

2013 ST-EMS COURSES

WEEK 1: JUNE 10-14

WEEK 2: JUNE 17-21

Week 1: K-1st Grade Classes

Feathers, Fins, and Feet!—*Diana Ballinger*

****TWO WEEK CLASS**** Why do animals look the way they look and live where they live? How do their unique characteristics help them survive? In this exciting two-week course, young scientists will explore animal classification and the relationship between animals and their habitats. In addition, students will discover ways that they can help protect animals and the environment.

Essential Questions: How do the needs of plants and animals differ? What helps a specific plant or animal survive? What characteristics are useful for sorting and classifying organisms?

Art Is Smart & Loaded with Math and Science—*Susan Hunt*

Let art be your window to math and science. Have art fun with fractions, symmetry, and measurements. Be curious about nature and living things and observe through the eyes of an artist!

Essential Questions: How can I connect science and math to my world and my art?

Lasers, Magnets, and Other Scientific Stuff—*Kristi Leonard*

What is the difference between a laser and an ultraviolet light? How can we make an electrical circuit? Can we make square bubbles? We will investigate lasers, electricity, magnetic forces, and lots of other scientific stuff. This class is designed to stimulate the scientist to ask questions. Most of the time will be spent performing experiments and learning by doing.

Essential Questions: What is the scientific process and how do scientists conduct experiments to learn something?

**Week 2: K-1st Grade Classes
are listed on the next page.**

Math Mania—*Debra Lucero*

Discover your passion for math. We will explore numbers, shapes, measurement, graphs, patterns, time, money, and fractions through read a louds, poems, games, scavenger hunts and art. We will also create a poster "Math in My World."

Essential Questions: Where is math in our world? How do you use math?

The Math Behind the Science—*Shirley Martinson*

Can we make lightning? Why are there rainbows? How does a computer work and what's inside? If you've ever wondered about these things and want to have some fun learning about them, then join me this summer when we will explore electricity, light, computers, and the solar system, using fun, hands-on experiments to discover the math behind the science.

Essential Questions: How does it work? Why does it work? How do we know?

Number Wizards—*Leah Menzies*

Do you want to learn everything about numbers? Have you ever made an edible graph? Have you ever had a 100 party? Can you make a pattern and count using body parts? If not, then this is the class for you! We will learn all about counting, number patterns, and graphing. A very creative and fun look at numbers!

Essential Questions: Counting to 100, find patterns in numbers, count by 2s, 5s, and 10s, make a graph, estimate and compare, add and subtract simple numbers, and use numbers for measurement.

Earth Rocks!—*Michelle Nab*

Come and explore just exactly what makes Earth an amazing place. Meet "Sed, Iggy, and Morph" as we learn more about the types of rocks our earth is made of. Be a junior geologist and use magnifying glasses and other "scientific" tools to collect, record, and sort data. And, believe it or not, we will make our own rocks!

Essential Questions: What are the three types of rocks and how are they formed? What are three properties we can use to describe rocks? How do people use rocks?

Blowin' in the Wind—*Kameron Russell*

Have you ever wondered about the wind? Join us for a week-long treasure hunt as we discover more about the mystery of the wind. This week will be full of thinking, questioning, measuring and planning as we make our discoveries. Bring your curiosity and creativity! There are paper airplanes to build, kites to fly, and so much more!

Essential Questions: How does the wind make things move? How can we measure the effects of movement?

Week 2: K-1st Grade Classes

Feathers, Fins, and Feet!—*Diana Ballinger*

****TWO WEEK CLASS****

****Please see description in Week One****

Blow Wind Blow!—*Molly Blehm*

Experience the wind! The students are going to be learning about the wind—with the help of a curious monkey named George! One windy day George becomes curious about the way the wind moves things. He ends up having a very exciting kite ride. The students will be working on math skills, science concepts, inquiry skills and engineering skills.

Essential Questions: What are some things we discovered about air and wind and what wind can do? Which experiments helped you learn the most about wind and air? Why?

