EXPO ARCADE 2023

Welcome to Engineering EXPO!

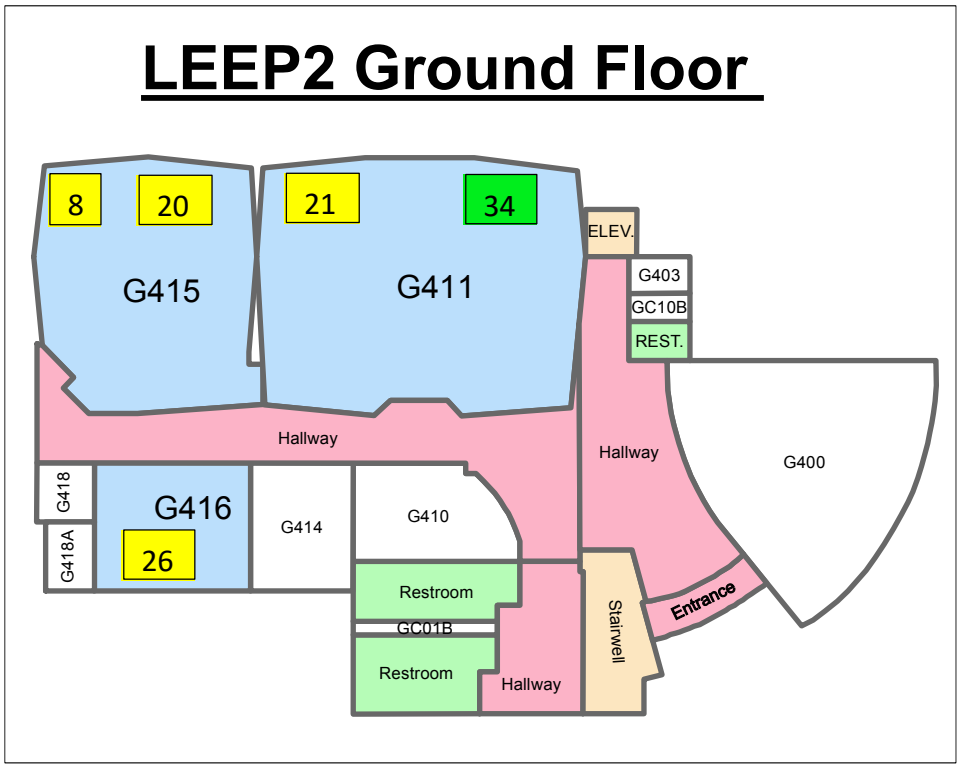
Check-in will take place in the LEEP2 Atrium.

Engineering Student Council members wearing EXPO T-shirts are available to answer questions and help you locate classrooms so please ask them for help!

