



# Outreach Playbook

## Fall Spectacular: Spaceship Escape Room

Metrics:

Grade Level: 9-12 (high school)	# of Student Participants: 8-16 students	Duration (hrs): Set up time: 1 hr Escape room time: 1 hr	# of SWE Volunteers: Planning: ~30 people Day of Event: ~3 people	Partner orgs (if any): 2
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### Overview of Activity

Based on the popularity of Escape Room games located in cities around the country, this event is space themed and tailored to high school students. With the premise that a nefarious ex-scientist has interfered and sent a group of high school students to the real International Space Station, students must find a way to escape their situation and make it back to earth in time for final exams! To do this, students must solve various riddles & puzzles both through examining video, audio, and physical clues in their room and environment. A basic knowledge of space history, electric circuit equations, & Fibonacci number sequences is required, and along the way, they'll use fun tools such as hidden messages, invisible ink messages, number locks, hidden clues, PowerApps, etc. The room showcased various women in STEM and their contributions which included a Lexington, Kentucky native who broke barriers in STEM. A thorough Work Instruction document is provided to administrators of the game, based on documents Toyota uses in Manufacturing every day.

Students must utilize teamwork and each one's individual strengths to solve the puzzles together, as there is a ticking time clock element to the game. Students must also use critical thinking to 'escape' and make it back to Earth; these are skills that are essential to all STEM careers. They may run into setbacks and frustrations when the puzzles don't seem to make sense – this happens every day in the manufacturing environment and engineers have to be resilient and persevere when obstacles arise.

Engineering can be challenging – but it is also very rewarding. It gives you the ability to solve complex problems and create new things that can improve peoples' lives. This escape room activity was a great success and allowed students a fun way to use their classroom knowledge in an exciting sci-fi environment. Can you RESIST the urge to panic and focus on the POWER you have to change your CURRENT situation??



## Outline and Script

- The flow chart below shows how the participants will work through the escape room:
  - Each purple arrow is a main even within the escape room. They are in sequential order starting with “Opening Video” and ending at “Complete.”
  - Each event has the required materials and actions.
  - Please refer to Appendix A for answer key to puzzles, escape room narrative, and more details on escape room set up.



## Lessons Learned

- Create mission based on active brainstorming. Start big!
- 3 strategies:
  - Leverage unique strengths.
  - Break down problem / event into smaller pieces.
  - Learn to delegate.
    - Get help when needed.
- Engage event participants to take ownership in the planning process.
- Develop a team that thrives during change (Change/Covid happens).
  - Learned new technologies, skills, to enhance the activity for the students and organizers.

## Accessibility Adaptations

For accessibility adaptations, there are several ideas for accommodating unique situations. For students that are completely virtual, all of the puzzles can be transformed to virtual, online puzzles by utilizing Power Apps, PowerPoint, video camera, and/or pictures. We also incorporated Toyota’s Business Partnering Group called Toyotability which is a group that encourages an all-inclusive work environment for all employees and/or family members with disabilities. With Toyotability’s support, we used one of their outreach promotions (a small child’s toy car) as one of the puzzles and activities the students had to complete in the escape room. We recommend hosting the escape room in a space that complies to ADA regulations. Regarding ESL students, we advise working with others who are fluent in Spanish, French, Japanese, etc. to translate all of the puzzles, words, and audio to accommodate ESL students. If there is a lack of internet access, we would recommend converting all of the Power Apps puzzles to physical ones that will be present in the room (printouts, pictures, 3D objects, etc.). If there is a smaller budget to adhere to, we recommend reaching out to friends, family, and the community for donations for room props as well as making your own puzzles and set up within reason (crafts, DIY, computer print outs, etc.).



## Materials and Costs

Please refer to Appendix A for additional information.

Item	Puzzle	Quantity	Where to Buy (link if applicable)	Total Cost
A. Laptop / phone	General	1	Donated	Donated
B. Banners	Decor/General	4 - used for decoration and to hide puzzle clues	Custom made by Toyota	\$250
C. Stands	Decor/General	6	<a href="#">Banner Stands</a>	\$690
Power App File	General	1	Included in computer applications. Alternative is to use PowerPoint or a free online presentation site.	Included in computer applications. Alternative is to use PowerPoint or a free online presentation site.
E. Notebook with clues	1, 4, 6	1	Any notebook can be used from Dollar Store, Walmart, etc.	\$2.00
D. White Boards	General	2	<a href="#">White Boards</a>	\$10.50
F. Soldering radio kit	1	1	<a href="#">Soldering Radio Kit</a>	\$17.99
G. Resistors (Including 10 ohm)	1	3	<a href="#">Resistors</a>	\$5.99
Wiring schematic for radio & chart of resistor color bands	1	1	Can be printed.	Free
Supply cabinet or lockable drawer	2	1	Can use something in environment that can be locked using (like a combination lock).	N/A
H. Food & water props	2	1	<a href="#">Food &amp; water props</a>	\$12.96
I. Numeric/combo lock	2	1	<a href="#">Numeric Lock</a>	\$5.49
Fibonacci wall art	2	1	Included on banner or can be printed	Free
K. Toolbox	6	1	<a href="#">Toolbox</a>	\$10.99
J. Lock & key	3	1	<a href="#">Lock &amp; key</a>	\$3.89
Hide-a-key desk decoration	3	1	<a href="#">Hide-a-key</a> or substitute with a box or similar household item	\$5.38 or Free
Chemical equation & clues	4	1	Can be printed.	Free
Periodic table	4	1	Can be printed from internet or included donated in textbook.	Free



N. Cardboard 'decoder keys' (make by hand)	4	4	N/A	Free
P. Water bottle	4	1	<a href="#">Nasa Water Bottle</a>	\$12.95
Q. Borax	4	1	<a href="#">Borax (1lb)</a>	\$8.99
R. Rubber cement	4	1	<a href="#">Rubber cement</a>	\$6.77
Women in STEM portraits (printed from computer)	5	4	N/A	Free
Invisible ink pens	5	1	<a href="#">Invisible Ink Pens</a>	\$6.98
S. Invisible ink flashlight	5	2	Option 1 (batteries included; Purple): <a href="#">Invisible Ink Flashlights</a> Option 2 (batteries not included; Black): <a href="#">Invisible Ink Flashlights</a>	Option 1: \$9.99 for 2 Option 2: \$10.79 for 2
V. Toy Car	6	We understand that this toy vehicle was donated in collaboration with other Toyota Business Partnering Groups. We recommend that this item be replaced with a prop to simulate opening a door to a room/pod (example: entering a passcode, finding a key for a lock, etc.).	Donated	Donated
W. Wheel	6	1	N/A	Included with Toyotability vehicle.
Tools for wheel install	6	1 Kit	<ul style="list-style-type: none"> <li>• <a href="#">Wrench</a></li> <li>• Brushings (Home Depot)</li> <li>• Washers (Home Depot)</li> </ul>	<ul style="list-style-type: none"> <li>• \$6.98</li> <li>• \$10.00</li> <li>• \$5.00</li> </ul>
Work instructions for vehicle	6	1	Can be printed.	Free
T. Textbooks	7	8	Used science textbooks	Donations
U. Jigsaw puzzle	7	1 with 8 pieces	Tilt Lab	Donation from Tilt Lab
Astronaut Suits [Optional]	General	4	Tilt Lab	\$155.76 for 4