

# Summer Classes 2023

All classes \$220 per half day

## WELCOME TO SUMMER AT LEONARDO'S BASEMENT

We are excited to present our schedule of summer workshops and are optimistic about returning to a normal number of offerings. 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. And to value process over product while learning important personal skills. And, 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.**

### NEW & SPECIAL in 2023:

- NEW LOCATION We have moved to 2 Malcolm Ave SE in the Prospect Park Neighborhood in Minneapolis (One block north of University Ave, just west of Hwy 280). Building entrance on SE 4th St.
- We will continue to utilize a drop-off and pick-up system where adult caregivers remain in their cars and are met outside the building by staff.
- Construction of a new "Death Star" by teens in the outdoor "Adventure Playground" for ages 6 and up.

We look forward to seeing you!



Steve Jevning  
Co-Executive Director/Founder



Tracy Nielsen  
Co-Executive Director

## NOTES

- Individual and collaborative project building in engineering, art, design, and technology for ages 6-17.
- 11 weeks of full and half-day workshops Monday-Friday begin June 19.
- Extended Day in AM (8:00-9:30 am) and PM (3:00-5:00 pm).
- Lunch: students registered for both an AM and PM workshop should bring a lunch.
- All half-day workshops cost \$220. [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,
  - 3) Less than two weeks before the first day of class you will not receive a refund or credit.
- Workshop located in southeast Minneapolis, near University Ave Hwy 280, at 2 Malcolm Ave SE, 55414.

Other questions? Look at [FAQ here](#) or [contact us](#) at [info@leonardosbasement.org](mailto:info@leonardosbasement.org) or 612-824-4394.

Register at [leonardosbasement.org](https://leonardosbasement.org)

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## Week 1 - June 19-23

### AM

#### Faerie Houses and Elf Shelves

Is there a faerie in your yard? Do you want to invite elves in your garden? Come to this workshop and build them a home, food truck or school. 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, swings, tacos, sofas, wallpaper and more to go inside! Make a shelf for your elf to store their books. Then add tiny woodland creatures to keep your faerie or elf company.

Ages 6-11

#### Boards of LEGO (but never bored of LEGO)!

Love board games and building with LEGO? Start the week recreating your favorite board game out of our mammoth supply of LEGO bricks. Bet you've never played Chess, Sorry or Stratego like this before! Think about what works well and what is difficult and finish the week by collecting your ideas, consider the unique features of LEGO, and invent a one-of-a-kind game that no one has ever played before.

May the best minifig win!

Ages: 9-14

#### Bench and Bookshelf Building

Learn or practice woodworking skills by designing and building a wooden bench or a custom book shelf. After you decide about size, style and design, you will learn advanced woodworking and construction techniques including measuring and cutting parts, joinery, power-tool use, and wood finishing.

Ages 12-17

#### Taskmaster

Do you know Taskmaster? No, not the bad guy with photographic reflexes in Avengers comics. The British telly program where six contestants complete a series of challenges. As Wikipedia notes: "Tasks range from simple physical challenges, such as "eat as much watermelon as you can in one minute", to more complex or artistic tasks. Some tasks may be timed, consist of multiple stages, or both. . . To complete tasks, contestants often have to apply a level of logic, creativity, or lateral thinking in order to achieve the end goal." And that's what you will do, alone and in teams! [Here's a fun example.](#)

Ages 13+

#### Wizards of Wood

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. Learn about fasteners and finishing too!

Ages 6-12

#### Adventure Playground

We have added additional Adventure Playground ([origin of idea here](#)) experiences this summer to meet demand. "A junk playground [is a place] in which children could create and shape, dream and imagine a reality," said the creator, Danish architect Carl Theodor Sørensen, in 1931. The outdoor yard at Leonardo's Basement is a wonderful play and build environment.

The space includes existing student-built projects, like a tilting two-story lighthouse and a 1/3 scale Millennium Falcon, in which to play.

Plus a broad assortment of building materials and tools, and supervision for you and your friends to build shared projects and create your own fun.

Ages 6-16

NOTE: Wear sturdy closed-toe shoes\* and weather appropriate clothes that can get dirty (and wet!).

