



Program of Exhibits

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APPL 1-1

Putt-Putt Game

Makers: Daniyah Khan, Warren Quadland, Elaine Tsui, Akash Veeragandham

We wanted to build a game that we both had never seen before and also a game that can be very adaptable. We utilized the 3D printer, sewing materials, and Arduino kit to put together all the individual pieces for our putt-putt game. We also made use of the laser cutter for prototypes with cardboard to test designs and their effectiveness. Our game contains different pieces, such as a bridge and windmill, that allow it to be organized on a table to build any putt-putt course the user desires. Building a putt-putt game with many different pieces let us learn the importance and value of both prototyping and the ability to divide work between a team. Our next iterations would be geared towards targeting kids more with a unified theme throughout.

APPL 1-2

City Planning Board Game

Makers: Anna Heisig, Will Hardy, Olivia Xiao

Our project is a board game about city planning, it has 3D printed houses, trees, buildings, hospitals, and bridges. There is a spinner and cards that go along with each of the 3D printed objects. The game board is laser cut and has holes for the pieces to fit into.

APPL 1-3

Laser-Cut Windmill

Makers: Megan Macdonald, Jackson Pineiro, Dylan Smith

Our project is a laser-cut plywood windmill, with 3D printed decorations, that functions as a night-light. Many people claim they have trouble going to sleep, so our elegantly designed night-light comes with a buzzer that plays a song while the windmill turns slowly! Not to mention, people love to have a little bit of light while sleeping, so our LED design bursting through the windows is there for that purpose. These electronics were made possible with an Arduino circuit board hooked up to a power source, including accessories within the windmill, and the code memorized upon the Arduino. Through the use of all these elements, including laser cut wood, 3D designed decorations, vinyl cut patterns, and Arduino electronics, we have combined them to create a beautiful product that serves a meaningful purpose.

APPL 1-4

Reusable Gingerbread House

Makers: Gilleyn Bunting, Bhuvanesh Kodem, Urael Mussie, Rithika Vasa

Our project is a reusable gingerbread house that will be used to cut down on waste that accumulates during Christmas. Our group designed this to be rebuildable so you can put it away during the rest of the year. It will be built with plywood and have 3D, vinyl cutter, and electronic components.

APPL 1-5

The Pill Wheel

Makers: Mallory England, Han Bao, Xudanyang Zhu, Cameron Figueroa, Devin Sheridan

The Pill Wheel would allow children who suffer from diseases that require multiple medications a day to have fun when taking their medicine. Childhood illnesses can be scary, and our product would help alleviate some of the fear and anxiety associated with taking lots of medicine as a child. The laser cutter, 3D printer, vinyl cutter, and electronic workbench will be used in combination to add structure, depth, and texture to our layered design.

APPL 1-6

The Tabletop Greenhouse

Makers: Desi Parker, Daniel Wu, Eden Spofford

A miniature greenhouse that fits on a counter that includes irrigation and a fan for good airflow. The greenhouse will be made of acrylic so that ample light can get through and will include a drawer underneath to store extra seeds and other tools. The planters themselves will be made of wood.

APPL 1-7

3D Printed Racetrack

Makers: Saachi Gandhi

I used the 3D printer to create a car, laser cutter machine to create the racetrack, and the vinyl station to decorate. The other tools I used included scissors, wood glue, and a heat gun. I learned how to operate these machines. My next iteration would be a larger racetrack.

APPL 1-8

Ball Shooter for Dogs

Makers: Alexis Nantz, Mia Kate Hardee, and Fletcher Cummings

We chose this project because we wanted to incorporate a cool moving mechanism like throwing a ball and have a project with an animal demographic. We used three different machines at Beam, including the vinyl cutter, the laser cutter, and the 3D printer. We used acrylic, vinyl, and sewing elastic. We learned that having a mechanism that launches something requires a lot of trial and error. Our next iteration would be to make the project more aesthetic and use a stronger launching system to get the ball to go farther.

APPL 1-9

Toy Organizer for Children

Makers: Sean Gilmartin, Camilo Montoyo, Cindy Lin, Daniel Pearlman

Our organizer aims to make cleaning up toys fun for children. With a friendly monster-esque design, and bodily features having functioning purpose (the nose is used as a handle, mouth as an opening), children won't realize they're doing chores while using their monster organizer.

