

Free Lesson Units Available

You don't have to re-invent the wheel. These are free. They cannot be copyrighted and they are relevant for grades K-12.

This document outlines the units we have available as free instructional units. These have been created during the last 10 years by two of our Spark staff. Both worked previously with another non-profit providing instruction in afterschool and in homes of mobile student populations. They worked together to create these to be designed to be shared in multiple programs, to be relevant for all grade levels, and to be free and accessible to all.



The beauty of these lessons is they are compilations of all sorts of effective creative instructional ideas from many different organizations and persons designed in a way to be effective for use with all grade levels. These units will remain free to the general public. They are not copyrighted works due to the nature of the curriculums and they cannot be copyrighted in the future. They pull from the ideas of many other wonderful ideas so they are available to all. Don't we wish more things in life were this way!

Professional Development training is available!

Spark staff do provide Professional Development trainings for curriculums that have activities that may be challenging for teachers to have time to walk through before providing instruction. These Hands in! Minds On! Trainings are designed to really help instructors be comfortable providing instruction on all of the activities included in the curriculums. In addition, we provide standards alignment training on how to make it relevant to various grade levels, pacing guides that show how to use the unit to structure it into a summer program or effective afterschool schedule, supply lists, suggestions on what has worked for us when we have used the unit with students, and more.

We offer several different options for high quality Professional Developments. You can work to schedule a time at our training facility at the Barn Studio at Grass Roots Farm or we can we can conduct them at your site at a time that is convenient. We offer various trainings throughout the year but if you want something else we can work it out. If we travel to you there is a minimum of 10 attendees required. We prefer, due to the hands-on nature of the training, that no more than 25 participants are in attendance at a time. You can contact us at sparkedinnovations@gmail.com to get additional information about scheduling, fees, etc.

There's so much more (these units are deep) but when we come to you we can cover the core! We'll help you feel confident with the most challenging aspects of the unit. And we'll answer all the how's, where's, and what's! In every professional development, we do it's always so much more than sit and listen. Attendees get their hands on (and in!) the materials needed to gain the experience and know-how to ensure success!

The units are outlined below by subject with a quick explanation of all that is included in each unit.



Advertising and Propaganda

Eating with your Eyes-- Media Awareness

Are your students influenced by taste or by advertising? In this lesson, they get to test their own taste buds and the power of branding on their brains. See if they choose something because of its name or because of its taste with a Mystery Brand Taste Test that will keep them talking for days. As a picture-perfect hamburger flashes across a television screen, mouths water at the sight of the three-inch high handful. Has your hamburger ever actually looked like that? Just who are the miracle workers behind those amazing food advertisements? Students learn some tricks of the advertising trade before getting to make their own "faux-burgers" they'll actually want to eat and other fun advertising activities.

All About the Body

I'm All Ears

Did you hear something? Maybe the sound you heard was quiet, like the click of a pencil. Or maybe it was loud, like a siren going by. Sounds are everywhere, but most of us don't pay much attention to those two cool parts on our bodies that let us hear them all: our ears! In this lesson students build models of their ears, experiment with their sense of hearing, learn tons of gross and cool things about those holes on the sides of their heads, come to realize they do a lot more than just catch sounds, and learn about some crazy phrases we call idioms. So, lend me your ears!

All About Blood

Did you hear something? Maybe the sound you heard was quiet, like the click of a pencil. Or maybe it was loud, like a siren going by. Sounds are everywhere, but most of us don't pay much attention to those two cool parts on our bodies that let us hear them all: our ears! In this lesson students build models of their ears, experiment with their sense of hearing, learn tons of gross and cool things about those holes on the sides of their heads, come to realize they do a lot more than just catch sounds, and learn about some crazy phrases we call idioms. So, lend me your ears!

Pump it Up

It's a bird, it's a plane....no it's Cardiovascular Kid! That's what your students will be by the time you finish this lesson, cardiovascular kids. They'll build models of veins, listen to the lob-dub of their own heartbeats, play with their pulses, diagram data, and compete to charge up their own Cardio Kids.

Stethoscope Science

What's that sound? It's your blood rushing around! Students learn that things haven't always existed, they have to be invented, even that seemingly simple doctor's assistant, the stethoscope. They learn how it came to be, find their heartbeats, and test out their own stethoscope designs to see if they too can find the best way to catch that good vibration.

Deep into the Eye, Lens, Action

It takes a lot to get the big picture and there are some big (and very tiny) helps that you can't see in your own eyes. Students dig deep into the eye structure and discover just what amazing things are going on inside their eyes through fun tests, games, and activities, before adding it all together to make their own inner eye.

Eye Didn't know that

Have you ever had tired eyes? Well, no wonder! Your eyes are busily at work from the moment you wake up to the moment you close them to go to sleep. Students learn exactly what they're seeing when they look in someone's eyes while they create models, learn just how much they like their eyes during blind relays, and see if it's their eyes or brains being deceived when they gaze at some rather tricky illusions.

What's on your Mind

Brain Concentration Extension

Get your hands on a bag of brains, model the inner-workings of your mind, find out that wrinkles are great, learn what other animal's brains look like, and play match the brain with this in-depth and fun lesson. (New information has been added)

Bones Unit

Strong, light, supportive, and dependable. Sound like something you'd like to have around? Don't worry, you already do, 206 of them. In this lesson students get to make edible "bone biopsies," construct a complete skeleton, learn how baby bones grow, test the strength of hollow bones, build a spinal cord, a 3D skull, and more.

Tasting with your Nose

Want to find out just how bad it would be if the cat actually got your tongue? Try eating an ice-cream cone or singing your favorite song without it. Our sense of taste has led to great geographical discoveries, the founding of nations, and to wars between countries, and now, it's led to this lesson in which students get to follow their noses and test their taste buds and see just how they work together through some rather tasty experiments.

Animals, Fish and Insects

The Eyes Have it- Predator and Prey

Quick, what's the difference between your eyes and the eyes of a gecko? A cat? An owl? A kangaroo? For centuries, humans were in the dark about what and how other animals see. But scientists are learning it's all about the eyes. Students learn how to determine predators from prey by looking at their eye placement, learn the order of the food chain, and use easy-to-make viewers to get a bee, owl, mole, or cat eye view on the world.

Hibernation Unit

You wake up a dark November morning only to find out it's pouring rain, even though the thermometer reads 30 degrees. It's enough to make anyone want to go back between the flannel sheets and set the alarm clock for May. You might wish you could stay in bed all winter, but some animals really do! Brown bears do it, ladybugs too. Bats and snakes, and a frog or two. Groundhogs, chipmunks, in a sleepy state. What do they do? They hibernate! In this lesson students explore the reasons animals eat so much in the fall (would you want a diet where you had to gain 30lbs a week?) learn who actually hibernates, what triggers it, what it really means to be cold blooded, who are nappers and snackers, and why animals hibernate in the first place. Through hands-on (and in) experiments and activities students get a real feel for the effects of animal insulation, track down torpor, figure out how animals find food in the winter, and learn that being asleep can be really hard work.

Lepidoptera

Did you know that butterflies don't have lungs, that they taste with their feet, and zip up their tongues? Go on a multi-nation adventure and delve deep into the magic and mystery of metamorphing and migrating butterflies. Students learn in-depth the amazing features, life cycles, and self-defense mechanisms of these fluttering creatures, create their own flying butterfly and learn the beauty of symmetry as they construct their own metamorphic masterpiece, and more.