\*sneakers, boots or tennis shoes are required (sandals, Crocs, and flip flops are not allowed)

### PM

#### Stop (& Go) Motion Animation

Bring motionless drawings, clay, paper, toys, LEGO, sawdust . . . or anything else, to life with movie magic! Tell your story through the magic of stop-motion techniques. For beginners and experienced animators.

Ages 9-15

#### Build What You Want

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

Ages 6-10

#### Puppets & Piñatas

We will be performing some surgeries on old stuffed animals and sewing them back together in new and unusual ways. Turn them into puppets with moveable mouths. (Ventriloquy is easier with a mask on!) We'll do fun things with fabric and sewing and glue and scissors AND then use papier mache to make animal piñatas.

Ages 8-11

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## Toy Architecture

Do your action figures, stuffed animals or dolls need a place to live and play? Make them a spaceship, carnival rides, RV, castle, cottage, treehouse or something else! Build for your Star Wars, American Girl Dolls, Beanie Babies, Batman, Marvel figures, or others toys you already have or use one from the many gallons of small stuffed animals we have in the warehouse.

Ages 6-12

## 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. Materials fee \$25.

Ages 14-17

## Launch After Lunch

Build slingshots and other projectile-launching machines like catapults. After you have built a couple of prototypes and learn how they work, scale them up to launch balls, water balloons, and cupcakes. Perhaps build a human slingshot!?

Ages 10-15

## Week 2 - June 26-30

### AM

#### Bigger Than Life Board Games

Put yourself in the middle of your favorite board games! Plan out a strategy on a chess board, conquer the world in Risk, or sink your opponents' Battleship; all on boards you can walk around on! Make Giant versions of Connect 4, Monopoly or any game you can think of! Add enormous dice, cards, and pieces to complete the set.

Ages 8-14

#### Adventure Playground

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The space includes existing student-built projects, like a tilting two-story lighthouse and a 1/3 scale Millennium Falcon, in which to play. Plus a broad assortment of building materials and tools, and supervision for you and your friends to build shared projects and create your own fun.

Ages 6-16

NOTE: Wear sturdy closed-toe shoes\* and weather appropriate clothes that can get dirty (and wet!).

\*sneakers, boots or tennis shoes are required (sandals, Crocs, and flip flops are not allowed)

#### Drones

Want to learn how to fly and code a small, sturdy drone with amazing photo and video capabilities? You'll fly your own [DJI/Ryze Tello](#), learn about current FAA regulations and register as a "recreational flyer" (\$5/year at (<https://faadronezone.faa.gov/#/>)) so you can try some larger drones that the instructor will provide. Project options include coding a multi-drone dance, turning a large drone into a mothership, building a drone race course, and anything else you dream up. Did you know that over two dozen high schools in Minnesota sponsor drone racing teams? Learn about that too! Materials fee \$150.

Ages 14-17

Max 8

#### 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: 13-17

#### Extra-ordinary Furniture Makeover

Start with an ordinary chair, end table or small shelf. Dust it off and develop a plan. Then, give it a never-before-seen design makeover! Add color, texture, gadgets and features (maybe wheels or lights or cup holders or curtains?) to make a creation uniquely yours. We'll have the furniture and tools . . . you bring the pizzazz!

Ages 9-15

#### Imagine, Invent, Innovate

Ever think of something that should exist, but doesn't? Have an invention you've been thinking about? Not quite sure exactly how it will work or how you should make it? This workshop will support your work on designs, solving problems, and building your ideas. Share your challenges and the project with others to get their suggestions. You'll leave with a prototype and the memory of models that didn't quite work. Enjoy the journey!

Ages 6-12

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## PM

### **CNC Cutters**

Design projects that will require a vinyl cutter and/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 CorelDraw graphics software to the computer-numeric-controlled (CNC) vinyl cutter or laser engraver.

Ages 11-17

### **Cardboard Cities**

The mayor gave you the key to a city that hasn't been built yet. Turn boxes, big and small, into the city of your dreams. Make a map and work with fellow city planners! The park could be next to the zoo or maybe across the street from the grocery store. The roads could be curvy or straight, with or without bridges for wildlife. Skyscrapers? Airport? Farms? You decide!

