest unless met by an unbalanced force. Children investigate and learn that objects with more mass require more force to move. They learn that for every action force there is an equal and opposite reaction force through a variety of volunteered powered demonstrations. Children take home a balloon-powered spinning device to demonstrate Newton's third law of motion.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades.</p> <p><i>Suggested as a 1 ½ hour program, but can be adapted for any length of time.</i></p>
<p><b>Mischievous Magnets</b></p>	<p>What makes metal magnetic? What shapes do magnetic fields invisibly form around different shaped magnets? Can compasses really help you to find your way? Discover the answers to these and many more questions about magnets and their fields.</p>	<p>Recommended for 3<sup>rd</sup>-5<sup>th</sup> grades.</p>
<p><b>Magnetic Magic</b></p>	<p>This class provides the basic physical principles governing magnetism. Children learn how and why magnets behave in such ways. They learn how to create magnets and how magnetism is lost. Children use compasses to gain a better understanding of how humans benefit from the Earth's magnetic force. Hands-on experimenting— from swinging compasses to motorized devices allows children to explore the role of magnetism in our lives.</p>	<p>Concepts adapted for grades 2nd-5<sup>th</sup>. Focuses more on electro-magnetism and magnetic fields.</p>
<p><b>Magnificent Magnets</b></p>	<p>This workshop provides an opportunity for younger students to explore the properties of magnets through a series of hands on activities. The students will learn about attractive and repulsive magnetic forces and discover what magnetic poles are through inquiry based instructional methods. Discover the invisible fields surrounding magnets with our iron fillings.</p>	<p>This is specifically design for K-2<sup>nd</sup> grade and provides and excellent introduction to the fundamentals of magnetism.</p>

<p><b>Slippery Science</b></p>	<p>This class demystifies one of the most beneficial molecules known to humankind...Polymers! These relatively complex chemistry concepts are introduced to elementary school-age children in tactile, visually-engaging experiments. Students create cross-linked polymers based on their observations of the properties of polymers and cross-linking agents. Students will learn about slime and its basic ingredients in a series of hands-on activities. <i>Polymer</i> paper clips and <i>cross-linking</i> magnetic marbles will help to examine the key components of slime.</p>	<p>Recommend for grades K-2<sup>nd</sup>.</p>
<p><b>Playing with Polymers</b></p>	<p>This workshop acts as a primer to basic polymer chemistry. It serves as an excellent vehicle for the introduction of the physical and chemical properties of matter. In addition, students will explore the plethora of polymers that play an integral role in our daily lives and they will begin to understand the role that chemistry plays in creating these products and their applications. Inquiry based teaching methods will be used to present the topic in an engaging, age appropriate manner.</p>	<p>Recommend for 3rd-5th grade.</p>
<p><b>Sound Basics</b></p>	<p>This workshop is an introduction to the basics of sound. Students will explore how sound travels through the air, how different sounds can be produced and how our ears help us hear sound. Hands-on activities and demonstrations will allow students in grades K-2 to discover how they can make different sounds and how vibrations produce sound.</p>	<p>Recommended for K-1st grades.</p>
<p><b>Sonic Sounds</b></p>	<p>Volunteers capture the characteristics of sound concepts and sound waves by role-playing molecules to demonstrate sound wave motion. Children participate in producing and identifying acoustic sounds from a variety of materials. Electronic distortions link shifting frequencies to voice alterations. Children bring home the Sonic Horn resonance chamber.</p>	<p>Recommended for grades K-5th</p>
<p><b>Good Vibrations</b></p>	<p>This workshop introduces students to physics of sound transmission and creation. Concepts like vibration, frequency (pitch), sound waves, and the transmission of sound waves through a liquid, solid, gas and even a vacuum will all be addressed. Students will learn about simple musical instruments and how they produce different notes, and they will have the opportunity to build their own instrument to take home.</p>	<p>Recommended for grades 3rd-5th</p>
<p><b>Junior Reactors</b></p>	<p>Students are introduced to the concepts of <i>atoms</i> and <i>reactions</i>! A demonstration of the differences between physical and chemical reactions is followed by a hands-on series of experiments. The children can create model molecules and use them to follow the atomic rearrangements that occur in a chemical reaction. All Students will perform experiments and</p>	<p>This class is adapted for all age groups and provides a basic lesson on the atomic make-up of matter. However, "<b>Matter of Fact</b>" is recommended for Grades 3<sup>rd</sup>-6<sup>th</sup>.</p>

