

'10-'11 Course Offerings



# LEAP

Learning Enrichment & Accelerated Pace



**Saturday Academy Classes that come to your school!  
LEAP courses are for students in grades 1-8.**

**Including: Computer Technology, Math, Science  
& Engineering, Language Arts & Humanities, and  
Creative Arts.**

**Give us a call to schedule a class, or go online and  
order: 503-200-5859; [www.saturdayacademy.org](http://www.saturdayacademy.org)**

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Your  
Curiosity...<sup>®</sup>*

# Saturday Academy



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# ABOUT LEAP

Saturday Academy, a non-profit educational organization, has provided educational enrichment classes for interested and motivated students since 1983. The mission of Saturday Academy is to academically engage motivated young people through hands-on, in-depth learning and problem solving by connecting them with community experts who serve as instructors. Through our LEAP (Learning Enrichment & Accelerated Pace) classes, students in grades 1-8 can explore a multitude of topics ranging from science, math and computer technology to humanities and the arts. These classes are small (maximum of 12 students) and delivered on site at your school, enabling highly-able, curious students to pursue their unique paths of inquiry in a pull-out model with their academic peers. The instructors are community resource professionals and/or former teachers whose expertise and experience give students an opportunity to investigate the fields of astronomy, forensics, mathematics, engineering, computer programming, graphic design, writing, acting, and much more. There are no tests or grades given through Saturday Academy classes, however the work completed in these classes can be added to student portfolios.

## Student Selection

LEAP classes meet during school hours. Participants are selected by the school TAG, EXCEL or Challenge coordinator based on their ability and interest in the content area. LEAP classes are intended for advanced students. The benchmark levels will be higher than the student's actual grade level.

## Class Size

Grades 1-3: 10 students

Grades 4-8: 12 Students

## Cost

Classes cost \$115 per contact hour. For example: a 1.5 hour class that meets 6 times will cost \$1035. Some classes may have an additional materials fee. Please check catalog for details.

## Scheduling Classes

Saturday Academy offers flexible scheduling to meet your school's time frame, however most classes meet once a week for 6-10 90-minute sessions. Ideally, students should be "pulled out" of the same subject as that being offered in the LEAP class. We suggest that classroom teachers do not schedule important (tests, oral reports) or fun (field trips, parties, PE) events during these class periods. Classes will not meet on school closure days so check your school calendar for holidays, conferences, or teacher planning days before confirming dates. If a class is cancelled due to weather, we will do our best to reschedule. The school coordinator will be notified if a class needs to be cancelled for illness or emergency. It will be the coordinator's responsibility to notify the students. The instructor is responsible for making up classes cancelled due to illness or personal emergency. The school is responsible for recruiting the students, and providing classroom space with basic classroom furniture. Our instructors bring only enough materials for the agreed upon number of students.

To schedule a class, please contact Wendy Thompson, Education Coordinator, at the Saturday Academy office. Email [wendy@saturdayacademy.org](mailto:wendy@saturdayacademy.org), or call: 503.200-5859. You can also schedule your class online using our web form. Go to [saturdayacademy.org](http://saturdayacademy.org) • Click on Group Options • Click on LEAP • Click on Schedule a Class. It is advisable to schedule as early as possible since many instructors have limited availability.



# Index

- Acting: Folk Tale Plays from Around the World 14
- Aeronautics 8
- Algebra Challenge 22
- Animal Stories 18
- Architectural Drawing & Modeling 14
- Art and Anatomy 14
- Art: Drawing & Painting Techniques 14
- Art through the Centuries 14
- Astronomy: Super Stars 8
- Biodiversity: Life at the Extremes 8
- Bones 8
- Cartoon & Character Drawing 15
- Cat Genetics 9
- Chemistry Experiments 9
- Clay and Sculpture 15
- Computer Graphic Art & Design 5
- Connect to Technology: Computer Basics 5
- Cool Wheels 9
- Coulombs & Amperes 10
- Create a Web Site 5
- Creating an Illustrated Storybook 18
- Creating with Photoshop 5
- Creative Engineering 9
- Creative Writing 18
- Critical Reading: 18
- Critical Thinking Skills 19
- Cryptography 22
- Digital Nature Photography 5
- Disease Detectives 9
- Do Statistics Lie? 22
- Dramatic Writing & Reader's Theater 19
- Electricity: Volts 10
- Electronic Music Making 6
- Evolutionary Tales 10
- Explorations in Electronics 10
- Flash Adventures 6
- Forensics: Science of Crime Solving 10
- Fun with Fibonacci 23
- FutureMakers 11
- Game Maker 6
- Garbage to Art: Reuse 15
- Geometry: Welcome to Flatland 23
- Get Ready to Write 19
- Glass Art and Jewelry Making 15
- Globe Trotters 19
- Harry's Discovery 20
- Hire a Robot as a Lab Assistant 11
- Improvisational Theater 16
- Introduction to Java Programming 6
- iPod Programming: Beyond Music 6
- Junk to Funk: Trashion Beyond the Runway 16
- Lego Physics Level I 11
- Lego Physics Level II 11
- Lego Robotic Engineering 6
- Light Fantastic 12
- Marine Biology 12
- Masks From Around the World 16
- Math Gems for Math Masters 23
- Math Quest 23
- Math Trek 23
- Microbiology 12
- Multimedia Presentations 7
- Nature Writing 20
- Painting with Wax: Incredible Encaustics 16
- Pixie 20
- Playing Shakespeare 17
- Poetry Jam and Slam 20
- Pre-Algebra Lab 24
- Puppets from Around the World 17
- Puzzles and Games for Math Lovers 24
- Race Car Physics 12
- Railroad Tycoons 21
- Robo Pets 7
- Rocket Science 13
- Science Labs with Robot Assistants 13
- Short Stories 21
- Solar Power 13
- Speech Easy 21
- Storytelling 17
- The 'Not So Daily' Show 20
- The Number Devil 24
- Wacky Weird World of Science 13
- WeDo TM Robotics 7
- Wildlife Illustrations 17
- World Dance 17
- World History 21
- World's Greatest Inventions 13
- Write Now! Improve Your Writing 21
- Write Your Life 21

# Computer & Technology

*In the rare case that a school does not have the necessary technology for these classes, Saturday Academy may be able to provide a portable computer lab for LEAP class use only. The user fee for the portable lab is \$50 per 6-week course. Most classes require software provided by Saturday Academy to be temporarily loaded on the school's computers*

## Computer Graphic Art & Design

Students will design their own CD labels, greeting cards, stamps, t-shirts, or posters. Using hi-tech drawing and design software, they will turn their ideas into graphically artistic designs. Computer drawing tablets work like an artist's paintbrush to control the computer's drawing and painting tools. Projects will combine computer technology with painting, coloring, and collage to create bold and beautiful new designs.

**Grades: 2-3, 4-5, 6-8 (PC Computer Lab with color printers, CD ROM drives)**

**Sessions: 6-8**

## Connect to Technology: Computer Basics

Develop computer skills in basic drawing and word processing programs. Students learn keyboarding, how to find and use Clip art, and some basic internet skills. They can spiff up their school reports, make cards for friends, and learn computer research skills.

**Grades: 2-4 (Computer Lab)**

**Sessions: 6**

## Create a Web Site

Students combine their creative talents and technology skills as they learn the basics of web page design. They'll create their own five page web site in a Macintosh or PC environment. The basics of HTML, making images web ready in Photoshop and adding video and sound to the web pages are all elements of this class. The emphasis will be on original content, images, and multimedia enhancements.

**Grades: 6-8 (Computer Lab)**

**Sessions: 8-10**

## Creating with Photoshop

Photoshop CS3® is powerful software that can be used to transform ordinary photos into extraordinary images. Both beginners and advanced users alike will learn the ins and outs of creating images with a computer as they build their digital portfolio. Students will learn how to blend images with layer masks, correct common photo flaws, change a photograph into a painting or animate the image.

