

# **Speculative Project Proposal: FortiDesk**

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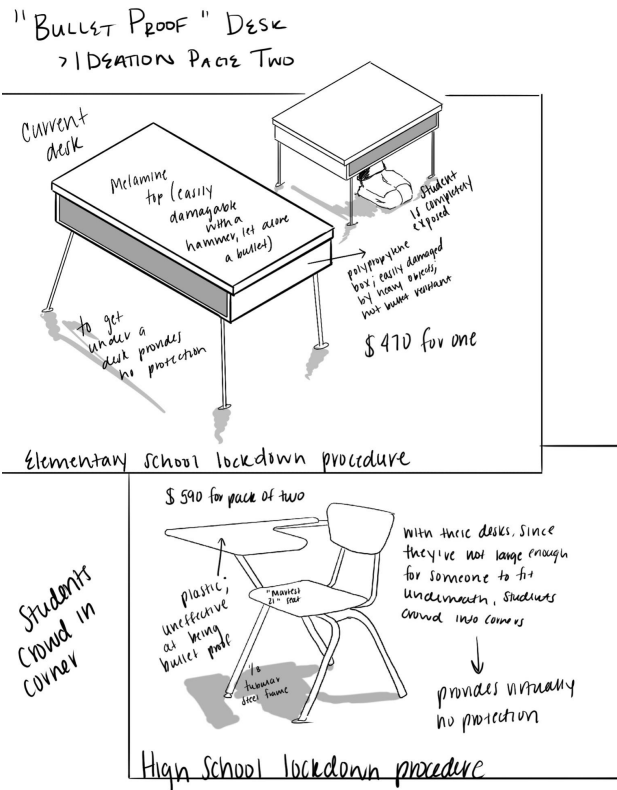
No parent, sibling, friend, or peer should ever receive a phone call that their loved one has been murdered by an active shooter at their school. Whether you are in preschool, elementary, middle, high school, or college, every student should feel like their learning environment is a place where they can prosper, where they can form relationships, where they feel safe- not a place where they fear they might be at death's doorstep by the end of the school day. FortiDesk aims to change this narrative and provide protection for students and teachers and ease for parents and friends. FortiDesk's objective is to create a bullet resistant desk that two students can fit into within the matter of seconds in case of an emergency, thereby greatly increasing their chances of survival in case of an attack.

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If you were to hear the words "fear" and "education" in the early 1900's, most people would think of anxiety regarding an exam. Or even before exams are given to students, in preschool and elementary, you might think of the word "fear" with school as bullying. But unfortunately this is not how we think any longer. In this era of education, we would associate the words "fear" and "education" with the action of an individual breaking into an elementary school and murdering your nine year old little girl. Well, this would never happen to your children, your family, your friends, right? This is just an uncommon nightmare that you will never have to worry about in your run of the mill town that has flower gardens on every corner. Tell that to Mrs. Scruggs, the mother of the nine year old girl who was shot while playing in her Nashville private Christian grade school.

I, along with my friends, family, and peers, hope to say that I can never understand the fear that comes with confronting death, the fear that comes from sending an “There is a shooter in the building. I’m scared, I love you.” text, the fear that comes with receiving this text. Or panic that comes from a mother not being able to get in touch with her little boy because he is too young to have a phone. But even though we hope and pray that we will never have to experience this, that is all it is- *hope*. I am going to change this word “hope” to “know”, instead of, “I hope to be able to send my child to school one day without worrying about whether they will return in the afternoon”, I want to hear parents say “I will be able to send my child to school *knowing* that they will return home safe”.