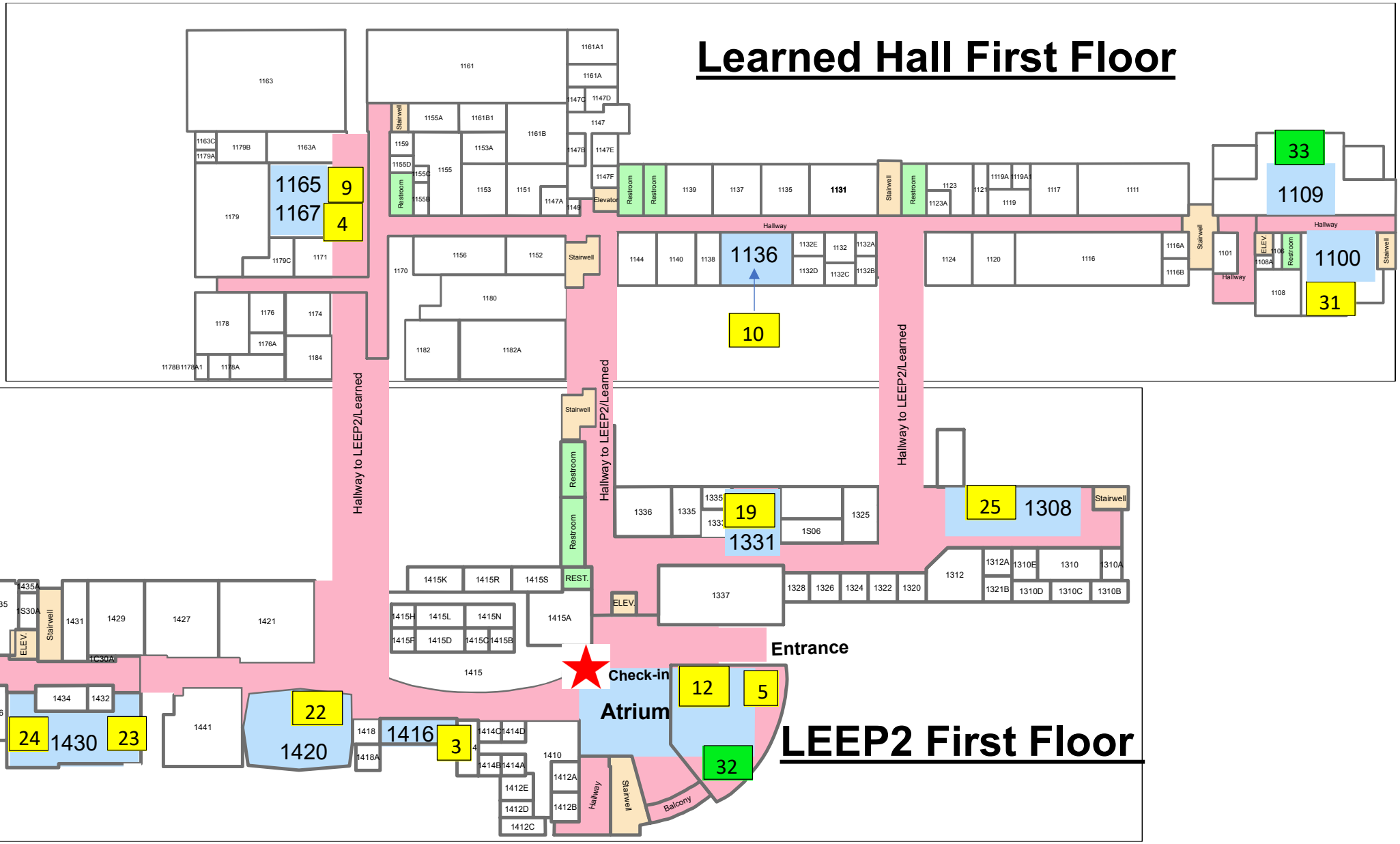
Lunch is going to be held outside (weather permitting) on the LEEP2 lawn or in the Eaton Atrium. Look for signs saying, “Lunch Zone.”

Lunch is also available for purchase at the DeBruce Center (next to Allen Field House and the Parking Garage).

Lost & Found is located in LEEP2 1415A.



	Activity/Demonstration	Room
21	Magic Worm	LEEP2 G411
34	Pom-Pom Launcher Competition	LEEP2 G411
8	Robotic Hand	LEEP2 G415
20	Kerbal Space Program & Satellites	LEEP2 G415
26	Zero Force Members	LEEP2 G416