	analyze their results to differentiate between the chemical and physical changes that may occur in a reaction.	
<b>Matter of Fact</b>	Explore molecules and how they are held together. See the dramatic differences between physical and chemical changes as you mix up a batch of your very own Mad Science Putty to take home.	Recommend for grades 3 <sup>rd</sup> -6 <sup>th</sup> .  *** For an introduction to molecules & states of matter for younger groups, please refer to "Junior Reactors" or "Slippery Science."
<b>Current Events</b>	This electrifying class teaches the fundamentals of current electricity. Children explore electrons and cooperate to create real series and parallel circuits. A bursting balloon illustrates how a fuse works, and children test their knowledge of what conducts with a conductivity tester. Newfound expertise helps them decipher the hidden connections in an inference box. At the end of the class, children build and take home their very own Circuit Maze to learn about circuits.	Concepts adapted for all K-5 <sup>th</sup> grade levels and mostly focuses on concepts of current electricity.  *Can be extended into an hour and a half long class for older grades for a more complex investigation of circuits.
<b>Electricity</b>	Excite some electrons as you construct some serious circuits during this program all about electricity. Test various materials for conductivity with space-age plasma balls. Finally, create and play an electronic game.	Recommend for Grades 3 <sup>rd</sup> -6 <sup>th</sup> .  Differs from "Current Events" due to more complex investigations of Electrons, Atoms, & electric fields.
<b>Kitchen Chemistry</b>	Children are introduced to the differences between chemical and physical reactions. The instructor demonstrates how yeast feeds on sugars to produce a gas-filled balloon. The children test food samples for starch and protein and learn that certain foods help us grow, develop, and function. They familiarize with digestion—the process that occurs after they eat. The hands-on, clear digestive-track model extends this concept at home!	Concepts adapted for K-5 <sup>th</sup> Grades. Activities vary depending on grade.
<b>Optical Illusions</b>	This class uses engaging demonstrations and activities to introduce children to the concepts of refraction, the science of optics, and the biology associated with sight. The instructor uses a wide variety of optical illusions like the mirror mirage, twisting copper coils, and convex and concave mirrors to demonstrate how physics can trick our eyes. Children use erasable markers to create a series of laminated paper illusions and explore the reflections of various mirror forms. The children build and take home a Periscope.	Concepts adapted for K-4 <sup>th</sup> Grades. Activities vary depending on grade.
<b>Dry Ice Capades</b>	Children will understand the concept of matter in its three states through visual and tactile experiences. They will learn both how and why matter changes between the different states and develop a good understanding of matter's elementary physical principles. Children will be able to relate the concept of matter to their world. They will receive the Take-	Concepts adapted for K-5 <sup>th</sup> Grades. Activities vary depending on grade.

	Home Thermocolor Cup and Home Lab to continue experimenting with the states of matter.	
<p style="text-align: center;"><b>The Scientific Method</b></p>	<p>This workshop introduces students to the common methodology used by scientists to formulate questions, make predictions, develop and perform experiments, collect and analyze data and draw conclusion. Students will be presented with a problem and asked to develop their own ideas to formulate a solution, make predictions, and test their solution. The goal is for all students to understand that when investigating scientifically, one should consider all the things that could change as variables, change only one variable and measure the response relative to the controls. Students will also discuss the implications of science in society, and investigate how their conclusions could impact the world around them.</p>	<p>Recommended for 3<sup>rd</sup>-6<sup>th</sup> Grades.</p> <p>*This class has several topics to choose from in Chemistry or Physics. We can tailor it to your curriculum.</p> <p>*This is only offered as a 1 <math>\frac{1}{2}</math> hour class.</p>