There are millions of articles that speak upon how we can limit the usage of guns and create more secure background checks on people wanting to buy these weapons. But the talk is just talk and without action, there will continue to be school shootings and murders to innocent people. Furthermore, even with background checks, even though the gun is licensed to a certain individual, attackers find their way to get their hands on a gun. Detroit Michigan had four students killed after Ethan Crumbley got his hands on his fathers gun- even though it was registered in his fathers name, the son still has hands and is still able to carry a gun and pull a trigger as long as he has access to one. So, although there should be NO reason for *anyone* to own an automatic (or semi automatic) gun unless they are in the military, let’s talk more about how we can protect school staff and children from an attacker. No matter what, there is always a way for a gun to enter an educational facility if someone puts their mind to it, and we have to prepare for that situation. So, instead of asking “how can we stop the shooter from obtaining a weapon”, because like I said, if there is strong intent, the attacker will find a weapon one way or another, let’s ask “how can we be more prepared for the attack and stay one step ahead”.



When I was in elementary school, we used to have lockdown drills where we went under our desk (that was open on all four sides- figure 1) and turned off the lights. In middle and high school, we turned off the lights and went into a corner of the classroom. In both of these instances, all students were exposed to an attacker's aim. So, in order to protect teachers and students, I have designed a cost effective desk that will protect students from an attacker.

Figure 1: Hand drawn renderings of the poor safety lockdown procedures provide

## Thought Process

Have there been bullet resistant desks made before? Yes, but these desks have not accounted for the price that schools are willing to pay. The most effective desk that I saw someone design was \$10,000 for one person to fit inside, and there is not a chance that every school is willing to pay such a price for every desk in the school. So, with that being said, the research for a cost effective material began.

# "BULLET PROOF"

## IDEATION PAGE TWO

different types of bullet resistant material

- Steel cubby  $\approx \$1200$
- polycarbonate cubby  $\approx \$1266.67$
- kevlar panel cubby  $\approx \$2340$
- polyethylene cubby  $\approx \$92.16$
- Fiberglass cubby  $\approx \$720$
- Ballistic nylon fiberglass cubby  $\approx \$41.92$

→ results varied on effectiveness

- Quikserv BSL3 - 10' 10' 4" Level 6  $\approx \$1.84$

calculations

Steel

$$3' \times 9' = \$900$$

$$3' \times 3' = \$300(4) = \$1200$$

Polycarbonate

$$3' \times 9' = \$950$$

$$3' \times 3' = \$316.67(4) = \$1266.67$$

Kevlar

$$1' \times 1' = \$65$$

$$3' \times 3' = \$585(4) = \$2340$$

Quikserv

$$10' 4" \times 10' = \$116.20$$

$$3' \times 3' = \$10.46(4) = \$41.84$$

Polycarbonate Sheet

$$4' \times 8' = \$82$$

$$3' \times 3' = \$23.04(4) = \$92.16$$

Fiberglass Sheet

$$1' \times 1' = \$20$$

$$3' \times 3' = \$180(4) = \$720$$

Ballistic Nylon fiberglass

$$5' \times 5' = \$29.10$$

$$3' \times 3' = \$10.48(4) = \$41.92$$

## QUIKSERV BSL3 - 10' 10' 4" LEVEL 6

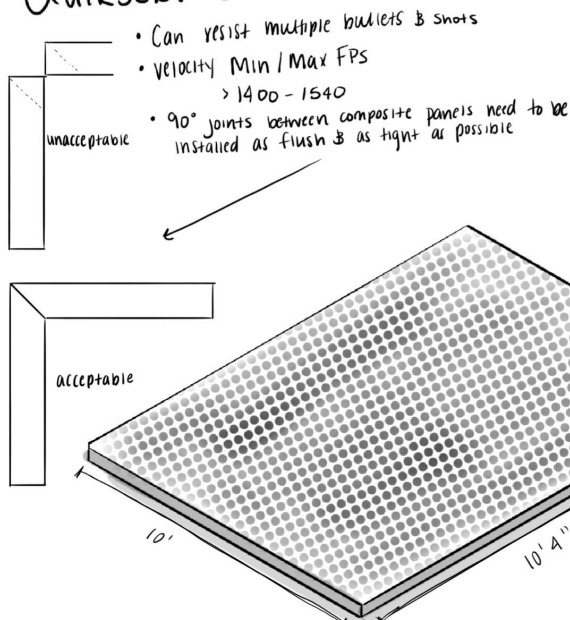


Figure 2: Price calculations to find a cheap yet effective material for building FortiDesk

