

Summer Classes 2019

All classes \$200 per half day

WELCOME TO SUMMER AT LEONARDO'S BASEMENT

We are excited to present our schedule of summer classes. Every year instructors dream up ideas for classes after watching and listening to you during the previous year. They will encourage you to design and build engineering, art and technology projects that spring from your imagination.

Leonardo's Basement is unlike any educational organization in the world. It is the largest (and oldest, since 1998) making space for builders of all ages. It is dedicated to helping students develop projects by dreaming and taking risks. To learn decision making by making decisions. To learn problem solving by solving problems. To develop technical skills using hand and power tools, computers and other technology. To value process over product. To have fun being curious, creative and industrious.

You will have considerable freedom. Along with freedom comes responsibility. We expect you to be self-directed, to respect others, and to work hard. We expect that you will follow three simple rules:

Be safe, be nice and have fun.

SPECIAL in 2019:

- Welding, metalworking, art, CAD, Arduino, woodworking, escape room & community service workshops for teens,
- Harry Potter Theme Week July 8-12 including giant Hogwarts Castle build,
- Three weeks of outdoor "Adventure Playground" for ages 6+.

We look forward to seeing you!



Steve Jevning
Founder and Executive Director

REGISTRATION NOTES:

- Individual and collaborative project building in engineering, art, design, and technology for ages 6-17
- 10 weeks of full and half-day workshops Monday-Friday begin June 10.
- Friday-only workshops.
- AM (8:00-9:30 am) and PM (3:00-5:00 pm) extended day available.
- Lunch: students registered for both an AM and PM workshop should bring a lunch.
- All half-day workshops are \$200. [Scholarships](#) are available.
- Cancellation Policy - If you cancel a class:
 - 1) At least three weeks before the class begins we will refund the entire class fee, less a \$25 processing fee;
 - 2) At least two weeks before the class begins we will issue a credit for the entire class fee to your Leonardo's Basement account for a future class or workshop, or
 - 3) Less than two weeks before the first day of class you will not receive a refund or credit.
- Workshop in south Minneapolis, near 35W and Hwy 62 (Crosstown), at [150 West 60th Street, 55419](#)

Other questions? Look at [FAQ here](#) or [contact us](#).

Register at leonardosbasement.org

Summer Classes 2019

All classes \$200 per half day

Week 1 - June 10-14

AM

Millennium Falcon Technicians

Our backyard hosts an amazing student built 30'-0" DIA replica of the Millennium Falcon. It is used for classes and for play. The spacecraft still needs improvements and always needs repairs. You will make repairs to the exterior plus build interior features like furniture, instrument panels and a holographic game table using cool materials from the workshop.

Ages 9+

Wood You Like to Build?

Saws, drills, files, hammers, vises, clamps and all of the wood that you can shake a stick at! Scrap wood, plywood, 1x4's, 2x2's, 2x4's and more. Cut and shape wood to build one or more projects in the woodshop. Learn about fasteners and finishing too!

Ages 6-12

Fire and Ice

Hot and cold, chemistry and curiosity. Experiment with ice (both dry and wet). Carve it, color it, defend it against the heat or melt it. Build small projects that will burn in your perfect fire (or will withstand the fire). Make candles and sparklers. See the effect specific chemicals have on both the hot and cold sides of the week.

Ages 13+

Fabric RE-Construction (i.e. Sewing)

Sew what?! Whatever you want. Make a puppet out of an old sock. Cut and rebuild a stuffed animal with mismatched parts. Re-make drab dress-up clothes into something fancy and new. Take an old favorite T-shirt and turn it into a comfy pillow. Get creative with fabric, yarn, needles & thread, buttons, pompoms, paint and of course, sewing machines!

Ages 8+

Leather Craft

Wet, shape, cut, dye, burn, rivet, punch and stitch your idea in leather. Use this versatile material on its own, or with metal, wood or vinyl. We have the tools and the materials. You bring your ideas to make key rings, cuffs, necklaces, earrings, coasters, bags, sculpture or something else.

Ages 10+

PM

Metal Working

Learn your way around the metal shop. Cut, bend, and weld steel to create furniture or whatever else you can imagine. Really, what's a more impressive skill than welding?

Ages 14+

LEGO Pneumatics

You have used LEGO motors and wheels to make moving robots, now add a new dimension to your Lego creations: pneumatics. Design and build complex machines using LEGO pneumatics, harnessing the power of compressed air. You will work with motors, cylinders, valves and storage tanks to build working compressors, multi-cylinder air powered motors and heavy lift machines. You can add pneumatic suspension to a robot vehicle or build a model of a hydraulic crane, all using the power of compressed air.