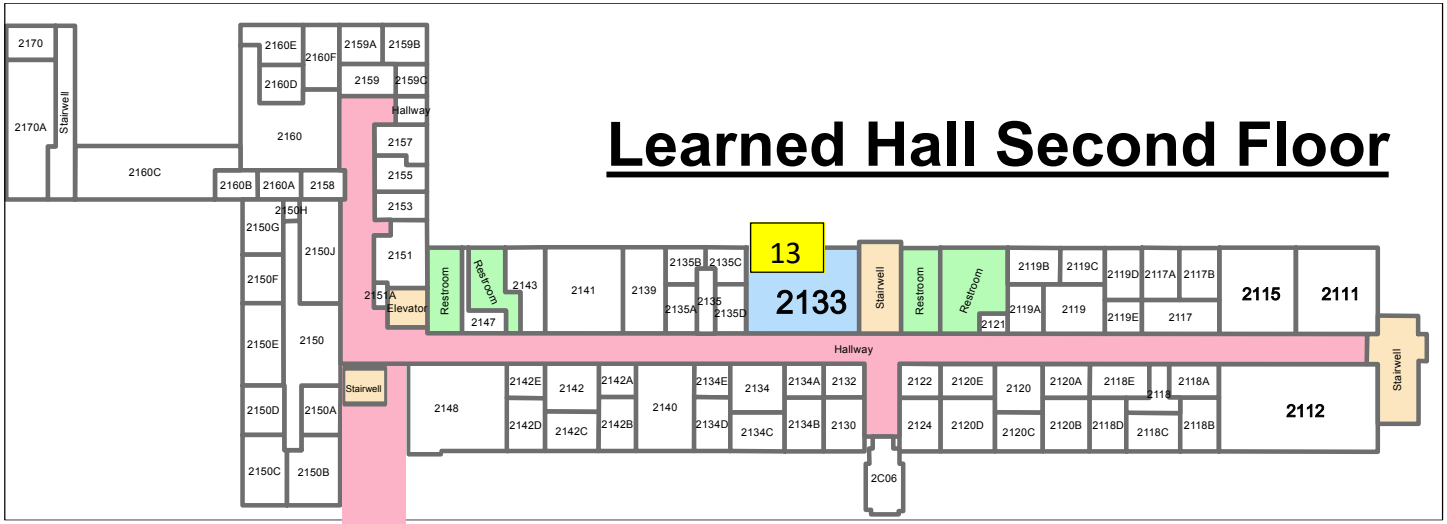


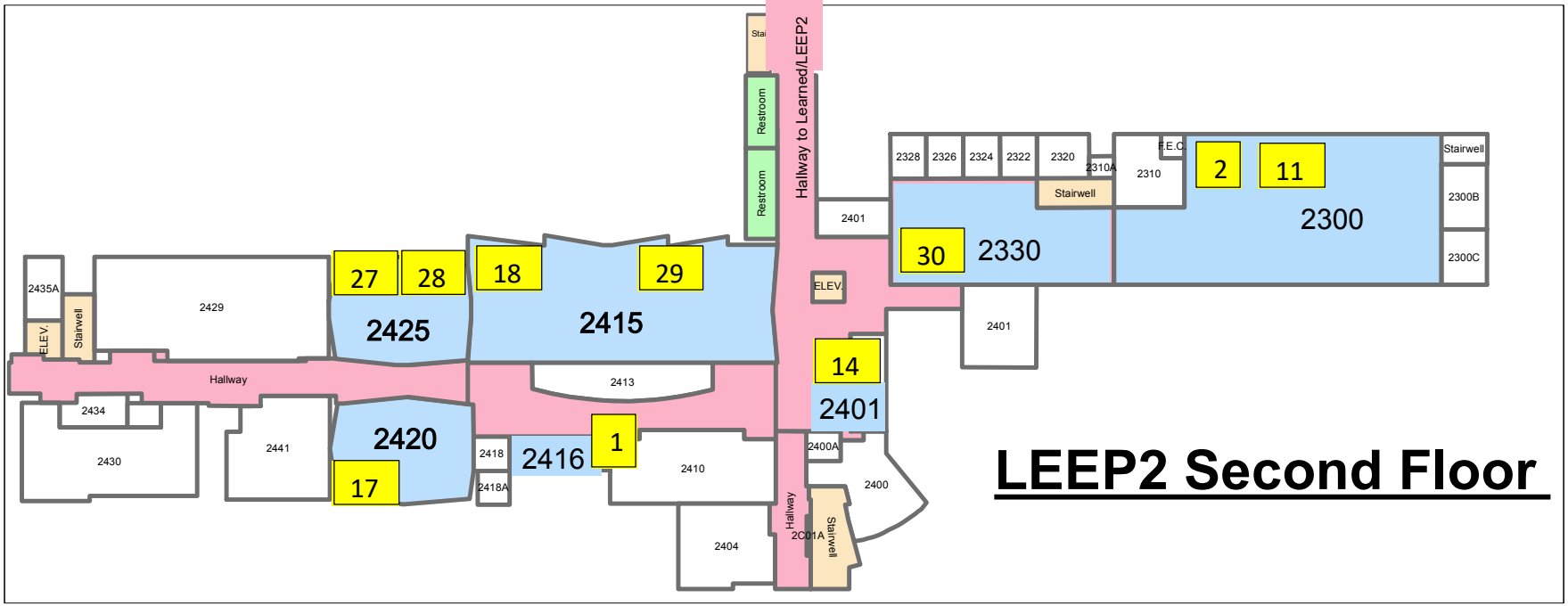
	Activity/Demonstration	Room
5	Where's My Water	LEEP2 Atrium
12	Student Projects	LEEP2 Atrium
32	Catapult Battleship	LEEP2 Atrium
25	Peak Oil Game	LEEP2 1308
19	Car Wars	LEEP2 1331

