Name(s): Daytona and Ally

# 2.3 Keep It Secret... Keep It Safe

Throughout Lesson 2 you've explored the use of inputs and outputs.  Now you'll use your physical computing and coding powers to secure a valuable object or information. **You will have 5 class periods to complete this project.**

You'll work with your partner to create a security device for one of the following three situations to protect your valuable possession from sneaky spies.

**[Keep It Secret Keep It Safe Video](#)**

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**Security Device Options**
1.  A system that alerts you when someone has opened a notebook of secrets
2.  A device that sounds an alarm when a spy removes a priceless object from a locker, box, or safe
3.  A system that notifies you when an intruder is detected in a restricted area

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Consider how inputs, like switches and sensors, can trigger these alarms.  Think about how you want to be alerted of suspicious activity when your alarm is triggered.  What outputs could you use?
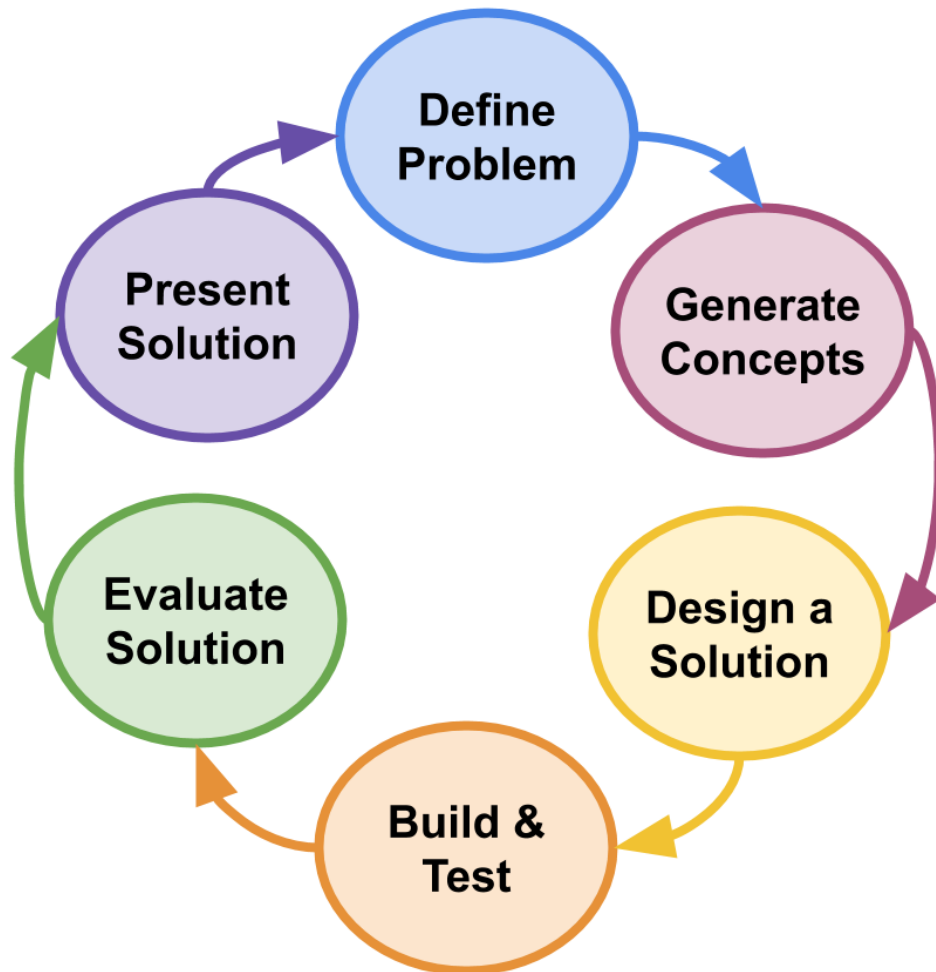
As you and your partner design and develop the hardware and software, you'll follow the steps of an **iterative** design process.  This means you'll test your device often to find ways to keep improving your design and code.

To make sure your team successfully completes this project, review the design requirements and the **Secrets and Safes Rubric** often.