# EARTH SCIENCES

<b>CLASS</b>	<b>DESCRIPTION</b>	<b>GRADE VARIATION</b>
<b>Earthworks</b>	Children dig-in to Earth Science! Children are introduced to the science of geology. They examine three different rock types and learn how and where they formed. Children investigate tectonic plates and learn how their movements cause stress on the Earth. They discover that these movements can cause mountains to form, earthquakes to occur, and volcanoes to erupt. The children make and take home a sedimentator. It reinforces the concept of sedimentary rock formation learned in class.	Concepts adapted for K-5 <sup>th</sup> grade. Activities vary depending on grade.  Can be extended into an hour and half long program for older grades due to the expansive curriculum available.
<b>Black and Blue Oceans</b>	This workshop introduces students to environmental issues relating to our water system. Students will devise and test oil spill techniques in a mock oil spill and learn all about the pollution that plagues the oceans.	Concepts adapted for K-5 <sup>th</sup> grade. Activities vary depending on grade.
<b>Mineral Mania</b>	This workshop provides students with an introduction to geology, including an understanding of the geological formation processes, classification systems, identification methods, and physical properties of rocks and minerals. Recreate the process of rock formation and devise ways to identify and classify rocks and minerals. Experience the thrill of panning for gems; the gems you find, you can take home for further study and investigation.	Recommended for grades 3 <sup>rd</sup> -6 <sup>th</sup> . But has been adapted for 1 <sup>st</sup> and 2 <sup>nd</sup> grade.
<b>Wacky Water</b>	Wacky Water introduces children to the properties of water. Children explore this fascinating fluid's many facets including density, water as the universal solvent, water pollution, and wave motion. Water is a remarkable substance. It covers more than three quarters of Earth's surface—and no life on Earth could survive without it. Yet, besides water's two other states (steam and ice), children know little about its other properties.	K-2 <sup>nd</sup> : Focus more on solvency and surface tension.  3 <sup>rd</sup> -5 <sup>th</sup> : More in depth investigations into density.
<b>Life in the Sea</b>	Life in the Sea introduces children to the diverse wealth of life beneath the ocean's waves. Children learn to distinguish fish from invertebrates, and explore some of the adaptations sea creatures have developed for survival. Real shark and whale tooth replicas let children get hands-on with marine biology. Group games help them explore the concepts of	Concepts adapted for K-5 <sup>th</sup> grade. Activities vary depending on grade.

	<p>food webs and sustainable fishing practices. They also learn some things they can do to help protect ocean creatures and habitats. The anaglyph ocean images and puzzle they take home will reinforce their learning.</p>	
<p><b>Earth Awareness</b></p>	<p>How are we hurting Mother Earth? Discover how science will help us protect our planet. Children will understand the basics of water pollution, acid rain, and the benefits of solar energy. Children experiment with many types of alternative energies and learn about the interconnections that exist between all the living things in ecosystems, including human beings.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<p><b>Watts-Up</b></p>	<p>Make indoor lightning and conduct hair-raising experiments with our electro-static generator. Children discover an electric charge's basic properties, learn to distinguish between static electricity and electrical current, and explore the science behind these phenomena. Hands-on activities provide a tactile lesson in charging and discharging objects with static electricity. Children will be able to relate a newfound understanding of lightning and static-electric shocks—that may have previously been confusing or even frightening—to their daily lives.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<p><b>The Dirt on Garbage</b></p>	<p>This workshop was created for Earth Day programs in schools. It is an introduction to improving the state of the environment through waste reduction by exploring the concepts of reduce, reuse and recycle. Hands-on activities and interactive demonstrations will illustrate to students their role in improving the state of the planet. Children will build models of landfills to learn the anatomy and explore the differing rates of decomposition.</p>	<p>Concepts adapted for 2-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<p><b>Decomposers</b></p>	<p>This workshop will allow students to gain an understanding of the concept of decomposition. They will learn its vital role in the food chain and in our environment. In addition, students are introduced to a variety of different decomposers both plant and animal. Through hands on activities and inquiry based teaching methods students will develop their scientific skills while learning all about worms and the process of decomposition.</p>	<p>Recommended for K-2<sup>nd</sup> Grade.</p>
<p><b>Bugs!</b></p>	<p>Children are introduced to the world of</p>	<p>Concepts adapted for K-5<sup>th</sup></p>