All of the materials I found to be bullet resistant are listed on the top left of this ideation page along with the prices it would cost for one desk (calculations for such is to the right of the material pricing- figure 2). This was based on material size, caliber resistance, and amount of material provided for said price. I was looking to create a 3 by 3 foot “cubby” with this material to fit two students into. I found that the cheapest material in relation to the amount of material

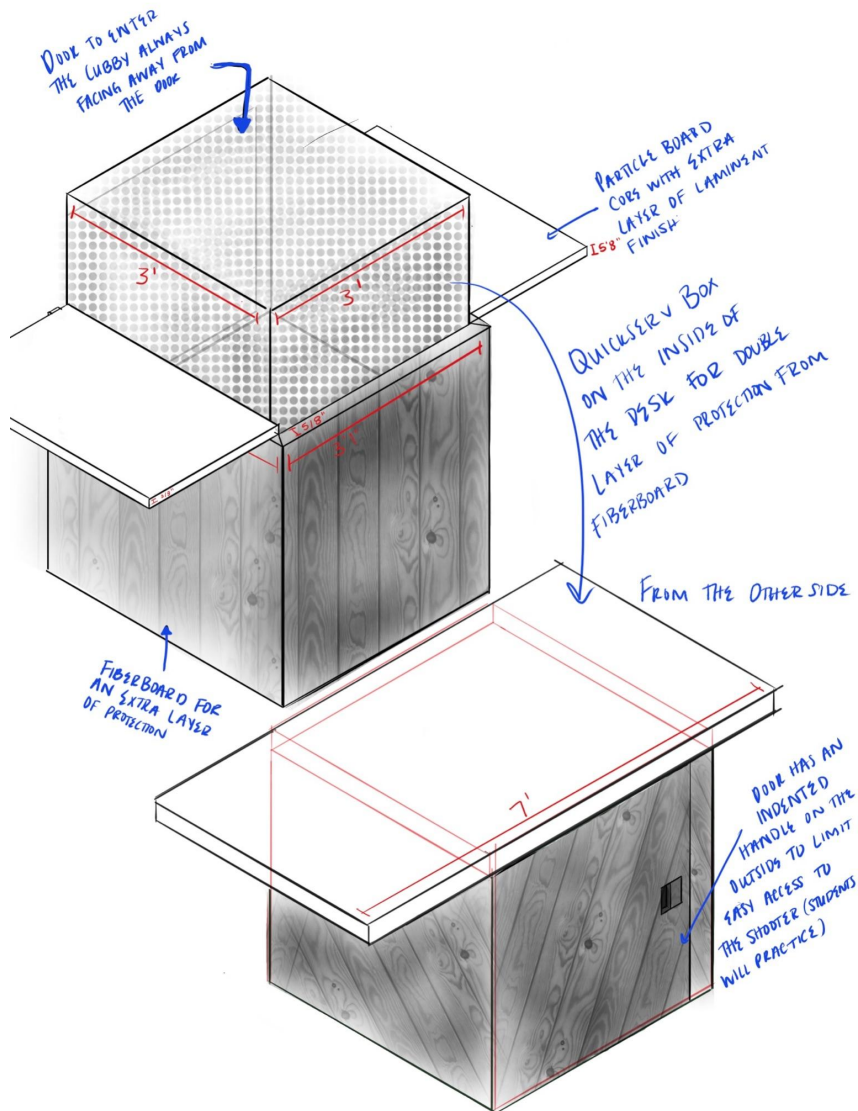
I originally found materials such as steel and fiberglass to be the most efficient at absorbing and reflecting bullets at .40 caliber, but with research on what kind of guns have been used in past school shootings, I found that this strong of a material is not needed. Although it might be a safer bet, it is thousands of dollars more expensive than other bullet resistant materials.

given was Quickserv BSL 3-10- price of \$41.54 plus an estimated \$100 for the fiber wood, table top, door handle, and manufacturing. This brings us to a price of \$141.54 whereas student desks now range from \$100-\$400 depending on the grade and money available to schools. But is this material strong enough to withstand the force of the guns used in school shootings?

