THE MAD SCIENCE® DISCOVERY LAB

SUMMARY AND EDUCATIONAL VALUE

All about Animals

Life in the Sea

Energy Burst

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Mix it Up

Moving Motion

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Super Power Sources

All About Animals

SUMMARY: All About Animals explores the amazing animal kingdom. Children learn about the diversity of animals as they experiment with camouflage and get hands-on with real tooth and claw replicas. Children see what's inside animals and discover which animals are truly spineless! Organizing a wide range of creatures teaches how scientists classify everything from elephants to arachnids. The real circle of life is revealed as children explore and compare animal life cycles. The Animal Tracks Take-Home lets children create casts of animal tracks just like real naturalists!

EDUCATIONAL VALUE: All About Animals teaches children about the incredible, diverse life in the Animal Kingdom. Children learn how animals adapt 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.

TAKE-HOME MESSAGE:

1. Animals are living things that can move and eat.
2. Animals must eat other living things to survive.
3. Animals have adaptations that help them live in their habitats.

TAKE-HOME PRODUCT: The Mad Science® Animal Tracks allows kids to walk in the shoes of a naturalist. They mix powder with water to form plaster and transfer the material into three animal track molds. Children then study the plaster casts and identify the mammal, bird, and amphibian that left the track. Animal Tracks makes a great impression!

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Energy Burst

SUMMARY: This energetic class explores energy transfer and energy conversion. Children will jump and push up to reach their potential. Students will stretch and release wound various rubber band gadgets. There is time to unwind with windup toys that swim, hop and flip. Children spring into action with poppers, Boinks, and jumping bugs. Pulling back a car lets children control how far it goes. Children pair up and drop frog splat balls from different heights. The Catapult Take-Home has the potential to get kinetic!

EDUCATIONAL VALUE: 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. Children build and take home a catapult that stores energy in a wound string.

TAKE-HOME MESSAGE:

1. In physics, we do work to give objects energy.
2. Potential energy is stored energy.
3. Kinetic energy makes things move.

TAKE-HOME PRODUCT: The Mad Science®

Catapult helps children explore potential and kinetic energy. To build the Catapult, children attach the frame to the base and secure the launcher between wound strings. When the launcher is pulled backward, potential energy is stored. The built-up potential energy changes to kinetic energy once the launcher is released. Catapult launches learning to great distance!

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Get Connected

SUMMARY: In this class children take on telecommunications. Interactive activities include seeing the sound of your voice and testing out telephone lines. Children chat on their own telephone network, find the limits to low-power radio signals, wind through a cell tower relay, and learn how to track cell phone users. The class wraps up with a card-flipping history quiz that builds on cellular network knowledge. Children show off their telecommunication knowledge with a worldwide optic fiber Wired World take-home product.

EDUCATIONAL VALUE: Children check out telecommunication technology and assemble sound wave-making devices. They set-up telephone networks and 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 fast-paced quiz game gives children a telecommunication history overview.
Children go home with a communication challenge!

TAKE-HOME MESSAGE:

1. We can use devices to send messages over a large distance.
2. A network is a set that links two or more devices.
3. Cell towers can help us find a cell phone user.

TAKE-HOME PRODUCT: The Mad Science® Wired World is an international success. Children build the world map card into a box and connect cities using optical fibers. When a light is shone through one end of the fiber, the point in that city illuminates. Go ahead and discover the cities of lights!

Life in the Sea

SUMMARY: Life in the Sea plunges children into the depths of ocean life. Children explore different ocean ecosystems and learn about the plants and animals that live there. Classifying creatures from sharks to sponges gives them a taste of ocean diversity. In Whales to Scale, they compare shark and whale teeth, and measure the size of these incredible predators. Hands-on activities teach the interconnectedness of an ocean food web, and the consequences of overfishing. The Anaglyph Sea Puzzle Take-Home lets children take some 3-D sea creatures home with them.

EDUCATIONAL VALUE: 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 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 and help them remember the incredible diversity of ocean life.

TAKE-HOME MESSAGE:

1. Sea animals have adaptations to live in the water.
2. Sea animals are linked in a food web.
3. The ocean is important for human life.

Take Home Product: The Mad Science® Anaglyph Sea Puzzle lets kids discover underwater creatures in 3-D! On the flip side, a 9-piece lenticular puzzle brings a spectacular coral reef to life. Unpuzzle the mystery of the sea!