Ages: 6-12

### **LEGOLAND at Leonardo's**

We have a plethora of LEGO including pieces for cities, ships, castles, and spaceships. We also have plants; plus animal and human minifigs. This is a build what you want workshop; build whatever you choose. Perhaps a machine, a game or puzzle, a medieval forest, boats to float or a Star Wars battle. Best of all. You decide. You can make as many things, or as big a project, as you have time to finish (and take apart on Friday)!

Ages 6-12

### **Adventure Playground BUILD**

The Adventure Playground gets constant use. It needs repair and new constructions every summer. You will work to identify tasks and ready the space for the next users. You might make exterior or interior repairs to the Millennium Falcon and lighthouse, install more holds and reset the bouldering wall, add recreational features for games, or construct semi-permanent water features. You should still have time to play!

Ages 11-17

### **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 new ones!

Ages 8-15

### **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 6-10

## **Week 3 – July 10-14**

## AM

### **Marbles and Mousetraps**

Let's build the biggest, most amazing, causation contraption that we can. Create a contraption that will tower above our heads and send balls of energy knocking things over under our feet. Perhaps you will add some amazing features to the track. How big can you make it? How cool? How many times will you and your friends redesign and rebuild it?

Ages 6-10

### **Basements and Dragons**

Create characters, roll the dice and venture into lands uncharted! Join your fellow builders in an epic Dungeons and Dragons game, paint a model, stich a bag for your polyhedral dice and see where your quest takes you.

Ages 13-17

### **Pyramid Scheme**

Create a giant outdoor pyramid using cardboard, masking tape, and boards. While you are building scheme about what to do with it, or in it, or on it. Does it have mazes or slides or a trap? Maybe a riddle to unwrap?

Ages 10-17

### **Inventing with Electricity**

Build contraptions with motors and gears and your gizmo imagination. Take apart electrical devices and make fresh models of your fresh vision. Make series and parallel circuits, use all kinds of switches, bells, buzzers, and lights.

Ages 8-11

### **All You Can Build Buffet**

Choose from a smörgåsbord of materials (think: wood, game pieces, pulleys, fabric and bins, boxes and trays of other tasty options).

Prepare them and/or take them apart with utensils, I mean . . . tools, like saws, drills, tape, hot glue, and wire. What you cook is up to you!

Ages 6-12

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## LEGO Dream City

Our cities are continually evolving. Build your own city (and the occasional monster) using our ginormous collection of LEGO bricks while you learn how cities work and grow. This class is about building with LEGO bricks and you can expect a few surprise pop-up building competitions during the week but the only requirement is an interest in the world's favorite construction toy. (LEGO maniacs encouraged). Ages 8-15

## PM

### Dyed, Tied & Dipped

Create one-of-a-kind clothing, pillow cases or wall hangings using tie-dye, stencils, and bleach PLUS other tools and methods of fabric design. You will then explore hydro-dipping on a variety of materials. Bring some of your own cotton items on the first day, or use ones that we have!

Ages 13-17

### Build What You Want

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

Ages 6-10

### 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. Next you need to figure out how to make the horse's move; to turn. The carousel will require giant barrels and a huge stock tank or swimming pool.

Ages 12-17

### 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. Sorry, no hammers allowed!!!

Ages 6-11

### En Garde

Before you prepare for a fight you need a sword. In this workshop you will craft a wondrous single or double-edged training sword. From wood! Start with a straight, sturdy 1x4, then make big cuts with a table saw before using hand tools like chisels, Surform, rasps, and files on your way to a hard, sharp, edge. You'll need a handle design, too. Hopefully, you will have time to make a sheath.

Ages 10-17

### Stop Motion Animation

Explore the world of video by creating your very own stop motion animation. Bring motionless 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

## Week 4 - July 17-21

## AM

### Adventure Playground

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The space includes existing student-built projects, like a tilting two-story lighthouse and a 1/3 scale Millennium Falcon, in which to play. Plus a broad assortment of building materials and tools, and supervision for you and your friends to build shared projects and create your own fun. Ages 6-16

NOTE: Wear sturdy closed-toe shoes\* and weather appropriate clothes that can get dirty (and wet!).

\*sneakers, boots or tennis shoes are required (sandals, Crocs, and flip flops are not allowed)

### Giant Potato Head

You've played the game, or at least you know about it. (But did you know that it was the first toy advertised on TV in 1952?) Build a cardboard and fabric costume with your very own special appendages, ears, eyes, shoes, hat, nose, pants, mouth, etc. After you've learned mad costume-making skills to make your special spud, plan and participate in a potato parade!

