Quick Facts

➜ Our user friendly design allows for speedy deployment
◆ Under 2.5 minutes deployment time
➜ The product is capable of stopping a maximum force of 340 lbs applied at the handle of the door
➜ Wood and steel material
➜ Works on inward *and* outward opening doors!

Figure 1: The safety door stop is small enough to fit into a backpack

Oregon State University

Safety Door Stop

Introduction

This product is an easily deployable door stop in case of armed intruder emergencies. The intended users of this product are students and school teachers. Our open sourced design uses materials and manufacturing processes accessible to the majority of the public. With a small number of moving parts, the product design can be created in a day.
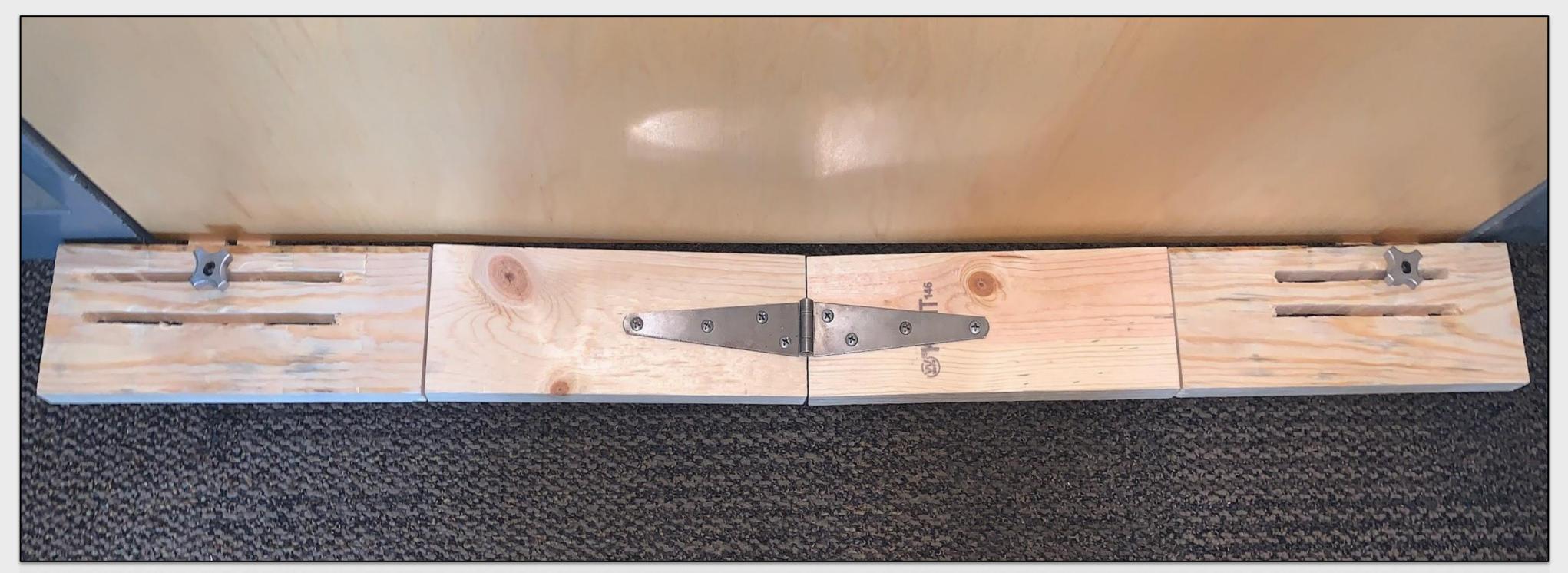

Figure 2: The door stop is shown deployed on the secure side. The Z-Axis locking pins are not shown to be in use.

By Misa MacDonald, Gabriel Connor, and Sean Slocum

Design Process
The design began by observing both door design as well as frame structure in order to deduce common shared characteristics. In order to create a universal door block that works on both inward and outward opening doors, we moved forward on using the gap underneath the door to our advantage. Combining building codes as well as simple door kinematics we iterated to the geometry you see today.

Design Scope
➤ Create a device that prevents intruders from entering classroom style space
➤ Create a thin device that works for all styles of doors
➤ Device is compact and lightweight
➤ Device is cheap and open source
  ○ Anyone can create this from tools at home (Drills, saws, etc)
➤ Device can be deployed quickly

Design Breakdown

• Three types of parts in the product.
  ○ The Cross Bar
    ■ This part unfolds to form a long beam to brace against the door frame
  ○ The Clubs
    ■ These grab the door or the door frame
  ○ The compressive screw
    ■ Clamps the bar and club together

Figure 3: All components are shown. Note that there additional washers

Figure 4: All components are shown in compact fashion