Mix It Up

SUMMARY: This class challenges children to branch out into the physical aspect of chemistry. A four-layer mixture *shakes up* the idea of water and solutions. Children pick up concepts of physical mixtures, solutions, and suspensions with sorting activities. Colorful demonstrations explain molecular movement and show how an antacid suspension buffers an upset stomach. Children carry out a *salting out* technique to pull soap out of solution and use tools of the trade to clarify water and to separate mixtures into their components. Children receive Super Sorters – a mixture sorting kit – to take home at the end of the class.

EDUCATIONAL VALUE: A discrepant event involving immiscible liquids and beads with different densities introduces the concept of mixtures. Children identify mixtures in bottles as solutions, suspensions, or physical mixtures. They use flashlights to differentiate between suspensions and solutions. The instructor demonstrates the difference in molecular movement between hot and cold water and uses a pH indicator to show an acid–base buffering reaction. The children separate mixtures with mechanical and chemical techniques. They take home a Super Sorter kit to continue collecting their chemical knowledge.

TAKE-HOME MESSAGE:

1. We use various mixtures in our everyday life.
2. We use chemicals to keep mixtures blended.
3. We use tools to separate mixtures.

TAKE-HOME PRODUCT: The Mad Science® Super Sorter allows children to explore different separation techniques. It provides children with three sorting tools to separate plastic and metal beads of various sizes. The Super Sorter really separates itself from the rest!

Moving Motion

SUMMARY: Children catapult into Newton's three laws of motion! They yank a cloth from under dishes and send crash test dummies flying. They adjust the mass of two identical cars and learn how heavier objects need a bigger push to move the same distance. Children drop two plastic eggs—one heavier than the other—and find out they hit the ground at the same time! They see action–reaction forces at work as a fan cart races across the room and mini-rockets launch through the air. They twirl into action with the Newton Spinner Take-Home.

EDUCATIONAL VALUE: 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.

TAKE-HOME MESSAGE:

1. Objects tend to keep doing what they are doing.
2. Heavier objects need more force than lighter ones to move the same distance.
3. For every action there is an equal and opposite reaction.

TAKE-HOME PRODUCT: The Mad Science® Newton Spinner introduces children to Newton's third law of motion: For every action, there is an equal and opposite reaction. Children assemble the device and blow up the balloon. After releasing the balloon, the device spins in the opposite direction of the escaping air. The Newton Spinner puts a new spin on science!

Radical Robots

SUMMARY: Children become wrapped up in the world of robotics! Volunteers act out a robot, remote control device, and an automaton. A reading and writing robot draw shapes, detects objects, and tracks lines. Children circulate learning centers to control an automaton through sound, move a robot through a maze, and make a soccer robot score a goal! A soft and snuggly robotic seal pup is passed around for all to pet. Children build the Robot Hand to take home.

EDUCATIONAL VALUE: Radical Robots reinforces the concept that science and technology go hand in hand. Real robots are devices that operate automatically with human-like 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.

TAKE-HOME MESSAGE:

1. Robots use programs to move and do actions on their own.
2. Automatons do the same actions over and over.
3. Remote control devices work when humans guide them.

TAKE-HOME PRODUCT: The Mad Science® Robot Hand enhances the learning of how robots do work in our place. Children build a robotic hand by attaching coils and strings to a palm-shaped plastic base. Once the hand is complete, they can pull on the strings to manipulate individual fingers. The Robot Hand gets two thumbs up!

Super Power Sources

SUMMARY: Children embark on a quest for alternative energy sources. They harness the sun's heat with a parabolic mirror and choose volunteers to ramp up a power generation station. They act as power hunters to pinpoint renewable and nonrenewable resources. Tight teamwork turns on solar devices and a united breath of air runs a fan-powered light bulb. A small scale demonstration reveals the enormous potential for fuel cells. Children carry out a chemical reaction, load a capacitor, and take home Crank'n Shine, a handcrank flashlight.

EDUCATIONAL VALUE: Super Power Sources is an interactive exploration of alternative energy. Children learn about power generators and separate renewable 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. They 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!

TAKE-HOME MESSAGE:

1. Moving electrons make power.
2. We get power from many sources.
3. We should reduce our power use to cut down on the energy we need to make.

TAKE-HOME PRODUCT: The Mad Science® Crank 'n Shine helps kids learn about renewable and nonrenewable energy sources. The flashlight can either be powered by the battery or a second power source, which is the built-in mechanical generator that the child cranks. This product shines light on alternate energy sources!