Ages 9-15

### Tools 2.0

You know how to use basic hand tools like saws, hammers, hot glue guns, screwdrivers, pliers, and cordless drills. Now learn how and when to use specialty tools and those with electrical cords. Miter boxes, chisels, levels, ratchets and sockets, Allen wrenches, pipe cutters, jig saw, orbital sander, and scroll saw. Make a bunch of projects using many different tools.

Ages 9-13

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## **LEGO on the Move**

Designed for students who want to get started building motorized machines with LEGO. Classes will focus on building techniques and simple machines. This class is an opportunity to design and build something that moves on its own. It's also great preparation for LEGO robotics.

Ages 6-10

## **Build What You Want**

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

Ages 9-14

## **Tabletop Game Studio**

Are you interested in tabletop games like Warhammer, Dungeons and Dragons, Magic: The Gathering, Star Wars, and KeyForge? Do you want to develop your very own game and make a tabletop terrain, die, cards, miniatures, and other accessories? Paint (or repaint) your new or existing miniatures. Use wood, fabric, foam, plastic and other materials to laser cut, carve, and assemble your miniature terrains and worlds before painting. Build and paint your pieces for existing games, new games, for no game at all!

Ages 12-17

## **PM**

### **Carnival Games**

Step right up, kids, step right up! We'll spend the week recreating some of the most popular games at the fair -- Milk Bottle Knockdown, Ring Toss, Balloon Burst, Basketball Free Throw and Skee-Ball. Come try your hand and see if you have what it takes to win big!

Ages 6-10

### **Cardboard Cosplay**

You have favorite characters from books, movies, comics, video games, anime, etc. Human and human-like, creatures and animals, real and fantastical. Harley Quinn, Wonder Woman, Groot, Iron Man, Captain Marvel, Godzilla, or Black Widow. Perhaps LEGO mini (maxi)-fig, real or fantasy animals. After choosing your favorite you will learn how to cut and bend and staple cardboard to complete your personalized costume.

Ages 10-15

### **Boff! (Bowling + Mini Golf)**

There is evidence of bowling in Egypt dating back to 5200 BC. The modern game of golf, on the other hand, originated in 15th-century Scotland, with its ancient roots in the Roman Empire and China. You will apply this knowledge, and your familiarity with the games, to design your own creation that is a combination of the two. Think min-golf course size. It probably needs its own name!

Ages 10-17

### **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! Or even if you have. 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

### **CNC Cutters**

Design projects that will require a vinyl cutter and/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 CorelDraw graphics software to the computer-numeric-controlled (CNC) vinyl cutter or laser engraver.

Ages 11-17

### **House and Free Range Plants**

Design and build regular and raised bed flower and vegetable gardens for the workshop. Shovel and rake and build some boxes. Fill 'em with dirt and cow poop and then plant an assortment of seeds, flowers and plastic scarecrows. If you take a class later in the summer you might get to eat some of your yummy harvest. Regardless, the Guinea pigs will enjoy every single piece!

Ages: 10-17

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## Week 5 - July 24-28

### AM

#### Adventure Playground

We have added additional Adventure Playground ([origin of idea here](#)) experiences this summer to meet demand. "A junk playground [is a place] in which children could create and shape, dream and imagine a reality," said the creator, Danish architect Carl Theodor Sørensen, in 1931. The outdoor yard at Leonardo's Basement is a wonderful play and build environment.

The space includes existing student-built projects, like a tilting two-story lighthouse and a 1/3 scale Millennium Falcon, in which to play. Plus a broad assortment of building materials and tools, and supervision for you and your friends to build shared projects and create your own fun.

Ages 6-16

NOTE: Wear sturdy closed-toe shoes\* and weather appropriate clothes that can get dirty (and wet!).

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#### It's a Dog-Treat-Dog World

Make a sturdy tug toy or chew toy for your dog. Or a school of stuffed fish or other playful teasers for your cat. Perhaps your pet needs a new climber or bed or dish mat. Design and build a house or bridge or tunnel or toy for your guinea pigs, hamsters, reptile or amphibian. No house pet? Make something for a wild critter like a bird feeder or squirrel ice cream truck!