APPL 1-10

Temperature Sensing Closet

Makers: John Lorick, Rhea Pokala, Ivey Parks, Martin Rodriguez

We have assembled a closet that senses the temperature and opens the left or right closet door corresponding to the temperature. Our closet will feature elements created by laser cutting, vinyl cutting, 3D printing, and electronics. We furthered our knowledge and experience working with BeAM machines. Additionally, we learned how to use a motor and code it. Our next iteration will look like a closet with a fully functional motor to open and close the doors.

APPL 1-11

Self-watering Plant Container

Makers: David Knight, Isais Estrada, Priya Patel, Lin Qi

We chose to make a plant container that detects the level of water in the soil and automatically releases more water into the soil if hydration is low. We used laser cutters, vinyl cutters, 3D printers, and an Arduino to complete this project. We learned how to combine our knowledge of each of these individual tools to work on a more comprehensive project.

APPL 1-12**Model Lighthouse**

Makers: Asa Petropoulos, Aryan Choudhary, Miguel Alvarado, Samuel Baily

Lighthouses have always been a part of human culture, guiding boats and sailors to safety. As such, we wanted to create a model lighthouse to pay homage to all of the previous lighthouses. We have LED lights in the top compartment of the lighthouse with a working case that rotates to create a “blinking” effect. We utilized a laser cutter to cut out the walls and railings, a 3d printer to create the rotating case, and an arduino to control the lights and servo motor that rotates the case. Throughout this project, we familiarized ourselves with the functions and operations of lighthouses in order to create the most accurate model.

APPL 1-13**Christmas-In-A-Box**

Makers: Chloe Ratcliff, Adam Konieczny, Azucena Maldonado

Christmas-In-A-Box is a festive way to showcase your favorite memories around the holidays. The structure of the box is made with laser-cut plywood, 3D-printed gears that rotate pictures around within the box, and LED lights illuminating inside of the box.

APPL 1-14**The Meow Box**

Makers: Bryan Fajardo-Vera, Aislin Collins, Jassenia Tasleem

A box designed for domestic cats to consume their food without the bother of larger dogs stealing their food. The project features laser cutting, vinyl, and 3-D printing. Our next iteration would hopefully increase the scale of the product to adequately house the average cat.

APPL 1-15**Rotating Organizer**

Makers: Jingyi Sun, Yuqing Gu, Rupad Bhandari, Ashley McGuire, Meghan Sun

An innovative organizer that aims to minimize space while allowing users to maximize items they want to store or organize in a fashionable manner. The rotating organizer has many storage platforms branching out of a central rod. This creates more surface area for users to store their belongings and also serves as a statement piece in a room due to its unique structure.

APPL 1-16**Safety System for Bicycles**

Makers: John Ford, Elizabeth Teka, Will Joseph, Kothai Kochi

One of our group members expressed how she would like to feel more comfort and safe while she rides her bike around campus. Using electronics, we wired all of the lights and speaker system. We make buttons using the 3D printer, and laser cut everything else. We learned how to identify and correctly implement a solution to a problem. Next time, we plan on making the project with stronger materials and actually getting to use it.

APPL 1-17

Spinning Silverware Drying Rack

Makers: David King, Jacob Otte, Yesha Patel

We chose to make a drying rack for silverware that can spin. This is a more efficient alternative to a washing machine or air drying. We used laser cut plywood, 3-D printed objects, and electronics to make this design. We learned how to use software such as TinkerCad, Fusion360, and Adobe Illustrator. We also learned how to use electronics such as arduinos, breadboards, and servo motors. Our next iteration would have a more sleek look with a 360 degree spinning servo motor.

APPL 1-18

Phone Lock Box to Avoid Distractions

Makers: Krupa Patel, Katie Sugg, Minglong Wu, Owen Barr

For our final project, we have decided to create a system that traps your phone in a box to help you avoid distractions while you are struggling to fall asleep. This system runs on a timer that will make noise and starts flashing through led lights when it's time for you to wake up. Our product is more effective in waking you up than other products by our competitors because you cannot simply "snooze" it, you have to physically get up, unlock the box, and turn the gears to turn it off. This product is intended for people who have trouble falling asleep and/or getting enough sleep.

