Stop ALICE

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Overviews

- It is important that all individuals be prepared during an active shooter situation
- For individuals who use wheelchairs, it can be difficult for them to quickly barricade themselves into a room
- The goal of this project is to create a device that efficiently barricades a door during an active shooter situation that can be used by individuals who use wheelchairs and/or have limited arm strength

Background

- ALICE Training – program created to prepare all individuals for an active shooter situation
- Stands for Alert, Lockdown, Inform, Counter, and Evacuate
- Prepared around 19 million people across the U.S.
- #1 rated solution during an active shooter situation

Market Analysis

Device #1: The Sleeve

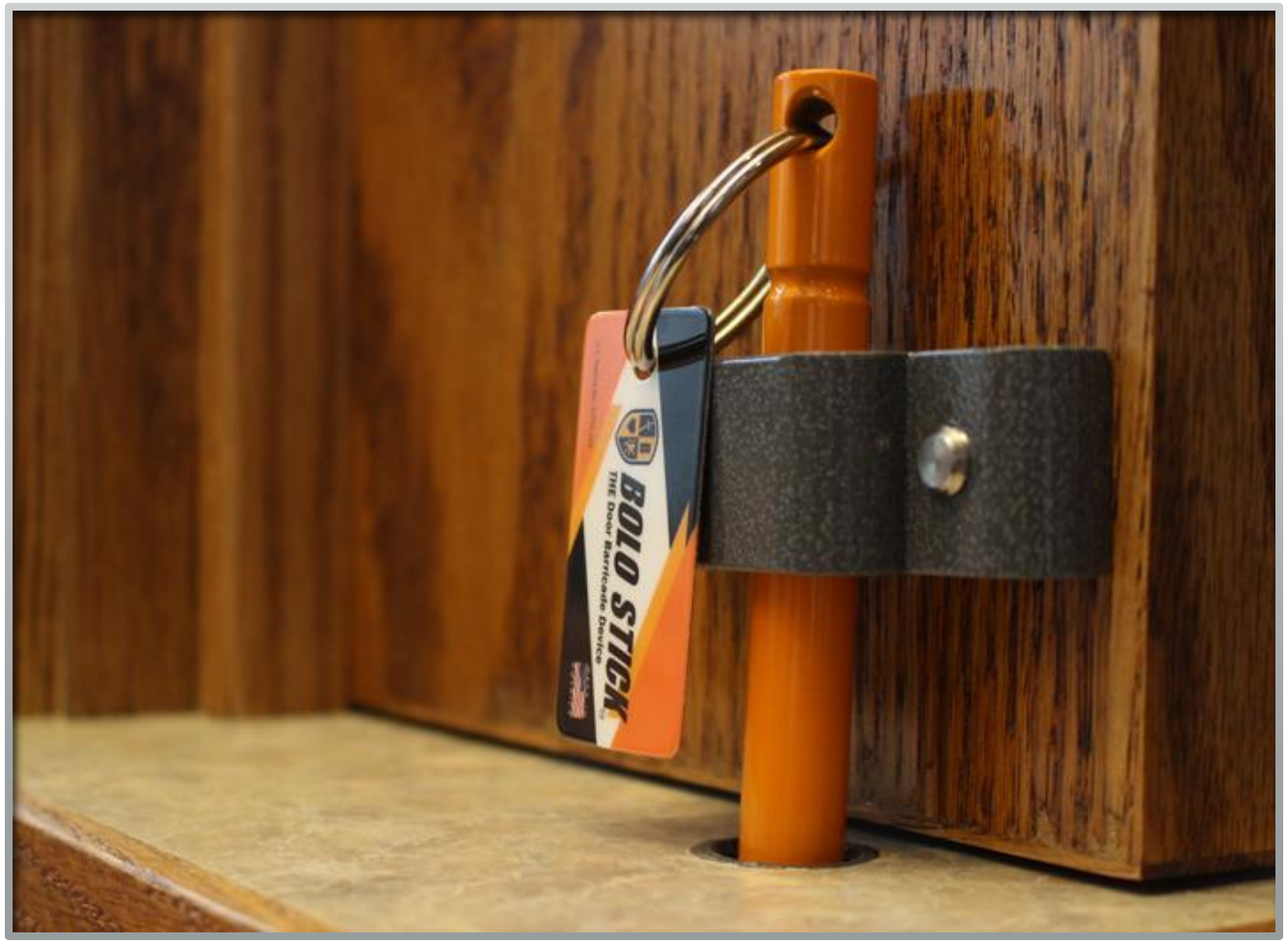
- Designed for classroom use
- Attaches very high on doorframe
- Red color
- Specifically tailored to one type of door

Device #2: The Nightlock Lockdown

- Secures to floor (an inaccessible location to wheelchair users)
- Extremely expensive, retailing at ~$60
- Works for both inward and outward swinging doors
- Lightweight and compact
- Requires additional installation of plaques

Device #3: The BOLO Stick

- Requires modification of both the floor and the door
- Made by an independent developer
- Intuitive to use
- Also makes use of a very low area on the door



Takeaways

- Location on door
- Size and weight for optimal storage
- Cost
- Universality
- Color for quick retrieval
- Modifications required to door/ floor?

Description of Need			
#	Level	Requirement Type	Requirement Statement
1	1	Functional	The device shall keep the door shut.
2	3	Functional	The device shall be portable.
3	1	Functional	The device can be activated in under a minute
4	1	Functional	The device shall not require a full range of mobility to activate.
5	1	Functional	The device shall withstand the force of an intruder.
6	2	Physical	The device shall weigh less than 10 pounds.
7	2	Cost	The device shall be less than $50 worth of materials.
8	1	User	The user must be able to come within arm's reach of the door handle.
9	1	User	The user must be able to lift the 10 pounds.
10	1	Documentation	The device shall include an instruction manual for installation.