Poseidon's Steeds

What has the head of a horse, with the sucking snout of an aardvark, spines like a puffer fish, a pouch of a kangaroo, eyes like a lizard, the tail of a monkey, an armor-plated body like the Stegosaurus dinosaur, the ability to change colors like a chameleon, and a tail like a monkey? Here's a hint, it lives at the bottom of the ocean...still no? In this lesson, students learn all about the mysterious and wondrous seahorse, learn how a dad really can give birth, come to understand how the concepts of buoyancy, density, volume, and mass are related to fish and just how they sink or float, learn why some fish have more than one bladder, understand why people create myths, create one themselves, and finish it all up with an original artwork of their own.

Herpetology

Imagine you are a time traveler; you hop in your time machine and travel back through time millions of years to the age of the dinosaurs. You step out of your time machine and gasp, Pterodactyls fly

high above a deep swamp filled with huge dragonflies. The earth shakes as an enormous 80-ton Brachiosaurus munches on the top of a tree nearby. On the muddy ground at your feet, something strangely familiar hops by: a frog? Surprised? No, it didn't sneak its way onto your time machine. Few people realize just how ancient frogs are. In this lesson students learn the secret to frogs' success, the truth behind hibernation and camouflage, the power of poison, how being a reptile takes a lot of work, just how far a frog can jump, and all about that sticky tongue. They also learn the simple needs of a frog, each stage of their amazing life cycle (including carnivorous tadpoles), dissection without a knife, and that's only the beginning. Kissing a frog won't turn it into a prince — except in fairy tales — but frogs may be hopping toward a real-world transformation into princely allies in our battle with antibiotic-resistant infections that threaten the lives of millions of people worldwide, unless they disappear first. Herpetology, it's all about the frogs!

Nishikogoi (Koi) Living Jewels

Imagine you are a time traveler; you hop in your time machine and travel back through time millions of years to the age of the dinosaurs. You step out of your time machine and gasp, Pterodactyls fly high above a deep swamp filled with huge dragonflies. The earth shakes as an enormous 80-ton Brachiosaurus munches on the top of a tree nearby. On the muddy ground at your feet, something strangely familiar hops by: a frog? Surprised? No, it didn't sneak its way onto your time machine. Few people realize just how ancient frogs are. In this lesson students learn the secret to frogs' success, the truth behind hibernation and camouflage, the power of poison, how being a reptile takes a lot of work, just how far a frog can jump, and all about that sticky tongue. They also learn the simple needs of a frog, each stage of their amazing life cycle (including carnivorous tadpoles), dissection without a knife, and that's only the beginning. Kissing a frog won't turn it into a prince — except in fairy tales — but frogs may be hopping toward a real-world transformation into princely allies in our battle with antibiotic-resistant infections that threaten the lives of millions of people worldwide, unless they disappear first. Herpetology, it's all about the frogs!

Hummingbirds Art and Science

With hearts that beat from 500 to more than 1200 times per minute, wings that buzz at as much as 52 beats per second and respiration that can clock in at up to 600 breaths per minute hummingbirds are truly some of the most incredible creatures on the planet. Students delve deep into the lives of these featherweights, making their own (edible) hummingbird nests, carving out birdbaths, finding out just how flight feathers help with flight, and learning to identify different species. Then they follow the flight path and discover if a ruby-throated hummingbird can really fly 500 miles over the Gulf of Mexico with no food or rest and make their own feeder to welcome the intrepid birds home. And at the end of the journey, students craft their own brilliantly feathered friends

Diving into the Gene Pool Unit

Ever hear the phrase 'Like father like son?' In this unit, students learn all about how they inherit their looks, height, size and chemical make-up from their parents! They'll also meet the amazing 19th century scientist, Gregor Mendel, who used short and tall pea plants to study heredity and have fun with Punnett who mapped out how Mendel did it. They'll construct an edible DNA double helix and make and match bonds before playing with "Doggone DNA" in order to create and decode a "DNA recipe" for their own man's best friend to observe how variations in DNA lead to the inheritance of different traits. *Note: additional extension activities are available for this unit.

Building Stories

Part 1

It's time to start a new adventure and we create our own 3D 'pulp fiction'! In this fun series, we'll be crafting characters and then crafting tales with 3D settings and flippable 'story boards' that will keep 'bored' far from these stories! Students will truly be able to visualize their stories as they literally build them and then set them in motion. But first of all, there's a question. Just what is 3D? Find the answer to that and more as we begin to explore just how to take 2D ideas and turn them into a 3D tale. It's time for the crew to craft the cast—after all story characters sure come alive in our minds when we read about them on the page...just imagine how it will be when they're our very own 3D creations!

Part 2

We may have built them, but you breathe life into your characters through description. So, how would you describe them? In this extraordinary week, we work to make paper come to life as we make our characters 'Fakebook official' and build a whole new world—setting the stage for incredible adventures.

Part 3

Stories can be living breathing *moving* things. And so maybe it's time to put a little motion in our ocean or some wiggle in our walkways. In other words, use automata to help tell our tales and help us set the stage for incredible tales of action, adventure, and intrigue. Is creativity a magical gift only a few lucky souls are granted? Nope. Creativity isn't about an idea or a sudden burst of information. It is a process, and often a messy one. We'll learn what it takes to be 'innovative,' discover how to get the good tales to roll, and find out how to make lightning strike...twice! (Okay, maybe it's metaphorical lightning, but it's still awesome!)

Part 4

"Writing" doesn't have to mean dumpy and dull. Especially when you use vivid verbiage! Words that evoke rich sights, smells, sounds, textures, and tastes. Turning 2D pages into entrancing 3D mental visions and making stories come alive. During this week students, will 'get a clue' and turn the ordinary into something extraordinary! They'll hunt down a wordy dinosaur and find out how, like a good stew, a plot can thicken. But they'll have to watch out because they might have the rug pulled out from under them or find themselves hanging off the edge of cliff. So, come along as we peer deep, peer quick, and head into the thick of adventure!

Part 5

It's time to shine! To add polish, sparkle, and refinement that make you glow with pride and say, "That's mine!" Then it's time for a little papermation and a little paper motion! That's right, we're animating these tales and putting stories in motion with 'stopmotion!' Did you know you can read movies the way you read books? We'll learn to read between the lines and see what's behind the scenes before learning how stop motion works and how filmmakers make it smooth (without lots of stops and jerks.) We'll even play some games where we get to stop and go and determine if the best action happens when we go fast or slow. Then we'll get a little crazy and flip out over our tales and begin to put our movies into motion. Stopmotion that is.

Art- Minds on!

Compilation of Art Projects from 50 different units. These are meant to correlate with units related to a myriad of subjects. They can also be used as standalone art projects. These projects are designed to be engaging to students of all ages.

Chinese New Year

Celebrate with China

Can you guess what is the world's most widely celebrated holiday? What happens when you base your year on the ever-changing moon? Come learn what happens when bones speak, how a calendar can benefit a farmer, explore the legend of Nian and have a little fun being madly glib as you ad lib, battle monsters with brave buzzing and flameless lanterns, practice vivid verbiage, and take part in a race that determines your fate!

Lanterns Light My Way

A burning goose with wings full of fire at night?! Don't worry about it, a red glowing lantern will hold off the fright. And now that we're ready, you'd better hold tight! This little lesson is chock full of light. With rhymes, riddles, and reason we've just barely begun, you see there's lace lanterns and lucky envelopes to add to the fun. So, come try your luck as you dance with the dragons and answer lost letters carried by wagons.

Defying Gravity

Let's Go Fly a Kite

Kites. Just, something to play with on a windy day? Or an invention with mysterious origins lost in the mists of time that not only changed history, but life as we know it today? Did you choose B? Then

you choose wisely. In this lesson students learn a smidge of the history of kites, come to understand just how kites manage to defy gravity for so long, build kites of their own, fly them, figure out how to get them up to the highest height, revise them, redesign them, and tie it all together with a piece of poetry. Hang on to your hats, your kids, and your kites, science is about to take flight!

