

# Summer Classes 2021

All classes \$220 per half day

## WELCOME TO SUMMER AT LEONARDO'S BASEMENT

We are excited to present our schedule of summer workshops. 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 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 2021:

- In addition to our three basic rules, we expect that you will follow all COVID safety procedures that include wearing a mask at all times, physical distancing and washing hands frequently. See COVID Operational Plan [here](#).
- Expanded teen workshops: drones, photography, fabric printing, welding, metalworking, 3D printing, Arcade Game development, furniture making and woodworking.
- Wooden swords, pneumatics, sewing, foam sculpture, new LEGO offerings, bike and water puppets, tie-dye and hydro dipping, painting miniatures, and interior design.
- Additional weeks of spectacular 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.
- 12 weeks of full and half-day workshops Monday-Friday begin June 14.
- 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 are \$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, 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](http://leonardosbasement.org)

# Summer Classes 2021

All classes \$220 per half day

## Week 1 - June 14-18

### 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 14-17

#### 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

#### 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

A few years ago kids and adults at Leonardo's Basement transformed the back lot into our version of an historic [Adventure Playground](#), with permanent and ephemeral structures to play on, and in. There's a 1/3-scale Millennium Falcon, a two-level lighthouse, a pair of zip lines and a giant four-column climbing tower. Plus, the area is full of eclectic building materials that you can use to build your own creations. Tools, fasteners, and supervision are available as needed. There are always containers to be filled with water - and emptied - on hot days! Ages 6-17



### PM

#### 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 6-11

#### Tools 1.0

Do you ever just want to hit nails with a hammer? Or drill holes with a drill? Use wire cutters, and a vise? This is the perfect class for you if you want to gain experience with tools! Make wacky sculptures. Drill holes to make pictures. Use your new skills to construct something practical, whimsical or both! You will also use other tools like handsaws, hacksaws, hot glue guns and pliers. Ages 6-9

#### 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

#### 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. Ages 13-17

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## Week 2 - June 21-25

### AM

#### **Adventure Playground BUILD**

Each year the Adventure Playground needs a few repairs, some maintenance, and fresh ideas. Work in a group to make the space and installations presentable PLUS design and construct new outdoor features. Projects might include interior and exterior repairs to the Millennium Falcon, painting and installing decorative wood to disguise the chain link fence, or installing game equipment. You plan it, you build it. And then play!

Ages 11-17

#### **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

#### **Practical, Playful Furniture**

Build a custom coat rack for your porch or a bookshelf for your bedroom. Modify an existing chair or table. Add clever personal elements as you develop and finish your design. Use a number of different tools and materials to make it look good and last a lifetime.

Ages 10-17

#### **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

#### **Craftimals and Critters**

Calling all animal lovers. This workshop is all about creating lovable and beautiful creatures out of exotic junk. Use hot glue, pom-poms, faux fur, sequins, fabric and foam to create an awesome real or imaginary animal. From fuzzy fluffy backpack companions to wooden horses. From creatures of the deep to cute and huggable unicorns and narwhals, the opportunities go on and on and adventure is yours for the taking.

Ages 6-9

### PM

#### **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

#### **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

#### **Paint Pendulums (and Other Colorful Physics)**

Create delivery systems to roll, bounce, drip, splash, spray, and dribble paint. Use those mechanical contraptions and clever containers to paint on wood, canvas, and 3D objects (that you will also make!).

Ages 9-13

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## Week 3 - June 28-July 2

### AM

#### **Adventure Playground**

A few years ago kids and adults at Leonardo's Basement transformed the back lot into our version of an historic [Adventure Playground](#), with permanent and ephemeral structures to play on, and in. There's a 1/3-scale Millennium Falcon, a two-level lighthouse, a pair of zip lines and a giant four-column climbing tower. Plus, the area is full of eclectic building materials that you can use to build your own creations. Tools, fasteners, and supervision are available as needed. There are always containers to be filled with water - and emptied - on hot days!  
Ages 6-17

#### **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

#### **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

#### **Alphabet Shelves**

Build our take on a genius European bookshelf design. Cut plywood to make cubes with integral shelves that form individual alphabet letters (or numbers) when viewed from the front. Paint the interior black and the front edge white. The other sides of the cube painted as you choose! Store trinkets and toys and . . . books!  
Ages 13-17

