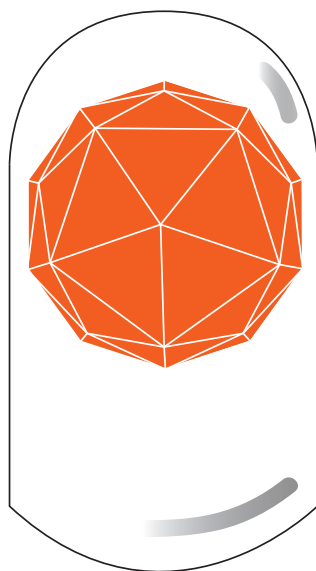




MIND̄

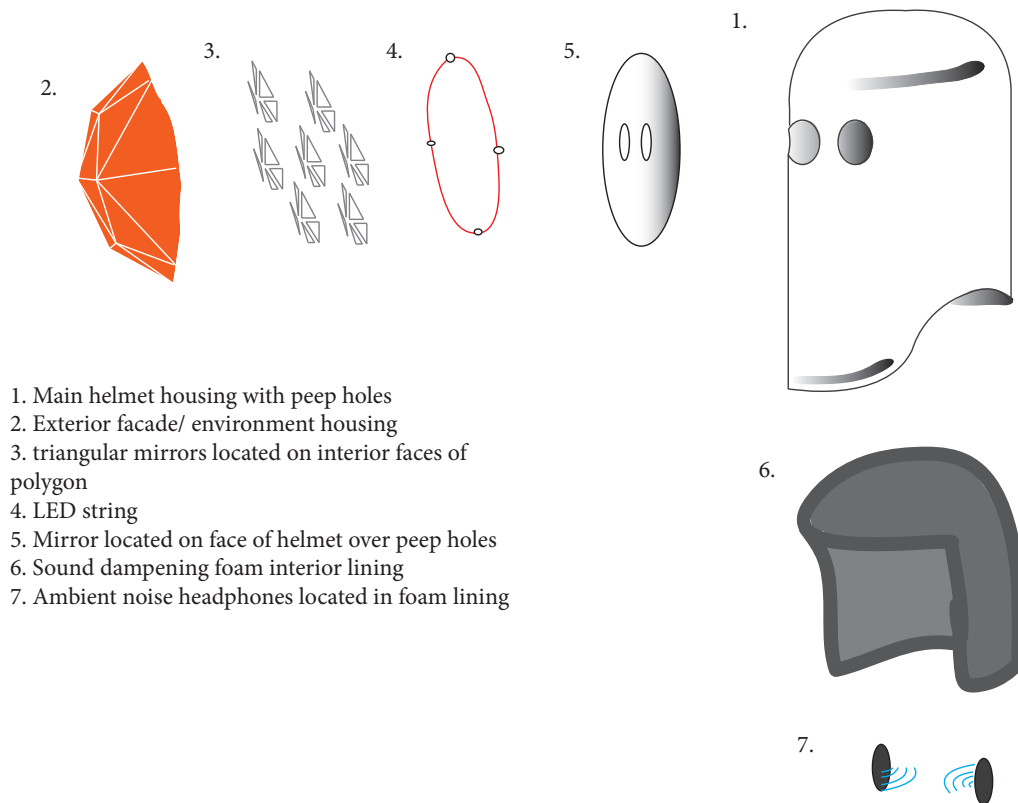
ENVIRONMENTS

The First Iteration:



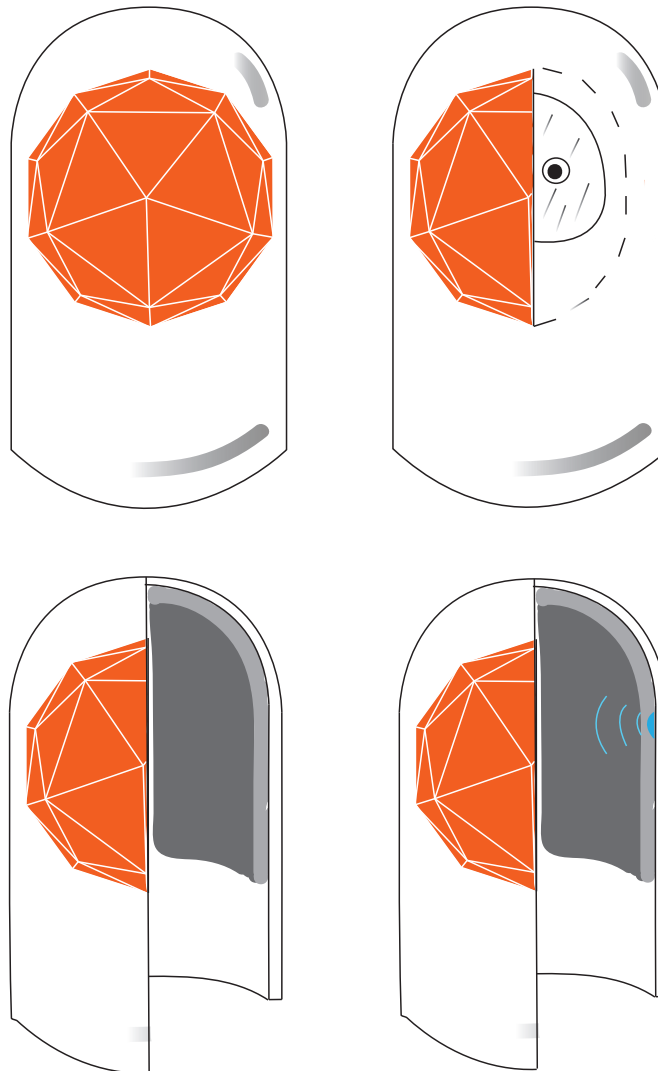
Mind Environments are spaces created for thought. The aim of Mind Environments is to pull users out of unstimulating workspaces to take thoughtful breaks so that they may return to their work feeling refreshed, with new perspectives and insights. Mind Environment helmets are built to fit within confined, sometimes unstimulating workspaces, allowing the user to leave their current sensory environment without actually having to leave the space that they are working in.

This iteration, the first from Mind Environments, has been designed for fit and use within the PDI Studio at Rensselaer Polytechnic Institute.



The main object as a whole is a helmet. The façade is a polygon shell that houses the interior environment. For this environment, on the inside of each face of the polygon there is a corresponding mirror. Two peep holes are located on the inside of the main helmet for the user to look into the environment of mirrors. On the face of the peep holes is another mirror facing opposite the triangular mirrors. This will create infinitely many of the user's own eyeballs appear before them. Along the right side of the helmet is a light switch that controls a string of LEDs lining the edge of the inner environment. The helmet is lined with noise cancelling foam. Within the foam are headphone speakers that play ambient music to fit with the visual of the environment. The music can be controlled using the

level knob located under the switch on the right of the helmet. All of these components work together to create a new sensory environment that allows the user to focus and enjoy their time within it.



Problem:

Often times, when confined to a singular workspace for long durations of time, the environment becomes stale and dull, and because of this, the mind does as well. For product designers, this is especially true. The usual result of this issue involves designers waiting around, expecting an idea to come to them. When workers within the PDI studio are stressed about an idea, there is no space for them to go to for relaxation. Instead they become frustrated and sit in the confined space for the allotted time until they may leave. This is not only true for the PDI studio but for any workspace where its user may feel confined.

Solution:

Mind Environments create a new space for the user to escape to when their work environment becomes dull and unstimulating. When confined in the PDI Studio for an allotted time, it becomes frustrating to be stuck on a design problem. When this happens, it is necessary to take a break. With a Mind Environment, the user does not have to leave their current workspace to immerse themselves in a new sensory environment, they only have to move within the room they are confined to. The user may enter the Mind Environment, isolating themselves from the sensory environment that they associate with being stale, effectively removing its associated distractions. As they break from their work within the Mind Environment, they gain time alone to think about whatever they choose. Having a separate sensory environment within the work environment allows the users to take more effective breaks more often, enabling the users to do more effective work more of the time.

User and Expectations:

This product is intended to be used as a creative tool and to be of benefit to anyone challenged with a creative thinking problem. Its purpose is to help promote divergent thinking in its user by providing a meditative environment within a helmet. These users include product designers, artists, computer scientists, or anyone faced with a creative problem in their respective subject. Although this product may be used by a wide variety of potential users, design specifications will limit the range of its potential users. Production and manufacturing decisions will make the product more available to more affluent users while psychological specifications will create more effective experiences for some users over others.