APPL 1-19

Hot Air Balloon

Makers: Akhil Kumar, Megan Simmons

Our design is going to be a hot air balloon and our target audience is to attract children and young adults for an enthralling experience in a hot air balloon ride. Some materials we have are the chains to support the bridge, a box that is laser cut with plywood, and the balloon top which is hand soven. We learned how to use the sewing machine and the vinyl cutter for the design aspects for our project. Our next iteration will be to maybe scale the design by an enormous amount since the balloon will have to fit humans inside. We also want to add more durable wood for support since the wood we are using for our project is light wood.

APPL 1-20

Center Console Organizer

Makers: Henry Chen, Summer Hyland, Adam Souter, Ananyaa Sundar

Our project is an extension for the center console of your car. If you are in need of more console space or help to organize your clutter, our project design could be the right thing for you. Our design consists of a center compartment that is the same size as the center console of a car that is able to be lifted up to access the original center console of the car while still giving you more storage space. Inside the compartment, there will be organizers that provide an extra cupholder, a holder for your phone, and a LED that is able to be turned on and off with a switch to provide light to the compartment. On top of the compartment, there will be a little pad that provides comfort, as opposed to a hard top.

APPL 1-21

The Wonderful Windmill

Makers: Samantha Benson, Yosyas Ghebru, Benjamin Corder

Our scaled-down version of a windmill brings back an iconic piece to farms. Using the laser cutter and 3D printers we were able to create a structure that is functional as storage but also serves to create a dynamic level of design that windmills might not otherwise have. We also used electronics to make it operational to spin in a 360-degree manner. Vynial was also used to add designs to the sides making it appear more life-like.

APPL 1-22**Anti-Smoking Lock Box***Makers: McKenna Harden, Connor Larson, Jacob Beam, Ethan Weber*

We created our project in hopes to help people break bad habits. Our initial intent was to help smokers quit smoking. This box utilizes the laser beam, 3D printer parts, and a circuit board to function. This box has a random generated number code on the front that is automatically assigned that the user will not know. It will make it virtually impossible to open and our hope is that the user will get frustrated before they try to guess every possible code. This door is held on to a box by a hinge and uses codes to make the passcode work. When completing this project we learned how to make separate projects interact and repurpose items to leverage our project more.

APPL 1-23**Cursive-Me-Learnsive***Makers: Julianne Vavolizza, Reilly Tran, Jagwinder Sandhu, and Amelia Paulsen*

We are changing the game for learning! Cursive-Me-Learnsive is a fully functional learning activity for children to put their motor skills into action. With laser-etched stencils that rest on a 3D-printed easel, the child can use their “light-up pen” to trace over these stencils and learn how to write cursive in a fun hands-on way. The pen’s electronic light-up capabilities add an extra element of creativity, enhancing users’ experience while providing a sustainable alternative to traditional workbooks. We use the 3-D printer, arduino, vinyl cutter, and laser cutter to create this project. We learned how to incorporate multiple components into one project along with the importance of creating low to high fidelity prototypes. Our next iteration would be a more scaled version of our product so that the easel can be the proper size and height for toddlers that will be using the project to learn. This was an amazing learning experience and we really enjoyed the project!

APPL 1-24**Light Up Art: Star Wars Edition***Makers: Claire Ribisl, Jake Terrill, Kaiden Adetunji, Abby Tilley*

Our group decided to create this light up art frame because we all agreed it would look super cool and stand out while also finding a user appeal by using an image of Darth Vader from the Star Wars Series to draw an audience. We used the laser cutter to perfect a sturdy frame to hold the piece of acrylic that we raster cut the image of Darth Vader onto. We also used the 3D printer to make a stand to hold our frame and house the Arduino which we will use to light up the LEDs that surround the frame. We all learned to be resourceful with our materials, to work together to create a great and unique project and to have fun with creating something you love overall!

APPL 1-25**Mini Train to Pull Item Cart***Makers: Anika Sharma, Jacob Dang, Nicholas Wind*

This product is mainly for decorative purposes (and can also be used as a toy), however it can serve multiple functionalities such as being a tool to send things across the room (when you don’t want to get up). Users will set up their desired track ahead of time with the buildable train track. When they need to send something to the other end of the track, they will load up the cart with the desired object and push it away. We used the laser cutter, 3D printer (wheels, axle and base of the carts) and vinyl cutter for this project. For the next iteration, we would like to make the cart motorized instead of just manual.