Ages 11+

Water Over (or Under) the Bridge

Construct a river of water - use a hose and PVC pipe and containers of various shapes and sizes to create our own stream complete with boulders, waterfalls, lakes, and rapids. Add a bridge. Or bridges. Can you can construct a small boat to navigate the treacherous waters and make it to the ocean?

And if you want, launch water rockets!!!

Ages 6-12

Build What You Want

This class is for independent builders who relish doing it your own way. Your scientific lab, woodshop, studio, craft room, giant junk drawer. Yes, we are here to help; but the big project decisions are all yours! Wood and doodads and motors and the universe of odds and ends are all here for you along with necessary tools and equipment to be your own inventive boss.

Ages 6-12

Electric Avenue

Design a contraption, car, sculpture or other creation. Use simple circuitry to create things that move and light up. Construct series and parallel circuits. Add switches and motors. Then test and re-invent until you are satisfied. What do you want to build? Let's do it!

Ages 8-12

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Week 2 - June 17-21

AM

Parade

Create costumes and a float for a Friday afternoon parade! Maybe you'd like to be dairy royalty with a giant crown waving a fancy wave, or banging a drum and playing a horn at the same time as a one-person marching band. Or perhaps you've always wanted to be a horse? Whatever the case, you're welcome in our parade!

Ages 6-10

Circuit Playground Express w/ Arduino

Learn to program a Circuit Playground Express Arduino board to create awesome projects. The board has lights, buttons, touch sensors, a speaker, temperature sensor, light sensor and more. Use materials from the shop, online example projects and playful experimentation to create things like laser tag, a fruit keyboard, glowy wearable costume props, sculptures, or even beautiful light paintings! Material fee \$25.

Ages 13+

LEGO Dream Job

Do you ever catch yourself wondering "How do they build those giant LEGOLAND creations?" And "Who gets to design and build them?" We will work together to develop a design and a plan to build a giant LEGO creation. Our LEGO group masterpiece will stay on display at the shop to identify the LEGO build spaces. Apply today!

Ages 8+

Invent What You Want

This week, the workshop is yours. Your scientific lab, woodshop, studio, craft room, giant junk drawer. Yes, we are here to help you; but the big project decisions are all yours! Look everywhere for the exact materials, tools and equipment that you will need to create your project(s).

Ages 6-14

Have a Seat: Chair Mod

Chairs can be so boring! Deconstruct yours and make it cooler!!! Turn a chair into YOUR vision of the perfect masterpiece. Make it softer, more useful, bigger or more colorful. Give it wheels, lights or even skis. Add gadgets. We provide the chairs (or bring one from home) and the tools. You come develop the ideas

Ages 9+

PM

Adventure Playground

Perhaps you have heard of Adventure Playgrounds. Over 80 years ago an architect in Denmark noticed that kids were playing everywhere EXCEPT on the playground equipment that he designed. He figured out that kids in the city wanted the same experiences as kids living in the country, "A junk playground in which children could create and shape, dream and imagine a reality." The outdoor yard at Leonardo's Basement is just such a play and build area. We will provide a broad assortment of building materials and tools and supervision while you and your friends build your own projects and create your own worlds.

NOTE: Wear sturdy shoes and clothes that can get really dirty (and wet!).

Ages 6+

Welding and Woodworking

Work in the metal shop and woodshop to design and build from your imagination. Maybe you have a sculpture or a piece of furniture you have been wanting to make. Learn to cut and prepare metal for MIG welding and brazing. Grind to a final finish.

Ages 14+

Evidence of Mythological Creatures

How do you know a unicorn has been grazing in the backyard or that a phoenix flew past just when you turned your head? You and your team will create models of that evidence (because Pegasus prints are sooo light, they are often invisible to the human eye, and dragon eggs are so well hidden we don't often catch a glimpse, for example). Your models can be placed around Leonardo's Basement, in parks or in your very own yard.

Ages 8-13

Hotwheels/Matchbox Re-deux AND Track Construction

Add wings, fins, numbers, flames, mickey-mouse ears or whatever to turn a mass produced toy into a one-of-a-kind creation. Then use your knowledge of physics, logic and a little bit o' luck to design-build-test a ginormous car track wonderland. Big/steep/loopety-loop!

Ages 6-13

CNC Cutters

Design projects that will require a vinyl cutter or laser cutter. Make a personalized graphic for your laptop, water bottle or skateboard; or vinyl decals for your phone, bag or clothing. Make dioramas, puzzles or castle models using the laser engraver. Learn how to import your vector (outline) designs from Inkscape graphics software to the computer-controlled vinyl cutter or laser engraver.