The caliber of a gun is a number that represents how much force that a bullet is meant to serve. A standard military grade caliber is 5.56mm which is far beyond anything we have seen in school shootings. According to the Statista Research Department “Handguns are the most common weapon type used in mass shootings in the United States, with a total of 161 different handguns being used in 111 incidents between 1982 and March 2023.” The largest caliber gun ever used in a school shooting was an AR-15 rifle which is .22 caliber. Quickserv BSL3-10 can withstand up to a .30 caliber which would be extremely effective in case of an emergency.

Before coming to the idea of a bullet proof desk for two students to fit into, I grappled with other ideas. One of them was having a large closet in the back of each classroom in order to minimize the cost for bullet resistant protection. Another idea was to have the teachers desk made of bullet resistant material and have it large enough for the whole class to fit behind or inside of. Both of these ideas do not account for if this classroom is the first classroom that the attacker finds. The process of closing the closet or fitting the students into the teacher's desk takes up too much time and the shooter would get too much damage done. Who is the decider of when to close the doors of the closet? Who is to say a student wouldnt be scared out of their mind and close the door right after they got in, leaving 20 other students to face the attacker without protection? This is some reasoning as to why I came up with the idea of two students per desk cubby. Cubby is the term I am using for the bullet resistant box.

## Design



The desk will have a 3 by 3  
 Quickserv Box cubby underneath  
 the table section of the desk  
 (particle board with extra layer of  
 laminate finish- this is what has  
 commonly been used on school  
 desks). The Quickserv cubby  
 will then have an extra layer of  
 protection of the fiberboard which  
 will also be used for a design  
 purpose. The door to the cubby  
 will *always* face away from the  
 door of the classroom and will be  
 on either the right or left side of  
 the student sitting at the table.

Figure 3: Hand drawn rendering of the desk from the designing side

Two students will be sitting across from each other and these two will be the ones who share their safety box. (Figure 3)

