# Concept Screening Worksheet

| **Overview** | |
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| Need statement: | |
| There is a need to reduce the risk of contents in a controlled environment from being compromised due to unexpected, unwanted, or unintentional access in frequently accessed refrigerators. | |
| Description of concept: | Concept sketch: |
| The use of the laser sensor prevents the risk of the refrigerator of being left open for a long time preventing unexpected and unwanted access of the refrigerator. If the refrigerator is left open too long, a light and sound alarm will activate which will then turn off when the refrigerator returns closed.  Main components include:  -Laser  -Laser Padding  -Light and Sound Box w/ AA batteries  The laser will detect whether the door is closed by reflecting off the laser padding. If the padding isn’t present in the laser’s direction, then the laser sensor won’t pick up any light reflection and thus determine the door is open. Alarms will eventually ring after a certain amount of time |  |

| **Need Criteria** |
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| Must-Haves | Confidence in Ability to Satisfy |
| --- | --- |
| Ease of Use | □ High □ Medium □ Low |
| Ease of Manufacturing | □ High □ Medium □ Low |
| Practicality | □ High □ Medium □ Low |
| Ease of Handling | □ High □ Medium □ Low |
| Affordability | □ High □ Medium □ Low |
| Power Delivery | □ High □ Medium □ Low |
| Longevity | □ High □ Medium □ Low |
| Security | □ High □ Medium □ Low |

| **Greatest Concerns About Concept’s Ability to Satisfy Need Criteria** |
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| While the concept has a very low security and less than ideal longevity, the concept makes up with its quick and simple development and is very easy to understand since the user will barely notice the device operating due to its passive nature. |
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| **Technical Feasibility** | | | |
| --- | --- | --- | --- |
| **Favorability** | **Disease Process/ Mechanism of Action** | **Key Concept Mechanism** | **Concept Feasibility** |
| ... success growth graph | Well Understood | Well Established Technology | Similar Devices in Related Fields |
| Mostly Understood | Demonstrated in Related Fields | Similar Devices in Disparate Fields |
| Partially Understood | Demonstrated in Disparate Fields | Novel Approach |
| Not Understood or Well Known | Technology Not Yet Available | Novel, Risky Approach |
| **Critical Questions to Answer to Demonstrate Technical Feasibility\*** | | | |
| How do we make the laser precise enough to know when it's closed and when the refrigerator is slightly ajar?  Are there any similar laser sensors that have worked in the past in closing or opening doors?  What possible stimuli could interfere with the sensor and what could we do to prevent that? | | | |
| **Estimated Time and Resources Needed to Demonstrate Technical Feasibility\*** | | | |
| Will need a laser sensor, laser padding, and an alarm box with an LED, a speaker, and AA batteries. Will require learning how to combine all components in a useful way.  Estimated time to demonstrate technical feasibility is approximately four days to prototype and test.  If we have to make our OWN laser sensor this might take more time, but prototyping should be fast and simple. | | | |

\*Refer to your prototyping plan for the key take-aways to include in these sections

| **Intellectual Property** | | |
| --- | --- | --- |
| **Favorability** | **IP Landscape** | **Comments** |
| ... success growth graph | No existing prior art |  |
| Little existing prior art |  |
| Some existing prior art | While not applied directly to a locking system, there are previous prior art of laser sensors being used to monitor the open and closed status of doors |
| Extremely crowded |  |
| **In specific terms, what does your concept do?** | | |
| The laser sensor helps simply to know when the refrigerator is open with its easy installation. If cheap and easy to apply onto the refrigerator, it will help prevent extra high costs in buying a new refrigerator. With the device applied, we will be able to know when the refrigerator is left open for too long to sound an alarm and have someone nearby to close the refrigerator. | | |
| **What aspects of your solution are useful (utility)?** | | |
| The solution’s simplicity and quick-to-understand design is very useful for people to quickly adapt to the new installation of the device in the labs. Stating again, while the device may fall short in security and longevity, the device will still overall prevent refrigerators from being left open for too long in the case that someone is nearby. | | |
| **What aspects of your solution are non-obvious?** | | |
| Its lack of active use is an aspect that makes this solution non-obvious. While other concepts we developed might worry about having security identification (the use of a pin pad), this solution mainly helps with preventing the door from being open for too long without causing unnecessary hindrances for lab workers. | | |
| **What aspects of your solution are novel?** | | |
| Due to the integration of the alarm systems and laser sensors into a single physical system, this product is more applicable to doors and refrigerators in areas where network connectivity may suffer such as in underground laboratories. | | |