Detective Series

Guess Who Gumshoe

There are cases to solve and mysteries await, the Effective Detective can't afford to be late, but as the cases pile up and the evidence abounds there's just too much with only one detective around. He needs some help that's tried and true so the Effective Detective is calling on you! In this diverting detective-based lesson students become Probationary Gumshoes, meet a defective detective, see if they can spot the Invisible Gorilla, get their hands-on evidence, solve mysteries, create case files, whip up some edible blood, make lasting impressions, detect dental details, and much, much more! By the time, they're done they'll become truly effective detectives!

Dr. Seuss

There's Fun to be Done (Thing One!)

Hey, put on your thinking cap, there's stuff to be done, and all of that that stuff is incredibly fun! We'll celebrate Theo and we'll work, learn, and play (and learn to say Seuss the Bavarian way.) There's stuff to discover, from 'pie-selling chants' sung at night by his mother to how Seuss was a name first used undercover. And then we'll continue and learn how a bet gave us one of the greatest storybooks yet! We'll discover what Doctor Seuss knew about the science of taste (and hopefully won't let green eggs go to waste!) We'll savor the flavors but we'll also be thrifty, don't you think we can keep it to just around 50? And that's just the beginning, that's just a small start, we haven't begun to cover the tiniest part! We're off to great places! Today is our day! Fun learning is waiting. *Let's get on our way!*

There's Fun to be Done (Thing Two!)

Aren't they fun, these mischievous Things? It's amazing the things they'll do to our brains! We'll find planets of Oobleck (it falls from the sky!? Those weather wizards sure can make a mess when they try.), and a strange thing called Glurch, and learn how a few hats and a King can leave a boy in a lurch! We'll learn about Horton and search for a Who (but we'll need some tools to see macro too!) Come on, hurry, there's no time to stop, we've got to get going it's time to glop! But wait, if we get into quicksand we'd better move slow, cause quicksand will cuddle you tight, don't you know? Maybe you're thinking cap will save you from slithery sand? If not, it will be dapper on your head, or your hand. Shuffle Duffle Muzzle Muff! It's fun to learn all this crazy stuff!

Lessons on Earlier Times

Life is an Adventure (Paleontology)

A mysterious package has arrived that will send your students off on a grand adventure. Students practice their cartography and journaling skills, find their own fossilized dinosaur embryo, make a special storage box to keep it safe as they travel, uncover the secrets of rocks, and discover a 112-mile-wide clue in the Curious Case of the Disappearing Dinosaur as they follow in the footsteps of other paleontologists.

Humans and Art: Caves of Wonder

Humans make art. Sometimes we put it on a wall, other times we put it in a museum, and occasionally we put it in a cave where it stays lost for thousands of years until someone falls down a hole and discovers it. In this lesson students act as modern explorers and archeologists as they journey through the lost caves of Lauscaux and interpret the meaning behind the beasts on the walls. Then as Paleolithic painters themselves they create their own cave art and tell the story of its creation and discovery.

Expedition Series

What is an expedition? It is a journey undertaken by a group of people with a definite objective. With the launch of eXpedition, inc. we have a definite objective: to allow students the opportunities to not only build skills and understanding of concepts they will be tested on, but to also experience the world that is beyond their everyday reach (deepest parts of the oceans, mountains, caves, deserts, shallow seas, seasonal forests, etc.) in new ways, to see astonishing sights and hear sounds from the remotest places on earth, to have adventures and make hands-in discoveries about their own planet, within the comforts of the classroom.

eXpedition, Destination Deep Blue Sea (Preparation is Key)

Our history has illustrated that ever since mankind has existed we have been fascinated by the ocean, leading many people throughout history to set off on ocean exploration expeditions in everything from a balloon to a deep-sea submarine. And we're going to be some of them! With this, the first of our newly created eXpedition, inc. series we're taking students deep within the seas to make marvelous discoveries and have incredible adventures deep below the waves. But first, big expeditions require a lot more planning than a three-day weekend! Students get to scout their route, learn how to speak geographically, go the distance, participate in a bit of armchair adventuring, learn not just about sunken treasure, but a whole sunken part of our nation, see stargazers from under the sea, play mapamoscas, pick up a passport, and find out the hilarious answer to the scariest of questions, but...what if we get LOST?!

eXpedition Destination Deep Blue Sea (We're Go for the Launch) P2

We're ready! We've done our final checks, we've packed our bags, we've planned our route, we've marked our destination with an X, our sat phone is at the ready, and one week of our three-week window is already gone! It's time head out on our expedition to find the rare glowing jellyfish and unique long fanged viperfish that could save so many lives. Those researchers are already wondering what's taking us so long! It's time to build submarines, get a taste of the sea, find out what to do when there is water everywhere but not a drop to drink, visit micro-worlds that are rather large, taste the deliciousness of deep blue, and find the beauty in flowing fields of salt.

eXpedition Destination Deep Blue Sea (The Midnight Zone) P3

The second week of our three-week window for our eXpedition is already gone! Those researchers and partners keep calling hoping for news and still no sign of the rare glowing jellyfish and special long fanged viperfish that could save so many lives. We've built our submarine and taken a few exploratory dives into the Twilight Seas, but now it's time to go deeper, all the way to the bottom, into the blackest pit in the sea. Are you ready to dive deeper, all the way to the Midnight Zone?

Geography Lessons

The Magnificent Seven

It's a small world, a wild world, and a world of wonder. It's our very own big blue marble and in this lesson students get to learn all about it: its countries, continents, the art of cartography, and the math behind maps. And what better place to begin than with the grandest sections of all, the magnificent seven?

Heart and Sole Lesson Unit

Although the human foot has remained unchanged for thousands of years, what people have worn on their feet shows incredible diversity and an endless variety of forms and functions. Regardless, a child's delight in a new pair of shoes is the same all over the world, whether the shoes are patent-leather sandals, straw alpargatas, deerskin moccasins, or wooden clogs. And when they get to design and build a brand-new style all their own? That's a whole new level of fun! In this lesson students get to debate form vs. function, track shoes throughout time, find out what's in a sole, walk like a Venetian (and rise high!), become shoe designers, cobble together something amazing, and much more.

Heart Strings Marionette Lesson

String. It will tie things up and tie things down, but did you know it can dance around? It's time for students to pull on some legstrings, headstrings, handstrings, and heartstrings in a fun new adventure for Thanksgiving. (Adapt this lesson as needed to research another holiday or other subject in history if it is not November.) We'll tie it all together when

students take up the threads of history, practice a little re-imagination, put their own spin on what really happened back then, and make history dance with marionettes they build themselves. They'll learn all about a Timecrowave and what might go wrong when you heat your dinner with the power of timetravel, learn the dangers of trying to change history in order to get an A, try to put their heads on straight, and find out just how much can hang on a nail!

Inventions, Gadgets and Gizmos!

Click

Hurry! Grab your camera and *Click!* The shutter snaps and the image is captured, forever frozen in time. Did you know the first camera was the size of a room? That's rather hard to fit in your pocket! In this lesson students learn the history of cameras, learn a lot about light, poke pinholes to make living pictures, build an actual working camera, deconstruct an actual working camera [and do their best to put it back together], find out why a picture is worth a thousand words, learn what horses have to do with the history of motion pictures, and discover what makes it all click!

Bright Ideas

There are a lot of things we don't know that we don't know, so how do we come to know what it is we've never known? All it takes is a problem and a question. A whisper of an idea sparked by a simple question, even one like, "What else could I do with this?" and then we're off, with bright eyes and bright ideas! To teach creativity we have to invoke curiosity and teach the ability to ask good questions. That's the start and the heart of this lesson where students get to practice their own ingenious ingenuity by solving problems; figuring out how to fly a funky little paper airplane on a tsunami of air; creating wild, wacky, and wondrous inventions; discovering how bikes are turned into blenders and soda bottles into bulbs; finding out that they're a target, learning the power of a tiny touch of yellow, ad-ing things up, and much more!