Math Mania—*Debra Lucero*

****Please see description in Week One****

The Math Behind the Science—*Shirley Martinson*

****Please see description in Week One****

Number Wizards—*Leah Menzies*

****Please see description in Week One****

Earth Rocks!—*Michelle Nab*

****Please see description in Week One****

Blowin' in the Wind—*Kameron Russell*

****Please see description in Week One****

Geo-gami: Learning Geometry with Origami—*Staci Schmidt*

Geo-gami: using the arts of origami and kirigami to explore the math of geometry, including shapes, fractions and measurements. In this course participants will use paper folding and cutting techniques to investigate the connections of art, design, engineering and mathematics. No prior origami skill is necessary and class will be differentiated to all levels of experience.

Essential Questions: Why not always count by one? How does place value work? How can one shape be divided into other shapes? How can folding or measuring divide different shapes into different fractions? What are the defining attributes of various geometric shapes?

**Week 1: 2nd-3rd Grade Classes
are listed on the next page →**

Week 1: 2nd-3rd Grade Classes

From Pole to Pole—*Jessica Bobbs*

****TWO WEEK CLASS**** We will be spending our time together learning about the different biomes (geographical regions) of the world. Each biome—forest, grassland, desert, tundra, and ocean—has its own unique plant and animal life, and climate. We will look at how each biome works and each one's importance in keeping life on our planet so rich and diverse. We will look at how, and why, some animals migrate, why leaves change color, how cacti survive so long without rainfall, and so much more! We will travel from South America, to Africa, to China, and more to discover how climate and geography determine the way plants and animals look and behave. We will create a "biome map" along the way! Be sure to join us for this awesome class!

Essential Questions: How does each biome work, and what is its importance in keeping life on our planet so rich and diverse?

Life in the Four Extremes—*Megan Bryant*

Do you wonder how camels survive scorching temperatures, how fish can live in complete blackness, how polar bears survive in frigid temperatures, or how a cactus can survive years without a single drop of rain? With hands-on experiments, students explore how animals and humans adapt to survive in extreme habitats, the vital components in sustaining life, extinction, and ecosystems.

Essential Questions: What are the basic needs of living organisms and how do these basic needs compare among all living organisms? How does an organism respond when basic needs are not met? How are resources shared in a habitat and what would happen if these resources were removed from an ecosystem?

Weird and Wacky Science—*Jeanna Dolezal*

Fly a 50-foot solar bag. Make your own winter snow. Whip up a batch of green slime to make your friends shriek in disgust! This summer's team of wacky scientists will uncover the truth behind mind-boggling mysteries. Watch polymers guzzle water, take the color black apart, and duck for cover when we make a liter of soda blow its top with these Steve Spangler experiments!

Essential Questions: How does applying a force affect the way an object moves? Can the state of matter of any object be decided?

Out of This World: A Journey into Space—*Heather Ko*

If you have an interest in space and space travel, you have come to the right place! We are going on an exciting adventure to learn about the mind-boggling mysteries of the universe. In this interactive, hands-on class, students will learn about planets, rockets, satellites, the Moon, and the future of space exploration. Get ready to blast off!

Essential Questions: How does Earth compare to other objects orbiting around the Sun? How do we study the solar system? What are some of the potential benefits of space travel? Why do we send satellites into space, and what do they do?

Physics is "Ph"-un!—*Denise Lewis*

Everything in the universe has an effect on every other thing. Physicists study those effects. This class will explore various areas of physics: motion, heat, light, electricity, and magnetism. Children will explore through experiments, technology, literature, observation, and discussion! The Sun and its effect on planet Earth will be discovered. We will use a *solar telescope* and *diffraction grating glasses*!

Essential Questions: How does energy impact our lives? How do we know energy exists? What benefits does the Sun offer and what ways do we use it? How are electricity and magnetism related?

H2OH-NO! Here We Go!—*Resa Mai*

Hey Kids, this is ALL wet! Together we will spray, splash and laugh our way through activities that teach us all about water. Using games, videos, and lots of hands-on activities, we will see water in brand new ways.

Essential Questions: What is water, why do we need water, and how can we protect our water?