APPL 1-26**Model Car for Office Desks that Holds Small Objects***Makers: Hagen Z., Joshua M., Femi O., Tobi A.*

We were looking for an object that would complement everyday desks. We needed to build something that would implement the design constraints and features asked of us, such as integrating a pen, using some sort of electronics, having 3D printed portions, and including laser cut parts. We thought that a small model car could be built and mix all of these features. We 3D-printed the exterior. We used a pen as axles. We laser cut the wheels. We included headlights powered by a simple circuit system. In our next pair of iterations we hope to expand the build and include more features, such as a USB holder.

APPL 1-27**Carolina Keepsake***Makers: Sarah Torzone, Rebekah Gill, Lindsay O'Dell, Xiangyu Zeng*

The Carolina Keepsake creatively showcases some of UNC's finest attractions, including the Old Well, Bell Tower, and Dean Dome in a compact box display. This keepsake is both decorative and versatile, as it includes drawers for personal use, a customizable photo holder, and even advises consumers on bus routes that can be used to visit the attractions displayed in the box. Leveraging multi-media materials such as laser-cut plywood, 3D printed objects, vinyl stickers, and textiles, the Carolina Keepsake has a unique visual appeal. By completing this project, we learned how to harness individual group members' talents to build a one-of-a-kind product that in a future iteration, may have more refined details and additional Carolina attractions.

APPL 1-28**Automatic Pill Dispenser***Makers: Jingyang Xu, Justin Lee, Ryan Schmelzle, Ariana LaCorte*

We are making this project for those who need a automatic pill dispenser. It was automatically dispense the pills a individual has to take for each day of the week which makes others live a lot easier. We used 3-D printing, laser cutter, and vinyl cutter. We learned many practical skills and also how to make our thoughts into reality. Next iteration will be more automatic, better material and will look more mature.

APPL 2-1**Fluid Mechanical Devices***Makers: Glenn Walters, Simmi Agarwal, Brendan Merritt, Zuntue Pommerich, Alex Lewis*

This is a cyclical hydraulic system. Water flows from a reservoir down a drop into a hydraulic ram pump. The pump harnesses a "water hammer effect" to send water up into an "Archimedes greedy cup". The cup uses a siphon to allow a tank to fill then completely empty. As this tank empties it is funneled to produce a laminar flow. The laminar flow is caught by a tank that also catches excess water from the ram pump. This water is sent back to the initial reservoir using a sump pump, the only use of electrical power in the system.

INLS 1-1

Book Nook

Makers: Alex Martin

This book nook represents myself as a maker, specifically highlighting my interest in quilting and cooking. More generally, the project reflects “making” as a broader category than it has come to be known, extending from the stereotypically high-tech, male-dominated field to include feminine-coded “arts and crafts” such as quilting as well as creation as a means of survival and self-sufficiency. The scene depicts a cabin in the middle of a Maine blizzard, with elements such as quilts, a wood stove, and soup cooking which the inhabitant would have had to create or supply fuel to themselves to make the cabin safe and warm in the storm. This scene is reminiscent of my time living in Maine, where the quilts I made helped fend off the especially cold, snowy, and isolated winter of 2020-2021. The piece is made up of elements designed and made by me (aside from the “box” itself, which was provided by my professor) using the methods of quilting, sewing, 3D printing, laser cutting, painting, sculpting, paper arts, and circuitry.

INLS 1-2

Data Physicalization: Tabernacle

Makers: Maria Palmtag

This data physicalization project was created for the class INLS 690-276 Informational Professionals in the Makerspace. The artifact imitates a Catholic Tabernacle, and the stained glass you see on the door is actually laser-cut acrylic embedded into the cut outs in the wood, designed and cut so precisely that no glue was required to hold it in place. It is also interactive, so feel free to open the “stained glass” door and see what is inside! Then, visit this website to find out more about the data set it embodies and why: tinyurl.com/inls690proj.