#### **Little Monster Puppets!**

Make a mask so big that it covers from your waist to your head, or even higher. Add a couple of stuffed arms with hands, a furry body and some claws to your shoes. Let's go Wild Thing with Little Monster puppets!  
Ages 9-14

### PM

#### **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

#### **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

#### **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

#### **Mini Hobbit Huts and Tiny Treehouses**

Build a dwelling for your favorite tiny friends, like Elves, Nisse, Faeries or even action figures. Cardboard and wood will be the base of your tree or house and then you'll add furniture, trampolines, paintings, swings, appliances or ziplines to make your guests at home!  
Ages 6-12

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## Week 4 - July 5-9

### AM

#### 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 6-12

#### 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

#### Cardboard Swan Boats

In Boston Garden they have a big one but we can create our own variety and see what comes of it. Small or giant we will give it a go making a signet-ure piece of fun.

Ages 10-15

#### Tiny Mini Golf

Monster Golf

Design and build table-sized miniature golf greens. Employ the usual features of miniature golf and scale them down considerably. What's your favorite hole? One with a tunnel? Windmill? Twisty-turny or a big jump? Once you have your mini course developed, find an appropriate-sized golf ball and craft a set of very tiny clubs.

Ages 8-12

### PM

#### LEGO Pneumatics and More!

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. By the end of the week you will be using a real air compressor, hoses, valves, and controls to operate bigger non-LEGO projects!

Ages 12-17

#### Build What You Want

This week, the workshop is yours. Your scientific lab, woodshop, studio, craft room, giant junk drawer. Yes, someone will help you if you need it, 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 6-10

#### Foam Food Fling

Make your own fast food. Craft foam into food, not for thought, but for throwing! Create phony food - eggs, steaks, pizza, bananas, hot dogs, tomato, hamburger or aebleskiver (look it up!) - decorate then accelerate it through the air. Explore aerodynamics and mass in the form of repast (look it up!), sculpted from soft cushion foam with electric knives and scissors. After creating a giant pyramid of food we'll take it outside for a food fight, something between dodge ball and a tossed salad.

Ages 8-12

#### 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 10-16



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## Week 5 - July 12-16

### AM

#### Undercover Secret Agents and Spies

Your mission, should you accept, is to gather information and send messages to other members of The Intelligence Agency without them being intercepted, set up surveillance on The Villain, sneak into The Villain's headquarters undetected, recover The Treasure and escape! You'll need all of the best gadgets and superb training to succeed. Are you prepared for the challenge? Learn about creating and reading coded messages, design gadgets to help you sneak past traps and spy on others. Put your creations to the test as you infiltrate the Villain's hideout.

Ages 6-9

#### RC Road Club

Why are race car tracks so flat? We'll build up, down and all around, and build a RC car track that makes use of space and whatever materials we can find. Think jumps, loops, obstacles, switchbacks up walls, pits of mud and ramps going out windows! We'll have a few RC cars to race, but bring your own if you have one.

Ages 8-12

#### 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

#### Faerie Houses and Secret Gardens

Where do faeries live? Create habitats and structures for your favorite tiny friends. Use cloth, wood, wire, jewelry, springs, bark, moss, twigs, sand, pebbles, cardboard, and more to build a garden with fences, bridges, ornaments, sculptures, painted rocks, and bird houses. Perhaps secret pathways or hidden compartments. Where do your faeries live? Tree house? Underground hideaway? Leaf Hut? Twig Tower? Floating Cottage?

Build the perfect dwelling of their dreams!

Ages 6-12

#### Drones

Want to learn how to fly and program small, sturdy UAV with amazing photo and video capabilities? You'll fly your own [DJI/Ryze Tello](#) drone using either your cell phone or a game-type controller and first person view goggles to see where you're going! We can lend you a drone and controller for the class if you wish. Learn about current FAA regulations and register as a "recreational flyers" (\$5/year at <https://faadronezone.faa.gov/#/>) so you can try some larger drones that the instructor will provide. 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

### PM

#### 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

#### 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 8-13

#### Tabletop Gamer's Toolkit

Never show up to the table unprepared again! Craft accessories for, or entire, games. Make die, cards, or miniatures. Build dilapidated buildings, unbreakable defense lines, or any kind of natural structures. Use wood, fabric, foam, and much more to make fine creations. Laser cut, carve, and assemble your miniature world. Design, build, and paint terrain, whether it's for games like Warhammer, Dungeons and Dragons, Magic: The Gathering, KeyForge, a game of your own invention, or for no game at all!