**More Week 1: 2nd-3rd Grade Classes
and Week 2: 2nd-3rd Grade Classes
are listed on the next page-->**

Design Your Own Airplanes—Kitty McKechnie

This is an exciting physics-based curriculum that is for future aviators, astronauts, scientists and engineers of all ages as they learn about the magic of flight. This class is full of hands-on experiments and activities in science and math that focus on the essential question: “How do airplanes fly?” It begins with observing birds and applying that knowledge to how airplanes were designed. We will learn about lift, gravity, drag, and thrust and how all of these must work together to create flight. We will end the week with applying what we have learned to the design of our own airplane.

Essential Questions: How do airplanes fly? What is the difference between falling and gliding? How are bird and airplane wings similar? How does an airplane get off the ground? What holds on Earth? Why are airplanes shaped the way they are? How do airplanes move through the air?

Why Is the Sky Purple? (It’s Weather and Climate Science)—Gary Metzger

Do you like to find out the answers to wacky questions? Then come and explore interesting questions like: Would you get a sunburn on Mars?, If hot air rises, why is it cold in the mountains?, and, yes, Why is the sky purple? We’ll have fun with rainbow glasses, sunburn beads, a solar lawn bag balloon, and marshmallows, too!

Essential Questions: Weather and climate science is very complex, but what is the major ingredient that causes the weather and climate and cannot be created or destroyed?

Week 2: 2nd-3rd Grade Classes

From Pole to Pole—Jessica Bobbs

****TWO WEEK CLASS****

****Please see description in Week One****

Life in the Four Extremes—Megan Bryant

****Please see description in Week One****

Weird and Wacky Science—Jeanna Dolezal

****Please see description in Week One****

Physics is “Ph”-un!—Denise Lewis

****Please see description in Week One****

H2OH-NO! Here We Go!—Resa Mai

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Design Your Own Airplanes—Kitty McKechnie

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Why Is the Sky Purple? (It’s Weather and Climate Science)—Gary Metzger

****Please see description in Week One****

Fun with Architecture and Design—Tanya Miller

Have fun creating a floor plan for your dream house and then build a model of it out of particle board and other fun art supplies. In this course, we will be learning how to calculate the perimeter and area of different polygons. We will also spend a day working with Google SketchUp.

Essential Questions: How do I calculate the perimeter of my floor plan? How can I calculate area? How can I transfer my two-dimensional drawing into a three-dimensional form?

Week 1: 4th-5th Grade Classes

10 Things Everyone Should Know About the Atmosphere—*Cherie Bornhorst*

Join the fun and get hands-on as we investigate why the sky is purple and clouds are white, why hurricanes spin counter-clockwise in the Northern Hemisphere, and why the most important part of the atmosphere is at the top, along with many other explorations of weather phenomena we experience here on planet Earth!

Essential Questions: Why does the Sun heat different surfaces at different rates? Why does the weather change from day to day? Why does the wind blow? How does the atmosphere keep the Earth warmer?

MythBusters: Confirm or Bust—*Angelique Campbell*

Myth or Fact? This is your opportunity to bust or confirm the most mind-boggling myths and urban legends of our time. We will be following the scientific method to investigate questions such as, “Do pirate eye patches improve night vision?” “Can helium balloons really lift a child into the sky?” and many more. Come see if you’ve got what it takes to be a MythBuster.

Essential Questions: How does the scientific method work? What does it mean to control variables? How can I test answers to my questions? How can I make science fun?

The Essential Meteorologist—*Scott Erickson*

“Everyone complains about the weather, but no one does anything about it.” —C.D. Warner

In this introduction to weather, we will do a lot with weather: create our own instruments to track weather, conduct experiments to predict cloud height, make a cloud, and study the components of violent weather. We will also tackle cloud types, forecast maps and air pressure experiments. There will be demonstrations and experiments each day.

Essential Questions: What factors determine weather? What factors determine the different cloud formations? How do meteorologists track, measure and forecast the weather? How can we communicate what we know about the weather to other people? What factors contribute to violent weather?

Animals Inside Out—*Lynn Gilbert*

If you want to know what’s on the inside of animals, this is the course for you. “Animals Inside Out” is a dissection class that allows students a chance to see the inner workings of both vertebrates and invertebrates. We will also be using research and critical thinking to design a food web for the animals.

