CRAZY CHEMWORKS

PROGRAM MANUAL

Chem in a Flash

Dry Ice Capades

Glow Show

Junior Reactors

Lab Works

pH Phactor

Slime Time

Super Sticky Stuff

Mad SCIENCE

CHEM IN A FLASH

SUMMARY:
Children take a trip through several fields of chemistry in this high-speed class on chemistry. They explore different salt solutions and the role of salt as a catalyst. There will be precipitation, acid-base reactions, and a color-changing electrolysis demonstration to wrap up these cool chemical concepts.

EDUCATIONAL VALUE:
This class introduces chemistry in our everyday world. Each activity makes connections between the chemicals in our experiments and the chemical reactions constantly happening around us. The children will use pH indicators as tools, compare the chemical properties of common salts and explore how acids and bases are important from the kitchen to the chemical lab.

TAKE-HOME MESSAGE:
1. Chemical reactions happen in our lives every day.
2. Chemical reactions can be sped up or slowed down.
3. You can get leftover chemicals depending on the amount that you add to make the reaction happen.

DRY ICE CAPADES

SUMMARY:
Children jump into this class with a molecular movement exercise to learn about the three states of matter. Instructors demonstrate the properties of matter at extreme temperatures with dry ice while the children get to compare volumes and mass in solid and gaseous states. The class rolls toward a grand finale that engages the group in catching a cloud!

EDUCATIONAL VALUE:
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-Home Thermocolor Cup and Home Lab to continue experimenting with the states of matter.

TAKE-HOME MESSAGE:
1. There are three states of matter.
2. Adding heat can change solid to liquid, and liquid to gas.
3. Removing heat can change gas to liquid, and liquid to solid.

GLOW SHOW

SUMMARY:
This class concentrates on how we perceive light and its effect on objects. A tricolor experience reveals the true colors of white light while a dark bulb highlights glow-in-the-dark and fluorescing materials among common objects. Chemiluminescence is de mystified and kids shine bright with their newfound knowledge of the visible electromagnetic spectrum.

EDUCATIONAL VALUE:
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 about the applications of the science of light.

TAKE-HOME MESSAGE:
1. An object is the color it reflects. All other colors are absorbed by the object.
2. An object that shines a different color under black light is fluorescent. We only see this when we shine a black light on it.
3. Things can shine in different reactions – fluorescent, phosphorescent, chemiluminescent, bioluminescent

JUNIOR REACTORS

SUMMARY:

In this class, children are introduced to the concepts of atoms and reactions! A demonstration of the differences between physical and chemical reactions is followed by a series of hands-on experiments. The idea of the relative size of an atom will be introduced as children try to reduce a strip of paper down to its atomic size during a cutting edge race. The class will wrap up with a creative molecular session. The children will explore how atoms join together and how molecules react using their Take-Home Atomic Coins kit.

EDUCATIONAL VALUE:

This class provides a basic lesson on the atomic make-up of matter. Students will perform experiments and analyze their results to differentiate between the chemical and physical changes that may occur in a reaction. The children can create model molecules and use them to follow the atomic rearrangements that occur in a chemical reaction.

TAKE-HOME MESSAGE:

1. Combining atoms together creates molecules, and groups of different molecules form chemicals.
2. Atoms from molecules can mix. They can then form new molecules in a chemical reaction.
3. If you know what clues to look for, you can explain the results of an experiment either as a chemical or physical change.

LABWORKS

SUMMARY:
Children become lab scientists-in-training in this whirlwind program on laboratory techniques! Each child learns to manipulate an assortment of lab equipment in a series of hands-on activities. They practice transferring droplets using a pipette and larger quantities of liquids using a stirring rod. They will swirl with a flask, stir with a beaker and measure with graduated cylinders.
The one-hour program ends with the class using all their new lab skills in a final experiment. The children will continue lab training with their Take-Home Graduated Gear kit.

EDUCATIONAL VALUE:
This program introduces the basic tools and techniques that scientists use in the laboratory. The children 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, children also learn to make a hypothesis based on their observations and spend time practicing their new lab skills during the class.

TAKE-HOME MESSAGE:
1. The tools that scientists use in a lab have names and particular functions.
2. Water sticks because it is adhesive.
3. Scientists make observations before making conclusions.

pH PHACTOR

SUMMARY:
Children explore the crazy chemistry of acids and bases in this fascinating one-hour program on the pH scale. The pH Phactors hydrogen and hydroxide give a colorful introduction, and the phantastic pH test is applied to common household chemicals. Children are challenged to bring a mystery liquid to a perfect pH balance. The festival ends with a Stopper-Popper reaction!

EDUCATIONAL VALUE:
Children are introduced to the concept of pH, acids, and bases through a series of engaging, inquiry-based experiments and exciting demonstrations. These concepts are applied using household items to improve children's understanding of the nature and purpose of the chemicals they often encounter. They learn how household chemicals are safely handled.

TAKE-HOME MESSAGE:
1. Acids are liquids which have particles called hydrogen ions, and bases are liquids which have particles called hydroxide ions.
2. The hydrogen ions in a liquid are what change the color of a pH indicator.
3. Acids and bases react together in a chemical reaction.

SLIME TIME

SUMMARY:
The Mad Science slime recipe is revealed in this ooey gooey chemistry class! Students will learn about slime and its basic ingredients in a series of hands-on activities. Polymer paper clips and cross-linking magnetic marbles will help to examine the key components of slime. The young scientists will stir up concoctions of slime in scientific style and test the properties of slime in a team-spirited fashion!

EDUCATIONAL VALUE:
Slime Time provides an entertaining lesson on polymers and their properties. 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.

TAKE-HOME MESSAGE:
1. Mixing a polymer and cross-linker forms a cross-linked polymer called slime.
2. The property of slime changes when the quantity of the ingredients changes.
3. Using different polymers and cross-linkers create different cross-linked polymers.

SUPER STICKY STUFF

SUMMARY:
Children will get stuck on science as they learn how to stick stuff together! From a close-up examination of hook-and-loop fasteners to adhesive testing of tapes, our junior scientists will sort through the powers that bind. They will also learn about setting up fair tests as they use labware and everyday items to investigate the concepts of suction, hydrogen bonding, and vinyl cling. This class will have the kids glued to their seats!

EDUCATIONAL VALUE:
This is a class that peels apart our assumptions about adhesives. Children already know how to use tape, glue, and Velcro, and we will use this base knowledge to work on doing fair tests. They will develop an understanding of the science of sticky elements and practice with hands-on activities to explore the nature of *natural* and *synthetic* adhesive materials.

TAKE-HOME MESSAGE:
1. Different types of adhesives are used to stick different materials together.
2. The liquid part of the glue needs to dry before the adhesive part can stick objects together.
3. Tape won't work if the sticky part collects dirt from our fingers.