**Grades: 4-6, 6-8 (PC Computer Lab with color printers)**

**Sessions: 6-8**

## Digital Nature Photography

Through the beauty of our environment, students learn the basics of digital photography. This course is an introduction to nature photography using digital cameras. Participants learn the basic controls on digital cameras and tips to enhance pictures using different functions such as ISO, aperture, and shutter speed. We will discuss composition, lighting, and perspective and learn how to best capture an image regardless of the lighting or weather conditions. In addition to improving camera skills, students will also learn how to save, edit, and print their photographs. At the end of the course, they will be presented with finished prints of their favorite images. School or students encouraged to provide their own cameras.

**Grades: 3-5 or 6-8 Additional Materials Fee: \$25 (Computer lab required)**

## Computer & Technology Instructors

**Theresa Alexander** has a BS in physics and computer science from Carnegie Mellon University and an MS in computer science. She worked for Intel as a software engineer for over 10 years.

**Lindsey Dotson** is a former firmware engineer for Electro Scientific Industries. She has been a volunteer teacher for TWIST, Teen Women in Science and Engineering, Junior Achievement and National Engineering Month.

**Rich Harris** has been a professional graphic designer and illustrator for 20 years. He is a college-level computer graphics instructor.

**Barbara Fujino-Lemon** has been a graphic designer for 20 years. She specializes in packaging, product development and marketing strategies. Barbara was the Creative Design Manager for Moonstruck Chocolates and Senior Designer for Integrated Bakery Resources, Inc.

**Diana Mati**, a technology consultant with 15 years experience in instructional and technical support, owns and operates C.I.E. (Computers in Education).

**Ashley Neese** has an MFA in visual art from California College of the Arts in San Francisco. She has shown work in the US in the Bay Area, Atlanta, Miami, Portland and New York and in Canada in Toronto and Regina.

**Edwin Pilobello** has been a programmer for 25 years. He is a Microsoft and Visual NQC Developer and a Robolab beta tester.

## Flash Adventures

Bring your ideas to life with action, sound and special effects! Using Adobe Flash CS3 in a computer lab, you will create your own animated cartoon clips. You can make silly or serious animated cartoons and even create animated greeting cards for your family and friends. Whatever you dream up, you will have great fun creating it with Flash!

**Grades: 3-5, 6-8 (PC Computer Lab)**

**Sessions: 6**

## Game Maker

Students learn how to design and modify their own exciting PC game by studying examples from Game Maker and analyzing the codes used. Using games such as Pong students learn to control characters, objects, and outcomes in their game.

**Grades: 4-6, 6-8(Computer Lab with PC environment required)**

**Sessions: 7**



## Electronic Music Making

FL Studio, a powerful and flexible computer program, lets students build any music they can imagine, note by note. Students are taught how to make a beat, craft harmony, and build interest that hooks listeners into their songs. They will experiment with sampling, mixing, and equalizing. Since they are building music note by note they will learn music theory as well. The class will end with an online release of their musical creation. Musical experience will be helpful but is not required.

**Grades: 6-8 Additional Materials Fee: \$25 (Computer lab required)**

## Introduction to Java Programming

Java is a sophisticated, commercial program language used primarily in Web-based development. Students will use IBM's freeware teaching system, RoboCode, to learn how to write computer codes and program using object-orientation. RoboCode is a video game played through analysis, strategy, and computer programming rather than by using a game pad. It is much like chess except that you program your "moves" against multiple players.

**Grades: 6-8 (Computer Lab with Windows Environment Required)**

**Sessions: 7**

## iPod Programming: Beyond Music

Extend the functionality of an iPod/iPhone to take notes from a computer note pad or web browser or add games and personal information. "There's an app for that!" Students become the inventor and design software for the iPod; program their own application on the iPod.

**Requirement: Students must have their own iPod Touch or iPhone.**

**Grades: 6-8 (Mac Lab required) Sessions: 6**

## Lego Robotic Engineering

Students gain an understanding of programming basics as they build and control Lego Mindstorm robots. They will use computer programming basics, touch, light, rotation, and temperature sensors to gather data and program their robots. The robots will be able to navigate a map, transport materials, communicate with each other and even play games.

**Grades: 3-5, 6-8 (Computer Lab Required) Sessions: 7**

## Multimedia Presentations

With all the bells and whistles, students learn how to use high-tech effects to enhance their oral presentations. After learning how to distill long reports into a brief outline for presentation, we add multimedia techniques such as video, scanned and original graphics and animation to give each presentation extra pizzazz.

**Grades: 4-6, 6-8 (Computer Lab Required) Sessions: 6-8**

## Robo Pets

Design and construct a robotic animal, then program it to act like the real thing. Students will build RoboPets using the Lego Mindstorm system. First, they will discuss animal physiology and kinesiology and unique features they would like to include in their creature. After constructing their pet, they will learn how to program it using Robolab software. In this class, we will make full use of light sensors, rotation sensors and touch sensors to make the interaction with the pets as realistic as possible.

**Grades: 5-8 (PC Computer Lab Required) Sessions: 6-8**

## Stop Motion Claymation

Oregon's own Will Vinton coined the term claymation to describe his film production company's work with such well known characters as the California Raisins and Domino's Pizza Noid. Stop motion is an animation technique which makes a physically manipulated object appear to move on its own. In this class students will learn to sculpt a 3D, pose-able, clay character, develop a storyline, paint backdrops, create scenery, experiment with lighting effects and soundtracks, and finally, shoot a short story animation sequence with their clay characters as the stars. Technical video and computer animation skills will be expanded through the use of the Stop Motion Animation program Dragon or i-Movie. The final product will be recorded on a DVD for each student.

**Grades: 4-6 or 6-8 Additional Materials Fee: \$50 (Room with sink and no carpet preferred)**

## WeDo Robotics

Robotics for early elementary students. WeDo robotics introduces technology in a hands-on engaging way. As they build and program simple robotic structures students will also reinforce skills in mathematics, communication, and science.

**Grades 1-3 Sessions: 6**



## Aeronautics

What makes an airplane stay in the sky? Students will learn about the principals of flight and how airplanes are engineered. They will explore the properties of air, flight, and aviation through hands-on activities, including investigating the geometry of kites, experimenting with rotary wings, modeling Bernoulli's principal of air flow, and making a flight plan. After learning how aeronautical engineers shape the airplane, its wing and tail so that it can lift itself off the ground and fly easily through the air, they will experiment with their own designs.

**Grades: 3-6 (Science Benchmark 6th)**

**Sessions: 6-8**

## Astronomy: Super Stars

Take a quick tour of our solar system then on to the stars! This cosmic adventure starts with our own sun. Students travel to planets and moons and explore their unique landscapes. They fly past the Oort Cloud and head toward Proxima Centauri, the next closest star. Also on the tour, blue stars, giant reds, brown dwarfs, and nebulas. During the journey, students will make their own spectroscope, sun clock, and telescope to aid in their investigations.

**Grades: 1-3, 4-6, 6-8**

**Sessions 6**

**Additional materials fee: \$25**

## Biodiversity: Life at the Extremes

Living things are everywhere—in deserts and hot springs, under ice caps, and even in the Dead Sea! How do they do it? Where does their food come from? How can they escape the sun, live without water, keep from freezing, or keep from burning up?

By studying plant and animal life in the harshest conditions on Earth, students will learn how organisms adapt to live in extreme environments. We'll also look beyond Earth and apply this knowledge to possible life on other planets.