Ages 10+

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Week 3 - June 24-28

AM

Animal House

Does your dog need an outdoor shelter? Does your cat need a place to perch? In this class, you could build a house (or why not a castle?) for your dog, a tree for your cat to climb, a labyrinth for your mouse, or an obstacle course for your hamster. Your pets will thank you!

Ages 8-12

Furniture Making

Learn and practice your woodworking skills. Build a coffee, side or end table; a step-stool or bench, or a book shelf. After you decide upon size, style and design, you will learn more advanced woodworking and construction techniques including measuring and cutting parts, joinery, power-tool use, and wood finishing. Material fee \$30

Ages 12+

Reverse Engineering

Old (and new) machines are really fun to take apart. They are full of twirly, shiny cool, bits and pieces that you can use to make NEW cool, shiny, twirly, robotic sorts of things. No hammers allowed!!!

Ages 6-11

Art of LEGO

Start with a picture on paper. Pixelate it. Sort and find appropriately-sized and colored LEGO pieces. Glue LEGO to a board and make beautiful crop art! (We are pretty sure there is a magical LEGO forest, somewhere.) Take home your masterpiece(s), and prepare for fame!

Ages 9+

Craft Lab

Slime, beads, wire, paint, ribbon, fabric, wax, needles, thread, buttons, plastic flowers, rubber bands, heat gun, CD's, costume jewelry, stickers, leather, beaded chain, Shrinky-Dinks, sharpies, duct tape, colorful cellophane, glitter, Modge-Podge, seashells, corks, bottle caps, tennis balls, feathers, pom-poms, hot glue, rivets, staples, drills, dowels, key rings, dowels, craft sticks. What will you craft?

Ages 6-12

PM

Digital Self-portraits; 3D Printing

Take a digital scan of yourself and make it into a real object. Use 3D scanning and laser cutting/3D printing to make a representation of your very own self that can be as real or imaginative as you'd like. Want to look just like your school picture? Have antlers on your head or ten noses? You can do that!

Ages 12+

Giving Back - Community Building

Use your creative building skills to give back. You'll work together to build a project for a partner in the community. It might be a play structure for a playground or a bench or table at a senior center. Perhaps animal houses and feeders at a school or amenities for a community garden. We'll find the partner. You'll do the design work, construction and installation.

Ages 13+

Build What You Want

This class is for independent builders who relish doing it their own way. Wood and doodads and motors and the universe of odds and ends are all here for you to be your own boss in the land of creativity and invention.

Ages 6-12

Water!

Ever wonder what water can do? Do we take water power for granted? In this class you'll learn what you can do with H₂O. Using things like hoses, PVC pipe, funnels, foam, wood and LEGO, you will explode, experiment (and cool off) with water . . . then make things to sail, float, sink, and paddle in it.

Ages: 6-10

Fools-ball!

Combine your favorite elements of foosball, pinball, air hockey and Skee-Ball to create your own moving-object board game. Use ping-pong balls, trophy figures and other cool materials along with some physics to create tabletop games.

Ages 9-14

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Week 4 - July 8-12

HARRY POTTER THEME WEEK

Six years ago we organized a magnificent week of Harry Potter workshops. We are revisiting our favorite witches, wizards and magical creatures. Welcome to Harry Potter Week. During this session all five classes will be working together to transform Leonardo's Basement into Hogwarts and Diagon Alley.

"Welcome," said Hagrid, "to Diagon Alley." He grinned at Harry's amazement. They stepped through the archway. Harry looked quickly over his shoulder and saw the archway shrink instantly back into solid wall. . . Harry wished he had about eight more eyes. He turned his head in every direction as they walked up the street, trying to look at everything at once: the shops, the things outside them, the people doing their shopping. *from Harry Potter and the Sorcerer's Stone*

You will enter Leonardo's Basement through The Leaky Cauldron (find the brick three up and two across and tap three times) and leave via King's Cross Station. Look for Platform 9¾! Our backyard will become a human-sized Hogwarts Castle with a dining hall and towers. On Saturday we will invite everyone (and the public) to return to Hogwarts for a celebration with friends, family, and homemade butter beer.

AM

Multiplayer Gamer's Workshop!

Do you like MMPORGs, RPGs, AC, and HP? How about rogues, wizards, and warriors or kobolds, trolls, and dragons? Good news, we've got a game you can create yourself. Make the rules, the board, the traps, and the treasure. Is it a puzzle, strategy, or adventure? Dice, cards, or both? You design the story and guide adventurers to glory or ... doom!