Ages 10-16

#### All You Can Build Buffet

Choose from a smörgåsbord of materials (think: wood, game pieces, pulleys, fabric and bins, boxes and trays of other tasty options).

Prepare them and/or take them apart with utensils, I mean . . . tools, like saws, drills, tape, hot glue, and wire. What you cook is up to you!

Ages 6-12

#### Heath Robinson Machines

Perhaps you have heard of Rube Goldberg and his drawings of complicated contraptions. He had a counterpart in Great Britain named [W. Heath Robinson](#). You will work as a group to complete a VERY BIG Heath Robinson Build. Our 15-foot tall ceilings with metal trusses and steel 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 12-17

#### LEGO Renewable Energy

Years ago LEGO introduced a 729-pieces Renewable Energy set to the educational market, "Embracing a wide range of elements-including a solar panel, a capacitor and two motors-this set helps students investigate the concepts of energy, energy sources, electricity and the environment by building models. Contains building instructions for constructing windmill, water mill or solar-powered Ferris wheel and several supplementary models." In this workshop you will build projects to help you better understand sources of renewable energy.

BONUS: You will take home a brand new eLAB kit to build more energy, or other, projects! Materials fee \$25.

Ages 9-17

### PM

#### Better Than an Operation

Know a lot about a favorite subject? Wanna stump your friends and learn about electricity? You will design and build a cool electronic game like "Operation," but way better. Choose a theme like unicorns or mythological beasts. Or Harry Potter or Star Wars. Then make electricity your foil - learn about conductivity, circuitry, and soldering. Build a cool container to hold your questions/answers and test the knowledge and physical skills of your friends.

Ages 10 and up

#### Magical Tree Houses

Build a tree house with lights and swings and ramps. Learn to build zip lines from branches and porches. Add lights and switches or imaginary characters. An elevator with a pulley might lift your treasures to the sky.

Ages: 6-12

#### Who You Gonna Call? Stress Busters!

Create projects like: Zen gardens, worry pets, stress balls, sensory putty and more! Use a wide variety of tools and materials to design and make things that put worries to rest. Make them for yourself, someone else or for both of you!

Ages 10-17

#### What Makes it Tick?

Ever wonder what makes a clock tick, an engine whine, or a monitor hum? In this class you'll take apart all kinds of stuff and figure it out! Machines, mechanisms, printers, laser scanners, bicycles, chainsaws; whatever you can find! Use some of your favorite harvested pieces and some new parts to build a project if you wish.

Ages 6-11

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## Animation Nation

Explore various styles of animation, learn about editing software and use special effects to create short movies. Experiment with Claymation, 2D and 3D stop-motion, pixilation, green screens, and lighting. Work in small teams to discover how to make stories come to life, frame by frame.

Ages 10-17

## Camping Tips 'N Tricks

Do you want to learn camping skills - or get better at them? Make a tiny wood stove, practice fire-starting, and simple cooking. Learn wayfinding techniques. Practice first aid. Practice the proper use of camping tools. Build temporary shelters. You get the idea.

Ages 13-17

## Week 6 – July 31-August 4

### AM

#### Adventure Playground

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Ages 6-16

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#### Wizards of Wood

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. Learn about fasteners and finishing too!

Ages 6-12

#### Raiders, of the Lost Junkyard

Sometimes, when something quits working, it is just the beginning! Take apart stuffed animals, toys, household items, games, and electronics. Use the pieces to make something that the world had never before seen! Checker board out of gears? Robot from an old VCR? Uni-Fish from plastic animals? Hmm . . .

Ages 6-10

#### Sewing Animals

Use a combination of faux fur, stuffies, felt, fleece, needles, thread, sewing machines and glue to make animal costume parts or stuffies. Perhaps animal paws, tails and ears for a Halloween costume, cosplay, or everyday! Maybe you'd prefer to make a stuffed mascot of your own design? Absolutely!

Ages 9-17

#### Extra-ordinary Furniture Makeover

Start with an ordinary chair, end table or small shelf. Dust it off and develop a plan. Then, give it a never-before-seen design makeover! Add color, texture, gadgets and features (maybe wheels or lights or cup holders or curtains?) to make a creation uniquely yours. We'll have the furniture and tools . . . you bring the pizzazz!