**Grades 4-6, 6-8**

**Sessions: 6-8**

**Additional**

**materials fee: \$50 (Room with a sink required)**

## Bones

We will explore similarities and differences between the bones and skeletons of many animals, and find out just how similar to a whale or a rabbit we really are! Bones and skeletons are both fascinating and mysterious. In this series of experiences, students will examine unusual bones and learn to make inferences about them based on observations and previous knowledge. They will study the structure and function of their own bones and teeth, then compare them to the skeletons of other animals. By the end of the class, they will better understand the relationship of an animal's skeleton to its environment. Finally, they will construct a model of an animal skeleton.

**Grades: 4-5**

**Sessions: 7-8**



## Cat Genetics

Why do some cats have stripes and others patches or spots? Cats provide the perfect family tree for studying the basics of Mendelian genetics. Students trace the inherited traits of cats: from the common such as coat color, to the rare, such as absence of a tail, extra toes, baldness, and dwarfism. They learn about DNA, RNA, and genes in order to “design a cat” to fit a specific environment.

**Grades: 6–8 (Benchmark 8th) (Classroom with a sink) Sessions: 6–8**

## Chemistry Experiments

Students will conduct fascinating experiments as they learn about elements, compounds, atoms, molecules, chemical bonds, and states of matter. They will experiment with mixtures and identify unknown ingredients by their properties and reactions. Students will also explore acid/base reactions and experiment with color, energy, and matter changes.

**Grades: 3–5 (Benchmark 5th), 6–8 (Benchmark 8th) Sessions: 6–8**  
**Additional materials Fee: \$25 (Classroom with a sink)**

## Cool Wheels

Students will discover firsthand how engineering principles work as they design, build and race a CO<sub>2</sub>-powered race car. How fast will their cars travel? The answer will depend on design and ingenuity; the more aerodynamic the design, the faster the speed. When complete, the car must meet weight and design specifications. Statistics will be gathered as students clock their speeds using a digital timer, analyze the data, and fine-tune the design to increase their cars' speed.

**Grades: 6–8 Sessions: 6 Additional materials Fee: \$50 (Hallway space to race cars)**

## Creative Engineering

Toys are a great way to learn about science, engineering, and the design process. Students will explore the creative thinking and problem solving techniques needed to bring their ingenious ideas for toys and games to reality. They will brainstorm innovative solutions and learn about basic engineering at the same time.

**Grades: 3–5, 6–8 Sessions: 6–8**

## Disease Detectives

A mysterious illness has been reported, and it's up to your students to figure out what it is, where it came from, and how it can be treated. Students will discover the differences between bacteria, viruses, and other micro-organisms. They will learn how diseases spread in an age of international travel, and will follow clues to trace the outbreak to its source. Students see how science is used to fight disease and save lives around the world.

**Grades: 3–5, 6–8 Sessions: 6–8**

## Science & Engineering Instructors

**Annie Corbett** has a BS in genetics from University of California, Davis and graduate coursework in microbiology at UC Santa Barbara. She has taught labs in microbiology at the college level and tutors in math, science, and SAT prep.

**Richard Duncan** has taught oceanography and marine biology for middle school, high school, the OSU Marine Science Center, and other universities.

**Stephanie English** is currently a chemistry and math tutor at Mt. Hood Community College. She's taught high school chemistry, physics, physical science, and earth and space science in the Portland area.

**Tom Giese** has both a BA and MA in chemistry as well as a masters in environmental biology. He teaches biology, chemistry, and physics at Northwest Academy. Tom has expertise in field identification, aerial photo mapping, and is getting a SCUBA certification.

**Wendy Hanson** is a freelance science and health writer. She has a PhD in biophysics from University of California, Berkeley and a BA in physics and French from Lewis and Clark College.

**Gary Hays**, a mechanical engineer, worked twenty-four years for Hewlett Packard, primarily as a Research & Development Manager. He has served two years as a technical judge for robotics competitions and teaches robotics for several organizations.

**Scott Isler** has been involved in science education for over 20 years focusing on physics and robotics.

**Eileen Kane** has a PhD in anatomy from Harvard and also received a BFA in art from PNCA. She is owner/director of ESKart Fine Art Studio in Hillsboro, and teaches anatomy and art classes throughout the Portland area.

## Electricity: Volts, Coulombs & Amperes

Volts! Coulombs! Amperes! In this class you can wave your handmade magic wand and mysteriously turn on a light bulb. Learn the difference in current between a round and long light bulb. Discover why spiral light bulbs are better for the environment. Get a charge out of the inner workings of batteries and learn the right hand rule of generators. Get wired up for a great time.

**Grades: 6-8 (Benchmark 8th)      Sessions: 6-8**  
**Additional materials fee: \$50**

## Evolutionary Tales

Students will use a variety of scientific tools as they participate in a paleontological research project studying the Xenarthra Order of anteaters, armadillos and sloths. Using the skulls of both extinct and extant Xenarthrans, students decide the direction of their research, design, develop, and conduct their own inquiries, use Vernier® calipers to measure the skulls, generate data tables and analyze the results. By focusing on skull characteristics, students will be able to chart the evolutionary changes and relationships between these species. They will also learn about the South American culture where these mammals evolved and the myths attributed to them.

**Grades 4-5; (Benchmark 5th), 6-8 (Benchmark 8th)      Sessions: 6-8**  
**Additional materials fee: \$25**



## Explorations in Electronics

Students experiment with basic electronic components using circuits, capacitors, and by building a simple radio transmitter. They learn to solder as they build circuits for an electronic siren and a flashing LED robot! They will explore electronics in their everyday world with a take-home digital multimeter to measure voltage, current, and resistance. In all of these activities they will develop their troubleshooting ability, one of the most important tricks of the trade for any future electronics engineer.

**Grades: 4-8      Sessions: 6      Additional Materials Fee: \$25**

## Forensics: Science of Crime Solving

A mysterious crime, an unidentified victim and no suspects – but wait! Whose footprint is this? Could that piece of fabric be a clue? Learn the scientific techniques used to investigate crimes. Students examine a mock crime scene for clues on how the crime was committed and learn ways to identify the victim and possible suspects. They analyze blood spatters, collect samples for examination and chemical analysis, explore the intricacies of fingerprinting, and are introduced to the science of genetics and DNA forensics. Using the scientific method and deductive reasoning, students evaluate motive and opportunity and then, in teams, ultimately solve the crime.

**Grades: 4-5 (Benchmark 5th) , 6-8 (Benchmark 8th)      Sessions: 6-8**  
**Additional materials fee: \$25 (Classroom with a sink)**

## FutureMakers

What does it take to turn a clever idea into a marketable product? We'll begin by exploring creative thinking and problem solving techniques. Visit several local businesses to identify specific problems or needs that could be solved by our ingenious inventions. Learn about patents and trademarks from a visiting patent lawyer and research ideas to see if they are patentable. Students will receive instruction to guide them through the concept and design stage to a product presentation for the last class.

**Grades: 6-8 (Benchmark 8th)      Sessions: 8-10**

## Lego Physics: Introduction

Students become expert Lego builders as they learn the principles of physics and engineering. They explore concepts such as balance and symmetry, acceleration and inertia, and shape and strength while constructing their Lego projects. They build bridges and other devices using gears and motors to add movement. Students learn how simple machines like levers, pulleys, and gears are used in everyday life and in their Lego projects.

**Grades: 2-3 (Benchmark 3rd)      Sessions: 6**

## Lego Physics Level I: Gears & Cams

How tall can a tower rise? How far can a bridge span? Can a tower be built three times taller by using three times the amount of materials? Students will find out the answers to these questions as they discover how physics principles are put to practical use. Using Lego building components, they will investigate structural designs and employ gears, cams, and pendulums to explore kinetic and stored energy.