Hydraulics

Once upon a time in ancient Greece,...okay, hydraulics isn't actually part of a story about a seven-headed serpent slobbering all over someone, as much fun as that would be, rather it is a branch of science and engineering that really gives kids a lift! Explore the wide world of hydraulics with students, learn about that rascal Pascal and his exploding barrels, create battle-bots that run on the power of water, and much more.

Nuke It!

The microwave oven is now an essential part of most kitchens when once it was considered a luxury only the very wealthy could afford. Now, everybody likes to use the microwave to pop popcorn, melt butter, or make hot chocolate. Unfortunately, most people still have no idea how their favorite popcorn popping machine even works! In this lesson students learn how it was all inspired by chocolate, meet the inventor, hypothesize and conduct experiments that will help them figure out

how this miracle machine does its job, learn about waves, make soap grow, and deduce that with the help of a little chocolate and a microwave they too can measure the speed of light.

Protecting the Harvest

Welcome to the Harvest! In this fun lesson students make scarecrows come to life by building animatronic hands, creating incredible 3D art that jumps off the page, mapping out legends of a worldwide protector, and getting a scarecrow eye view of nature by crafting photographic poetry. It's a lesson students will never forget!

Zap Electricity Unit

Have you ever been "shocked" when you touched a doorknob, a car-door handle, or a water fountain? Ouch! Well, then you already know something about the effects of static electricity. What you might not know is how static electricity happens. Students get to explore the structure of atoms, learn how opposites attract, discover practical purposes for static, find out what's the biggest kind of static electricity, and see for themselves the shocking effects of static during hands-on experiments like the Super Sparker!

F-tWaNg!! ThW-ump!!

"catapult (n) - ancient device used for hurling cats at the enemy. It was later replaced by the rockapult, a much more effective weapon." Okay, that really isn't true, probably, but seriously, weapons that once smashed castle and fortress walls are now great lessons in how basic mechanical principles can, and did, turn simple materials into very useful, effective, and protective tools. Students learn the power of simple machines like levers, spend some time with Newton's laws, and play with potential and kinetic energy while constructing and designing their own catapults.

General Review

Ready Set! Math

A little competition is healthy. A little competition is fun. So, when they flash the flashcard, (pose the problem, state the sum) you'll want to 1st correctly answer, then run, run, RUN! (or toss the ball, or get the points, or however it works in the game of choice!) Either way it's a ton of fun and rather a lot of skill practice is done!

Instructors at the end of this unit there is a comprehensive list of the math skills students learn in each grade. The skills are organized into categories: As you read the activities in the plan, keep in mind the specifics skills your students need to practice and master in the different grade levels you work with. Use their needs to guide your approach in how you'll modify and present the activities and what specific tasks you will have the students do.

Fractions

Easy, Peasy, Pizza Pie!

Every second, Americans eat 350 slices of pizza. That's 23 pounds per person, per year. Don't you think it's time we put all that pizza to a purpose? Pizza teaches everything from basic fractions and numerators and denominators, to word problems ["If we have 5 pizzas and eat 3 pizzas, besides a stomachache, what is left?"], graphing, and second semester algebra formulas in this mouth-watering lesson, all with a slice of history on the side. A pie chart has never smelled so good.

Probability

A Wizard of Odds

Someone may have told you that chance is just a roll of the dice, but...hey chance actually IS just a roll of the dice! So, what are the chances you are a math wizard? Find out while we review the ins and outs of probability. Students will learn all about what probability means, why we study it, and how to express a probability on paper. Should they take the deal? With probability on their side they won't have to guess. They'll be able to determine the number of possible outcomes in a random event and know how to use a grid to figure it out. They'll learn about mathematical expectation and that probabilities aren't just for predicting dice rolls - the principles they'll learn are the basis for predictions in all kinds of complex systems, from the stock market to the weather!

Introducing Probability Pig

Pig! is more than just a game where you try not to get too greedy, it's a great way to teach students at every level how to think strategically—to look ahead and figure out how what just happened, and what might happen next, will affect their chances of winning. And this effort to predict provides a perfect chance to explore probability, a way to measure how likely something is to happen. Are they going to have fun while learning? The probability is high!

Probability of Pursuit

In pursuing the answers, in chasing the truth we encounter math from here to Duluth. We find fractions in food and hear math in our stories. When snake eyes are watching, how can math ever be boring? What's going to happen? How do you know? What does it mean when they say, "probably so,?" From baseball to bankers, when it's all on the line, we'd like to be certain it will turn out just fine. What are the odds? How can you tell? If you get near a skunk, are you going to smell? Chase down the answers, roll the six-sided die, if you know probability you won't just let fate decide.

Symmetry

Sym City! Symmetry Unit

Everything from butterflies, to algebra, to the universe is based on symmetry. So how come we know so little about it? Compared to other famous concepts of mathematics and physics—infinity, uncertainty, relativity—the notion of symmetry might seem a bit boring at first, but not when you can use it to make creepy, strange, whimsical aliens; mysterious mirror drawings; perfect portraits; terrific tessellations; and turn your own name into a funky piece of art. You really can find symmetry everywhere! Even in ancient (but still really fun) games like Madagascar Solitaire in which knowing symmetry is simply good strategy!

Measurement & Money

GastroKids Cooking with Math

Math is in every kitchen, on every recipe card, and at each deluxe dinner holiday gathering. With this lesson students dig their hands into the concepts of weight, cost, estimation, money, supply and demand, measuring, conversions, and more as they become caterers and shop at your supply store. Will they make enough in time to feed their hungry guests and still make a profit? Or will they run out, run late, and run up a bill? If they're savvy they might just get to savor the sweet taste of victory.

Math Review Games

Four Heads

Everything's more fun with a little competition! With these games students gain a solid understanding of basic concepts, while having so much fun they may not realize it's a math review. But when it comes time for that big equivalents quiz, your students will remember the equivalents practice they got while snatching that spoon!

Math-O- Matic

It's not "Oh, math..." it's Math-O! Fractions are flying, numbers are huddling, teams are tagging, students get 20, make "mummies" and money, and math skills become automatic with these fun hands-on games as students answer the question, "What's your final answer?"

Math, It's All in Your Mind

It's all in your mind! No, we don't think you're crazy. Math skills may lay dormant, you may feel a bit lazy, until it comes time, and it's all on the line, then the skills that you need aren't that hard to refine. Play Football and Bingo, I've got this, Who has that?, Tic Tac Toe that is tricky, and more fun games like that. With such fun to be had, with such skills to be tried, you'll soon unlock talents you've buried inside!

Stop the Yawns! Math Activities and Skills Practice

Math cards and graphing. A race to be first. Is it luck or strategy? Which one will work? A friendly feud or an all-out battle? Will they sink the captain's ship? Or are you going to make them paddle? Put an end to indifference, call "Cease Fire!" on those yawns. Play a fun game and the boredom is gone!

On Target! Math Games with Impact

Thinking fast can make cents, a good guess might pay off, if in practice they're not perfect, not all is lost. Small change adds up fast and it's not just dumb luck, strengthening math skills is worth a lot more than a buck. Staying on target and practicing math? It really does have an impact that lasts.

Music Lessons

The String Family

Maybe you've never really considered yourself very musical. Maybe you sing like a nightingale. Maybe you quit the flute three months after you picked it up. That's okay. Music is in all of us, and even just by popping a CD into the stereo, or turning on your mp3 player, we're tapping into its power. Students tap into the power of music as they learn to recognize the voices in the string family, find out that pitch doesn't always involve a baseball, learn just what sheep, horsehair, rattlesnake tails, and violins have to do with each other, and strum sweet sounds from their own washtub bass.