This product will be used by any person faced with a creative problem including product designers, artists, and engineers. It will be widely used by groups like product designers that are confined to a specific and sometimes unstimulating workspace. These users will seek to become removed from their current environment and be aided into a meditative state where they can relax and let their minds wander. Product designers may use it to take a pause and think about their product. This time will allow for them to reflect on how impactful their decisions will be, and to analyze other possibilities and iterate on their progress as of yet. The helmet will be used as a tool to help generate ideas by promoting an environment inviting divergent thought. These users will want the helmet to

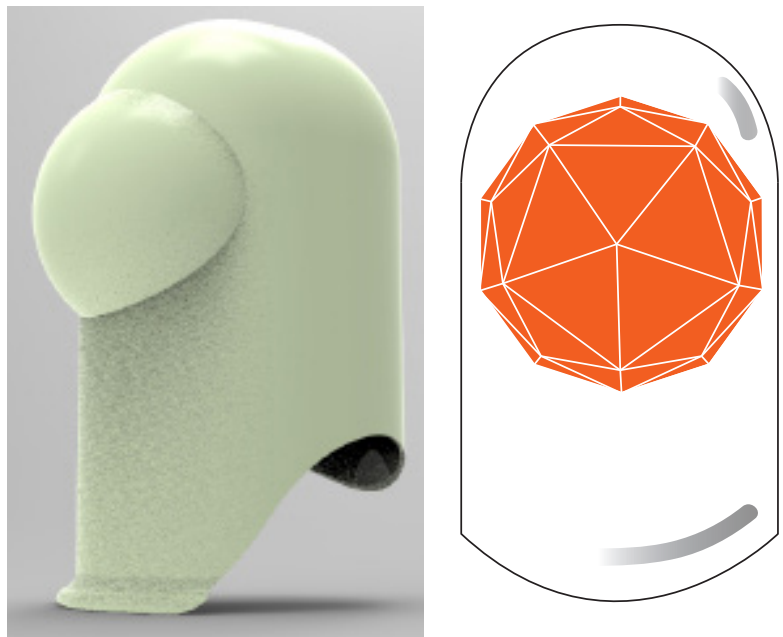
deliver quick and effective help so that they may get back to work. The use of time is important when doing project work.

The helmets are intended to run as one-off productions, built to fit specific environments. The final products will have art piece appeal. The helmets will appeal more largely to product designers and workers in fields associated with industrial design. These users will have a greater appreciation for high design and art. They want the visual aesthetic and meanings to transcend normal product boundaries and develop or encapsulate a higher meaning and artistic association. With these users, the helmet should not only look pretty and develop emotional appeal, but it should serve a purpose. This demographic of users will have varying ideas on what purpose the helmet serves.

Product designers and users working in a studio or confined workspace will want the helmet to serve them and the space as they work. They want the helmet to benefit their work space and help them create better work and execute ideas in a timely manner. Users with an appreciation for design want the product to act as a design piece that they look at and find inspiration in. The piece must be additive in any sense, both in function and aesthetic.

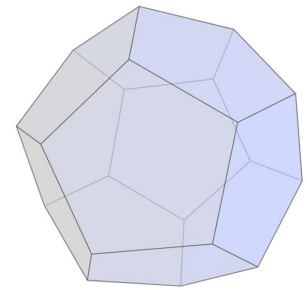
User Experience:

Each helmet is built uniquely in correspondence with its intended space. This helmet is designed to fit within the space of the PDI studio. The outer aesthetic of the helmet uses contour bias to attract the user's attention. Its complex geometric façade and orange color attract attention. They both sit in contrast to their surroundings in the PDI studio. The main shape of the shell housing the interior environment is based on



left: CAD rendering of standard helmet with bubble place holder shell
right: front view of helmet designed to fit in the PDI studio

the dodecahedron. The dodecahedron has been studied by Kepler and other astrologists as a representation of space and thought about the universe. The dodecahedron is a polyhedron with twelve flat, pentagonal faces. In order to add depth to both the exterior visual experience as well as the interior experience, each pentagonal face is made of five triangles, slightly angled at one central point. The polygon face is made as a singular component using fiberglass molding. This gives the façade rounded edges, softening its appearance; representative of a more inviting interior environment, as opposed to sharp ones that would occur if the polygon was assembled piece by piece. The initial visual interaction with the helmet, spiking curiosity, is the first step toward pulling the user out of their current environment.