**Grades: 3-5 (Benchmark 5th), 6-8 (Benchmark 8th)**

**Sessions: 7-8**

## Lego Physics Level II: Motors & Movement:

Learn more about gears and stored energy by putting the principles of physics to work. With the addition of electric motors, students will build and improve a motorized crane, a "Tug-Bot," and steerable car. They will investigate the fundamentals of robotic development while constructing and operating Lego components. Finally, they will use acceleration, velocity, and electric motors to create truly sophisticated projects. In this advanced class students can choose a project of their own or work on challenges suggested by the instructor.

**Grades: 3-5 (Benchmark 5th), 6-8 (Benchmark 8th)      Sessions: 7-8**



## Science & Engineering Instructors

**Dawn J. Nilson** is an environmental consultant with over 23 years experience specializing in natural resources management and assessment. She has been a volunteer with AWSEM and Saturday Academy for 7 years and enjoys sharing her passion for science with people of all ages. She has been an avid amateur astronomer since the age of six, and one of the growing numbers of "sidewalk astronomers" in Portland.

**Amber Roesler** has an MS in Geochemistry and a BS in Environmental Chemistry. She is on staff at GeoEngineers as an Environmental Scientist responsible for environmental site assessments.

**Marjan Rotting** has a BS and an MS in earth science from University of California, Santa Cruz. She has five years of university and community college teaching experience, including seismology with an emphasis on building design, oceanography and dinosaurs at the University of California, Santa Cruz and oceanography and paleontology at the College of San Mateo.

**Martha Royster** received a BA in Biochemistry and German from Mills College. She has worked as an analyst/chemist with Brown and Caldwell Analytical Laboratory and at the Endocrine Research Unit at the University of San Francisco.

**Emily Shields** has a masters in biology. She has studied at the Oregon Institute of Marine Biology and is a former middle school science teacher.

**Joseph Wasserman** has a BA in anthropology from Reed College. He taught geography and anthropology at the Center for Gifted in Glenview IL.

## Light Fantastic

Two hundred thousand times faster than a speeding bullet; more than 300 sextillion times more powerful than a locomotive; able to leap the tallest building in 7 millionths of a second. Look, what's in the sky? It's SUNLIGHT! Using prisms, lenses, mirrors, filters and lasers, we will investigate how light can be separated, concentrated, and bent. We will experiment with a pin hole camera, mirrors, kaleidoscopes, jello optics, and even start a fire using solar energy and a biconvex lens (weather permitting)! We will investigate how lasers work and explore the very nature of this amplified light. Finally, we will recreate Newton's experiments in spectroscopy, colors, lenses, reflection, refraction and more.

**Grades: 3-5 (Benchmark 5th), 6-8(Benchmark 8th) Sessions: 6-8**  
**Additional materials fee: \$50**

## Marine Biology

We will explore the behavior and biology of the northwest's marine animals. Students dissect a squid and examine intertidal invertebrates to study their anatomy and physiology. They examine preserved specimens of animals found in tide pools and will be able to identify them on their next trip to the coast. In-class activities will teach students about whales and other marine mammals.

**Grades: 3-5 (Benchmark 5th), 6-8 (Benchmark 8th) Sessions: 6-8**  
**Additional materials fee: \$50 (Classroom with a sink, DVD/VCR/TV)**

## Microbiology

Investigate the invisible world of microorganisms in this introduction to microbiology. Students will look at the diversity of bacteria and how it occurs. Then they learn to identify the different forms of microorganisms by observing colonies under a microscope and by staining techniques. They grow their own culture from milk then count and identify the bacterial communities within. Using scientific skills to conduct experiments students test the effects of various disinfectants on bacterial growth.

**Grades: 3-5 (Benchmark 5th), 6-8 (Benchmark 8th) Sessions: 6-8**  
**Additional materials Fee: \$50 (Classroom with a sink)**

## Race Car Physics

Race into Physics! How do you design a winning race car? Physics is the key—aerodynamics, friction, Newton's Laws, and more. In this class, students will build model race cars out of various materials and experiment with scientific principles to make a fast car faster. They will tweak the shape and weight of their car, experiment with spoilers and test their modifications on a custom built racetrack.

**Grades:6-8 (Benchmark 8th) Sessions: 6-8**



## Rocket Science

By exploring Newton's Three Laws of Motion and how they apply to rockets and aeronautics, students learn how things fly. In this class, students build a balloon powered rocket car, paper rockets with drinking straw propulsion, or liter-size pop bottle rockets. They investigate the principals of flight, and gain hands-on experience designing, building, and launching a model rocket. In addition, they learn how rocket fuel can be improved by conducting antacid tablet races. In the final class, students launch their rockets and learn how to use triangulation and altitude trackers to calculate how high the rocket flies.

**Grades: 3-5 (Benchmark 5th), 6-8 (Benchmark 8th)**

**Sessions: 6-8**

## Solar Power

Students will learn to harness the sun's energy to fuel their own solar projects. They will explore the science and principles of renewable energy by drawing sun diagrams, building solar profiles, and then constructing projects such as solar cookers, 3D sun path models, and toy cars.

**Grades 4-6 or 6-8 Additional Materials Fee: \$25**

## Science Labs with Robot Assistants

Using Vernier sensors and Lego Mindstorm robots, students will conduct a variety of inquiry-based science labs. The class begins with measuring temperature through evaporation while being introduced to scientific process and robotic skills. Students build and program the robots to carry out data collection and automation. They use the data logging capability to graph and analyze their data. Further experiments could be conducted in acid rain, soil testing, water quality, and UV lighting.

**Grades: 6-8 (Benchmark 8th)**

**Sessions: 8-10**

## Wacky Weird World of Science

From the most bizarre to the most fascinating, explore the mysteries of our universe through science. Conduct hair-raising experiments with electricity and discover the three laws of motion in action through stomp rockets and air cannons. You will explore the chemistry of freaky, creepy dry ice and find out what's up with the parasitic tapeworm and its totally gross relationship to its host. Don't miss these amazing adventures in science!

**Grades: 1-2 (Benchmark 3rd)**

**Sessions: 6**

**Additional materials Fee: \$25 (Room with sink required)**

## World's Greatest Inventions

From the wheels to the computer, students learn how creative thinkers made ground breaking products, and how early inventions like transistors laid the groundwork for modern technology like laptops and iPods. Students investigate how money and even the number zero were invented. As they dive into the thinking behind these inventions, they will learn about design, engineering, and the evolution of modern science.

**Grades: 3-5, 6-8**

**Sessions: 6-8**



## Acting: Folk Tale Plays from Around the World

The basics of acting and staging a play will be taught as students adapt a folktale, myth, or trickster tale to the stage. After investigating the culture from which the tale originated, students will create authentic characters, props, and sets. The final production will be presented to an audience.

**Grades:** 3-5, 6-8      **Sessions:** 7  
**(Large, open classroom or gym required)**

## Architectural Drawing & Modeling

Using the architectural tools of mathematics and art, students create renderings of houses and buildings. They will be introduced to different architectural styles and the elements that distinguish them. As they draw, they learn the mathematical and artistic skills behind the art of perspective and three dimensional drawing. Foam core will be used to build a model of a dream home or school

**Grades:** 1-3, 4-6, 6-8      **Sessions:** 6-8  
**Additional materials Fee: \$25 (Room with sink, slide projector, work tables)**

## Art & Anatomy

Human anatomy and drawing and sculpting of the skeletal and muscular system combine to make this a challenging, integrated class. Through the rendering of images and 3D models, students learn the names and functions of various muscles and bones. They will study the different types of joints and examine simple motions like bending the arm at a hinge joint and more complex motions like how we walk, run, jump, and dance. Students will learn to accurately and artistically represent the human form in their work.