I Bet You Think This Song Is About You

Students struggle with vocabulary but seem to learn the lyrics to the latest song effortlessly. If only there was a way to harness that power! There is, through music and lyrics students are able to practice a wide variety of language skills [reading, writing, listening, and speaking] in a fun manner. In this lesson, we provide an easy formula for bringing music into the classroom and getting that tricky vocabulary into their brains. Included are some great sample activities to get you started with Carly Simon's infamous, "You're So Vain" And later they get to write some new and funky lyrics of their own.

Lessons about Plants

Pass the Plant Parts Please

Did you know that at one time only kings and other wealthy people could afford such a delicacy as cinnamon and it was more valuable than gold? That people risked their lives traveling on wooden ships across uncharted oceans to find spices? That huge wars that lasted for years were fought over black pepper? Students learn to identify the parts of plants along with the tastes and scents of spices, becoming botanical taste bud detectives along the way.

Falling for Leaves

The wind is on fire with flame colored leaves dancing and twirling before bowing low, and still lower to finally touch the earth. Autumn has come and trees are slowly unveiling their branches. Where did all those brilliant colors come from? Were they there all along? Students uncover the secrets of leaves and get inspired to create some shapely art of their own in this colorful fall lesson.

Presto Magic Series

Part 1: Presto!

What if? Why not? Could it be? Science is the truth...Magic is the Mystery! On the surface, science and magic probably seem to have little in common. One is an art of deception while the other is an established entity based on hypothesizing, testing, repeatability and theory, but there's more to magic than first appears. In the first part of this three-part series we're going to follow the rules (and break them); discover there's magic all around the world; see if it can be broken; learn a few tricks; make solid objects leap, link, and fly; predict which hand is holding the prize; solve a problem for Monty Hall; and figure out the secret of cups and balls. It's time to find out your answer to that age-old question...Do you believe in magic?

Part 2: Chango!

chan·go *verb imperative* : a sudden transformation as if by magic.

Things can change quickly when magic is involved. In this second part of our magical series students read a transformative tale about the power of books, they discover the magic inside their wand of a pen as they become Wizards of Words and tell complete tales using six little words and illustrate images with nouns, adjectives, and verbs. They watch a funny witch advertise her wares and find out why little old ladies made people scared. Make your mind flip with a Mobius strip, make an empty bag lay eggs, and find out how to float above ground (yes, even your legs!) Now here's your next question...do you believe you can fly?

Part 3: Prestidigitation

Prestidigitation: sleight of hand, stage magic French, from *prestidigitateur* prestidigitator, from *preste* nimble, quick (from Italian *presto*) + Latin *digitus* finger

Houdini... Except for the legendary Merlin of King Arthur's Court, no name so conjures up the realm of magic, but he himself got his name from another magician. Students discover Houdini's secrets and master a few elegant tricks of their own, learn of a love that lasted beyond death, and a tiny mysterious organ that caused it. They escape a crazy man's handcuffs, ropes, and become master mentalists, able to bend spoons with their minds! Then listen to a modern-day magician speak of his greatest fear and face it themselves as they pull back the curtain and prepare for their first performance! Ladies and Gentleman, it's your turn to amaze!

Recycle and Reuse

That's Rubbish

That's Rubbish! For some of today's students, recycling is a way of life. But that doesn't mean students understand why we recycle and why that green triangle is everywhere. More than ever, it is important for students to know what "living green" really means and why it has become such a big thing. If we don't think about where things come from, and where they're going to go, eventually, that can become a very BIG problem...Students learn about trash in the past, trash today, and where our trash will be tomorrow, how nature recycles, why rottin' is awesome, how to make biodegradable work for them, and get a little culture, vermiculture.

Piling Up! Reduce & Refuse

Piling Up! Reduce the Refuse: Hey, take the garbage out! So, what if we don't? Does it really matter that much? Just ask Sarah Cynthia Silvia Stout what happens if you don't take the garbage out. Piling it on may be great when you're filling a plate, but it's not so great when you're filling the lake. In this lesson students continue to learn about the importance of recycling, get motivated by Möbius, learn that what they do really does matter, get to be opinionated, watch feelings spread, and get the answer to the age-old question, "When the garbage truck comes and takes away our garbage, where does it go?"

Robots

Robots Part 1: Weeks One and Two

If something has the ability to think, acquire and apply knowledge and skills, in essence to learn, is it alive? Students figure out their own answer to the 'robot problem' as they meet 'I, Robot' and Mr. Robot-Oh!, learn where and when it all began (it wasn't as recent as you might think), discover what androids dream about, try and defeat Talos (the first robot in history) at his own game, before using some whim-agination! They'll figure out what's a robot and what's not, assemble some problem solvers, and learn what happened between the Greeks and advent of the Geeks. Finally, they turn a mole-hill into a mountain as they create their own complicated answers to a simple problem, Rube Goldberg style! Come on and join the fun, it's time to power up our brains!

Robots Part 2: Week Three and Four

In part two of our robotic adventure we explore just what makes a robot tick and where automatons wound up. Discover how old robots can bring modern people together and a dusty broken boy can inspire a tinsel town hit! Then it's time to set our own ideas in motion as we tinker and tweak, twist and turn, and go round and round and up and down! We think we 'cam!'... We think we 'cam!'

Robots Part 3: Week Five

Be ye man or machine? Did you know that humans and robots have a lot in common? And that there's a test to see just how human-like a machine can be? In this fun exploration of just what it means to be 'real' students find out who is on the other side of the line when the phone goes Ringy Dingy! We'll see what it takes to build trust between mankind and machines, get some feedback, catch the wind and find out if intelligence can be artificial. Finally, we'll harness some power, fluid power that is, and build the CLAW! Will it choose who will go and who will stay? There's only one way to find out.

Robots Part 4: Week Six

It's not a revolution, it's a robot evolution! From just for entertainment and stuck to the factory floor, robots have moved up and on to so many more uses than before. They're partnering with painters ('an artist in the shaking?') and creating works of art (hmm, what is it that it's making?) While they've moved up, they've run into a valley, where they aren't quite real enough (you don't want to see that in an alley!) So, it's time to figure out just what's up with robot skin and Albert Einstein is always a great place to begin. Then when we've got that part, there's another task to start...it's time for us to train and learn to speak to our robot's brain! And we'll finally shed some light on just what makes robots tick and see if we can figure out a place where that light will stick.

Robots Part 5: Week Seven

Robots like to move it! And in this fascinating unit, we find out how brainless robots can act pretty smart, and then get our very own swarm to start. We learn how the sun can give some good vibrations and that Scotty isn't the only one that can BEAM you up! We play a game of Rock, Paper, Scissors, Swarm that will have kids giggling up a storm! Then we make some bots, lots and lots and lots and lots [of wibbly wobbly vibrobots!] And we wind up discovering a new form of life, kinetic creatures that swallow the wind, made by a man who envisioned their kind, a vision he found deep inside of his mind. So, come on, get moving, you don't want to miss out...it's time to get your [bot's] wiggles and jiggles on out.

Robots Part 6: Week 8

It's time for a challenge, it's time to start because robotics is both a science and art. And here is the challenge, here's what to do...put your notions in motion...it's all up to you!

Rocket Science

It Really IS Rocket Science- Part One

It's not...wait! It IS! It really is rocket science! And, Pop, Pop, Fizz Fizz...oh, what sweet rocket science it is! In the beginning of this fun three-part series students learn how a hero spins when it gets all steamed up, pop a top to start their engines, go back in time, mark up

maps as they wander all over the world, have a blast with bottles, and find out why Wan-hu said Wahoo! It's a crazy adventure that just might make you feel over the moon!