	<p>entomology. Examining real specimens and models help children familiarize themselves with insect anatomy. They discover that insects have specific body parts that set them apart from other arthropods. An insect habitat match-up helps children understand how insects adapt to their environment. They learn how insects defend themselves and pollinate plants. Children see from an insect's point of view with an interchangeable lens viewer to take home.</p>	<p>Grades. Activities vary depending on grade.</p>
<p><b>Atmosphere and Beyond</b></p> <p><i>***Developed in Partnership with NASA</i></p>	<p>In this Earth-science-focused program, children gain an understanding of the importance of the atmosphere for life on Earth, and compare the composition of Earth's atmosphere with those of other planets in the solar system. They learn what it takes to make a planet viable for life as we know it, and explore the effects of atmospheric particles on the color of sunsets and rainbows. Finally, they have a chance to build a Mad Science Meteorological Station to monitor the weather patterns caused by the interaction of Earth's atmosphere and the Sun's energy.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<p><b>Walloping Weather</b></p>	<p>Children conduct hands-on experiments to understand how and why weather occurs. They find out that seasons change as the Earth tilts toward and away from the sun. Children learn that air affects weather. They perform experiments to prove that air has mass and takes up space. After learning that water in the air affects the weather, children recreate the water cycle and mimic a rain cloud. They try out meteorology measurement tools and act like weather reporters. They make and take home a color-changing ultraviolet light detector.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>

# LIFE SCIENCE

CLASS	DESCRIPTION	GRADE VARIATION
<p><b>All About Animals</b></p>	<p>All About Animals teaches children about the incredible, diverse life in the animal kingdom. Children learn how animals are adapted to their different habitats through specialized feet, fur, and feathers. Real tooth and claw replicas provide hands-on experience with the science of zoology. Activities about classification, camouflage, and animal life cycles introduce the diversity of animals on earth. Children step into the shoes of a naturalist as they create their own casts of animal tracks to take home.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<p><b>Body Basics</b></p>	<p>Study the science of your insides by learning about the major systems of the human body. Learn about how your food is digested, how your blood flows through your body and how your brain controls all of these parts.</p>	<p>Recommend for K-2<sup>nd</sup> Grade.</p>
<p><b>Cells</b></p>	<p>This hands-on workshop provides students with an introduction to cell structure, including an understanding that cells are the building blocks of all living things, basic cell process and cell division.</p>	<p>Recommended for grades 3<sup>rd</sup>-6<sup>th</sup>.</p>
<p><b>Introduction to Microscopy</b></p>	<p>Children learn that microscopes are instruments designed to produce magnified visual or photographic images of objects too small to be seen with the naked eye.</p>	<p>Recommended for grades K-1<sup>st</sup>.</p>
<p><b>Labworks</b></p>	<p>This program introduces the basic tools and techniques that scientists use in the laboratory. The students will develop their scientific vocabulary and fine-motor skills as they learn to manipulate instruments scientists have created for lab work. As the instructor demonstrates more complex experiments, students will also learn to make a hypothesis based on their observations and techniques learned during the class.<sup>3</sup></p>	<p>Recommended for grades K-2<sup>nd</sup>.</p>
<p><b>Tantalizing Taste</b></p>	<p>This workshop is an excellent introduction to the sense of taste and smell. Children use tools such as magnifying glasses and mirrors to compare the parts of their tongues with models. Children count the taste buds on their tongues to learn about taste sensitivity. The instructor demonstrates the sugar content in</p>	<p>Recommended for grades K-4<sup>th</sup>.</p>