**Grades:** 4-6, 6-8      **Sessions:** 7-9

## Art through the Centuries

“Art reflects life.” Most of history and culture can best be learned through the works of art created during a particular time period. In this class, students will learn to identify, explain and analyze different styles of art, the cultural context of the work, and key artists who have made their mark over the years. Then, they will create their own representational, abstract and decorative pieces to further their understanding and appreciation of the various styles that artists have contributed throughout history.

**Grades:** 4-6, 6-8      **Sessions:** 6-8

## Art: Drawing & Painting Techniques

Students will use a variety of artistic media such as watercolor, pencil, ink, and charcoal and apply fundamental techniques to create a finished work of art. They will be introduced to the work of various famous artists, explore their techniques and style, the historical context of their work, and then create their own masterpiece.

**Grades:** 2-3, 4-6, 6-8      **Sessions:** 6-8  
**Additional materials fee: \$50 om with sink, slide projector, work tables)**



## Cartoon & Character Drawing

Use your drawing and storytelling skills to create fun and interesting characters. Learn techniques used by professional cartoonists and animators to make your characters unique and appealing. Develop four original characters, taking them from sketches to line art. Your full color characters are now ready to star in cartoons, animations, graphic novels, or an original comic book.

**Grades:** 1-3, 5-8      **Sessions:** 6-8

## Clay and Sculpture

Students learn basic coil, pinch, slab, and extruded methods of handbuilding with clay. Draping clay techniques are used to create realistic animal sculptures, clay masks or Aztec sculptures. This class will explore world civilizations through various vessels from Ancient Greece to U.S. Civil War face jugs. Students work with a variety of air dry and kiln fired clay.

**Grades:** 1-3, 4-6, 6-8      **Sessions:** 6-8

**Additional materials fee:** \$50 (Room with sink, work tables, no carpet and kiln available)

## Garbage to Art: Reuse, Recycle, Invent

Save the Earth and make art at the same time. In this class students will scour their surroundings to find good, discarded “junk” that they can turn into 2D and 3D art. All the stuff scrounged up will be organized with other art materials and found objects to create individual and or group works of art for to take home or donate to your school.

**Grades:** 6-8      **Sessions:** 6

**Additional Materials Fee:** \$25 (Room with sink and storage space ideal)

## Glass Art and Jewelry Making

In this exciting class, students create multiple fused glass projects including glass jewelry, sun-catchers, night lights, paper weights, and an 8 inch square plate. Basic glass cutting techniques are taught as well as many fusing techniques. Students learn the science behind this “super cooled liquid” material and what makes the vast array of colors available for use. They learn how to create chemical reactions between different colors used in the art work and how heating and cooling of the glass affects the final result.

**Grades:** 2-3, 4-6, 6-8      **Sessions:** 7-10

**Additional materials fee:** \$85 (Room with sink, work tables, no carpet, kiln preferred)



## Creative Arts Instructors

**Erin Berzel** is a freelance photographer with a background in photojournalism. Her focus is on natural portraiture, travel, culture, and micro-organic photography.

**Carolyn Conahan** attended Reed College and the Pacific Northwest College of Art. She is the staff illustrator of *Cricket* magazine, and has illustrated several books by other authors, the most recent being a storybook, *The Discontented Gopher*, written by L. Frank Baum.

**Nancy Coffelt** is an illustrator/writer with ten titles to her name, most notably *Dogs in Space*. She was honored with a Boston Globe-Horn Book award for her latest children's book, *Fred Stays With Me*.

**Debra Galaty**, the community art class coordinator at Grace Institute, is a professional fused glass artist in Portland.

Professional actor **Caren Graham**, a prior recipient of the Drammy Award, is a freelance vocal and acting instructor and teaches for Young Audiences.

**Carolyne Haycraft** received her MFA in theater directing and BA in theatre production from the University of Western Sydney in Australia. She has taught acting and directing to all ages in several states.

**Eileen Kane** has a PhD in anatomy from Harvard and also received a BFA in art from PNCA. She is owner/director of ESKart Fine Art Studio in Hillsboro, and teaches anatomy and art classes throughout the Portland area.

**Kimberly Kent** has a BA in art from PSU. She has taught classes and workshops throughout the Portland area.

**Jackie Kramer** has served as a staff and freelance writer and editor for various publishers including HarperCollins, Simon & Schuster, and Scholastic Inc. She develops, edits, and writes books, magazines, software, and other special projects for children.

## Improvisational Theater

Although much improvisational theater is funny (like in the television show *Whose Line Is It, Anyway?*) the same skills and techniques can also be used to explore social issues and problems. Improvisational theater uses audience suggestions to create unique scenes on the spot with no planning. Utilizing theater games and exercises, students build a repertoire of skills for creating characters, dialogue, and comedy spontaneously through their words and actions.

**Grades: 4-6, 6-8    Sessions: 7-9**  
**(Large, open classroom or gym required)**



## Junk to Funk: Trashion Beyond the Runway

Reused and recycled materials are transformed into real fashion accessories and couture fashion in this class. Students create trashion garments and take-home usable fashion accessories from materials found at SCRAP. They will not only learn about fashion design, but also the impact of consumerism on our environment. This class culminates in a fashion show for friends and family. Save the Earth and look good doing it.

**Grades: 6-8 Additional Materials Fee: \$25**

## Masks From Around the World

Students create beautiful masks out of papier-mâché, watercolor paper, paint, and other materials. They develop their artistic design skills in drawing, painting, and sculpting while learning about the myths and traditions behind the masks. Inspiration may come from Japanese theater, Native American or African culture, or even Mardi Gras. Although a mask can hide a face, it often reveals a great deal about its wearer. What will these masks reveal about your students?

**Grades: 2-3, 4-6, 6-8    Sessions: 7-9**  
**Additional materials Fee: \$50**  
**(Room with a sink, slide projector, no carpet, and work tables)**

## Painting with Wax: Incredible Encaustics

No experience necessary for this quick-start wax painting class. Encaustic painting uses colored pigment suspended between layers of wax and resin. Students explore the science behind the elements and compounds in this unique process of art making. Paints, collage, scraping, layering, incising, and textured finishes are used to make an original creation while gaining a basic understanding of the chemistry behind the art.

**Grades: 6-8    Sessions: 7-9    Additional materials fee: \$50**  
**(Room with a sink, no carpet and multiple outlets required)**

## Creative Arts Instructors

**Rachel Lidskog** has been a certified dance professional since 1989. She has traveled the globe for training, teaching, and competing and won bronze medals at the 1992 Las Vegas Fred Astaire National Ballroom Competition and at the 2005 World Championships for Country Western and Swing.

**Tracy Mandel** has an MA in Art Therapy from Marylhurst University. She teaches 2D and 3D art at Grace Art Camp and conducts art therapy sessions at several hospitals, centers and shelters in the Portland area.

**Kirsten Rian's** poetry has appeared in Rhino, Upstreet, and other literary journals. She is a Poet-in-Residence through the Literary Arts Writers-in-the-Schools program, teaching poetry to high school students.

**Marjan Rotting** has a BS and an MS in earth science from University of California, Santa Cruz. She has five years of university and community college teaching experience, including seismology with an emphasis on building design, oceanography and dinosaurs at the University of California, Santa Cruz and oceanography and paleontology at the College of San Mateo.

**Catherine Schaper** has a BA in fine art and was a Spanish minor. She teaches drawing, painting, print making, and illustration at Grace Art Camp, Caldera and Sitka Center for Art and Ecology.

**Andrea Schwartz-Feit** is a teaching artist. She has exhibited her work since 1989. She taught most recently at Pacific Crest Community School and in her own studio.

**Dia Varano** is a professional Puppeteer and also has five years experience as an arts educator. She has taught and performed with Mudeye Puppet Company, Tears of Joy Theatre, Grace Art Camp, and New Moon Theatre. She has a BA in theatre from Hampshire College.