Bigger, Better, BOOM- Part Two

Since the earliest days of discovery and experimentation, rockets have evolved from simple gunpowder devices into gigantic vehicles capable of traveling into interplanetary space. Wouldn't it be interesting to hear the thoughts of those earliest rocket pioneers, with their fire arrows and spinning spheres if they could be brought through time and shown where their discoveries have led (would Wan-hu say wahoo?) In this second installment students find out who first paid the price of the race to space, discover who deserves the fame of the name Rocket Man, debate the rights of some brave four-footed explorers, try to balance a bird on its nose, taste the sweet sensation of speed (and space food!), meet Mr. Newton, and try to break some laws. Rockets have certainly opened an important door to the universe and some brand-new doors in our minds!

The Rocket's Red Wet Flare - Part 3

We've practiced, studied, and waited, and learned and wondered with our breath bated! When would it be our turn to fly, and send water up in the sky! It's time! Time to build and launch and create, that most marvelous marvel, a rocket that's great! A rocket that's launched with dramatic flair. How fun to see water bursting in air! We'll build it a body that's perfect and neat and will shoot up high and not fall at our feet! After that we'll design some fins, for stability and balance are key in controlling the spins! And if our rocket tumbles like a football in a 20-yard fumble, we'll laugh and we'll fix and we'll learn and we'll run, and we'll truly discover...rocket science is FUN!

Scream Machines

Scream Machines- Paper Roller Coaster Unit

For many people, there is only one reason to go to an amusement park: the roller coaster. Some people call it the "scream machine." The history of roller coasters reflects a constant search for greater and more death-defying thrills and in this lesson, kids find them. Well, not death defying, but desk defying at least! Students get up and moving, hands in and minds on, as they create their own coasters from the first rough sketch of that glimmer of an idea and rocket all the way to a fully 3D model tested, retested, and ready for competition. So, lower your lap bars, keep your hands and feet inside the ride at all times, and get ready to launch learning in 3, 2, 1...

Space and the Universe

Moonstruck Unit

The Moon has fascinated people throughout history and while most of us may never touch its surface with our own two hands that doesn't mean we can't understand what the ever-changing bright silvery disk is really doing in the darkness beyond our atmosphere. This lesson provides students the opportunity to recreate the lunar surface and bombard it with asteroids, to experience a taste of space and feel a fraction of what astronauts go through, peel back the layers and see beneath the surface, recreate craters, learn about orbits and why we can't see the dark side of the moon, determine what life might be like without the moon in our sky, practice the phases with the Oreo Moon, and determine the veracity of legends about lunar luck.

The Family of the Sun

What do you begin an astronomy lesson with? A first taste of the constellations? Celestial coordinates? Physics? History? Our galaxy, the Milky Way, a spinning top, with swirling arms extending from the center like a pinwheel. Our Sun, one of about 100 billion stars in the Milky Way. Our galaxy? Just one of roughly 100 billion in the visible universe. With all that to cover, where in the worlds is the best place to start? In this lesson, Students not only find constellations, create models, and become able to picture the dimensions of our solar system, among many other things they discover that with Space no matter how much progress one makes, there is always the thrill of just beginning.

Mission X

Can you imagine if your job might only last a few hours, a few days, a few months, but it took years of training, constant preparation, and lifelong dedication in the hopes that you'd get to do it? That's what life is like for astronauts. In this lesson students, complete, "missions" to train like an astronaut, learn why astronauts need to be physically fit, and gain a better understanding of just what astronauts have to do to keep in shape on Earth so they can get shot into space!

Solar Travels

Any kind of journey takes preparation. You have to know what to pack, you need to know what the weather is going to be like, and you have to figure out how you're going to get there. In this lesson students, have been hired by Solar Travels, Inc and are in charge of a new company division that will put together a vacation package that can safely deliver the company's very important clients (V.I.Cs) to the ultimate vacation destination and back home to Earth. And when the journey is measured in light years, there's plenty of time for "Are we there yet?"

Asteroid Orbits

It's like a traffic jam in outer space, we've got rocks and dust flying all over the place! There's metal and dirt just zooming around, and scientists know surely more will be found. A big fender bender would mean the end of life as we know it. An asteroid crash? Well, that would just blow it. What do they taste like, those rocks from so far, and are they really lots bigger than Grandmother's car? Who

is Icarus and why did he fall? Can a collision be avoided at all? How can we tell if The End is quite near? Shouldn't we all be quaking with fear? These questions are answered, if you just click right here.

Mining Meteors

“If it wasn't grown; it was probably mined.” What is it that makes humans dig endlessly into the dark, risking their lives in search of glimmering scraps of gold, dark iron, bright copper? Our world hinges upon metal. The progress of cave-dwelling humans to today's modern society, progress in agriculture, transport, technology, advancement in arts and crafts, none would have been possible without metal. But what of the day when every scrap has been found? Where do we turn? In this lesson students learn what their cars are really made of, what makes one man's junk another man's treasure, get a taste of mining, pan for gold, and make a plan for when the supply has a limit.

Super Heroes!

Super Who? Super You! Week One

It's time to go on a journey, a hero's journey. We'll have a blast as we dive into the past and learn that it's no mystery that heroes have existed throughout history. On the way, we'll discover that heroes and villains aren't so different at all, in fact the differences can be really quite small. And we'll overcome obstacles, of course! as we race against the clock (tick tock!) to discover just what makes a hero super. To learn just how they 'come to save the day' we'll watch heroes in action and see if their plans work as well as they say. Then it's time to dig deep and look for the roots of the thing that led to comic offshoots. We'll seek out the Shadow and find out what's up with the 'Doc (did you know that the Man of Steel is a chip off the old block?) And then...Oh look! It's a Bird, It's a Plane, It's a...Villain? There's more to discover there's more to explore, there's plenty more heroics in store, so come on and find out today that it's not SuperWho, it's Super You all the way!

Super Who? Super You! Week Two

You'd better be quick on the draw because it's about to be your turn! You're about to make the page of your very own comic burn. It's time to show the exciting story of what happened one night in the laboratory. And then it's time for a polite debate on who is right and which is great, “I'm reading a graphic novel,” “Hey, it's a comic book, mate!” Meet the 'golden boys' who led to comics today (which led to the toys with which many kids play.) Stan Lee & Jack Kirby and the fun that they had (and the controversy when things, well, got bad.) Find inspiration and quench (super) thirst before playing a math game to see who can defeat villains first. And then ask questions and explore even more. Can parents pass down superpowers like the power of flight? With the power of heredity, they just might! Discover how genes (like superheroes) have special jobs to do and the power of heredity in passing things down to you!

Super Who? Super You! Week Three

Remember that little question? You know the one. “If you had to create a superhero or super villain what would you use as inspiration?” Hope you’ve been thinking because you’re gonna have a turn behind that desk as a comic creator, a comic book writer, a superhero imagineer! Then we’ll start our hero’s journey and tell some thrilling tales of wild adventures (is yours a ‘SuperWhale?’) Then we take flight with the man of the night, the Caped Crusader and learn how he’s a homebody, more than anybody! Heroes can be a reflection of their cities, and with some super art by you, that city is looking pretty.

Super Who? Super You! Week Four

So, we’ve learned of adventure, we’ve had some fun, but superpowers aren’t how it always gets done. There’s gadgets and gizmos a-plenty and whozits and whatzits galore for those heroes who’ve never had powers before. *Badaboomit*’s time for boomerangs, *click clack* it’s time for claws...and then it’s time to get involved in a secret lab because...your hero needs some gadgets, your hero needs some gear, and your awesome new invention, Code Name: Gizmo, is starting out right here.