Ages 10-15

#### 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+

### PM

#### Robots, NOT Robotics

Do you have a favorite robot? The Iron Giant, R2D2, Chappie, Wall-e, Optimus Prime or C-3PO? Explore piles & piles of toys and games and old appliances to find the pieces to build your favorite 'bot. Better yet, invent one that the world has never before seen!

Ages 6-10

#### 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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## Imaginary Landscapes for Real Buildings

Students have crafted a few playful and clever pieces of miniature public art in front of the workshop. We need more! Scout locations outside the shop - on walls, steps, piano sound boards, fences - wherever. Then design and build whimsical additions to the Leonardo's Basement landscape.

Ages 10-17

## 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: 13-17

## Sandbox Games IRL

Draw inspiration from Minecraft, Stardew Valley, Terraria, Factorio, Roblox, a Building Mechanic from Fortnite, or another of YOUR favorites. Design a world on a giant piece of graph paper and then construct your pixels in 3-dimensions using wood and paper cubes. Build terrains structures, props and characters. Perhaps a castle with turrets and a dungeon; or a tower that stretches to the sky, or an enormous maze. Join us for the ultimate building challenge. Anything is possible (well, except for playing the video game).

Ages 8-12

## Sew Great!

Explore the basics of hand sewing and sewing with a machine! Learn to thread a needle, when to use different kinds of stitches and make a drawstring pouch or bag, a pillow or animal. This workshop is for beginners of all ages, and experienced sewists.

Ages 9

## Week 7 - August 7-11

### AM

#### Adventure Playground

We have added additional Adventure Playground ([origin of idea here](#)) experiences this summer to meet demand. "A junk playground [is a place] in which children could create and shape, dream and imagine a reality," said the creator, Danish architect Carl Theodor Sørensen, in 1931. The outdoor yard at Leonardo's Basement is a wonderful play and build environment.

The space includes existing student-built projects, like a tilting two-story lighthouse and a 1/3 scale Millennium Falcon, in which to play. Plus a broad assortment of building materials and tools, and supervision for you and your friends to build shared projects and create your own fun.

Ages 6-16

NOTE: Wear sturdy closed-toe shoes\* and weather appropriate clothes that can get dirty (and wet!).

\*sneakers, boots or tennis shoes are required (sandals, Crocs, and flip flops are not allowed)

#### Logic Mazes and Puzzles

Design and build 2- and 3-dimensional puzzles, labyrinths, and mazes. Make flat puzzles with fun images, or no image at all! Build 3D SOMA puzzles, and master some of the 240 solutions. Grab graph paper and design labyrinths and logic mazes before crafting them out of imaginative building materials.

Ages 8-12

#### Invent What You Want

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

Ages 6-10

#### Cardboard Armor

Using sources from history and fantasy you will construct and design your own suits of armor with working joints and links using cardboard and papier-mâché. Perhaps you will add a hidden compartment in your gauntlets for poison? Or leave room in the taces for a rondel dagger!

Ages 9-15

#### Thrift Store da Vinci

Start with large, existing paintings and prints from thrift stores and rummage sales. Add your own images or words using stencils, paint, markers or collage materials. Create something that makes a statement, makes you laugh, or both! No painting experience required to create this super fine found art.

Ages 13-17

# Summer Classes 2023

All classes \$220 per half day

## PM

### **Scientists in the Workshop**

Turn the shop into your personal laboratory! A little biology, a little physics, and a lotta fun! Grow bacteria and crystals. Play with your new friend, Bernoulli. Orchestrate chemical reactions. Explore surface tension and experiment with ice, both wet and dry.

Ages 6-9

### **Assemblage Marionettes**

Marionettes are puppets controlled from above using wires or strings. Assemblage is three-dimensional art that typically uses found objects. You will locate clever artifacts in the workshop and fasten them together to make human, animal or imaginary characters before suspending them from fishing line attached to wooden bars that will help you make them walk and dance and jump and . . .

Ages 11-17

### **Labyrinths, Mazes and Pinball Machines**

Enter the world of 3-dimensional puzzles. Start by making Cat's Cradles to loosen up your brain and your fingers. Grab some graph paper and design labyrinths (with a single path to the center and back out) and mazes (with multiple choices of path and direction). Finish up the week designing your very own working pinball machine.