**Jenny Wells** is a former special education teacher with a degree from Radford University. She taught glass art at Grace Institute and recently opened her own glass studio, Jennifer Wells Design.

**Tracy Wolf-Pacquín** is an established glass artist and experienced educator. She developed a curriculum for the John F. Kennedy Center Arts' Seminar that explores the scientific realm of glass artistry.

## Playbuilding

How do script writers and playwrights capture an audience’s attention and imagination with just dialogue? What makes a scene funny or dramatic? In Playbuilding we use prompts to uncover our ideas, engage in dialogue, experiment with stand-up improvisations, and refine and rehearse our work for an informal performance for friends and family. Students will experience intense opportunities for individual creativity while building their skills in group cooperation and commitment.

**Grades: 3-5 or 6-8 (Large space needed)**

## Playing Shakespeare

Every generation of readers rediscovers Shakespeare. The stories, characters and language keep us returning over and over again to these classics. In this class, students perform scenes from *A Midsummer’s Night Dream*, *Romeo and Juliet* or *MacBeth*—plays filled with suspense, greed, witchcraft, romance, and revenge. Preparation includes reading, writing and acting exercises.

**Grades: 6-8 (Benchmark 8th in reading/writing)      Sessions: 7-9**

## Puppets from Around the World

Students build amazing, colorful puppets of their own design; they create whatever kind of creature they desire out of reused materials. They choose from three styles of puppetry from around the world—a Japanese Bunraku, which ranges in size from two-and-a-half to four feet tall or more, a Chinese Rod puppet, made with true-to-life features and raised overhead at the top of a stick, or an Indonesian Shadow Puppet. Puppets are showcased in a final presentation on the last day of class.

**Grades: 1-3, 4-6, 6-8 (Room with a sink required)      Sessions: 7-9**

## Storytelling

Storytelling is one of the oldest art forms; while it is easy to tell a story, it takes skill to tell a story well. This class will teach beginner storytellers the basic public speaking skills needed to be an entertaining storyteller. Participants will learn how to create different voices for various characters, how to add gestures, facial expressions, and flow to their stories. They will practice projecting their voice and using eye contact to keep their audience engaged. Stories from a variety of genres from creation myths to personal narrative will be rehearsed and then presented to the class to record as a DVD and/or podcast.

**Grades: 1-3, 4-6, 6-8 Additional Materials Fee: \$5/student for DVD copy**

## Wildlife Illustrations

Using pencil, ink, charcoal and markers, students create portraits of the animals of North America as they train their eye and hand to express themselves in simple but powerful ways. Techniques for shading, contouring and perspective help students create depth and proportion in their drawings. Step by step instruction, including animals in motion will be covered. Students will choose from a variety of animals that are native to North America and learn about the habits and habitat of each species that you draw, from a spider to a large mammal.

**Grades: 3-5, 6-8      Sessions: 7—9      Additional Materials Fee: \$50**

## World Dance

You’ve seen the dances on TV, now your students can learn an array of popular dances from around the world. Dance like the stars with the Rumba, ChaCha, Merengue & more. They will discover how to move their bodies in new ways with a Cuban style Rumba, spirited ChaCha, and maybe even the jivin’ Jive. Hear stories from each culture of dance origin and play an assortment of music from around the world. An exciting routine of a variety of social dances will be taught to present to classmates, family and friends.

**Grades: 1-3, 4-6, 6-8      Sessions: 6      (Large movement space required)**

# Language Arts & Humanities

## Animal Stories

Younger students will really enjoy reading and writing stories about real animals. Live rabbits, chickens, and other animals will be brought to class to stimulate development of character building, description, plot, and conflict resolution. Students will be introduced to famous animal literature like *Peter Rabbit*, *Rabbit Pirate*, *Tops and Bottoms*, and *Little Red Hen*. Finally, students will write and illustrate their own animal stories and share them out to the class.

**Grades: 1-3 (Benchmark 3rd)**



## Comic Books and Graphic Novels

Basic techniques of graphic storytelling, from storyboarding to penciling and inking, are taught as students develop their knowledge of character and plot formation. The class focuses on composition, expression, lettering, and pencil and ink drawing. By the end of class, students will self-publish a short graphic story.

**Grades: 4-6 or 6-8 Additional Materials Fee: \$25**

## Creating an Illustrated Storybook

After learning the elements of story writing: character, dialogue, setting, plot, and action, students will write and edit group and/or individual stories. Different art media such as oil pastel, water color, or colored pencil will be used to create illustrations to accompany the stories. These stories will then be bound through a variety of techniques to create a one-of-a-kind, hand-made storybook. Group books are donated to the school library and individual books are taken home to share with friends and family.

**Grades: 1-3 (Benchmark 3rd), 4-5 (Benchmark 5th) Sessions: 6-8**

**Additional materials fee: \$40**

## Creative Writing

Young authors learn to turn their words into rich, imaginative prose and poetry in this survey class. Using professional writing techniques such as writing from memory, free writes, and sensory awareness, students craft their writing with the 6-Traits of Writing. Emphasis is placed on image, description, and voice – the building blocks that can be used in all genres of creative writing. Genres explored may include poetry, short story, myth, fairy tale, animal stories, screenwriting, mystery, fantasy, and/or science fiction.

**Grades: 3-5 (Benchmark 5th), 6-8 (Benchmark 8th) Sessions: 6-8**

## Critical Reading: A Multicultural Coming of Age

In this class, students read from a variety of texts that seek to describe the process of growing up in America's "melting pot." Responding to the literature both in writing and in structured class discussions, students learn to read, think critically, and to engage actively and respectfully with their peers about thought-provoking topics. Possible authors include: James Baldwin, Frank Chin, Sandra Cisneros, Langston Hughes, Jamaica Kincaid, James McBride, and/or Toni Morrison.

**Grades: 6-8 (Benchmark 8th) Sessions: 6-8**

# Language Arts & Humanities

## Critical Thinking Skills

Students will improve their ability to think clearly, critically and on their feet in this introduction to informal logic. Techniques for constructing and deconstructing arguments will be emphasized as the class considers issues relevant to young people today. The class will be introduced to the rudiments of critical thinking such as logical fallacies, causation versus correlation, basic syllogisms, and informal fallacies.

**Grades: 6-8 (Benchmark 8th) Sessions: 6-8**

## Dramatic Writing & Reader's Theater

Learn the art of script writing. How do script writers and playwrights capture an audience's attention and imagination with just dialogue? What makes a scene funny or dramatic? Working in pairs and groups, students will create characters and storylines then draft, edit, and perform their scripts in class. Students will ham it up using intonation and gestures appropriate to their characters while becoming better readers.

**Grades: 3-5 (Benchmark 5th), Grades: 6-8; (Benchmark 8th) (Large space needed) Sessions: 6-8**

## Fiction Writing

Students find their unique writing style while they explore the basics of fiction. They learn techniques to captivate readers, methods of storytelling and ways to develop realistic and memorable characters. They practice weaving carefully crafted sentences into a work of lasting impression. Through in-class exercises, such as writing "flash" fiction, students will learn to write stories that will engage and satisfy both author and reader.

**Grades: 3-5 or 6-8**

## Get Ready to Write

Students use their senses, life stories and imagination to create unique stories and poems. They work in pairs and groups to tell their stories, create characters, explore outrageous places, and practice putting their great ideas on to paper. Emphasis will be placed on word choice, voice, fluency, and organization.

**Grades: 1-3 (Benchmark 2nd) Sessions: 6**

## Globe Trotters

Students pack only their imaginations for this guided tour of the world. Through storytelling, map reading, and multimedia art projects, we will explore the cultures of different regions around the world. Interdisciplinary projects may include Indonesian Wayang Kulit shadow puppets, Mexican piñatas, and decorative Australian boomerangs. Students learn about a variety of cultures, traditions, and geography while they create crafts from around the world.