Ages 12-17

#### Open Electricity and Electronics Lab

Start with an introduction/refreshers about simple circuitry and ways to control incandescent and LED lights, motors, and other devices. Learn the difference between electricity and electronics building a variety of projects. By the end of the week you will be making programmable integrated circuit projects.

Ages 10-15

#### 3 - 2 - 1 . . . Water Blastoff!!!

Ever want to build your own miniature watercraft? This class is for anyone interested in how water works. (It will also keep you cool in the hot summer sun!) Design and make small boats that you can float in a giant tank of water outside the shop. Engineer a water-powered drag racer and blast it down a track at super-high speeds. Construct water-powered rockets, blast them off toward outer space, and try to get them to land on a floating raft in a giant water tank like the Space X Falcon 9 booster. Learn about materials that float in water and learn how water pressure works. Don't miss this cool and wet summer class!

Ages 6-10

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## Week 6 - July 19-23

### AM

#### **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 workshop. Learn about fasteners and finishing too!

Ages 6-12

#### **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

#### **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 9-17

#### **Digital Photography**

Take better photos, and make the most of your digital cameras features. Learn how you change aperture, shutter speed, and ISO to bring your images to the next level. Experiment with lighting, composition and style to compose that perfect shot. Portraits, still life, action shots . . . you'll experiment with all of them. Finally, head to the computer room for post-production editing. Bring your own digital camera (stand-alone or cell phone camera) or use one of ours.

Ages 13-17

#### **Toy Laboratory**

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

Ages 6 to infinity

### PM

#### **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. Learn to use rivets and solder if you need a different or better way to fasten pieces together.

Ages 10-13

#### **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

#### **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 6-11

#### **Team Installation Project**

Work as a team to design and build a permanent contraption or piece of electro-mechanical art for the workshop. Kick around ideas that represent the spirit of Leonardo's Basement, then construct and install this collaborative project. Andrew is a professional tinkerer and creative innovator who will support your process as you learn new and amazing skills.

Ages 13-17

#### **Double Dare Design Challenge**

Create outdoor games of the hilarious and challenging variety. Test them out with your team, and then share with others. Cupcake catapult competition? Jell-O slip-n-slide? Quest to find the mouse in the enormous taco? Riddle room? Paint balloon toss? We won't know until YOU and your team create them!

Ages 10-17

# Summer Classes 2021

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## Week 7 – July 26-30

### AM

#### **Adventure Playground**

A few years ago kids and adults at Leonardo's Basement transformed the back lot into our version of an historic [Adventure Playground](#), with permanent and ephemeral structures to play on, and in. There's a 1/3-scale Millennium Falcon, a two-level lighthouse, a pair of zip lines and a giant four-column climbing tower. Plus, the area is full of eclectic building materials that you can use to build your own creations. Tools, fasteners, and supervision are available as needed. There are always containers to be filled with water - and emptied - on hot days!  
Ages 6-17

#### **Furniture Making**

Learn and practice your woodworking skills. Build a coffee, side or end table; a step-stool or bench, or a bookshelf. 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 12-17

#### **It's Your Birthday**

Every party needs decorations, presents, and treats. Make signs and banners, table and wall decorations, party hats and piñatas. Perhaps a confetti launcher! Repurpose things in the shop to make appropriately-sized gifts and fake food items: fabric, blocks, beads, buttons, glitter, springs and other doo-dads. Finally, what's a party without guests? Create your guest list by creating your guests! Look through our piles of stuffed animals and choose a couple to take apart and reconstruct making new creatures using hot glue or by hand sewing. You might even want to make clothes for them. After adding a few more ideas, celebrate with your human and animal friends.  
Ages 8-14

#### **Playhouses**

Make your own playhouse out of cardboard as fancy or as rustic as you like. As the week progresses you can add a room each day. It's YOUR cottage or castle so we'll create them to fold up and take home when you are finished.  
Ages 6-12

#### **Sea Foam**

Make underwater creatures out of foam then make your own mobile or menagerie. Add liquid latex if you choose to give a more creepy crawly feel to your anemone, fish, eel, or imaginary creature from the Deep!  
Ages 8-12