	popular drinks and leads a discussion about taste changes as we grow older. A flavorful experiment introduces children to scientific protocol to examine extracted samples in test tubes. Children observe carbonation and taste test cola creations.	
<b>Photosynthesis</b>	This workshop provides students with an introduction to photosynthesis, including an understanding of the chemical processes at work in the plant, plant respiration, and the role of plants in food webs.	Recommended for 3 <sup>rd</sup> -6 <sup>th</sup> Grades.
<b>Inner Workings</b>	This workshop will take an in-depth look at two of our organ systems: what they look like and how they operate. Students will learn to locate, name and orient the organs that make up these two systems and discuss how they interact. Students will examine the digestive tract and develop an appreciation for its length and complexity. Students will have the opportunity to measure their own blood pressure and construct a two-pump heart model to clearly explain the function of this powerful organ. A teacher guide and student activity workbook will be included with this workshop.	Recommended for Grades 4th-5 <sup>th</sup> .
<b>Mission: Nutrition</b>	Step into some healthy habits! This program introduces children to nutritional basics including the role of carbohydrates, proteins, and fats. The children will gain an understanding of how food provides energy for the body and how exercise plays an important role in energy levels. The program increases knowledge, stimulates motivation, and encourages healthy attitudes toward personal health, nutrition, and fitness.	Concepts adapted for K-5 <sup>th</sup> Grades. Activities vary depending on grade.
<b>Dinosaurs</b>	Examine real fossil casts, and explore the differences in the teeth of herbivorous and carnivorous dinosaurs. Students will participate in a mini dinosaur excavation, examine many fossils, get messy in a slime tar pit, and excavate for their own fossils.	Recommended for Grades K-3 <sup>rd</sup> .
<b>Seeking our Senses</b>	Explore all five senses. Test your vision with optical illusions, experiment with your hearing, and try your hand at reading Braille, use your hands to decipher patterns, and view a micro-slide of your tongue. Children get to try out their own taste test kit to learn how the nose is linked to taste.	Recommended for Grades K-2 <sup>nd</sup> .
<b>The Science of</b>	What do football players, scientists and ballet dancers have in common? Explore how Newton	Concepts adapted for K-5 <sup>th</sup> Grades. Activities vary

<p><b>Sport</b></p>	<p>helps us learn why we move the way we do, and improve the games we play. Campers experiment with games and activities while learning how physical and chemical sciences affect their equipment, movement, and technique.</p>	<p>depending on grade.</p>
<p><b>Discover Detection</b></p>	<p>Step into the shoes of a detective—uncover the science involved in evidence gathering and analysis. Using the power of observation and the Inspecti-Kit, young detectives will have all they need to get started with their investigations. Children use the gear in their kit to find, collect, and analyze evidence.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<p><b>Living in Space</b></p> <p><i>***Developed in Partnership with NASA</i></p>	<p>Students will set out on a mission to investigate life in space! Children will see the special adaptations needed to live in space, learn about mission training techniques, and participate in the construction of a model space station. Children then investigate astronaut training, mobility, and life support, and experience astronaut life for themselves as they participate in a Mad Science Spacewalk Mission.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>