Dodecahedron



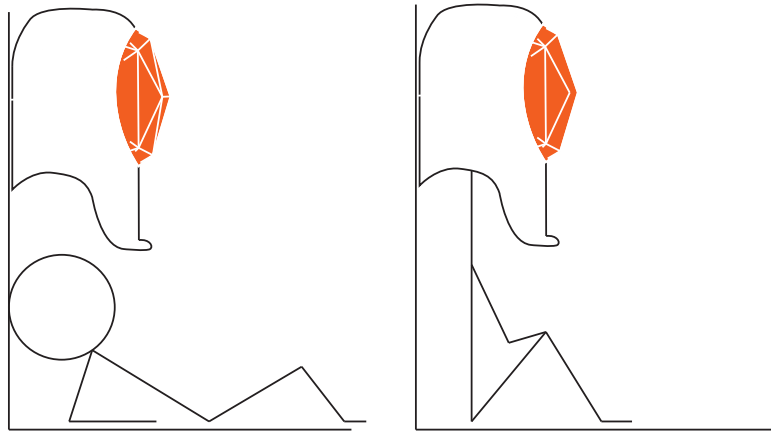
modified dodecahedron
with five raised triangles per
pentagonal face

The geometric façade stands out over the body of the full helmet and attracts attention. The orange color and complex faces of the polygon boast over the helmet's soft contour and lack of color. The helmet serves as a strong base and canvas for the polygon. The curves of the helmet are there to make the product look more like a helmet, communicating affordance to the user: "That looks like a helmet. It looks like I would be able to put my head inside of that."

The helmet sits, mounted to a desired wall, suspended in the air, in a fixed position. This creates a specific space for this environment and spatial memory associated with it. Giving the helmet a designated position forces the user to

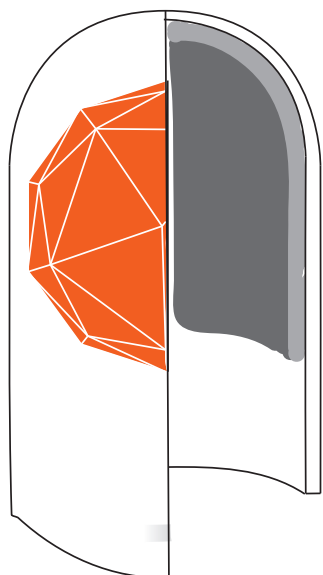


consciously enter the space within the helmet. The user must go out of their way and approach the helmet if they wish to experience what it holds within. This allows the user no excuse as to their intent for entering the environment. With the helmet in a fixed position, the user must fully commit to entering, as opposed to the helmet being mobile, where the user may simply place it on their head without much careful thought or interest about what may be inside.

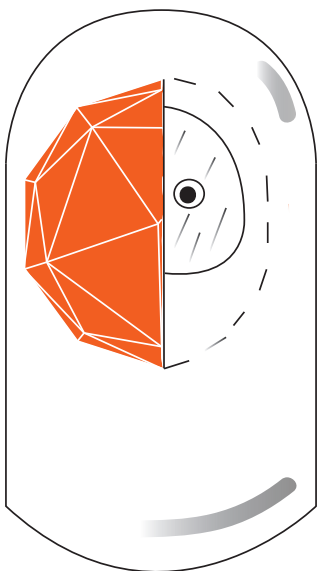


It is up to the user to decide where the helmet will be placed within a given space. The user puts forth an effort to enter the environment. Based on the position of the helmet within the room, the user will have to crouch and bend to enter from beneath, and position themselves accordingly to find a comfortable pose for thought. Using an adjustable chair may be the best option to accommodate use by multiple users with different heights.