Design Requirements

The Design

Door Wedge with Extended Handle: Fast, Simple-to-Use and Wheelchair-Accessible

a) Handle
- Length: ~6 in (0.15 m)
- Material: PVC / Wooden Dowel / Aluminum
- Sticky Rubber Grip

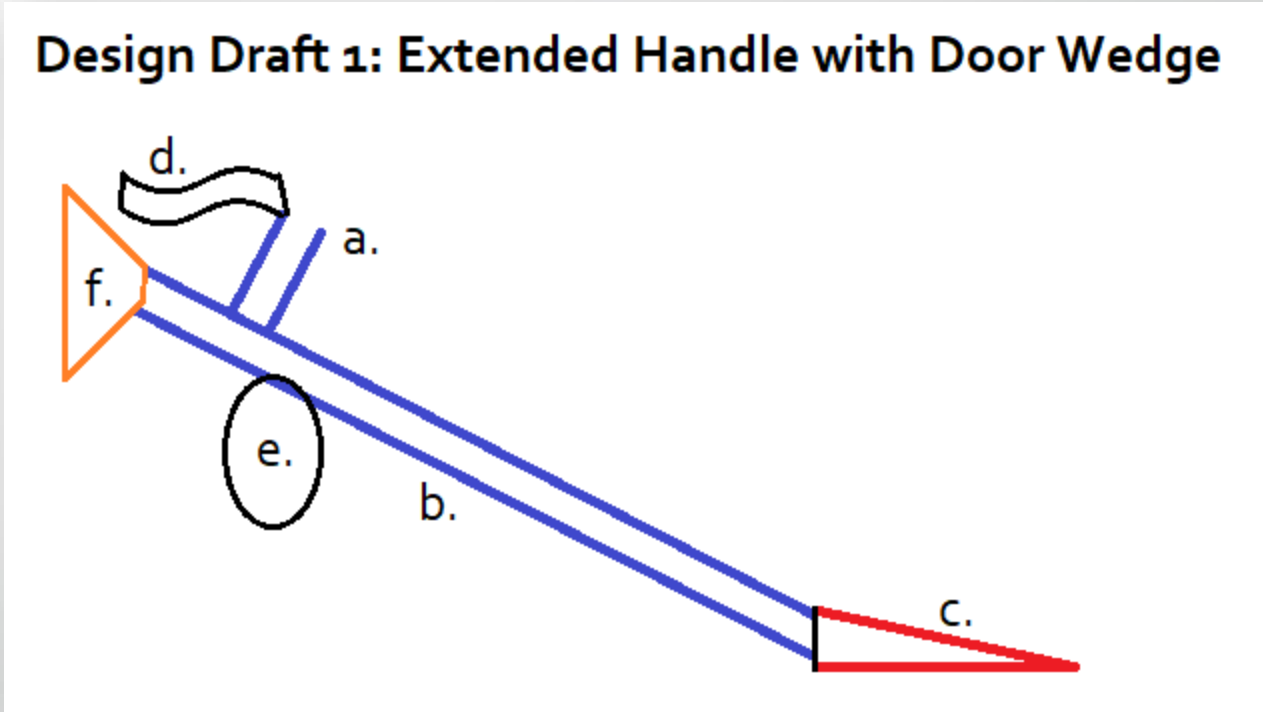
b) Rod
- Length: ~4 ft (1.3 m)
- Material: PVC / Wooden Dowel / Aluminum
- Light, yet strong

c) Wedge
- High μ_s to ensure firm hold
- Barricades inwards-opening doors

d) Velcro Strap
- Keeps rod from falling out of the grip of those with reduced arm strength.
- Idea inspired by "Adjustable Snow Shovel" from STEM2 2019

e) Loop
- Goes around door handle, and crosses door frame
- Barricades outwards-opening doors
- High tensile strength

f) Ram Block
- Facilitates effective momentum transfer from wheelchair to wedge.



Timeline

- **CDR:**
- Background and Market Research: Updated throughout the timeline, as needed
- Requirements Document: Updated throughout the timeline, as needed
- Design Document: Completed by **March 21st**
- Proof of Concept: Procedure developed w/ Design Document by **March 21st** , and prototype completed by **March 28th**.
- Presentation: Updated after the Design Document is approved, and again after the prototype is completed.
- Meeting Log and Digital Logbook: Updated throughout the timeline, as needed.
- **TRR:**
- Requirements Document: Updated throughout the timeline, as needed
- Progress Document: First draft completed by **April 12** and updated as needed throughout the timeline.
- Design Study: Completed by **April 25th**. Updated continually as well.
- Current Prototype: Redesign for implementing client requests should be completed by **April 11**. The redesigned prototype should be produced by **April 18th**.Presentation: Updated after the Design Document is approved, and again after the prototype is completed.
- Meeting Log and Digital Logbook: Updated throughout the timeline, as needed.
- **ADR:**
- Instructable: Completed by **May 10th**.
- Current Prototype: Redesign for implementing any pending client requests should be completed by **May 3rd**. The redesigned prototype should be produced by **May 17th**.
- Poster: The poster should be ready by **May 20th**.
- Handout: The handout should be completed along with the poster by **May 20th**.
- Digital Logbook: Continually updated through **May 21st**.

Resources and Budget

Item	Supplier	Catalog #	Quantity	Unit Price	Total ($)
Nylon Paracord			1 yd		~5
PVC			4 ft		~10
Wooden Dowel			4 ft		~10
Velcro Strap	Amazon	B000TGXoH	1	2.98	2.98
Big Foot Rubber Stop	Staples	816249	1	4.29	4.29
Orange Master Giant Foot Rubber Stop	Staples	816249	1	7.29	7.29
					34.56