Ages 8-12

### **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 13-17

### **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, paint water balloons and maybe have a food fight. Start collecting your ideas so you can bring your messy dreams to life!

Ages 6-9

## Week 8 - August 14-18

## AM

### **Adventure Playground**

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Ages 6-16

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### **Welded Yard Art**

Metal garden art is made to last. Make cool stationary or kinetic sculptures out of metal that will live outdoors. Use rivets and bolts to fasten pieces of steel, aluminum, copper, and brass together. Learn how to weld or improve your existing welding skills.

Ages 14-17

### **Kite Cargo**

How big of Mylar kite do you need to build to fly a small puppet or other toy creature? This will require some experimentation, like lifting objects with a helium balloon. While you're getting your personal kite airworthy, you can also work together fly a much bigger creature, with a huge kite, or kites! Hope for wind.

Ages 12-17

### **Toy Inventors Workshop**

Let's use batteries and motors and rubber bands and balloons and string and glitter. Make tops, JiggleBots, catapults, optical toys, and things with wheels. You can invent and make your own board game or card game. Experiment with hand-cranked contraptions and make new ones.

Ages 6-12

# Summer Classes 2023

All classes \$220 per half day

## LEGO Masters

Are you up for a daily LEGO building challenge? Themes for the structure or problem or theme will be drawn from a hat each day. How will you plan and build your solution? How will you manage your construction to generate a really cool project in the allotted 2-hour building time?

Ages 10-15

## PM

### Pewter Casting

Design and cast fantastic currency or charms or trinkets. Draw coinage inspiration from Republic Credits, Knuts, Sickles, Gil, Simoleons, Munny, Rupees, or Dogecoin. Or design baubles, medallions, pendants, and tchotchke. How about crafting your very own tabletop game miniatures! Use the laser cutter to make molds and cast melted pewter into them for your final creations.

Ages 13-17

### Cardboard Armor

Using sources from history and fantasy you will construct and design your own suits of armor with working joints and links using cardboard and papier-mâché. Perhaps you will add a hidden compartment in your gauntlets for poison? Or leave room in the taces for a rondel dagger!

Ages 9-17

### 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

### 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

### 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!

Ages 11-17

## Week 9 - August 21-25

### AM

#### 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 6-10

#### Room to Build

Make your room a reflection of you! Wall decor, sculptures, picture frames, lights, pillows, coat hook, jewelry holders . . . maybe a sports theme with trophy book ends and a basketball hoop for your laundry basket. Love music? Paint a wall hanging with your favorite lyrics or a drum end table. We won't know what will be created this week until it's over!

Ages 10-14

#### LEGO Renewable Energy

Years ago LEGO introduced a 729-pieces Renewable Energy set to the educational market, "Embracing a wide range of elements-including a solar panel, a capacitor and two motors-this set helps students investigate the concepts of energy, energy sources, electricity and the environment by building models. Contains building instructions for constructing windmill, water mill or solar-powered Ferris wheel and several supplementary models." In this workshop you will build projects to help you better understand sources of renewable energy.

BONUS: You will take home a brand new eLAB kit to build more energy, or other, projects! Materials fee \$25.

Ages 9-17

#### PVC Archery

Create your own bow, arrows, quiver, and targets. Shoot at fruit: Become aplomb enough to hit a plum! Increase your aim and range.

Experiment with arrow building and find the perfect ones for you. Choose an archery archetype. Perhaps Artemis, Robin Hood, Atlanta, Diana, William Tell, Legolas, Skadi, or Katniss Everdeen.

Ages 12-17

# Summer Classes 2023

All classes \$220 per half day

## 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 3D printing. 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: 13-17

## Wonders of Fabrication

Build with hinges and springs and connectors of every kind. Blend wood and plastic and metal into a project of your own imagination.

Ages: 6-12

## PM

### Sling-Things

Perhaps you'll invent a better confetti launcher or dog-treat flinger or bouncy-ball slinger. Use springs, rubber bands, shock cord, air power and more to get smallish and large objects to fly through the air! Experiment with different materials, design a mechanism, choose your energy source, test a prototype and then scale it up to launch balls, water balloons, cupcakes or . . . confetti and dog treats!