INLS 1-3

Data Physicalization: Modified Jacket

Makers: Grayson Yount

This project is a modified jacket featuring embroidery and 3D-printed elements. A Plos One study across a wide sample of 28 EU countries and an objective index of 197 countries found “that the majority (83.0%) of sexual minorities around the world conceal their sexual orientation from all or most people” (Pachankis & Bränström, 2019). This concealment in everyday life is called masking, and its necessity causes a variety of harms on the LGBT+ community including mental, emotional, and social harms. This data physicalization artifact aims to represent these invisible harms, bringing pain queer people feel to the surface. The artifact also invites the user to metaphorically experience these harms by putting it on.

SPAN 1-1

Symbolic Embroidery

Makers: Amy Dragelin

My embroidery is symbolic of the summer I spent volunteering for a scholarship initiative in Nicaragua. The organization I volunteered with pays for kids in Chiquilistagua to attend private schools and provides funding for electricity in homes as well as a safe area with wifi for kids to do homework and hang out with friends. The rainbow in my embroidery is a tribute to the rainbow in the Nicaraguan flag which stands for Nicaragua’s bright future. The words “education is freedom” symbolizes how the organization provides children with the opportunity for a successful career through access to excellent education. I chose yellow for the words because of the yellow on the Nicaraguan flag and as a symbol of hope for the future.

SPAN 1-2**Flying in the Face of Resistance***Makers: Rachel Scrudato*

This hand-painted jacket serves as a tribute to the persistent resistance of oppressed groups in Latin America. The bloody corporate hands reaches down to extract the life-giving resources of the region, creating bloodshed, violence, and instability in order to build its own fortune. Yet flying up, each butterfly represents a different social movement that has arisen in the face of oppression (immigration, Water Wars, feminist, environmental, and labor movements) and a thriving sense of intricate beauty that cannot be captured by the hand. Embroidered with the BEAM machine, the phrase translating to “you can’t buy my life” encompasses the pride and self-value of the Latin American people, who have persistently asserted that despite US corporations exploiting their natural resources and labor, the value of a Latino life is greater than any amount Uncle Sam could offer.

SPAN 1-3**Cultivemos la esperanza***Makers: Amy Lawson*

“Cultivemos la esperanza” is a Spanish phrase that means “Let’s cultivate hope.” Inspired by the song “Ojalá que llueva café” (“I hope it rains coffee”) by Juan Luis Guerra, this purse represents how our choices as consumers can improve the quality of life for farmers around the world, and specifically Latin America. This purse is made from a burlap coffee bag and old jean scraps, which symbolize resilience and hard work. The fabric inside is white and brown: milk and coffee. However, the white is not a pure white, because the cultivation of such products is tainted with corruption. The brown symbolizes dirt, which is both hardships that people endure to grow these crops or the fertile soil where they plant crops and therefore grow their livelihood and dreams. The patch on the back shows a woman picking coffee for the world, and each group of coffee berries represents consumption of coffee per capita in a specific country. Top consumers of coffee include the US (4 kg per capita) and Germany (6 kg per capita). Top producers such as Brazil and Mexico consume 5 kg and 1 kg per capita respectively.

SPAN 1-4**Globalization, Poverty, Feminism, Immigration and Dreams***Makers: Alec Marsh and Gosia Lee*

The projects were inspired by the course concepts within the SPAN 344 class curriculum. They combine a variety of themes present within the course such as poverty and dreams, the environment, and globalization through the painted letters made of various Latin American resources. However, through the phrase “más que un recurso” or “more than a resource,” the work aims to make viewers see value in each letter. Everything has a story, and I encourage anyone interested to ask questions on what those stories might be. The shirt was painted with acrylic paints and sharpie markers were used to add detail. Other projects were used using BeAM embroidery machines (T-shirts, bags etc.) and vinyl transparencies.

INDIV 1-1**Kenan Science Library Makerspace***Makers: Kenan Science Library Makerspace*

The Kenan Science Library Makerspace supports innovation and creativity as part of UNC University Libraries’ Research Hub. The Makerspace@KSL hosts workshops and offers 3D design consultations, and is open for tinkering during library hours. Sew, solder, or use the 3D printing service for your next research project or assignment, or just for fun! At MakerFest, we are displaying a selection of projects in different mediums demonstrating Makerspace resources, including 3D prints, paper crafts, and fiber arts. Stop by our table for more information and interactive activities!