Ages 12+

Wooden Castles

Design towers and dungeons with dragons and trap doors. Create ramps and catapults with springs and lights and hinges. Or build a spectacular castle like the one that Cinderella lives in. Or Hogwarts. Perhaps add ghosts like in the Tower of London. Learn woodworking skills along the way and take your creation home at the end of the week.

Ages 6-12

Diagon Alley: Potions, Apothecary, and Wands

Imagine that you are the producers and manufacturers for Diagon Alley stores like Slug and Jiggers Apothecary, Quality Quidditch Supplies or Ollivanders Wand Shop. You will make essential Harry Potter accessories and invent a few more!

Ages 8+

Dragons on Wheels

Imagine your most-liked dragon like Smaug from *The Hobbit and Lord of the Rings*, Toothless from *How to Train Your Dragon*, Viserion or Drogon from *Game of Thrones*, or other monster from your favorite book or movie. Now build it upon a wheelchair so you can move around in all of your wyvern glory.

Ages 11+

NOTE: We need manual wheelchairs if you have one!

Build Hogwarts Castle

Join a large crew of muggles to build human-scale Hogwarts world in the backyard. Visitors will approach the giant entry hall before exploring the dining hall and residence towers. You will also build Platform 9¾. Once the buildings - with towers and pointy roofs - are built you will add countless architectural details including, paintings, chandeliers, flags, and banners. Friday will be a day for finishing details and play!

Ages 9+

PM

Build Hogwarts Castle

Join a large crew of muggles to build human-scale Hogwarts world in the backyard. Visitors will approach the giant entry hall before exploring the dining hall and residence towers. You will also build Platform 9¾. Once the buildings - with towers and pointy roofs - are built you will add countless architectural details including, paintings, chandeliers, flags, and banners. Friday will be a day for finishing details and play!

Ages 9+

Puzzle Room Creator

Imagine all of the elements for a great experience before designing and building human-sized puzzle room. Theme? Elements? Riddles? Difficulty? Take over part of the shop and transform it! Test it out before sharing with your friends and family on Friday.

Ages: 13+

Magical Creatures and Baby Beasts

Use foam, knives, scissors and markers to carve and color creepy crawlies. Baby basilisks, or cockatrice chicks or magical unhatched owl eggs, pixies, dragons, fairies and their familiars. Kinetic or static, cuddly or sully; you design and decide!

Ages 8-12

On Bobbins and Needles

Sewing has its ups and downs. Come to this class even if you have never ever used a sewing machine or even needle and thread. Sew anything from a pillow to a cape to a costume. Make a new lovey for your little brother or sister. Mend something old and worn. Cut clothes apart and sew them back together - a T-shirt Frankenstein! You can hand-sew, use a sewing machine, or both.

Ages 8-12

Wands and Confections

Carve and create wands & patches & accessories. Design and make treats like chocolate frogs. Ribbit Ollivander would be proud.

Ages 6+

Build What YOU Want

This week the workshop is yours. Your scientific lab, woodshop, studio, craft room, giant junk drawer. Yes, we are here to help you; but the big project decisions are all yours! Look everywhere for the exact materials, tools, and equipment that you will need to create your project(s).

Ages 6-13

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Week 5 - July 15-19

AM

Chemistry, Bath and Beyond

Make all sorts of beauty and body care products including bath bombs, lip balms, scrubs, lotions and more! Customize your products with different scents and essences, and maybe even create your own branding for packaging to have everything you need to treat your friends.

Ages 8+

Dragon Ship

Build a 20'-long dragon ship using wood and cardboard built around a canoe with outriggers. Be inspired by fantasy, Chinese or Viking dragon vessels. Dragon ships were often double-ended, with symmetrical bow and stern - including a fierce dragon head that you will design - allowing the ship to reverse direction quickly without having to turn around. On Friday you will transport your boat Bde Maka Ska (Lake Calhoun) for its maiden voyage!

Ages 9+

Squishies and Stuffies

Make your very own custom squishies. Use foam, fabric, duct tape, googly eyes, markers, and more. What will you make? A mermaid, ghost, princess? Fruit, vegetables? French fries, hamburger, popcorn? Donuts, cupcake, sushi? Unicorn, hedgehog, panda, dog, Pikachu?

Ages 6-10

Toolcraft

Do you ever just want to hit nails with a hammer? Or drill holes with a drill? This is the perfect class for you if you've never tried using tools before! Make wacky nail sculptures with wood, nails and a hammer. Drill holes to make pictures on wood. Then use your new skills to construct something practical, whimsical or both! You will also use other tools like handsaws, hot glue guns, vices and wire cutters.

