

ID	Category	Description	Status	Notes	Source	Testing Procedure	If Passes Testing	If Fails Testing
1	Weight	The fully assembled toy shall weight no more than 2 lbs.	Preliminary	This way children can hold in in their lap without issue.	Client meeting #1	Weigh all components of the toy separately on an imperial scale. This will include each individual cube assembly, all fasteners, the interlocking component, each 3D printed maze, all ball bearings, and any other feature that may be included. This will give us a better understanding of which part of the toy will be the area to reduce weight in if the toy does not meet the 2 lbs requirement. Weigh the completed assembly of the entire toy, all parts included, on an imperial scale.	No adjustments need to be made to the completed assembly in regards to weight.	Need to evaluate where the most of the weight is coming from within the assembly. Then we need to remove material or design a smaller assembly that will reduce overall weight. This could include adjusting cube sizes, changing the amount of aluminum used for the interlocking component, and changing the thickness of cube walls.
2.1	Size	The toy will be no larger than 10x7x7 inches.	Preliminary	iPad size with room for 3D expansion	Client meeting #1	We will measure our toy using an imperial measuring tape. The length, width, and height need to be measured to find the volume and size.	Then no changes need to be made to the size of the toy.	We would need to reevaluate either our specification or the size of the toy. We could take a poll of children and see if they think the toy is too large. If so, then we would need to redesign our product.
2.2		The toy shall have no more than 2 separately sealed assemblies.	Firm	This gives us some options without limiting to one sealed assembly.	Team brainstorming session	When the toy is fully assembled, no parts will be able to be torn off and turned into a random assembly that we did not design for. We will test this through rough manhandling of the product, including impact testing (throwing the toy on the ground at a high velocity), and strain testing (through pulling opposite ends of the product apart at high loads).	The toy is tough and cannot be taken apart and made into something we did not design for.	We will need to re-evaluate the strength of our materials. The weak points could be at milled components of polycarbonate, at the interlocking interface between the cubes and the aluminum, and at corners where an impact could be the most detrimental. If changing the materials cannot be done, then we will add bumpers to reduce the impact of the toy components and will add reinforcements to any connection points that might break.
3.1	Safety	The toy will have rounded and filed edges of 1/4 inch.	Preliminary	No sharp corners or edges. The purpose of this specification is to make sure nothing will harm the user. So we really only need to file down edges, as told by the hospital risk management staff.	Team brainstorming session	We will file down all edges of the exterior of our toy, including but not limited to, polycarbonate edges and corners, and aluminum edges. These will be compared to a known object with 1/4" radius edges to determine the validity of the rounded edges of our final product.	No adjustments need to be made, and we can continue with testing procedures.	Keep filing edges until the specification is met, or add bumpers onto the sides and corners of the exposed edges to reduce the sharpness.
3.2		The toy will not have flashing lights.	Firm	For children with epilepsy and who are prone to seizures, this is very important.	Hospital standards	We will not include flashing lights at all in our toy so this will not be an issue.	This has to pass since we are not including these in the toy.	This test will not fail based on essence of our design.
3.3		The toy shall conform to Children's Hospital Risk Management standards.	Firm	If we don't meet these standards, the project is a failure.	Hospital standards	We will make a check list of all hospital standards our product must conform to. Most of these standards have already been listed. The final assembly will go through a thorough quality control check by our team to ensure all safety measures have been met.	Our product meets all safety measures and is ready to be introduced to a hospital environment.	We clearly need to review what aspect of the product does not meet the safety standards and change this so that it can be used in a hospital. This could mean changing designs, materials, and any and all else to meet these specifications.
3.4		The toy will not have any exposed components that can fit through a tube of 1.75 inch diameter.	Firm	Need to avoid choking hazards.	Hospital standards	We will use a toilet paper role (which has the diameter of 1.75 inches) and compare all exposed components of the assembly, that can be actively used and accessed by children. This does not include any internal parts which will be entirely enclosed.	The toy meets this standard and no choking hazards are being given to children.	The components that are too small HAVE to be changed to meet specification. This could mean changing designs and finding new materials.
4.1	Durability	The device shall still function after being dropped from 4 feet over 25 times. The device shall be tested until it fails so we know at what point it will fail if a child abuses it.	Preliminary	If toy falls off bed or kid drops it, it needs to function still. No child shall be injured by our toy if it breaks.	Client meeting #1	We will drop each prototype and final product from a height of 4 feet. We will record the damage incurred after each drop until we reach 25 iterations. This includes external and internal damage. After this, we will proceed to test the toy under worse situations, include slamming it in doors, stomping on it, and banging it on the ground. We want to be sure the toy cannot break when a child uses it, and potentially abuses it. We do not want to give any child the opportunity to harm themselves due to our product breaking.	We do not need to change anything since the toy survived the impact testing. This means it is child proof and can be thrown around a ton.	We will need to check our attachments on every aspect of the toy. The impact failure is likely to fail at corners or at the interface between the interlocking component and the cubes. If we cannot strengthen these parts, then we can add bumpers to the corners and edges where the toy might break. After adding these changes, the drop tests need to be done again. If the failure happened to the internal maze, then we need to consider better ways to attach the maze and how we can make it more impact resistant.
4.2		Opacity must be no more that 30% on all clear parts.	Preliminary	If you can't see inside the toy then it is a failure.	Team brainstorming session	Visual test that will include comparing the clarity of the toy's windows and walls after sanitation to that of an object with 30% opacity. This visual inspection will be performed after multiple sanitations (over 50).	Then no changes need to be made.	We would need to consider the material properties of our product and find out why the chemicals are causing clouding over the clear aspects of the toy. We could consider a super thin vacuum sealed cover over the whole toy that would be disposable and not need the sanitation.
5	User Friendly	The toy must go through iterations and testing with children to ensure they enjoy playing and learning from our product.	Firm	The goal of the toy is to be interesting, engaging, and educational for children. If kids do not like our product, then our efforts are all for naught.	Client meeting #1	We will take our toy to Horizons K-8 and have children ages 4-8 play with the toy and give feedback. We will give them a survey to fill out answering the following questions: 1. Is the toy too heavy? 2. Is the toy easy to play with? 3. Do the concepts in each maze make sense? 4. What can we add or improve on each maze? 5. What do you like about this toy? 6. What do you dislike about this toy? The feedback from the children will help us have hard concepts to adjust and iterate so our final product will be as kid friendly as possible.	Passing will mean that the children overall enjoy the toy and do not have any concrete changes for us to make (i.e. weight, color, maze design, etc.). This will mean we can finish iterating and focus on manufacturing a final product.	Failing testing will mean more that there are clear design features the children gave us feedback on to change. This means we will have to iterate multiple times to make a product the children love to use. This will also mean repeat visits with children to gather feedback after each stage of iteration.