Ages 8-12

### Build Bigger 'Bots

We have three suitcase-sized working and nonworking robots that long to be reimagined for new lives at the shop. Get them operational or salvage for parts. Find ways for them to interact with one another. Or combine them to make a larger, more feature-laden machine. Employ woodworking, metalworking, electrical wiring, mechanics, and programming skills. Connect power supplies, motors and drive trains. Add controllers and sensors. What will the 'bot(s) do?

Ages 13-17

## Craft Lab

Make purses out of albums, boards out of cork, unicorns out of horses, rainbows out of beads, robots out of wire...AND/OR anything & everything out of: 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, 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

## H2(g)O!

Work inside the shop to build seaworthy projects and then take them outside to launch in multiple water resources in the Adventure Playground. You will design, build, and test vessels that to go in, on, or under the water. Use foam, wood, upcycled objects and the necessary tools. Perhaps you'll make boats, narwhal, rafts, submarines, mermaids, octopi, Sponge Bob, sharks, launchers, squirters, or splashers. You'll decide!

Ages 6-10

## Dragon Making

Imagine your favorite 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; Shenron, Dragonite, or another monster from your favorite book, movie or comic. Next, craft a moveable fire-breathing (well, not really) monster (in a variety of sizes) with scales and a tail; perhaps wings. Bring a manual wheelchair if you have one; they make great wyvern bases!

Ages 9-17

## 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 clever physics to create tabletop games.

Ages 10-16

# Week 10 - August 28-September 1

## AM

### Adventure Playground

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Ages 6-16

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# Summer Classes 2023

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## Logic Mazes and Puzzles

Design and build 2- and 3-dimensional puzzles, labyrinths, and mazes. Make flat puzzles with fun images, boxes for Wordle-like games, or no image at all! Build 3D SOMA puzzles, and master some of the 240 solutions. Grab graph paper and design labyrinths and logic mazes before crafting them out of imaginative building materials.

Ages 10-14

## 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. Materials fee \$25.

Ages 14-17

## Stop Motion Animation

Explore the world of video by creating your very own stop motion animation. Bring motionless 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 9-12

## Animaliers

Create animals - real and imaginary - using wood, foam, wire, springs, cardboard, paint, feathers, fabric, and more. Use faux fur to make your fox furry or bottle caps to make your dragon's scales shine! Sew, saw, staple and snip to bring everyday objects to life. Wooden horse or lizard king . . . you can imagine and make anything!

Ages 6-9

## (not actually Heavy Metal)

Make 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. Attach pieces together with rivets, adhesives and solder too.

Ages 10-14



## PM

### Metal Working

Learn your way around the metal shop. Cut, bend, grind and weld steel to create furniture, sculptures or whatever else you can imagine. Learn about the properties of metals and how to use tools safely.

Ages 14-17

### All You Can Build Buffet

Choose from a smörgåsbord of materials (think: wood, game pieces, pulleys, fabric and bins, boxes and trays of other tasty options).

Prepare them and/or take them apart with utensils, I mean . . . tools, like saws, drills, tape, hot glue, and wire. What you cook is up to you!

Ages 6-12

### Mirror, Mirror, Off the Wall

Design clocks, mirrors, pencil holders and 3-Dimensional wall art. We have been saving all kinds of treasure for this workshop! You will: take -apart, reconfigure or build from scratch to create one-of-a-kind objects for your space!

Ages 9-14

### Tools 2.0

You know how to use basic hand tools like saws, hammers, hot glue guns, screwdrivers, pliers, and cordless drills. Now learn how and when to use specialty tools and those with electrical cords. Miter boxes, chisels, levels, ratchets and sockets, Allen wrenches, pipe cutters, jig saw, orbital sander, and scroll saw. Make a bunch of projects using many different tools.

Ages 9-13

### Wheel Up, Fly Down, Sail Over on Land & Water

Split your week into three not-necessarily-equal parts: land, air, and water. Make wheeled creations that zoom down mountains and roll over hills. Craft birds, gliders or superheroes that coast over skyscrapers. And build ships, mermaids, or rafts to sail down the river, through the rapids, and to the sea.

Ages 6-10