Ages 6-9

3D Printing

Learn how to use CAD software to make solid models. You will cover the basics of designing in 3-dimensional space and learn how software helps turn ideas into physical objects. After creating your CAD design you will use another software product to "slice" your model and generate machine code for the 3D printer. Finally, your 3-dimensional design will be printed in ABS plastic. Discover how fun and easy it can be to bring your ideas to 3-dimensional life!

Ages: 13+

PM

Gravity Schmavity

What goes up, must come down. You will design and make your own experiments, games and wacky creations to explore the effects of gravity. Use balls, balloons, parachutes, fans, leaf blowers, marbles, and ping pong balls. Add other material from our junk bins and lumber shelves. Climb a tower, lift a car. How will you defy gravity?

Ages 8-12

Far Fetched

Ideas and testing around the history and design of the arrow we will build different weights and designs and see how far they can go. Do you know the "Eleven Steps to Archery Success?" You will learn them because what's the use knowing about arrows if you don't know how to shoot them! Plus, you need to make targets, quivers and other items.

Ages 11+

Mermaids, Rafts, and Galleons

You will be afloat making small shark fins, boats, ships, sea monsters, galleons, rafts, mermaids . . . whatever you can dream up that rides on or in the water. Your project may require a sail or a propeller, a sparkling fin or a viewing deck for the captain. Use wood and foam, toy parts, LEGO and the tools that bring your ideas to life. Head outside to test your vessels and creatures in a big tank of water!

Ages 6+

Lasers 2D to 3D

We have a laser engraver that etches and cuts through things with a laser . . . well, flat things that is. But you can make a lot of 3D things from flat things! Dioramas, puzzles, castles, and models. It's time to turn your thinking up-side down and figure out how to create three dimensional designs from two dimensional pieces.

Ages 12+

Creativity Convention

This workshop offers you a different take-it-or-leave-it theme each day incorporating engineering, design, art, and building. Work with tons of cool materials like: wood, fabric, cardboard, metal, plastic, electronics and use the tools you need to work with them!

Ages 6-12

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Week 6 - July 22-26

AM

Creatures

Have you ever dreamed of making your own animals? In this class, you can explore the world of creatures- real and imagined. Using feathers, Styrofoam, clay and fur, make a jumpy giraffe or a pink unicorn, any creature that you can think of. We will brainstorm habitats and ways to construct these animals. Ages 6-9

Slapstick Movie Props

Wile E. Coyote has nothing on this class as we create foam rocks bricks hammers or anvil or bowling ball barbells. Anything heavy we will make light of, either in cardboard, foam or papier-mâché. Let the comedy begin! Ages 10-15

Adventure Playground

Perhaps you have heard of Adventure Playgrounds. Over 80 years ago an architect in Denmark noticed that kids were playing everywhere EXCEPT on the playground equipment that he designed. He figured out that kids in the city wanted the same experiences as kids living in the country, "A junk playground in which children could create and shape, dream and imagine a reality." The outdoor yard at Leonardo's Basement is perfect for such a play and build area. We will provide a broad assortment of building materials and tools and supervision while you and your friends build your own projects and create your own worlds. NOTE: Wear sturdy shoes and clothes that can get really dirty (and wet!). Ages 6+

Welding

Attention new or experienced welders: put on your safety gear and start welding. You will explore the techniques of welding steel and then let your imagination run wild. The sky is the limit as you weld your designs, devices, and sculptures. Ages 14+

LEGO Animation

Our wide range of LEGO characters are waiting for you to help them tell their story! Choose any tale and put LEGO into action! You will work in small groups to create the scenes, take pictures, produce and edit a video of your work! Make your own LEGO Movie and post it on YouTube. Ages: 9+

PM

Bombs, Balms and Scrubs

Experiment with and make all sorts of beauty and body care products including bath bombs, lip balms, scrubs, lotions and more! Customize your products with different colors, shapes, textures and scents. Ages 8-12

Stilt Building and Walking

Novice, brand new, experienced stilts: Build stilt and then learn to walk a couple of feet off the ground. You will spend about half of your time building a custom pair of stilts - with wood and nuts and bolts and strapping - to take home. When finished you will learn to walk. Take the high ground! Ages 10+

Furniture Making

Learn and practice your woodworking skills. Build a coffee, side or end table; a step-stool or bench, or a book shelf. After you decide upon size, style and design, you will learn more advanced woodworking and construction techniques including measuring and cutting parts, joinery, power-tool use, and wood finishing. Material fee \$30 Ages 12+