INDIV 1-2

Solid State Adjustable Device-Holder: Lite (SSAD: L)

Makers: Hanqi Xiao

Most tablet device and phone holders fall into two categories. The device is too big to fit into a pocket or small purse, or often in the case of phone holders, the holder requires attachment to the back of the phone, making wireless charging impossible. I wanted to watch movies at the dinning hall with a holder I can fit in my pocket, so I used a CAD software called Onshape to design a device holder which is similar in size and shape to a phone, can hold devices at many different angles, and has no moving parts for durability. The device is 3D printed and I am in the process of refining phone-fit and switching to a nicer wood material. This is my first time working with 3D printers and my first project with Onshape. I learned about the various functions of onshape for dimensioning, why we always check if we converted units correctly, and why brimming is important.

INDIV 1-3

The Drone Club at Carolina

Makers: Joseph Sharp, Khristopher Lane

The Carolina Drone Club encourages students to build and fly unmanned-aerial-systems for leisure, or to aid in the production of art or science. On display are two racing drones built with off-the-shelf electronics, custom-cut carbon fiber frames, and many zip-ties. Used in FPV racing, they are highly maneuverable, going 0-60mph in less than a second.

INDIV 1-4

UNC-Themed Coffee Table

Makers: Cy Pair

This is a UNC themed coffee table, with a restaurant grade epoxy fill over the top and a customizable LED setup.

INDIV 1-5

Chapel Thrill Escapes

Makers: Sameer Rao, Tyler Xia, Noah Hulse, Jacqueline Nguyen, Kelly Yun, Owen Althouse, Reese Letts, Royal Bao, Niah O'Briant, Madison Lester, Brittany Huffman, Savitha Patil, Grace Coleman, Mariana Chavez, Tim Yeung, Arunav Baruah, Ally Mattson, Chase Spencer, Sahra Rajani, Thomas Altmann, Riley Harper, Anshu Shah, Jacob Crawford, Tia Pulikal, Swagat Adhikary, Keller Huffman, Aidan Maguire, Francine Wei, Emily King, Zach Maready, Shreya Gundam, Sameera Poddutoori, Nolan Welch, Neil Thupili, Karina Samuel, Jayden Brown, Will Kleinschmidt, Erin McLurkin, Vinny Rottger, Gayatri Kotcharlakota, Aser Moustafa

We are an educational nonprofit for student creativity and entrepreneurship on campus through the operation of escape rooms built by and for students. Our external purpose is to showcase the creativity of students while providing engaging, imaginative, escape rooms for the students, faculty, staff, and residents of Chapel Hill. Our internal purpose is to provide a “sandbox” for students’ wide range of capacities — pushing the boundaries of their skills to create unique experiences for the community. Using anything from plywood to arduinos, our building team created all of the puzzles and decorations in the room- none of which would have been possible without the tools and supplies from the Makerspaces on campus. The next iteration of the project is currently in the works with a refreshing new theme that connects deeply to UNC traditions and includes around 14 new puzzles all built by, and originating from, the creative and collaborative minds of the team.

INDIV 1-6

North Carolina Botanical Garden

Makers: Jennifer Peterson, David Michaud

Join our partners at the NC Botanical Garden and learn about how to get involved. Check out plants from the Garden and discover how to make sustainable, biodiverse habitats that support our local ecosystem.

INDIV 1-7

AgTech

Makers: Swagat Adhikary, Prajwal Moharana, Arya Bharti, Pranav Kallel

AgTech is built with HTML, CSS, Json, React, Python, Arduino Uno, and Raspberry Pi. AgTech measures 5 important aspects: temperature, humidity, heat index, water level and object detection. We collect data using the Arduino microcontroller and we calculate values. We output this data using Comma-Separated Values (CSV) and transmit it to the Raspberry Pi. All of this data is synched with the realtime Firebase database, which provides data for the visualization on Google Colab. All of this is also available using the Firebase hosted website. We designed this as a tool for farmers to monitor the health of their soil and practice sustainable farming. The next iteration of our project would be more production ready, such as being water-tight and more polished.