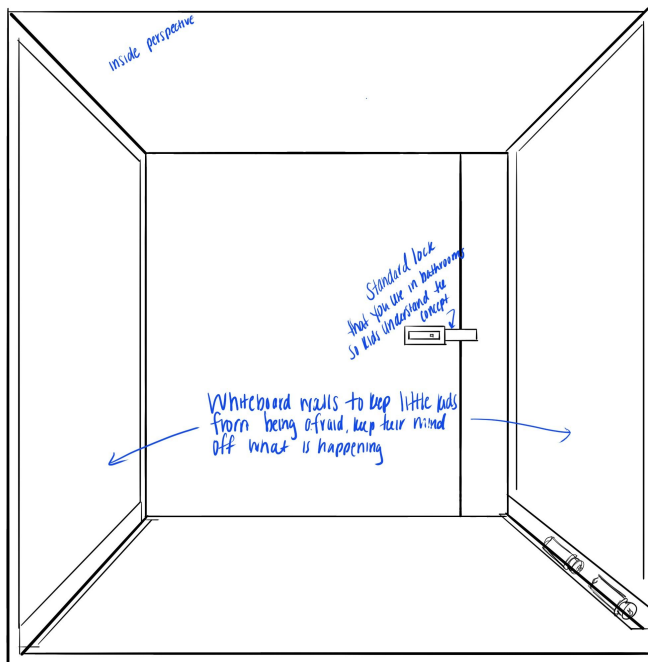
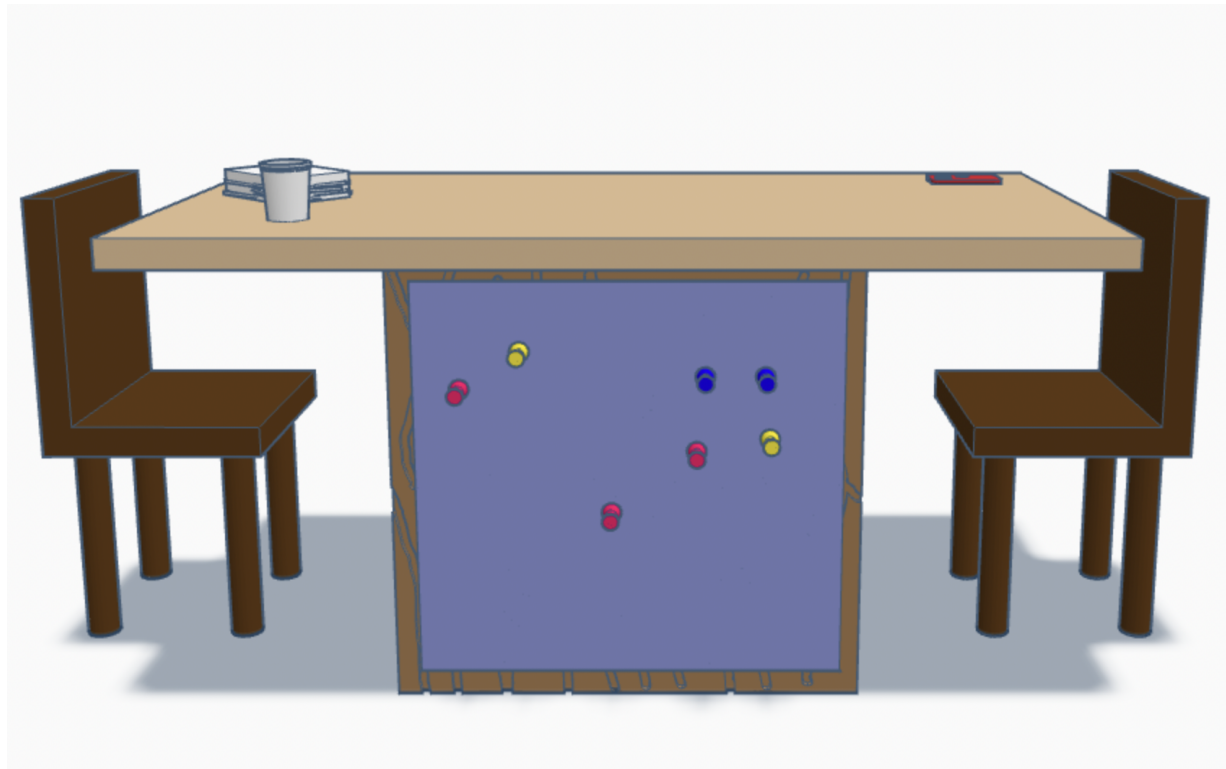


Figure 4: View from inside of the cubby

From the inside of the box there will be a lock that is similar to a bathroom door lock so young kids understand the concept, but this lock will have a cover over it that you place on so a student does not accidentally push it open. There will also be whiteboard walls or some sort of distraction on the inside so children can keep their mind off of what is going on.

## CAD Rendered Images



*Bullet Resistant Desk Front*



*Bullet Resistant Desk Back*

## **Annotated Bibliographies**

### ***Annotated Bibliography 1***

The list provided by Rapid Response Defense Systems provides names of "Top Bulletproof Materials for Improved Workplace Safety". This article focuses on educating readers about the different types of bulletproof materials available to improve workplace safety. *RRDS* was written with the intention of helping individuals, organizations, schools, and companies understand the options available to them when it comes to defense structures.

In today's world, active shooter situations have become more common than ever, and it is important to be prepared for the worst. The writer of this article has spent several months researching and organizing the information on the different types of bullet proof materials available to provide readers with a comprehensive understanding of their options.

Some of the materials mentioned in this article are steel, ceramic, fiberglass, wood, kevlar, polyethylene, and polycarbonate. According to *RRDS*, these materials undergo rigorous testing to determine their UL rating or NIJ level in order to determine a material's ability to stop different types of ammunition and effectiveness in providing protection.

This article is extremely important to my inquiry because if I were to make a bullet resistant desk, you must start somewhere. This is the perfect place to begin with researching these materials and their UL rating/ NIJ level along with the pricing. Attempting to find the perfect balance between the resistance necessary to provide protection and a reasonable price stems from the material itself.