**Grades: 2-3, 4-6, 6-8 Sessions: 6-8**

**Additional materials fee: \$50 (Room with sink, work tables, no carpet)**

## Language Arts & Humanities Instructors

**Turiya Autry's** work takes the form of slam poetry, hip-hop rhymes, and soulful singing. As an instructor at PSU, she teaches a wide range of courses. She tours as the "good" half of the spoken-word dynamic duo Good Sista/Bad Sista.

**Claudia Baskind** has an MFA from the University of Iowa Writers' Workshop and has taught writing at the precollege, college, and graduate levels.

**Nancy Coffelt** is an illustrator/writer with ten titles to her name, most notably *Dogs in Space*. She was honored with a Boston Globe-Horn Book award for her latest book, *Fred Stays With Me*.

**Carolyn Conahan** attended Reed College and the Pacific Northwest College of Art. She is the staff illustrator of *Cricket* magazine, and has illustrated several books by other authors, the most recent being a storybook, *The Discontented Gopher*, written by L. Frank Baum.

Professional actor **Caren Graham**, a prior recipient of the Drammy Award, is a freelance vocal and acting instructor and teaches for Young Audiences.

**Brian Christopher**, editor and publisher of *Rain City Review*, has taught creative writing in the Portland area since 1990.

**Carolyne Haycraft** received her MFA in theater directing and BA in theatre production from the University of Western Sydney in Australia. She has taught acting and directing to all ages in several states.

**Walidah Imarisha** is an historian, reporter, poet, and spoken-word artist. She has shared the stage with folks as different as Ani DiFranco and John Irving and is the author of two chapbooks. She is the bad sister in the spoken-word duo Good Sista/Bad Sista.

**Paul Kennison**, AB in philosophy from Princeton University, teaches a diverse range of subjects to all ages.

**Jackie Kramer-Arden** has served as a staff and freelance writer and editor for various publishers including HarperCollins, Simon & Schuster, and Scholastic Inc. She develops, edits, and writes books, magazines, software, and other special projects for children.

## Harry's Discovery

Students learn to think quickly and clearly as they solve mysteries and resolve dilemmas presented in the story Harry Stottlemeier's Discovery. The class discusses the adventures, mysteries and questions Harry and his friends encounter in their daily lives. In the process, students will develop reasoning and thinking skills they can use to solve their own questions and dilemmas.

**Grades: 4-5 (Benchmark 5th)**

**Sessions: 6-8**

## Nature Writing

In this integrated class students will explore the nature around them: flora, fauna, the elements, geology, and landscape of our environment then record their observations and research in a nature journal. They will select one object to write about in depth, becoming experts on the scientific aspects as well as the mythology and lore of each. These writings will be included in a hand-made book with illustrations and collage that illustrate their discoveries.

**Grades: 3-5 (Benchmark 5th)**

**Sessions: 8-10**

## The 'Not So Daily' Show

Bring current events to life for the stage. We will combine acting, writing, comedy, and student interest in current events to create our own version of "The Daily Show." Students will investigate current events using national and international media then interpret these events to create a live performance. They will have the opportunity to write, direct, or perform events as newscasters, readers, and/or reporters in this highly collaborative class.

**Grades: 4-5 (Benchmark 5th) or 6-8 (Benchmark 8th)**

**Sessions: 6-8**

**(Large movement space ideal)**

## Pixie

Pixie is a reasoning and Language Arts & Humanities class that concentrates on the development of thinking skills in young students. Students boost their brain power by exploring where ideas come from and how they get into the mind. This class will explore logical reasoning and creative writing through games and activities. As students read the children's book Pixie, they'll develop their thinking skills and see how various meanings can be communicated by using language in different ways.

**Grades: 1-3 (Benchmark 3rd)**

**Sessions: 6-8**

## Poetry Jam and Slam

Poetry is everywhere, in the music we listen to and even on our refrigerator doors. Students will learn about different types of poetry, both free verse and formally structured. Emphasis will be placed on the use of figurative language including simile, metaphor, alliteration, personification, and word choice. They will work individually and in groups to create explosively descriptive poems. The poems will be published in a small book and/or shared with the class in an informal 'poetry slam'.

**Grades: 1-3 (Benchmark 3rd), 4-5 (Benchmark 5th), 6-8 (Benchmark 8th)**

**Sessions: 6-8**

**Additional materials Fee: \$25**

## Language Arts & Humanities Instructors

**Rosanne Parry** is a published author and teacher for public and private schools who specializes in reading and math. She has taught study skills for Saturday Academy for ten years.

**Mark Pomeroy** is the author of *The Brightwood Stillness*, for which he won an Oregon Literary Fellowship. He taught middle school humanities for four years.

Poet **Donna Prinzmetal** has taught creative writing for seventeen years and currently teaches for the TAG program and Community of Writers.

**Kirsten Rian's** poetry has appeared in Rhino, Upstreet, and other literary journals. She is a Poet-in-Residence through the Literary Arts Writers-in-the-Schools program, teaching poetry to high school students.

**Wendy Thompson** taught writing at the Vancouver School of Arts & Academics for six years and has worked with the Confluence Project and the Right Brain Initiative. She is currently the Education Coordinator at Saturday Academy.

**Joseph Wasserman** has a BA in anthropology from Reed College. He taught geography and anthropology at the Center for Giffen in Glenview IL.

## Railroad Tycoons

Working in pairs, students will play a number of railroad-building board games in which they build their own rail network from scratch, pick up goods from their locations of origin, and fulfill contracts by delivering these goods to cities where they are in demand. By actively engaging with the geography of cities, resources, rivers, mountain ranges, deserts, and more, students learn about geography in a way that is more meaningful than the mere memorization of facts. They will also discover the colorful history of the northwest railway systems. Because students work in teams, they will have to negotiate, argue, compromise, and cooperate with each other to be successful.

**Grades: 4-8      Sessions: 7-10**

## Short Stories

Students develop their own writing style to create gripping, evocative short stories. Each session focuses on a different aspect of imaginative writing: character, setting, plot, point of view, and editing. Through in-class exercises, such as writing “flash” fiction, students will work toward a polished, final draft that includes: a compelling opening, realized characters, vivid settings, clear conflict/resolution, and well organized prose.

**Grades: 3-5 (Benchmark 5th) or Grades: 6-8 (Benchmark 8th)      Sessions: 6-8**

## Speech Easy: The Art of Public Speaking

Turn your students into fearless and effective public speakers. This class covers the basics of public speaking including eye contact, speaking rate, volume, enunciation, oral fluency, vocal energy, and gestures. Students learn how to prepare a speech and practice impromptu, expository and persuasive speaking.

**Grades: 4-5 (Benchmark 5th) or Grades: 6-8 (Benchmark 8th)      Sessions: 6-8**

## World History: Strategy & Diplomacy

Instead of memorizing events, names, and dates, students will actively control nation-states, important historical figures, and civilizations through several board games. Doing so, they will experience first-hand some of the historical constraints on and impulses for action, as well as encountering the potential effects of their own history-altering decisions. Interacting with world and area maps fosters memory not merely of place names, but of the political, strategic, and economic importance of places. Working in pairs or small teams, they will create and implement their own long-term strategies, negotiate deals, and maneuver toward victory. Negotiating with other teams will be crucial for success, they will practice and develop negotiation, interpersonal, argument, and speaking skills.

**Grades: 6-8 (Benchmark 8th)      Sessions: 7-8**

## Write Now! Improve Your Writing

Students will learn effective strategies for writing academic papers and performing well on writing skills assessment tests. Through creative exercises, they will practice the mechanics of first-rate writing and learn how to convey clear, compelling, and focused ideas on the page. The primary emphasis will be placed on the 6-Traits of Writing with exercises in narrative, persuasive, descriptive, and expository writing modes. Students will learn a variety of self-editing techniques to strengthen their school writing assignments.