	Activity/Demonstration	Room
3	Iodine Clock Reaction & Film Canister Rockets	LEEP2 1416
22	Build Your Own Board Game	LEEP2 1420
23	Swinging Ball Annihilator	LEEP2 1430
24	Lava Lamp	LEEP2 1430

	Activity/Demonstration	Room
31	Mechatronics Activity & Display (until 2pm)	Learned 1100
33	JMS Kart	Learned 1109
10	Shake Table Activity	Learned 1136
9	Will it Sink or Float?	Learned 1165
4	Reinforced Soil Sandcastles	Learned 1167

	Activity/Demonstration	Room
13	JAD Invaders	Learned 2133

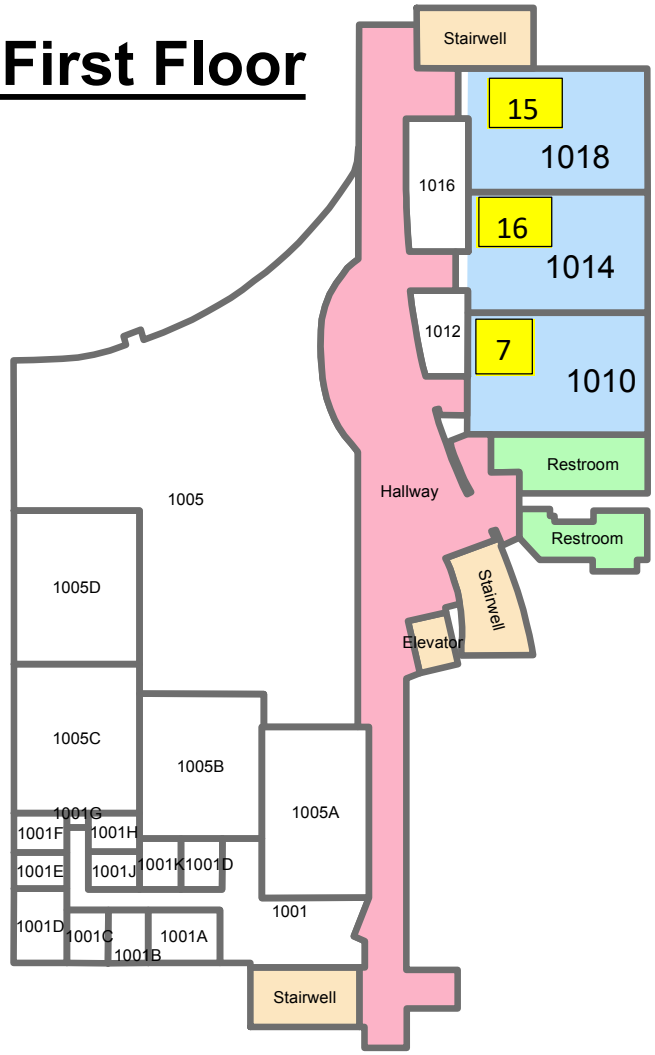




	Activity/Demonstration	Room
2	Designing Skee Balls	LEEP2 2300
11	Minecraft Composter	LEEP2 2300
30	Pac-Man Code Maze	LEEP2 2330
14	Various Rocket Activities	LEEP2 2401
18	Recyclable Carton Planter	LEEP2 2415