### ***Annotated Bibliography 2***

The School Outlet guide is a website dedicated to providing information on the prices of different types of student desks. The site is easy to navigate, and it includes detailed descriptions of each desk model, along with images and pricing information. The website is designed to help students, parents, and educators determine the price range for different types of desks that fit their needs.

This website includes a vast list of several student desks that may be seen in an educational setting. The desks I chose to determine the price range I would keep my bullet resistant desk design to was determined by the ones that have been a part of school shootings in the past. Although the price range is affected by inflation since the earliest shooting I looked at was Columbine 1999, the desks seemed to be in the price range of \$100 to \$400 each, depending on the school.

With that being said, I determined that the price for my desk design should be in the limit of \$300 to \$500, considering that each desk would accommodate two people and would offer protection for both.

### ***Annotated Bibliography 3***

This website provides a detailed description of the product, including its size, weight, and level of protection. The site also includes images of the product, allowing customers to see the batten strips in detail before purchasing. Additionally, the website offers a competitive price for the product, making it a great option for my design product being that I am trying to find the perfect balance between price and protection.

One of the key benefits of buying the Quikserv BSL6 10-10-4 Wide Bullet Resistant Bullet Resistant Batten Strips Level six from DK Hardware is the company's reputation for quality products and "excellent customer service". Furthermore the company offers a satisfaction guarantee on all purchases, and they have competitive pricing and customer service make it a top contender in the market.

Overall, this website helped me determine the exact product that would be a viable balance between protection and price. This material is bullet resistant and when adding it to a wood outerbase, it will double the protection.

### ***Annotated Bibliography 4***

*The Impact of Gun Violence on Children, Families, and Communities* speaks upon the insidious impact of gun violence on the vulnerable members of society, including children, families, and communities, is undeniable and cannot be ignored. The widespread fear and trauma that ensues from these incidents have become a prominent topic of public discourse, necessitating an urgent need for an enlightening perspective on the devastating nature of gun violence. As a firm advocate for the protection of students at all educational levels, I strongly

urge individuals to join the collective effort against this increasingly normalized and prevalent issue.

In the ongoing debate about gun regulation, mental health has been the subject of much discussion, though with a focus on the mental health of perpetrators of gun crimes. Nonetheless, it is crucial to acknowledge that the vast majority of individuals with mental illnesses are not violent and are, in fact, more likely to be victims of violence than to perpetrate it. Thus, there is an imperative for thorough evaluation and careful consideration of an individual's mental health before granting them access to firearms.

This article presents a valuable perspective on the issue of gun violence and takes a decisive stance against it. The evidence and statistics presented regarding recent incidents of gun violence, particularly in educational settings, emphasize the need for heightened protection and safety measures for children. As an individual deeply concerned about the safety of future generations, I find this discourse to be a compelling call to action for all of us to collectively address this pressing issue.

### ***Annotated Bibliography 5***

The article entitled "How to Respond to an Active Shooter: 6 Steps to Protect Yourself," published by City Wide Protection Services, provides a comprehensive guide on how to protect oneself from gun violence, even in seemingly impossible situations. This written effort serves to educate individuals on the best strategies to ensure their safety during an active shooter incident. The six recommendations outlined in the article, including "Entrances and exits, survey your surroundings, remain calm, find cover, evacuate and alert, counter," provide practical and effective steps to minimize harm.

The aforementioned quote from the article highlights the importance of not impulsively running for an exit and instead utilizing the surroundings to hide and protect oneself from incoming fire. The article emphasizes the significance of finding cover that can absorb bullets and the value of concealing oneself, even if the cover is not ideal. The adage of "out of sight, out of mind" reminds readers that being hidden reduces the likelihood of being targeted by the shooter.

The article's credibility is derived from its authorship by a reputable organization and the simulations and research that support its recommendations. As an individual seeking to create a safer environment for children and adults, this article offers valuable insights that can inform the development of protective artifacts. By implementing the strategies outlined in this article, the safety of individuals can be maximized during an active shooter incident.

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