Essential Questions: What is the difference between the anatomy of vertebrates and invertebrates? What is a food web and why is it important to the ecology of the planet and your life?

Design Your Own Airplane—*Stefanie Hutchins*

This is an exciting physics-based curriculum that is for future aviators, astronauts, scientists and engineers of all ages as they learn about the magic of flight. This class is full of hands-on experiments and activities in science and math that focus on the essential question: “How do airplanes fly?” It begins with observing birds and applying that knowledge to how airplanes were designed. We will learn about lift, gravity, drag, and thrust and how all of these must work together to create flight. We will end the week with applying what we have learned to the design of our own airplane.

Essential Questions: How do airplanes fly? What is the difference between falling and gliding? How are bird and airplane wings similar? How does an airplane get off the ground? What holds us on Earth? Why are airplanes shaped the way they are? How do airplanes move through the air?

Robotics Technotics—*Cathy McCluskey*

Enter the world of engineering with robotics, using Lego Mindstorms software and equipment. Students will experience the engineering cycle as they design, program, and test their robot in order to accomplish specific challenges. This is a chance to explore mathematics and technology in an atmosphere of teamwork and friendly competition.

Essential Questions: How is the engineering cycle helpful in solving problems of many kinds? How can I use what I know about math to program a robot to accomplish what I want it to do?

**More Week 1: 4th-5th Grade Classes
and Week 2: 4th-5th Grade Classes
are listed on the next page →**

Journey from the Center of the Earth to Outer Space—

Miranda Reynolds

Come have fun exploring the geosciences this summer! We will travel from the center of the Earth to outer space. Exciting activities will include learning more about the following topics: earthquakes, tsunamis, rocks, minerals, oceans, weather, the water cycle, tornadoes, mountains, the Solar System, and the Universe. No passport required.

Essential Questions: How does Earth's surface change? How do changes on Earth's surface impact humans? What are the patterns of movement for the Sun and Moon across the sky? How does Earth compare to other objects orbiting the Sun?

Test It!—Emily Yenny

Let's build it, race it, and fly it! Test the limits of your imagination with scenarios and problems each day. We will drop melons from the Mega Tower, sail boats across the water, and launch a tennis ball over 100 feet in the air. Put your curiosity to the test as you answer questions about science and experiment your way through a week of fun.

Essential Questions: How do I approach a challenging problem? Does every scenario have a right answer? How can I use my strengths and the strengths of my team to solve a challenging problem? How do tall buildings stand in the wind? How do airplanes stay in the sky? How high can a bird fly? How do Nascar drivers make their cars go faster than their opponents?

Week 2: 4th-5th Grade Classes

10 Things Everyone Should Know About the Atmosphere—Cherie Bornhorst

****Please see description in Week One****

MythBusters: Confirm or Bust—Angelique Campbell

****Please see description in Week One****

The Chemistry of Matter—Scott Erickson

Pop! Pow! Whoosh! This hands-on, lab-based unit will give you new insights into the basic chemistry of matter. Learning through discovery is one of the best ways to encourage students to think critically and learn generously. Loads of experiments and demonstrations! Make slime, calculate density, identify unknowns and separate substances. What matters to us, matters to everyone.

Essential Questions: How does the arrangement of atoms determine states of matter? How can we use properties of matter to identify unknown substances? How can we use properties to separate different mixtures of substances? How do chemical reactions create different forms of matter?

Book It with Science—Lynn Gilbert

"Book it with Science" is a class where students will be designing and publishing books on science topics or experiments. We will use the RealeWriter computer software to become real authors. This class will stress scientific literacy and research with a fun flair.

Essential Questions: What are the elements of a good science experiment? What are the elements of a good book? How do you write a non-fiction science book for a specific audience?

Design Your Own Airplane—Stefanie Hutchins

****Please see description in Week One****

Robotics Technotics—Cathy McCluskey

****Please see description in Week One****

Journey from the Center of the Earth to Outer Space— *Miranda Reynolds*

****Please see description in Week One****

Test It!—Emily Yenny

****Please see description in Week One****