**Grades: 3-5 (Benchmark 5th), or Grades: 6-8 (Benchmark 8th)      Sessions: 6-8**

## Write Your Life

Students learn how to capture ordinary moments from their personal lives into something extraordinary. Through a series of writing exercises, they will discover how a single memory—an image, a smell, a snippet of dialogue—can open up into an engaging piece of writing. In addition to writing their own story, they will read and discuss work from a variety of published authors.

**Grades: 4-5 (Benchmark 5th) or Grades: 6-8 (Benchmark 8th)      Sessions: 6-8**

## Algebra Challenge

We will explore the applications of algebra through the concept of mathematical models.

As students apply their algebra skills to real-world problems and experiments, they will expand their appreciation for math and improve their grasp of the concepts involved. Algebra topics that will be used include slope, linear equations and inequalities, direct and inverse variation, graphing functions, quadratic equations, exponents and growth and decay. Students must have completed or be currently enrolled in an algebra class.

**Grades: 6-8 (Benchmark 8th)**

**Sessions: 6-8**

## Cryptography: Making and Breaking Secret Codes

Creating secret codes, decoding encrypted messages, and understanding why it is safe to type a password on the Internet are all elements of cryptography: the study of making and breaking codes. Students will learn about shift ciphers, the Vigenere cipher, and the Enigma machine. They will also learn about the history of cryptography from the days of Julius Caesar to World War II. Advanced problem solving skills are applied to crack codes and for students to create their own codes.

**Grades: 6-8 (Benchmark 8th)**

**Sessions: 6-8**

## Do Statistics Lie?

A British politician once said, "There are three kinds of lies: lies, darned lies, and statistics." In this course, students will explore newspapers, magazines and the Internet to find how people use statistics. Can we believe the statistics we read? How are polls taken and are they accurate? Do politicians use the same set of statistics to argue opposite positions? Who really is the best baseball hitter of all time? These investigations will lead to a better understanding of probability and statistics as well as the world of media literacy.

**Grades: 6-8 (Benchmark 8th)**

**Sessions: 6-8**

## Go Fly a Kite

Students apply math skills of measurement and calculation to build artistic kites that really fly. They learn how kites work, what shapes are most desirable, and why kites need tails and strings. Also, students will build a wind measuring tool to test fly their kites.

**Grades: 2-3, 4-6, 6-8 Additional Materials Fee: \$45**

## Money \$ Math

Instead of learning equations and graphs, students will engage in economic simulation board games to reinforce math skills. Working in pairs, they will play a variety of board games, like Settlers of Catan, Modern Art, Tinners' Trail, and Stone Age, featuring various economic mechanisms, starting with simpler games and advancing to the more complex. They will learn to manage scarce resources, experience first-hand the importance of capital investment and development, and alter their strategies as supply and demand fluctuates.

**Grades: 6-8**



## Fun with Fibonacci

Find the hidden order behind pine cones, sea shells, tree branches, rabbits, and the Egyptian Pyramids encapsulated in a single number. Through investigations into statistics, Platonic solids, bee genealogy, plant growth, and architecture, students will discover ways to generate and uncover Fibonacci numbers. They will delve into the fascinating and beautiful world of Penrose tilings, creating some unique and gorgeous works of art with mathematical meaning.

**Grades:** 4–6, 6–8 (Benchmark 8th)    **Sessions:** 6–8

## Geometry: Welcome to Flatland

Flatland, the two-dimensional world of Edwin A. Abbott's 1884 math fiction novel is as challenging today as it was 125 years ago. Using Abbott's story, students will design and build a 2D city. In Flatland nothing has thickness, not even its inhabitants. Is this possible? What challenges does the 3D world have in common with Flatland? This math adventure will include the relationship between one-, two-, and three-dimensional figures; angles, polygons, and their properties; and mastering Euclidean geometry constructions, using only a compass and straight edge.

**Grades:** 3–5 (Benchmark 5th)    **Sessions:** 6

## Math Gems for Math Masters

Young mathematicians will learn to solve seemingly impossible math problems. In this class students will play probability and logic games to learn math strategies. They will work independently and in teams while having a good time with puzzles. Students will discover number patterns, sequences, and cryptography (secret codes) that help them build problem-solving skills.

**Grades:** 4–5 (Benchmark 5th)    **Sessions:** 6

## Math Trek

Students' thinking and problem solving skills will be challenged in this exploration of number systems from around the world. They will begin with Roman Numerals then on to Chinese numerals while learning to use an abacus. The journey continues with Egyptian hieroglyphs and the Rosetta Stone. Students investigate Babylonian numerals and the 60 based number system. The trek ends with Indian numerals and the invention of the zero.

**Grades:** 2–3 (Benchmark 3rd), 4–5 (Benchmark 5th)    **Sessions:** 6

## Math Quest: Time & Place

Using maps and math, students will find their place in the world. They will compute distances and trace their ancestors' journey. As they make their own map and compass, student will learn how cartographers combine math, science, and design. The math tools will include coordinate systems, ratios, proportion, scale, area, and angles. This class also uses math to investigate history and increase students' understanding of their place in time as they create a time table for planet Earth. The mathematical concepts of powers, variables, negative numbers, fractions, and decimals will be used to answer questions such as: How has population grown over time? How long ago did people first have computers, telephones, or the wheel? Are their patterns in the history of civilizations? Students will attempt to use the math in historic and geographic patterns to predict the future.

**Grades:** 4–5    **Sessions:** 6–8

## Math Instructors

**Lindsey Dotson** is a former firmware engineer for Electro Scientific Industries. She has been a volunteer teacher for TWIST, Teen Women in Science and Engineering, Junior Achievement and National Engineering Month.

**Roger Eiss**, a former chemistry professor, has worked as a computer consultant, and for Mentor Graphics, Oregon Department of Economic Development and Oregon Graduate Institute.

**Soenke Hollstein** has a BS in physics, a BS in mathematics, and an MS in nuclear physics from Westfaelische Wilhelms-Universitaet in Muenster, Germany.

**Barbara Kerr**, with a masters degree in education, is a certified math teacher and a math tutor for 5th – 12th grade students.

**Matthias Kullowatz** earned his bachelor's degree at Lewis and Clark College.

**Martha Royster** received a BA in Biochemistry and German from Mills College. She has worked as an analyst/chemist with Brown and Caldwell Analytical Laboratory and at the Endocrine Research Unit at the University of San Francisco.

## The Number Devil

Higher math concepts become more approachable as students step into the magical world of a young math student's dreams in the book *The Number Devil*. While listening in on his conversations with his mathematical mentor, the class will explore prime numbers, square roots, exponents, irrational numbers, Fibonacci numbers, triangular numbers, Pascal's triangle, infinite series, and other higher mathematical concepts.

**Grades: 4-8 (Benchmark 8th)      Sessions: 7**

## Pre-Algebra Lab

Using non-traditional exercises and games, students will develop a concrete understanding of pre-algebra material such as integer operations, variables, coordinate graphing, and simple equations. This class emphasizes hands-on activities for concept introduction followed by written work and games for practicing new skills.

**Grade: 5 (Benchmark 5th)      Sessions: 6-8**

## Puzzles and Games for Math Lovers

Students will stretch their thought processes with riddles, logic problems, Japanese Nanograms, mazes, and math games. In hands-on explorations into geometry they will create Pascal's triangle, Pythagora's wild triples, and build structures out of paper plates, including a grand tower of tetrahedron and the hexa-flexagon.

**Grades: 2-3 (Benchmark 3rd), 4-5 (Benchmark 5th), 6-8 (Benchmark 8th)      Sessions: 6**



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