Faerie Houses and Elf Shelves

Is there a faerie in your yard? Do you want there to be a faerie in your yard? Come to this class and build an inviting abode for a magical creature. If you build it, they will come! We will use wood and natural materials to make the basic structures (you be the architect!) and then you can add tiny lamps, chairs, wallpaper and more to go inside! Make a shelf for your elf to store their books. Build tiny woodland creatures to keep your faerie or elf company. Ages 6-11

Engineering the Imagination

Be the lead engineer on a project of your choice. First, imagine an idea (or many ideas). Second, draw it. Third, find materials. Fourth, build it. Fifth, test it. Finally, make modifications. Don't worry about the idea part, you will figure it out. Ages 6-12

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Week 7 – July 29 - August 2

AM

Cardboard Fantasy Architect

Moving into your Hobbit Hut, Faire House, Space Capsule or Castle will be a whole lot of fun after you bring it home. But first you need to design and build that personal dwelling from your favorite fantasy story. Cardboard and fabric will be your primary building materials. Create details with stencils, paint and random objects.

Ages 6-12

Lance Launching and Custom Atlatl

An [atlatl](#) is a spear-thrower dating back to the Stone Age. People across the world designed these tools that use leverage to achieve greater velocity for hunting. Today they are used primarily for spear-throwing competitions (for both distance and accuracy).

Ages 11+

3D Printing

Learn how to use CAD software to make solid models. You will cover the basics of designing in 3-dimensional space and learn how software helps turn ideas into physical objects. After creating your CAD design you will use another software product to "slice" your model and generate machine code for the 3D printer. Finally, your 3-dimensional design will be printed in ABS plastic. Discover how fun and easy it can be to bring your ideas to 3-dimensional life!

Ages: 13+

Leonardo's Test Kitchen

You know that famous painting by our friend da Vinci showing a group of people eating a meal? Well, now it's your turn to turn to combine art and science with everyone's favorite activity, eating! Learn the basics making things like crackers, quick breads, cheese and cookies. The add sauces plus mix and match spices, flavors and ingredients to create recipes like a master.

Ages 8-12

LEGO Machines

Build motorized machines and contraptions with LEGO. Engineer sturdy and functional frames to hold gears, pulleys and motors. Make a practical mechanism or a whimsical sculpture. Build a fast vehicle or a very powerful one. Craft a one-of-kind gadget or gizmo.

Ages 6-10

PM

Aquatic Carousel

You will be over a barrel, or in it, as we create waterborne steeds out of wood and whatever other material that we can find. And then figure out how to make it turn. The carousel will require giant barrels and a huge stock tank or swimming pool.

Ages 9-14

Build What YOU Want

This week, the workshop is yours. Your scientific lab, woodshop, studio, craft room, giant junk drawer. Yes, we are here to help you; but the big project decisions are all yours! Look everywhere for the exact materials, tools and equipment that you will need to create your project(s).

Ages 8+

Circuit playground

Are you interested in microcontrollers? Let's explore what we can do with the [Circuit Playground](#). You can write programs using integrated sensors, control LED's and motors and even use it as a computer input device like a game controller. You could make a magic hat, cool cosplay prop, burglar alarm, or???

Ages 12+

Waterworks!

Construct your own river of water We'll use a hose and some PVC pipe and containers of various shapes and sizes to create our own stream of water complete with boulders, waterfalls, lakes, and rapids. Think you can construct a small boat that can navigate these treacherous waters and make it to the ocean? We'll test that too, and as always, we'll shoot off water rockets!!!

Ages 6-12

Reverse Engineering

Old (and new) machines are really fun to take apart. They are full of twirly, shiny cool, bits and pieces that you can use to make NEW cool, shiny, twirly, robotic sorts of things. No hammers allowed!!!

Ages 6-12

Summer Classes 2019

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Week 8 - August 5-9

AM

Welding

Attention new or experienced welders: put on your safety gear and start welding. You will explore the techniques of welding steel and then let your imagination run wild. The sky is the limit as you weld your designs, devices, and sculptures.

Ages 14+

Tools 1.0

Do you ever just want to hit nails with a hammer? Or drill holes with a drill? This is the perfect class for you if you've never tried using tools before! Make wacky nail sculptures with wood, nails and a hammer. Drill holes to make pictures on wood. Then use your new skills to construct something practical, whimsical or both! You will also use other tools like handsaws, hot glue guns, vises and wire cutters.