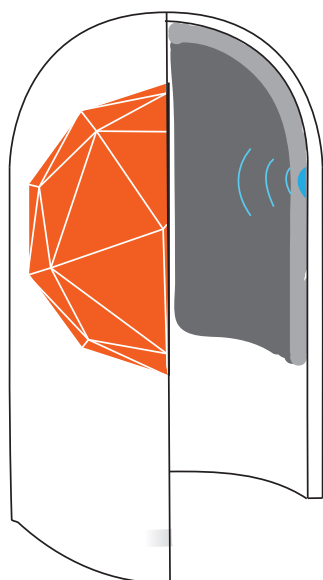
First time experience with the product is necessary to acquaint the user and the environment, whether familiar with the helmet's purpose or not. The user will be lead in with their initial visual attraction and wish to enter. They will experience the interior environment for the first time specifically out of curiosity. The helmet in the corner of the room is a new addition to the space. They want to know what it is. While experiencing the helmet's environment for the first time, the user most likely will not have intent for entering other than curiosity. Their work environment may not be the driving force for them to want to enter. Later experiences within the environment will be driven by the intent to escape from a dull workspace.



Entering the helmet at first is in darkness. The plush foam interior hugs the head, giving stability and comfort. The interior of the helmet is noticeably quieter. From this vantage, the user eliminates distractions and may now focus on the experience within the new environment. Along the smooth surface of the helmet, the user will find a light switch. With this, they may turn on the LED lights located within the interior environment and illuminate the mirrors.



The initial appearance of the mirrors throws the user off guard. They find wonder in observing the mirrors and how they visually play with one another at different angles. At this point, a new idea has entered their mind, even if it is something as simple as thought about the mirrors and the helmet itself, it has effectively dragged their thought out of their previous environment and put it into the new one.



If or when the mirrors become too much to look at, the user has the option to turn off the LEDs and sit in darkness. They may also turn on the ambient music paired with the visual experience of the helmet and enjoy their time inside.

Studies on ambient music and sound have shown that ambient music and in particular white and pink noise, are helpful in occupying the worrisome parts of the brain. The use of constant noise allows the subconscious brain to occupy its attention by counting the beat and correctly anticipating what will occur next in the sound, as opposed to outside noises that occur in spurts and distract the mind easily. This brings the minds attention and focus to thought without distraction, allowing the user to enjoy their experience without interruption and feel more immersed in the Mind Environment.

Competing Products:

Only one product was found to be of similarity. A sensory deprivation helmet was produced by an artist named Joep van Lieshout. The helmet was produced in 1997 and made of fiberglass. The helmet is a bit large. No information could be found about the reasons for its production.



The only other similar product seems to be a sleep aiding mask called a “Dream Helmet.” The mask is similar in that it covers the head and dampens sound. The masks are basically pillows that wrap around the head, with a sleeping mask to covers the eyes attached to it. This product is aimed at a wide consumer market, claiming to be the sleep aid of all sleep aids. Its purpose is aimed towards sleep.

Although similar products may not exist, similar paradigms for solving the problem include the use of ambient to control environment and the use of sensory deprivation for meditation.

Ambient music can be used as a tool for drowning out exterior distractions. Ambient sound moves in long, drawn out tones, changing only slightly over periods of time. This type of sound occupies parts of the brain that control reaction. With long, unchanging tones and phrases, the brain anticipates what is coming next, and rests easy. Music and sounds with constantly changing tones and beats require more attention. New sounds and rhythms cause the brain to react, and snag attention easily, pulling conscious thought toward the sounds instead of concentrating on desired thoughts.

Mind Environments use this notion to control the sensory environment of the user. The subconscious, worrisome part of the mind occupies itself with the constant tones of the ambient music. It creates a sonic environment with no change, where the exterior soundscape of the world has no set beat, tone, or rhythm. Sounds in the outside world happen at random, and when they do, they

call the attention of the brain to decipher what made the sound and where it came from. Closing out these distractions is beneficial to the concentration of the user to take their mind where they want it to be.

Sensory deprivation used as a tool for meditation allows the user to cut out all distraction, making it easier to enter a relaxed and meditative state. Meditation helps relaxation and promotes a healthier mind. Sensory deprivation is considered by some to be therapeutic, allowing the user to cut off all outside distractions of the world to focus on thought and the mind. Mind Environments use the idea of sound deprivation to control the environment and reduce distraction.

The placement of the helmet is similar to the paradigm of being in an interactive art exhibit. When viewers attend art exhibits, they look at pieces and attempt to make connections with them. With abstract art, the viewer is given room to interpret for themselves what the piece means to them. This notion is used in the Mind Environment to push the users to take a more interpretive view of the helmet and to make it their own piece with specific meaning to themselves. Art exhibits make the pieces within them more desirable because they are there being shown off. The Mind Environment is being shown off in the same sense when it is given its own permanent space. It gains respect from the viewer because of its respected space. If it has its own spot then someone must think it deserves its own spot, and this makes the user more open to it and respectful of it.