# TECHNOLOGY, ENGINEERING, & MATHEMATICS PROGRAMS

CLASS	DESCRIPTION	GRADE VARIATION
<p><b>Laser Light</b></p>	<p>Students will learn that light waves move at different speeds and that the speed of a light wave determines what color it appears to your eyes. Students perform experiments that illustrate how Lasers can produce beams of different strengths and intensities and that is why Lasers are used for sending information and performing operations. We will wrap up the class with some fiber optics investigations.</p>	<p>Recommended for Grades 3-5<sup>th</sup>. *Can be adapted for Grade 2</p>
<p><b>Green Technology</b></p>	<p>This Workshop is designed to teach students that Technology can be used to go Green! Students learn how power generation works and how we can harness energy alternatively to power our houses, schools, and our future. Students learn about wind, hydro, fuel cell, and solar energy by rotating through hands-on stations that feature small scale models of what is being developed in the real world to make our future sustainable.</p>	<p>Concepts adapted for 1st-5<sup>th</sup> Grades. Activities vary depending on grade.  *You may choose to build miniature windmills at an extra supply cost. This would also extend the class to an hour and a half. Contact for pricing.</p>
<p><b>Rocket Science</b></p> <p><i>***Developed in Partnership with NASA</i></p>	<p>Children are provided with a valuable hands-on experience as they build a Mad Science Skyblazer Rocket. As they move through the various stages of construction, children learn the components of a rocket and the roles each play in a rocket's flight. Children will learn about the four forces affecting flight in lessons that will be reinforced with a fun game in which they race through space.</p>	<p>Concepts adapted for 1st-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<p><b>Space Travel</b></p> <p><i>***Developed in Partnership with NASA</i></p>	<p>Students will launch their investigation of rocket propulsion using the compressed air inside balloons for thrust. The class will race balloon rockets and be challenged to devise a balloon-powered rocket car. Experimenting with the fast moving air produced by spinning propellers, students will build a unique Shuttle Copter to take home. For our grand finale, students will witness a thrilling model rocket launch, and learn the meticulous preparations necessary to send up a rocket!</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<p><b>Super Power Sources</b></p>	<p>Super Power Sources is an interactive exploration of alternative energy. Children learn about power generators and separate renewable</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>

	<p>from nonrenewable resources. Heat from artificial sunlight melts a wax figurine. Children use their breath to run wind turbines, power solar cells by teaming up with flashlights and witness a fuel cell turn water to electricity. Assemble chemical battery components to power a fan and try their hand at filling a hand-crank flashlight's capacitor. Children keep this handy flashlight as a take-home!</p>	
<b>Invention-ation</b>	<p>Who gave us Morse code? How about earmuffs or the light bulb? Children will be guided from observation through presentation on their journey to becoming a great inventor. This workshop introduces children to how inventors work and that many inventions happen by accident. Through a hands-on approach students will learn that anyone, of any age can be an inventor.</p>	<p>Concepts adapted for 2nd-5<sup>th</sup> grade. *There are several versions of this class available. Let us know what you want and we will tailor make your program. *This class is only offered as an hour and half class.</p>
<b>Super Structures</b>	<p>Super Structures introduces children to the fascinating science of architecture and engineering. They learn about structures, the forces behind them, and shapes and materials that strengthen them. Images of real-life structures reinforce these concepts. Children take home a bridge-building kit.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<b>Radical Robots</b>	<p>Radical Robots reinforces the concept that science and technology go hand in hand. Real robots are devices that operate automatically with humanlike skill. They have internal systems comparable to humans. Children discover how robots work in our place and are introduced to several real-life examples such as the Canadarm. Children move through learning centers to test and differentiate between robots, automatons, and remote control devices. They learn how robotic devices use sensors to learn about their environment. Children build and take home a mechanical robot hand.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.  *Recommended as a hour and half long program.  *Bristle Bots can be built in class at an additional fee.</p>
<b>Mad Science Machines</b>	<p>Mad Machines introduces basic physical science. Children investigate mechanics and the role that they play in our everyday lives. Children learn about forces and work, and discover that simple machines make work easier by allowing us to push and pull less strenuously, but over a longer distance. They will extend this concept at home with the Drag Racer, a car model complete with wheels and axles.</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>
<b>Get Connected</b>	<p>Children check out telecommunication technology and assemble sound wave-making devices. They set-up telephone networks and</p>	<p>Concepts adapted for K-5<sup>th</sup> Grades. Activities vary depending on grade.</p>