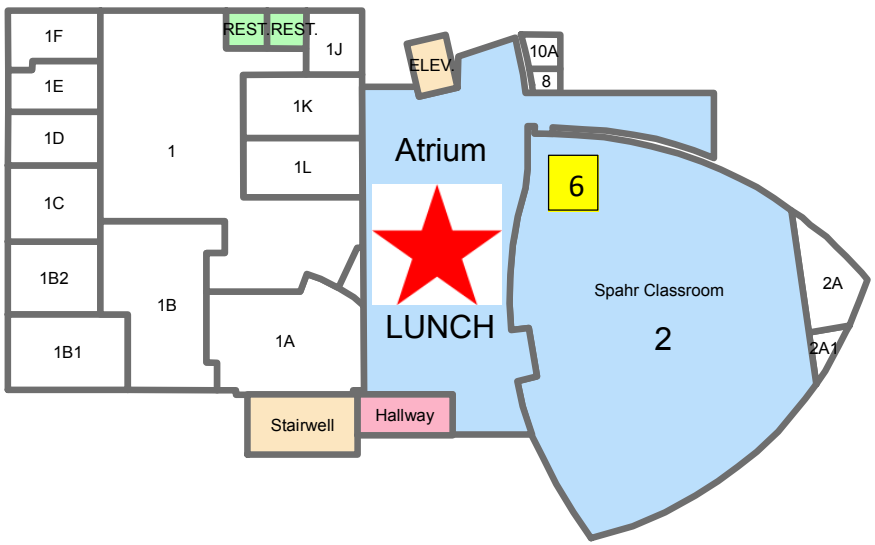
	Activity/Demonstration	Room
29	Virtual Reality Experience	LEEP2 2415
1	Help the Ghosts!	LEEP2 2416
17	Various Robotics Demonstrations	LEEP2 2420
27	Build a Challenge Course for Mario	LEEP2 2425
28	Slippery Slope	LEEP2 2425

Eaton Hall First Floor



	Activity/Demonstration	Room
7	Flappy Jay	Eaton 1010
16	Video Game Ciphers	Eaton 1014
15	Arcade AI	Eaton 1018

Eaton Hall Ground Floor



	Activity/Demonstration	Room
6	Construction Simulation	Eaton 2

Expo 2023 Activities and Demonstrations

1 **Help the Ghosts!** (Alpha Sigma Kappa - Women in Tech)

- For this experiment, students will build a perch for a ghost (big puff ball) using foil, pipe cleaners, tape, cupcake cups, and/or paper so Pac man can't get them.

2 **Designing Skee Balls** (American Institute of Aeronautics and Astronautics)

- Students will design "flying skee balls" for the brand new-and-improved skee ball. Students will help improve on the original ring design by adding tissue paper and other accessories to the original cardboard ring. Students will learn about lift and how this affects the distance something can fly.

3 **Iodine Clock Reaction and Film Canister Rockets** (American Institute of Chemical Engineers)

- Students will watch a demonstration of an iodine clock reaction. Students will then learn about pressure and acid base reactions by making film canister rockets using Alka seltzer tablets and water, attaching them to a piece of cardboard to make a launcher, then firing at Jenga towers angry bird style.

4 **Reinforced Soil Sandcastles** (American Society of Civil Engineers)

- Students will be making sandcastles that can support bricks or even a kid's weight by adding layers of paper towel/window screening.