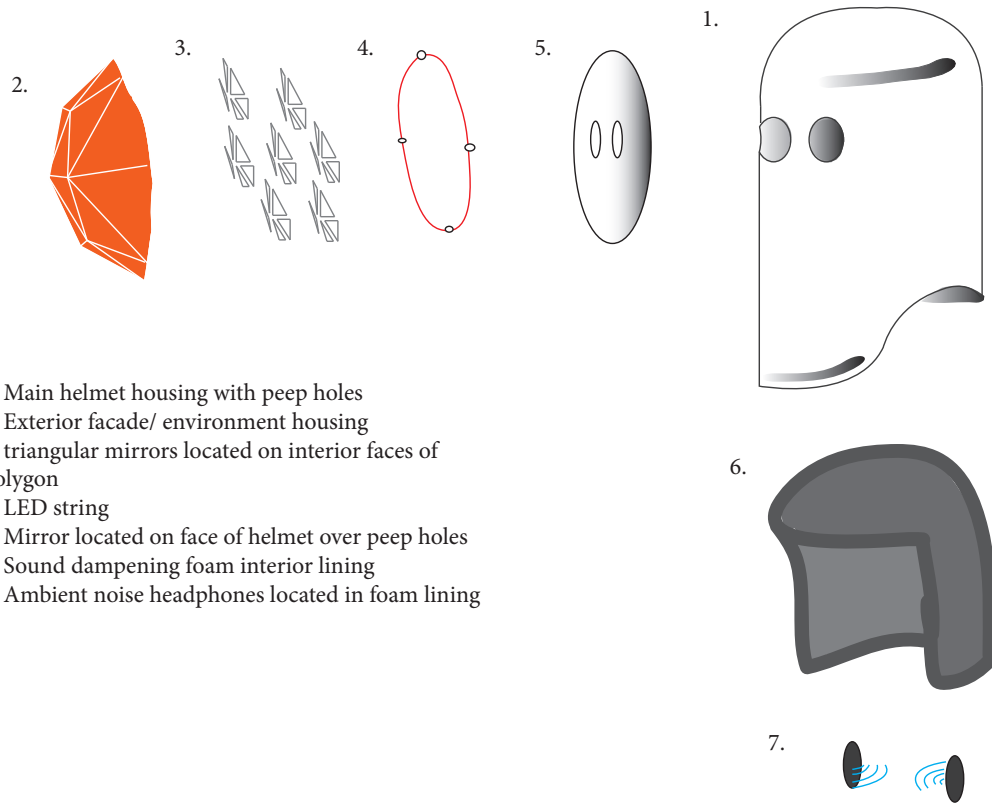
Market:

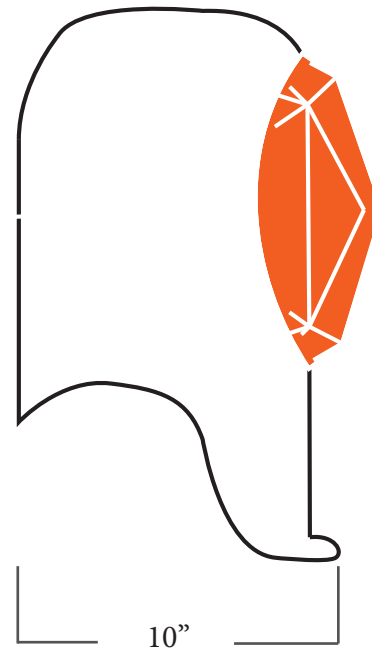
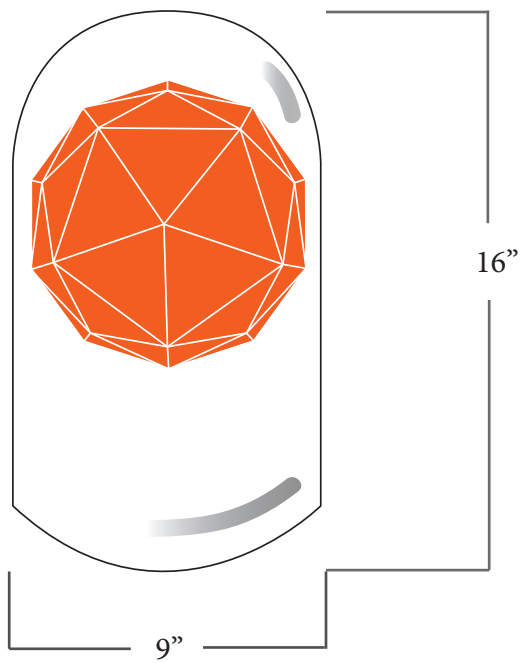
Mind Environments is a company creating one-off production environments for fit in a specific space. Aesthetic specifications are made based on the environment that the helmet is being made for, and the users that are located within that specific environment. The helmets being produced are high quality production models, hand-crafted using forms of fiberglass molding.