### PM

#### **Mobile Menagerie of Bike Puppets**

Turn your bike into a creature by hook and crook, coaxial cable and a little fur or just decorate it in custom art car fashion. Give it a tail that wags or wings that flap and a distinctive head. When finished we can head for the hills with our Mobile Menagerie!  
Ages 10-15

#### **Laser Engraver and 3D Printing Projects**

Use CAD software and CorelDRAW to make solid 3D models and 2-dimensional projects. 3D printer projects are built with ABS plastic and can be up to 8"x8"x8" big. The laser cuts and engraves thin sheets of wood and plastic up to 18"x24" in size and you can make multiple pieces to create a 3-dimensional object if you wish. Discover how fun and easy it can be to bring your ideas to life. The possibilities are endless!  
Ages 13-17

#### **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 6-14

#### **Interior Designer**

Design things that make your personal space more FUNctional and more FUN! You'll measure floor and wall dimensions, note floor type and the amount of light in the space that you want to improve. Think items like clocks, mirrors, foot stools, coat rack, lights and 3-dimensional art. Take-apart, reconfigure or build your projects from scratch to create one-of-a-kind accessories and furnishings.  
Ages 12-17

#### **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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## Week 8 - August 2-6

### AM

#### **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

#### **Cardboard Kayaks**

Design and build cardboard kayaks, small and strong, wrap them in plastic, make a wooden paddle, and finally climb in to test it out in our backyard pool.

Ages 10-15

#### **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 6-9

#### **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 8-14

#### **Tools Rule**

Do you ever just want to hit nails with a hammer? Or drill hundreds of holes? Make wacky nail sculptures with wood, nails and a hammer. Use a drill to make pictures on wood. Measure, cut, fasten and take things apart. Then use your new skills to construct something practical, whimsical or both! You will also use other tools like handsaws, screwdrivers, hot glue guns, vises and wire cutters. We have a lot; try them all.

Ages 6-9

### PM

#### **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 14-17

#### **Water Puppets**

Saw and carve water puppets out of wood, connect them with rubber, and paint them with polish. Make fish or frogs. Tarantulas or turtles. Snakes or sharks. Imaginary or real. Bring them to life in our huge black stock tank!

Ages 9-14

#### **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

#### **Magic Makers!**

You are a maker of magical experiences. Create things that will surprise and delight people who discover them. Things like: painted rocks with positive messages, ladders or swing sets or doors for faeries and elves, phoenix feather fossils, signs for unicorn crossings, or dragon egg shells. Put them around our neighborhood, in your neighborhood, or in your yard!

Ages 6-12

#### **Inventing with Electronics**

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

# Summer Classes 2021

All classes \$220 per half day

## Week 9 - August 9-13

### AM

#### **Adventure Playground**

A few years ago kids and adults at Leonardo's Basement transformed the back lot into our version of an historic [Adventure Playground](#), with permanent and ephemeral structures to play on, and in. There's a 1/3-scale Millennium Falcon, a two-level lighthouse, a pair of zip lines and a giant four-column climbing tower. Plus, the area is full of eclectic building materials that you can use to build your own creations. Tools, fasteners, and supervision are available as needed. There are always containers to be filled with water - and emptied - on hot days!  
Ages 6-17

#### **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 eggs, pixies, fairies and their familiars. Kinetic or static, cuddly or cuddly; you design and decide!  
Ages 9-12

#### **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 12-17

#### **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

#### **Marble Menagerie**

Tinker with marble runs and marble mazes. Make those marbles spin, whirl and dance as you create new uses and discover classic games with brightly-colored glass spheres. Sew a pouch to hold 'em ('cause you don't want to lose your marbles!).  
Ages 6-10

### PM

#### **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 6-12

#### **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

#### **High Art!**

Create beautiful works of art and then send them 700 feet into the sky (or more). Build Art rockets! They can take the shape of a fish, superhero, dragon (baby doll!) or anything you can imagine. Be an expressionist or an impressionist. Take your artistic expression to new heights in High Art!  
Ages 12-17

#### **Tornados, Godzilla & Waves of Water**

Build a structure or landscape and then test the limits of your design and construction as you experiment with air pressure, waves of water or Godzilla feet!