Ages 6-9

Creature Feature

Create your own movie monster in one scale or more and then "go Godzilla" with them creating miniature environs or sets that they can destroy. Add some theme music and record it all.

Ages 9+

Intro to Gube Roldberg

Contraptions that transfer energy from one object to another are sometimes called causation machines. That's what Rube Goldberg machines are. Think dominoes tipping over; or balls rolling down a ramp and crashing into something. How about a pendulum? Or a catapult? Find items and materials in the shop that can crash and roll and bounce and drop upon other objects. Connect them all together and make a one-of-a-kind Gube Roldberg machine.

Ages 6-11

Electric Avenue

Design a contraption, car, sculpture or other creation. Use simple circuitry to create things that move and light up. Construct series and parallel circuits. Add switches and motors. Then test and re-invent until you are satisfied. What do you want to build? Let's do it!

Ages 10+

PM

Craft Lab

Slime, beads, wire, paint, ribbon, fabric, wax, needles, thread, buttons, plastic flowers, rubber bands, heat gun, CD's, costume jewelry, stickers, leather, beaded chain, Shrinky-Dinks, sharpies, duct tape, colorful cellophane, glitter, Modge-Podge, seashells, corks, bottle caps, tennis balls, feathers, pom-poms, hot glue, rivets, staples, drills, dowels, key rings, dowels, craft sticks. What will you craft?

Ages 6-9

Mini Golf Mayhem

Let's make the best mini golf course ever. We can make moving obstacles and crazy tracks to challenge each other. How long? How tall? How curvy? How complicated?

Ages 8+

Wild Flights

Bamboo gliders for wild flights of the imagination Flying fish, dragon, Harry potter broom, start with a bamboo staff and who knows where it will take you?

Ages 9+

Giving Back - Community Building

Use your creative building skills to give back. You'll work together to build a project for a partner in the community. It might be a play structure for a playground or a bench or table at a senior center. Perhaps animal houses and feeders at a school or amenities for a community garden. We'll find the partner. You'll do the design work, construction and installation.

Ages 13+

The Art of Messiness

Summer is coming and it's your chance, nay, your duty, to take advantage of the warm weather by doing all of the messy, squishy, crazy things outside that you can't do in winter. We'll occupy ourselves with a shaving cream slip-n-slide, water balloons filled with paint, and maybe have a food fight. Start collecting your ideas so you can bring your messy dreams to life!

Ages 6-9

Summer Classes 2019

All classes \$200 per half day

Week 9 - August 12-16

AM

Whittle While You Work

From spoons, wands and key chains to figurines and your wildest dreams. . . Whittle your way to fabulous finished products. And along the way learn what "sloyd" means!

Ages 12+

Metal Magic

Are you itching to work with metal so you can learn to weld once you are 14 years old? This workshop is about making creatures and creations out of old watches, nuts, bolts, cogs, springs, and anything else you can get your hands on. Learn to bend, cut and shape metal. If you need a better way to attach pieces together you can learn to rivet and solder too!

Ages 10+

Toy Design

Use stuffing and batteries and motors and rubber bands and balls and string and glitter and wood and cunning. Create toys that spin, catapult or roll on wacky wheels. Maybe the toy that you invent will make people laugh or perhaps they will be challenged to think really hard! You can make your own strategy game, baby toy, dog toy or desk toy! Perhaps your playful creation will end up in a movie!

Ages 6 to infinity

Ages 6+

Stop Motion Animation

Explore the world of video by creating your very own stop motion animation. Bring your drawings, clay, paper, dolls or anything else to life with movie magic! Learn basic computer and camera skills. Walk away with the next viral video!

Ages 9-15

Making Simple Machines

Do you like to build things that move? This is the class for you. You will learn about and use six simple machines that make human work easier. Using levers, wedges and screws we will construct vehicles or other toys that move. Use your creativity and engineering skill to use recyclables and new materials to create your own moveable machines. At the end of the week you will test your vehicles against other engineers in the class. Happy building!

Ages 6+

PM

Double Dare Design Challenge

Create games of the hilarious and challenging variety. Test them out with your team, and share with others on Friday.

Cupcake catapult competition? Ramen noodle slip-n-slide? Quest to find the mouse in the enormous taco? We won't know until YOU and your team create them!

Ages 10+

Carpentry for Stuffedies, Action Figures and American Girl Dolls

Make beds, cars or even a house for your action figures, stuffed animal or American Girl doll. Start with a plan to get everything the right size and build a rough prototype before you select final materials and construct your final project. Decorate of course!