Super Who? Super You! Week Five

Designers assemble! You can throw out any number of explanations for the enduring popularity of superheroes - the flashy, larger-than-life battles, the never-ending soap opera storylines, the desire of readers to immerse themselves in worlds where good and evil are easily delineated, etc. But part of it has to be the costumes. This week we’re working on costumes and K.I.S.S.ing it better (and awesome logos come down to the letter!) We’re working being the poster-children of super and find out that superhero hero pets are just super-duper! We learn secret identities and get our capes off the shelf. Come on and let’s get started on your super-est self!

Super Who? Super You! Week Six

And so we meet again... It’s time to go back to the drawing board, or at least the drawings you’ve already done when you were ‘imagineering’ your hero and her journey. We’ve expanded your hero’s world (and maybe you’ve gotten a few more good ideas.) They have a costume, a logo, a gizmo (or two), and possibly even a powerful pet...frog. Hey, it’s possible! So now it’s time to go back and expand their story and tell more thrilling tales of adventure before your hero can join the upcoming Gallery of Heroes. The stage is set, the characters are ready to perform, let the story begin! (And if you do your best through and through (especially during peer review) we’ll end our journey with a Super Quest!)

Super Hero Drawing Guide

With this handy reference guide put your drawing fears aside. We cover the basics for all ages on how to draw superheroes from the simplest of shapes to the flowingest of capes. From basic shapes to shading we’ve got you covered and to help you feel like a hero instead

of a 'non-artistic' zero. And if you need more help, we've got additional resources to give you the most advanced of drawing courses.

Survival! (Ecosystems)

Welcome to the first part of our four-part series of Ecosystem Survival! In this unit students journey into the world of the Rainforest. They learn what makes the rainforest unique and vital to the whole earth. These units are broken down into days. They include four days of instruction. It is expected that they will take an hour to an hour and 15 minutes to complete. Suggested standards have been mapped out.

Instructors should feel free to change the standard alignment if needed to meet the individual needs of their students. The key to making the unit successful for students in ensuring that the activities are aligned to skills that each grade level needs to master.

Surviving the Rainforest- Part One

Take your students on a wild adventure as they learn how to develop tribal unity. They will learn of tribes who live in the rainforest now and use mapping coordinates to determine exactly where they are. They will use their artistic abilities and create their own tribal banners. Their very own tiny rainforest will come to life. Fruit loops will come in handy as they recreate how life can be in the rainforest jungle. They will learn of the Great Kapok tree and through an engineering project create their very own forest floor and walkway. Only the brave will survive!

Surviving the Rainforest- Part Two

The rainforest is really a fitting name. Rainforests receive nearly an inch of rain every day of the year. In this lesson, be prepared to take your students on quite an adventure. During the unit, they will recreate the funnel naturally occurring in the rainforest from layer to layer. Learn which birds and animals are thriving and others are threatened. They will create their own decomposition chamber, and go on a search for water. As they create their own water filter they will learn about common practices of water filtration today. Their tongues will learn of the tastes of the rainforest while they some quick thinking in games of skill where they will need both brains and strength to compete.

Welcome to the second part of our four-part series of Ecosystem Survival! In this unit students journey into the world of the Desert. They learn what makes the desert unique and vital to our world. These units are broken down into days. They include four days of instruction. It is expected that they will take an hour to an hour and 15 minutes to complete. Suggested standards have been mapped out.

Instructors should feel free to change the standard alignment if needed to meet the individual needs of their students. The key to making the unit successful for students in ensuring that the activities are aligned to skills that each grade level needs to master.

Surviving the Desert Part One

Phew! We made it through the wet and wild rainforest! We've gathered data and learned and explored and now it's time do some more! No sweat, right? It's just...the desert! In the first of two units' students get a chance to dry off and dry out, quench their parched throats, pull a vanishing act, watch the desert bloom, figure out just what happened at tower 37, and learn the answer to that crucial question. Live or die? Do we have the skills to survive?

Surviving the Desert Part Two

Apparently, we do because then we continue our desiccated desert adventures in part 2! Students figure out the dangers of the mysterious Fata Morgana, learn how to keep from getting 99.9% parched, make sure that lemons become lemonade, think like survivalist dieticians, give a few opinions, and shake down some rain before crossing the sea of sand. Then they rise to the sky for a windy perspective on this slow-motion ocean before the sun sets and cool colors cover the landscape. Finally, students finish the journey by making their own desert dune buggy and putting it to the test on the shifting sands. Will theirs be the fastest to cross the wind carved lands?

Surviving the Swamp

Welcome to the third part of our four-part series of Ecosystem Survival! In this unit students journey into the world of the Desert. They learn what makes the desert unique and vital to our world. These units are broken down into days. They include four days of instruction. It is expected that they will take an hour to an hour and 15 minutes to complete. Suggested standards have been mapped out.

Instructors should feel free to change the standard alignment if needed to meet the individual needs of their students. The key to making the unit successful for students in ensuring that the activities are aligned to skills that each grade level needs to master.

Surviving the Swamp Part One

Do you hear that sound? The bzz and blurp, what is this place with the liquid dirt? We've made it through rainforests and deserts, but will we survive the swamp? Come tromp, tromp, tromp, through the [more than just] misty, murky, mysterious swamps. Learn how your step makes the wet and wild earth tremble, make a wetland in a pan, and reclaim your rights to play with bubbling ooze and chocolatey goo. We'll find out what bubbles beneath when it's bedtime at the swamp, discover the secrets of cryptic cryptids, and wander the wilds with will-o'-the-wisps. Come follow the whispering blue lights that lead to cute and creepy creatures of our own creation and find out who wins when you play swamp tag, is that really a log? It's a wet and wild time! Come on in! The swamp feels fine!

Surviving the Swamp Part Two

We've made it halfway through the swamp, but will we get bogged down in the middle? Of course, not! It's time to follow the figments of our imaginations (and we're not talking about will-o'-the-wisps or fata morganas) and tell a tale or two worth telling. It all began with a strange, mysterious correspondence...an unfinished tome filled with eyewitness accounts and images of mysterious creatures otherwise thought to be the stuff of legend...legendary writing that is. Those tales lead us to the masters of the swamp, the ones who have traveled this non-existent road before and we learn from them before traveling the treacherous paths of sand, quicksand that is. For such quick stuff, we'll need to move nice and slow! Especially if it begins to glow. So, just what grows in the mud between our toes? It's a towering kind of mystery, but the key to our solution lies in history...and once we've unlocked the coils of questions we'll follow the slithering to the solutions we long for. And perhaps in the end we'll end up on dry land...or perhaps we'll just be another mystery in the heart of the swamp.

Mountain Survival (The Trek's Begun)

We've ran through the rainforest, danced in the deserts, sloshed through the swamps, and now it's time to master the mountains! We'll learn about survival and see if actions speak louder than words, even when you're telling a story. Then we'll flip out and get board (nope, never bored, board!) before making six word stories. It's a good thing we're going to have a lot of good stories to tell because we're about to get stranded! It's survival of the fittest out here in the mountains and we'll need to work together to keep ahead of the game. But hey, yoo hoo!, there's a big summer blowout happening in this mountain range, can students supply the demand for an icy exchange? It's time for adventure, it's time for some fun, so grab your gear...come on everyone!

Mountain Survival (Rising Higher)

Mountains Part 2, Rising Higher: We've ran through the rainforest, danced in the deserts, sloshed through the swamps, meandered up the mountains and now it's time to put our webbed feet forward for the final climb where we walk on frozen water, and put our feet in flux! We're sure to have some close encounters of the abominable kinds as we follow (and taste) yeti tracks while hearing wild tales of Mountain Men and learn the secrets of the invisible men of Everest and determine what's fact and what's fiction. Then students get to traverse the crevasse as they try to keep up with the world's greatest mountain climber, a goat, as they play predator and prey. Is there an obstacle? Of course! Finally, when we're tired at the top of the trail it's time to build ourselves the perfect home, our own dome, sweet dome. And we get the final answer to...Ae you up to the challenge? Can you survive the ecosystems?