	learn about frequencies on walkie-talkies and cell phones. An active, role-playing game introduces how cell towers relay signals and demonstrates cell tower triangulation techniques to locate cell phone users. A fastpaced quiz game gives children a telecommunication history overview. Children go home with a communication challenge!	
<b>Space Technology</b> <i>***Developed in Partnership with NASA</i>	Space Technology starts with an exploration of space-related technologies used on Earth. Students will help laser light through a maze, use principles of radar technology to find hidden mountains, and discover the importance of points of reference to depth perception. From there, it's out into space with the launch of a satellite into orbit (at the edge of their desks) and an examination of potential threats to spacecraft. Children will leave revved up by an investigation of shuttle fuel! Mad Science Stereoscopic Viewer, will make this investigation of Space Technology a fun learning experience.	Concepts adapted for K-5 <sup>th</sup> Grades. Activities vary depending on grade.
<b>Measure for Measure</b>	Children will have a unique opportunity to learn all about the metric system of measurement and trek through a treasure trail.	Recommended for Grades K-2 <sup>nd</sup> grade.
<b>Turn Up the Volume</b>	This workshop introduces the concept of measurement through hands on activities that provide opportunities for children to learn proper way to measure volume. Through inquiry based teaching methods students will be introduced to and work with different items and challenges to engage their critical thinking and measuring skills.	Recommended for 3-5 <sup>th</sup> grade.

## "JUST FOR FUN" CLASSES

CLASS	DESCRIPTION	GRADE VARIATION
<b>Science of Magic</b>	Science of Magic introduces children to a wide variety of scientific topics, challenging them to think logically and scientifically. Natural curiosity leads the way to the ultimate in inquiry-based learning as children ask, "How did they do that?" Scientific concepts ranging from optics to optical illusions and the importance of observation to the chemistry of hydrophilic polymers are investigated.	Concepts adapted for K-5 <sup>th</sup> Grades. Activities vary depending on grade.
<b>Science of Toys</b>	Children are introduced to the science of toys through toy-themed centers. Both familiar and novel gadgets are investigated. They discover how motors make toys move, and play with tops to learn about potential and kinetic energy. Balancing toys are used to familiarize children with the center of gravity. They find out that opposite poles attract each other when experimenting with magnetic toys.	Recommended for Grades K-2 <sup>nd</sup> grade.
<b>Detective Science</b>	Children are introduced to the science techniques used to investigate and analyze crime scene evidence. The children begin their training by observing a fictional crime scene. Their inquiry continues with a mystery powder analysis, fingerprint examination, ink separation investigation, and teeth impression match-up. They create a composite of a perpetrator from memory and then analyze all the evidence to determine which suspect committed the crime. They take home a kit to record their own vital information.	Concepts adapted for K-5 <sup>th</sup> Grades. Activities vary depending on grade.
<b>Movie Effects</b>	Movie Effects is an exciting introduction to the science involved in the spectacular special effects and technology that are behind motion picture magic. Children learn the science applications in filmmaking, from the chemistry of movie snow, to the acoustics of Foley artist sound effects, to the optics of 3-D technology.	Concepts adapted for K-5 <sup>th</sup> Grades. Activities vary depending on grade.
<b>Super Sticky Stuff</b>	Students will be given the opportunity to perform inquiry-based experiments to test the properties of adhesive objects. They will develop an understanding of the science of sticky elements and practice hands-on activities to explore the nature of natural and synthetic adhesive materials.	Concepts adapted for K-5 <sup>th</sup> Grades. Activities vary depending on grade.

# Specialty Programs for Community Sponsorship

These workshops were designed with a specific sponsorship in mind. They are designed to be used for grades K-6 although they may contain specific age appropriate activity adaptations.

<b>Be Tobacco Free</b>	This workshop introduces students to the danger of using tobacco products. Be Tobacco Free is a one hour workshop designed to target children in grades K-6 to dispel many of the myths surrounding tobacco's effects on the body. A pre and post package provides educators with additional resources to augment the program delivered by Mad Science.
<b>Be Sun Smart</b>	This interactive workshop will educate students about the need to protect themselves from the power of the sun. They will understand the fundamentals of ultraviolet radiation and the ozone layer while discovering the tools that can help protect them from the sun's damaging effects. The primary message is that UV radiation created by the sun can damage your skin if you do not appropriately protect yourself. It was promoted during Sun Awareness weeks in the spring.
<b>The Great Brush Off</b>	This workshop was created in partnership with Gillette as part of its Oral B division for education in schools. It has been adapted into a 45 minute program about dental health. It features micro-slides of tooth decay, large scale model teeth, and the science behind what is going on with the bacteria in your mouth.