Ages 8+

Gube Roldberg

Build a big, very BIG, machine as a group project. The 15-foot tall ceilings with metal trusses and steel columns and beams allow for generous elevation and support for a lot of weight. That means zip lines, pulleys and other hardware will probably be a big part of your chain reaction contraption. Thinking big usually means making big mistakes. Make a bunch. Make it cool.

Ages 12+

Superball Plinko, Ping Pong Mazes and Marble Coasters

Rolling balls are fascinating, especially when they bounce into and off things. You will design and make your own Plinko game, mazes and marble runs using wood, plastic, trophies, rubber bands, bells and any assortment of material from our junk bins through which marbles, super and ping pong balls will careen, coast, drop, shoot and dribble.

Ages 6-12

Invent What You Want

This week, the workshop is yours. Your scientific lab, woodshop, studio, craft room, giant junk drawer. Yes, we are here to help you; but the big project decisions are all yours! Look everywhere for the exact materials, tools and equipment that you will need to create your project(s).

Ages 6-14

Summer Classes 2019

All classes \$200 per half day

Week 10 - August 19-23

AM

Adventure Playground

Perhaps you have heard of Adventure Playgrounds. Over 80 years ago an architect in Denmark noticed that kids were playing everywhere EXCEPT on the playground equipment that he designed. He figured out that kids in the city wanted the same experiences as kids living in the country, "A junk playground in which children could create and shape, dream and imagine a reality." The outdoor yard at Leonardo's Basement is just such a play and build area. We will provide a broad assortment of building materials and tools and supervision while you and your friends build your own projects and create your own worlds. NOTE: Wear sturdy shoes and clothes that can get really dirty (and wet!).

Ages 6+

Explorations in Laser Cutting

Design projects that will use the laser engraver. You can etch wood, metal, plastic or glass. You can also cut thin pieces of wood. Start by designing your project using Inkscape software, then send your design to the laser for "printing." Make dioramas, puzzles or castle models. Etch a logo on your phone or laptop. Make multiple pieces and glue them together to make 3-dimensional objects.

Ages 11+

Toy Laboratory

Now is your chance to take old toys apart to see what's inside. Use the parts from old toys to make a new toy of your own. Stuffed animals, dolls, cars, electronic games will get new and surprising lives! Combine and add new and re-purposed elements like wheels, lights and wings!

Ages 6+

Look Alikes

Build projects that are not exactly as they seem. Perhaps you will: hollow out a book just enough to hide a key, make boxes with secret compartments, alter glasses to allow you to peek behind while you face forward, transform a stuffed animal into a flashlight . . . or something completely different. Whatever you decide, we won't reveal the mystery!

Ages 9+

Building Buildings

Like making structures and buildings? Like designing houses or castles? You will design and build whatever kind of edifice that you desire. Start with graph paper or a simple prototype. Then source material and construct your final dream house, skyscraper, treehouse, faerie house, or replica of a famous building.

Ages 8+

PM

Intro to LEGO Robots

Design and build autonomous robotic creations using LEGO Mindstorms NXT. Write computer programs to make the machines navigate on their own, sense their surroundings and perform practical and playful tasks. This class is a fantastic introduction to robotics. It is also appropriate for students with some Mindstorms experience who want to further develop their skills.

Ages 9+

Leonardo's LEGOLAND

We have tubs of LEGO including pieces for cities, ships, castles, trains and spaceships. We also have plants, animal and human minifigs. This is a Build What You Want workshop. You can build whatever you choose. Perhaps a machine, a city, a medieval forest, fleet of ships or a Star Wars battle. Best of all. You decide. You can make as many things as you have time to finish (and take apart on Friday)!

Ages 6+

3D Printing

Learn how to use CAD software to make solid models. You will cover the basics of designing in 3-dimensional space and learn how software helps turn ideas into physical objects. After creating your CAD design you will use another software product to "slice" your model and generate machine code for the 3D printer. Finally, your 3-dimensional design will be printed in ABS plastic. Discover how fun and easy it can be to bring your ideas to 3-dimensional life!

Ages: 13+

Wood You Like to Build?

Saws, drills, files, hammers, vises, clamps and all of the wood that you can shake a stick at! Scrap wood, plywood, 1x4's, 2x2's, 2x4's and more. Cut and shape wood to build one or more projects in the woodshop. Learn about fasteners and finishing too!

Ages 6-12

Creativity Convention

This workshop offers you a different take-it-or-leave-it theme each day incorporating engineering, design, art, and building. Work with tons of cool materials like: wood, fabric, cardboard, metal, plastic, electronics and use the tools you need to work with them!

Ages 6+