Wander Games

Welcome to the Bonus part of our series of Ecosystem Survival. This should be completed after students have participated in the other four parts of Ecosystem Survival. Can you help your students survive?

It takes more than just strength, or smarts, or stealth. In this fun series, we'll put students through the Trials to see their likelihood of survival – then they'll try to discover how they might improve their chances. Remember, there is only one path to survival through the ecosystems full of booby traps, lethal animals, and hidden secrets. Get ready for the games!

Sweet Lesson Unit!

Chocolate. There are few foods that people feel as passionate about -- a passion that goes beyond a love for the "sweetness" of most candies or desserts. Where the mere word can cause mouths to water. But where did the human hunger for sweet begin? And why do we seem to associate candy with medicine-like powers? In this sweet lesson students get hands on (and hands in!) while creating home-made truffles, discovering the history of conversation, or rather conversation hearts, practice origami giving, and learn a little about Hansel and Gretel Much as they, much like the ill-fated siblings, follow a trail of crumbs (in the form of written clues) to progress through the forest! It's a scrumdiddlyumptious time for all!

Wild Blue Yonder

This unit was created to be used in a series of 3-4 home visits for MEP instructors or 1-4 weeks instruction in AIM. The focus of these units is not only on science, technology, engineering, and mathematics but also reading and language arts. These lessons are designed to be used in the order they are listed below.

Wild Blue Yonder! Part 1

Do you ever dream of flying -- making lazy circles in the sky like a seagull or a hawk? If you do, you're not alone. With this lesson students take the first steps in a truly fantastic journey. Hot air balloons send students soaring over landscapes, historyscapes, and imaginariescapes all while discovering scientific principles through exploration. They learn what happened when a sheep, a duck and a rooster hopped into a balloon, discover the origins of some rather strange traditions, explore what makes something go up and what brings it back down, learn about the loudest sound ever heard on Earth, follow a Professor around the Globe, and much more. Come on! Let's discover what's out there in the Wild Blue Yonder!

Going Up! Part 2

"*You can never tell where the winds will blow you, what fantastic. good fortune they can lead you to. Long Live Balloons!*" The adventure continues in Part 2 of Wild Blue Yonder! If we're setting off like Professor Sherman, we'll each need our own hot air balloons! Students prepare to take off by becoming apprentice basket weavers, sending potatoes aloft, learn what happens when real-world engineers are inspired by Pixar movies, and much more as they discover just what it takes to Ride the Wind.

Preparation is a Breeze! Part 3

If we're going to follow Professor Sherman around the globe, we have a lot to do to be ready! And when our preparation is finished it's time build actual working hot air balloons & launch them Up, Up, and Away! Then we'll measure how far they've gone, learn about real world Balloonatics, and figure out how to get our own balloons back safely so we can launch them all over again. It's a very good time to be full of hot air!

Making our Great Escape! Part 4

This final chapter of our adventure is a treasure trove of fun as students get to sea and see stunning scenes, discover and create lost landscapes, find out that diamonds make a sure foundation, mine for treasures, find out what it's like when it's all in the family, create their own "diamonds" and watch them grow, get a taste for travel, take a delicious test, and much more. This is one escape they'll want to write home about!

Vocabulary Review Games

Snowball Charades

Will you be a shivering elf? Or, maybe a snowy tree? With this fun game students get to practice their reading, writing, and acting skills as they expand their vocabulary and possibly shiver their way to a win.

Word Slam

Great for kids of all ages who love games, need vocabulary practice, and don't want to sit down and read. This is a high-speed game where all players compete at the same time to change the word on the table using the cards in their hands. Excellent way for students to practice spelling and increase vocabulary and reading, while having fun! Just remember to keep a dictionary handy!

Scrambling for Eggs

The spring egg hunt is a classic, but a little switch-up makes it fantastic for reading, writing, and racing. See change can be healthy and exciting! So why not do the egg hunt with a clever twist this year and make writing sentences a sweet experience?

All About Water

Aquifer Lesson

Where did that water come from before it came out of the pipe? This lesson provides students with a hands-on discovery session all about groundwater and its journey from the sky through the earth and

up to your sink. Students love the opportunity to create their own delicious edible model aquifer, though they just might enjoy adding the "pollution" a little too much!

Bubbleology

What is so fascinating about bubbles? Why do we love to chase them and create them and pop them as soon as we can? Is it the precise spherical, round ball, shape, the incredibly fragile nature of the thin soap film, the beautiful colors that swirl and shimmer, or most likely, a combination of all these? In this unit students play with bubbles for a purpose, hypothesizing and determining the strongest bubble formula, using color to measure their thickness, solving bubble mysteries, constructing square bubbles and geometric suds, determining bubble chemistry, making elephants toothpaste, bouncing bubbles, creating super strong bubbles, putting students in a bubble, creating CO₂ Sandwiches, and much more.

Twisters and Volcanos

Heart of Fire

Welcome to the greatest show on Earth. Propelled by intense heat simmering beneath the crust, Earth's surface is dramatically reshaping itself in an endless, slow-motion ballet called plate tectonics. Deep inside Earth, there are many layers and students learn about each one in this lesson as well as how volcanos produce a lot more than just lava, and come in more shapes than simply a cone. They'll visit Pompeii and then make a volcano of their own (and erupt it of course). Finally, they'll become experts in the science of stratigraphy as they determine once and for all which came first, the crack or the rock?

Twister

A tornado isn't likely to sweep down and take you to Munchkin land, as it did to Dorothy in Frank L. Baum's, *The Wizard of Oz* but this lesson will take students into the center of the storm and down into the heart of tornado alley. They'll learn about the Fujita scale and the recipe for the perfect storm, grow their own tornado in a bottle, and become engineers as the endeavor to construct a tornado-proof house. They'll also create terrific twisting tornado art and see what they know with a review game that just might blow them away.

World War Two

Wings of the Crane Part One

In Japanese, Chinese, and Korean tradition, cranes stand for good fortune, peace, and longevity because of its fabled life span of a thousand years. An ancient Japanese legend promises that anyone who folds a thousand origami cranes will be granted a wish by a crane. A common wish we hear people say is for world peace. In this first section of our fascinating series students and staff will explore a small portion of World War Two, learn how folding paper led one girl to become an international heroine, discuss what we can do to change the world, come to understand the impact of a decision, play a few [math] war games. They'll also discover that Manhattan is more than just a part of New York, measure

the invisible, learn about a physicist who was afraid of the floor, solve some mysteries, and find out that you can't trust an atom, they make up everything!
And perhaps, as we learn about our past, we can affect the future, so that someday the world will find peace, under the wings of the crane.

Wings of the Crane Part Two

As we dive deeper atoms give students the warm fuzzies and they learn that your teeth aren't the only thing that can decay when there is candy, actually 'Candium,' around! Then we'll go on an adventure that'll let us say we've 'gone fission!' with over 300 mousetraps, a few ping pong balls, a little rubbing alcohol, and a droplet or two of oil. It's no fish story, it's the truth! Students will test out the domino effect in a nuclear reactor and learn to 'shut the box' as fast as they can! It's a good thing to practice when it's time to face Nuclear Clams and they have to do a little Fast Fission!

Wings of the Crane Part Three

In this wild ride about what's deep inside, deep inside a nuclear reactor that is, students get to pile on their knowledge, find out where a giant is buried, and get a taste of power. Moving on they'll find about action and reactions with nuclear marbles, learn some moves from Manhattan, learn it's not delivery...actually it is! And learn a lot more than lyrics when they say, 'You dropped a bomb on me!' A helmet will come in handy since we'll be building up a good head of steam during (and after) debating if we should preserve the past...or let it remain buried, forever.