5 **Where's My Water** (American Society of Heating, Refrigerating, and Air Conditioning Engineers)

- Students will use pipes to transport/connect water to predetermined buckets to learn about water lines in refrigeration.

6 **Construction Simulation** (Associated General Contractors)

- Students will build a specified structure within a given time limit and with a restricted budget. The students will have to plan how to spend their "money" on the available materials. Means and methods are up to the students. The building time will be subjected to unforeseen conditions causing the groups potential delays.

7 **Flappy Jay (**Association of Computing Machinery)

- Students will be led through a step-by-step tutorial on how to create a scratch-based game of Flappy Jay (KU version of Flappy Bird)!

8 **Robotic Hand** (Society of Biomedical Engineering)

- Students will create a robotic hand using straws and string to pick up and move ping pong balls into a cup.

9 **Will it Sink or Float?** (Concrete Canoe)

- Concrete Canoe will demonstrate how concrete can float and the science behind why certain objects sink or float.
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10 **Shake Table Activity** (Earthquake and Engineering Research Institute)

- Student will fabricate a structural model utilizing allowed materials, following specific limitations and rules, and putting it to a stability test by placing it on top of an earthquake-simulating "shake table." The structural models will be placed on a "shake table" and will be subjected to varying, and increasing, levels of "shaking."

11 **Minecraft Composter** (Engineers Without Borders)

- Students will make their own personal composter. The composter will be composed of a water bottle, soil, and newspaper in it. The engineering behind composting will be talked about.

12 **IEEE and HKN Student Led Projects (**Institute of Electrical and Electronics Engineers and Eta Kappa Nu)

- Students will get to interact with our projects, see them demonstrated, and ask any question that crosses their mind. We will have a console disassembled for students to see its inner workings and discuss the internal systems/mechanisms that result in a game showing up on the screen. There would be an opportunity for them to play the game we have on display.

13 **JAD Invaders** (Jayhawk Aero Design)

- A play on "Space Invaders", students will assemble small toy planes and throw them at alien targets that are set up to see how many they can knock down. We will also have our own competition planes and jets on display and members will show aspects of the plane as well as teach the kids aerospace basics!

14 **Various Rocket Activities** (Jayhawk High Power Rocketry)

- We will have a virtual reality headset that kids can put on and play the game "Reentry". In this game, you pilot a rocket into orbit around Earth. We will guide the kids through the process of how to fly the rocket while they are playing the game.
- We will have a trivia game like Jeopardy. Kids will be asked questions about rockets/space/video games and will be awarded with candy.
- We will also have a “build your own rocket" station. Here, we will have kids use paper, straws, and other general construction materials to build their own small rockets. Once they have completed their rockets, we will use an air pump to launch the rockets across the room.

15 **Arcade AI** (KU AI)

- We will have two different neural network AI's playing two different games, one that runs tetris in the background and interactable Pacman AI.

16 **Video Game Ciphers** (KU Information Security Club)

- We will create a static retro themed web page that includes 3-4 cipher challenges for participants to solve. A web page we create will include buttons where participants can learn about the given cipher, submit their answer, and reveal the answer if they are stuck. Cipher challenges include the Minecraft enchanting language, standard shift/rotational cipher, and converting decimal values to alphanumeric characters.

17 **Various Robotics Demonstrations** (KU Robotics)

- Demonstrations of the following student-made projects
  - 64x64 raspberry pi game
  - Shooting gallery project using a leap motion controller
  - Circuit pong
  - Elegoo robot maze
  - A looking glass game
  - Flight simulator.

18 **Recyclable Carton Planter** (KU United States Green Building Council)

- Students will plant seeds in egg cartons and decorate their respective cartons to emulate Stardew Valley gardens. When the seeds begin to sprout roots later the students can remove them from the carton, recycle the carton, and plant the sprouts outside!

19 **Car Wars** (KU Institute of Transportation Engineers)

Participants have to drive a remote-controlled car on three different tracks. Each track will have different roads (arterial road, highway, freeway) so they can understand the different types of roads and their purposes. Each track will also have different obstacles like 4way stop signs, detouring due to road work, intersections, traffic, speed limit, etc. where they will understand more about transportation engineering and safety. All three tracks will coincide at some point.