Design studios, wealthy individual designers, and art collectors will serve as the main market for these one-off pieces. Helmets will be made in collaboration with studios and its users. Each helmet will carry a story of the studio and why it was made to fit for that studio. Wealthy designers may wish to have one made for their own personal work space. Helmets will gain collective appeal based on their one-off collaborative stories and will appeal to the collector market.

Design studios around the world will be interested in this type of collaborative process with Mind Environments and will all wish to own their specific pieces. As of now only one Mind Environment will exist within the space of the PDI studio. The number of environments will rise with participation from more studios.

Design Specifications:

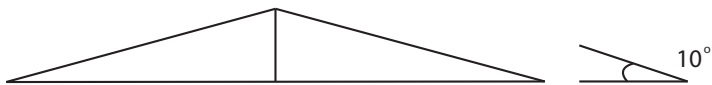




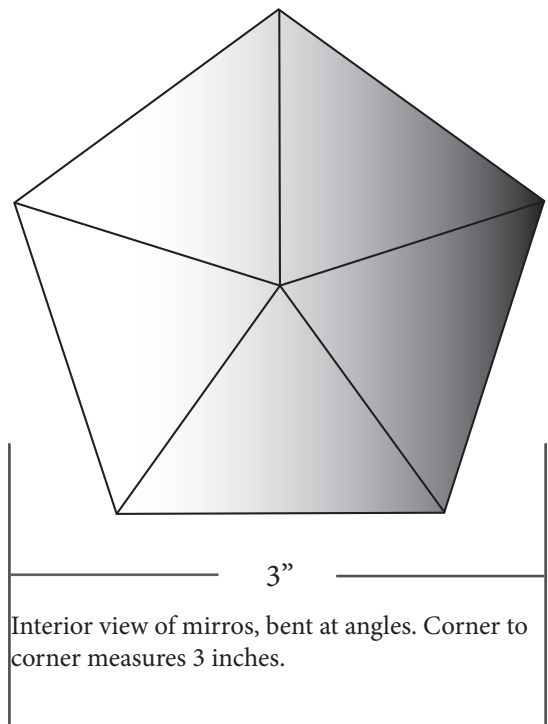
Exterior:

- Fiberglass molded using handmade wood mold
- Shape, peep holes, and switch housing laser cut
- Weight of the polygon face: about 711.2 grams
- Weight of fiberglass shell: about 6845 grams
- Colored using fiberglass resins

Estimate cost of materials: 150 dollars



Profile view of mirrors/ polygon. Each triangular face is elevated 10 degrees from flat.



Interior view of mirrors, bent at angles. Corner to corner measures 3 inches.

Interior:

- 1 inch thick acoustic foam

Estimated cost: 180 dollars

- laser cut mirrors

Estimated cost material: 5 dollars

- Lighting:

- 4 medium strength LED's

- 9 volt battery

- 10k ohm and 50k ohm resistors

- copper wire

- switch

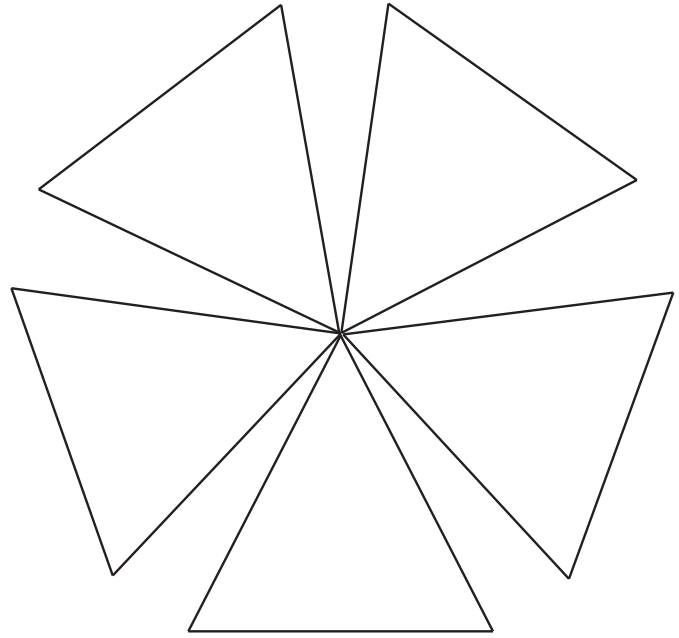
Estimated cost: about 5 dollars

wireless headphones and volume control

Estimated cost: 280 dollars

Total estimated cost of materials:

620 dollars



Mirrors arranged on a flat surface with points touching at center, before being angled 10 degrees to close the polygon.

The cost of labor is where the larger pricing comes from. The maker must handbuild the mold being used only once for the specified Mind Environment. Tremendous amounts of behind the scenes work must go into background research, studying the specific users in the environment, working with those users, and possibly creating more than one iteration for a specific helmet design. For a maker creating environments, performing all the work themselves for the most part, the labor costs will be very high. For the many hundreds of hours that go into developing every aspect of the Mind Environment, being generated by one mind, the estimated cost of labor is \$3,500. This is the price that customers would be paying for their environment.

Environmental Impact:

Mind Environments are built to last. They are constructed using high end manufacturing processes, allowing them to last lifetimes. The helmets do not undergo much wear throughout their lifetime. The one component that will not last as long as the others is the foam padding. The foam will wear out and thin over time. Like the foam padding, the other structurally independent items like the headphone speakers, and LED lights will run their course at least once while the helmet is still in commission. Based on how many different users each environment takes on, there may be some hygiene issues that may arise, but it is expected of the user to treat the environment with respect and wipe down the interior after they are finished. Simple upkeep will help the helmet remain pristine over time.

The production methods of the environments are not the most sustainable, for example, making a fiberglass mold that may press only once if the façade meets expectations. The fiberglass pressing and resin coatings will create excess waste and dangerous fumes. Although the helmets are not designed with the environment as a primary concern in mind (maybe a future iteration will), they are all designed for individual purposes. They are produced because they are wanted and because they will be used. Their value will not allow them to be a likely product to end up in a landfill. They will stick around for long, until they fall apart. Then, maybe, they will make it to the landfill.

Appendix:

This project was easy to put effort into. I looked forward to working on this project. Even when the work piled up, it was enjoyable to work on a problem that I created for myself to solve. Creating the design report, forced me to look at the product in new ways that I would usually not want to do at all. It was a bit overwhelming trying to think of the product in every context, but it made me feel like I was actually creating something. It made me push to support my idea from context to context.

The helmet itself was an interesting product to work on. It was tough at first to try and pick a specific environment to choose to go with. Original ideas including images of nature supporting biophilia seemed too easy, so I decided to go with my strangest idea to see how it would work. The mirrors were fun to work with, kind of. The prototyping process was really a mess, and for the amount of time I vested in wanting to make a close to the mark prototype, I became a bit disappointed in how it actually turned out. All of the user experience through visual aesthetic completely misses the mark with the prototype.

The prototype came out a bit ugly and uncomfortable, but it did help me discover a big design flaw. It is hard to view something in depth when it is so close to the face of the user. The peep holes allow the user to peer into the environment, but also obstruct parts of it. Talking about escaping confined environments, the peep holes make the helmet feel even more confined than the work environment. I really would like to get ahold of some sort of fisheye or wide angle camera lens to place inside and determine if that resolves the issue. Fisheye or wide angle views would add to the overall new feeling of the environments, and would help make the helmets feel more spacious.

It seems to be a recurring thing for how I choose a problem to work on. It usually stems from my own procrastination and struggle to think thoughtfully about products that would actually benefit others. I would like to take steps away from stemming ideas out of my own problems or desires and to start thinking about products and ideas that would effectively make users' lives better.