- Step 1: Make a wall or tower or city or house
  - Step 2: Design and build something to topple it
  - Step 3: Test it! Did it survive?
  - Step 4: Redesign your creation and repeat!
- Ages 6-9

#### **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?" Work with others to develop a design, plan and then build a giant LEGO display. Your LEGO group masterpiece will stay on display at the shop to inspire other LEGO designers and engineers. Apply today!  
Ages 8-12

# Summer Classes 2021

All classes \$220 per half day

## Week 10 - August 16-20

### AM

#### Mini Golf Madness

Design and build the cleverest mini golf course ever. Make moving obstacles and ramps, tracks and bridges and hidden holes to challenge each other. Perhaps your course has a trivia component, a joke challenge, or a water feature. Create clubs or paddles to tap the balls (you'll customize both of those, too!)

Ages 10-17

#### 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

#### Cardboard Fantasy Architect

Moving into your person-sized 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 8-12

#### Build Your Own Arcade Game (Software and Hardware)

You'll go retro and spend the week at the arcade -- no quarters needed. Program a 2-D retro arcade-style game using the MakeCode Arcade platform. MakeCode Arcade is a web-based code editor that can use either block editor interface (like Scratch) or JavaScript for programmers of all levels to create arcade-style games. Add your own artwork to your game to make it one-of-a-kind. Play and share your game with others on the web and on a handheld gaming machine that you will also build! Includes a materials fee of \$35.

NOTE: Students must have previous experience programming in block-based code editors (Scratch or something similar).

Ages 13-17

#### 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

### PM

#### H<sub>2</sub>(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

#### 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 workshop. Learn about fasteners and finishing too!

Ages 6-12

#### 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 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

#### Intro to LEGO Robots

Design and build autonomous robotic creations using LEGO Mindstorms EV3. 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 9-13

#### Daring Derby Designer

Design, build and tweak your foot-long wheeled car or creature. Go for style, go for speed, go for gophers! Then work together to build a ramp and components. Multiple races, challenges and belly laughs are sure to follow with your wild and crazy pinewood derby-style racetrack.

Ages 8-12

# Summer Classes 2021

All classes \$220 per half day

## Week 11 - August 23-27

### AM

#### Adventure Playground

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Ages 6-17

#### 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

#### Invention with a Side of Wheels

Engineer a toy that rolls and spins and jumps and shakes on a landscape of your design. Truck, duck, robot, wagon or dragon, they all have wheels in this imaginative workshop. Choose the number, size and even shape of the wheels. Build from scratch or use repurposed toys from the warehouse. Test your designs on the terrain that you and your friends build. Steep and dangerous? Curvy and hilarious? It's up to you!  
Ages 8-12

#### 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

#### Teen B.W.Y.W

Work with instructors and with each other to build independent engineering, art and technology projects. Our workshop is loaded with tools\* and materials for you to build from your imagination! Build many small projects or plan and construct a bigger creation or prototype. Come with an idea OR develop one once you get here! (\* This workshop is held in a general-build area, using hand and power tools; welding is not an option.)  
Ages 13-17

### PM

#### Making (Painting) Miniatures

Do you have gaming miniatures that haven't been painted, or that you'd like to repaint? Warhammer? How about learning to customize non-gaming small objects like chess pieces or Matchbox vehicles? Railroad or dollhouse miniatures? LEGO minifigs? How about Yu-Gi-Oh!, Pokémon or Star Wars characters? HeroClix? Learn to paint, or improve your skills, we'll have the teeny-tiny brushes, a rainbow of colors and an expert instructor to guide you, in this workshop. We have smallish items if you need them.  
Ages 12-17

#### 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

#### 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

#### 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 8-12

# Summer Classes 2021

All classes \$220 per half day

## Week 12 - August 30-September 3

### AM

#### Adventure Playground

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Ages 6-17

#### 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 6-10

#### Build What You Want

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Ages 10-17

### PM

#### Tools 1.0

Do you ever just want to hit nails with a hammer? Or drill holes with a drill? Use wire cutters, and a vise? This is the perfect class for you if you want to gain experience with tools! Make wacky sculptures. Drill holes to make pictures. Use your new skills to construct something practical, whimsical or both! You will also use other tools like handsaws, hacksaws, hot glue guns, and pliers.  
Ages 6-10

#### Water Park Design Engineer

You know those really cool water park and amusement park rides? The prototypes that you design and build will be faster, spinn-ier, slippery-er, splash-ier and wilder! The scale will be appropriate for an action figure or doll (but you will also get plenty wet when you test your models).  
Ages 6-10

#### Invent 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 10-17