20 **Kerbal Space Program and Satellites** (KUbeSat)

- There will be a demonstration of a Kerbal space program type video game. We will also do a build your own satellite activity with toilet paper rolls, and/or build your own CubeSat handout activity.

21 **Magic Worm** (Society for Biomaterials)

- Participants will get to make gummy worms, but we are not going to include the eating aspect of this activity. Gummy worms can be made with a sodium alginate mixture and calcium chloride. The engineering behind polymers will also be discussed.

22 **Build Your Own Board Game** (Out in STEM)

- Participants will build their own game board, created using magnetic pegs, that must be able to be navigated by a small ball. Participants will be expected to come up with a purpose for their design (focusing on difficulty and design of the board).

23 **Swinging Ball Annihilator** (Society of Hispanic Professional Engineers)

- Students will build a pendulum to try to knock down a tower of blocks. A discussion about variables affecting a pendulum including string length and size of the pendulum will occur.

24 **Lava Lamp** (Society of Women Engineers)

- Students will make a lava lamp to learn about buoyancy, carbonation, and chemical reactions. Using oil, water, and Alka seltzer, kids will make their own lava lamp!

25 **Peak Oil Game** (Society of Petroleum Engineers)

- This activity will demonstrate what happens to production as the amount of oil in the ground decreases.

26 **Zero Force Members** (KU Steel Bridge)

- We are having students build the tallest spaghetti and marshmallow tower they can. Given a base area constraint of 16 square inches. This activity will help show how certain geometric shapes are structurally stronger than others, and gives students a chance to test their creativity.

27 **Build a Challenge Course for Mario** (Tau Beta Pi)

- Donkey Kong: Stop Mario from reaching the top and keep Princess Peach to yourself! Students will be able to use the paper to create their own Donkey Kong level. The students will use construction paper to build a challenge course for Mario to climb. They will use marbles as the rocks that Donkey Kong throws to see if they can stop Mario from reaching the top of their course.

28 **Slippery Slope** (Theta Tau)

- This is a game mimicking skeeball with a flat section and a ramp. On the ramp there are sections with different point totals with the most points being in the middle of the ramp and the least being on the outer edges of the ramp. The ramp and flat section will have different materials showing the effect of friction (felt, wood, and wallpaper). The ball used will be a tennis ball.

29 **Virtual Reality Experience** (Upsilon Pi Epsilon)

- We have access to VR headsets that attendees can use to play games to experience VR and we will show off a VR project one of UPE's members is working on as a part of their capstone project.

30 **Pac-Man Code Maze** (Women in Computing)

- The students will try to escape the maze through blocks of code (these code statements will be prewritten). There will be 3 mazes, each one has a different level of difficulty. One maze will be large enough that the kids can walk through the maze. As kids walk through the maze, they will be given a magnetic clipboard with prewritten chunks of code that have magnetic tape on the back, that they can move around and piece together. The other two mazes will be much smaller and be placed on tables.

31 **Mechatronics Activity and Display** (ME 228) *only 2/27 until 2pm

- ME 228 (instructed by Dr. Wilson) will have many mechatronics activities and displays her students have put together this semester.

Expo 2023 Competitions

32 **Catapult Battleship** (American Society of Mechanical Engineers)

- Students will launch marbles at boats in a small body of water. Design a catapult that will shoot a standard size marble three to five feet. Make sure to practice precision. The more boats you sink, the more points you will earn. Whichever team gets the most points, wins!

33 **JMS Kart** (Jayhawk Motorsports)

- Participants will build balloon cars and race in a straight-line course against each other.

34 **Pom-Pom Launcher Competition** (National Society of Black Engineers and Society of Asian Scientists and Engineers)

- For this competition, you will be creating a pom pom launcher to launch a lightweight pom pom a fixed distance.