## Design Requirements

❏ Your device uses at least one input component to trigger the alarm.
❏ Your device uses at least one micro:bit to run a program that receives and responds to environmental interactions. (Your team may choose to connect two micro:bits and work with one other team to create one security device.)
❏ Your device uses at least one output component to alert people.
❏ The user can activate and deactivate (turn on and off) the device as needed.

# Design Process

Define Problem

Generate Concepts

Design a Solution

Build & Test

Evaluate Solution

Present Solution

# 1. Define the Problem

Take a few minutes to discuss the three security device options with your partner. Choose one of the options and write a problem statement that fully describes the security problem your team's device will solve. What do you need to protect and from whom or what?

📓 **Define your problem in the table below.**

| | |
|---|---|
| **Client** | Old lady named Marjorine |
| **Designer(s)** | Daytona Pearson and Ally Webb |
| **Problem Statement** | Marjorine has moved into a new home. She has experienced intruders in the past, and has looked into getting alarms that can help with this problem. She is requesting from the designers (Daytona and Ally) to make an alarm that can help notify her that someone is in her home. |
| **Design Statement** | Our design is going to alert our client Majorine whenever her home is in danger, the sensors on the windows and doors will send a bluetooth alert to her phone in order to keep her home safe. |
| **Constraints** | One main constraint is time, we only have five periods to make this project, so we will try and sign up for knightimes here for extra time with our work. |
| **Criteria** | This project needs to be able to disarm, turn off and control a security system. |
| **Deliverables** | We are going to create an alarm system to show we can keep a safe environment. |

# 2. Generate Concepts

Individually, create a list of at least two ideas for solving your defined problem. Share your list with your team and discuss reasons that each

design idea might or might not be an effective solution. While comparing your design ideas, you might think about ways to take the best ideas from each suggestion and create a new design solution.

**Write your two ideas in the blue box.**

- This alarm system could be a pressure sensor, making a noise if someone tries to walk into the home and steps on the pressure sensor. It alarms Marjorine with a noise from a buzzer
- We could use lights that help notify Marjorine if someone walks into her home uninvited.

**Add your ideas to the chart and answer the following questions as you discuss each design solution idea with your partner.**

- **Does the solution solve the security problem you defined?**
- **What are the hardware and materials you might need to build the solution? Do you have enough resources/materials?**
- **Does the solution meet the design requirements?**
- **Do you have enough time to complete the design solution?**

| Idea | Solves a defined problem? (yes/no) | Do you need materials? (yes/no) | Meets design requirements (yes/no) | Enough time to build? (yes/no) |
|---|---|---|---|---|
| This alarm system could be a pressure sensor, making a noise if someone tries to walk into the home and steps on the pressure sensor. It alarms Marjorine with a noise from a buzzer | This idea does solve the defined problem because it is a simple way to let Marjorine know that someone is in her home. | yes | yes | no |

| | | | | |
|---|---|---|---|---|
| We could use lights that help notify Marjorine if someone walks into her home uninvited. | Yes this will help because if margarine is asleep or phone is off she will be able to know when there is an invasion | yes | yes | no |
| Sending a bluetooth notification to another microbit in order to notify marjorine. | Yes, this solves a problem because when Marjorine is away or not paying attention. She will be able to see the notification that there is an intruder. | yes | yes | yes |
| Put bend sensors on the windows if they are opened. | Yes because,a lot of intruders climb through windows to get into houses. A lot of security system companys don't think about this, with the sensors on the windows she will be able to know when the windows open. | yes | yes | no |

After answering, completing the table, choose the design solution that best meets the design requirements and can be created successfully by the deadline.

**Summarize the design solution your team chose and briefly describe why you chose it**

We chose to use the pressure sensor with the buzzer for our design solution. Because when the alarm system is on and armed the mat will sense pressure and make noise, this will alert our client that there is an unwelcome visitor in their house.

# 3. Generate Concepts: Sketch Ideas

What will your project look like? What materials will it be made out of? Include measurements of the actual size.

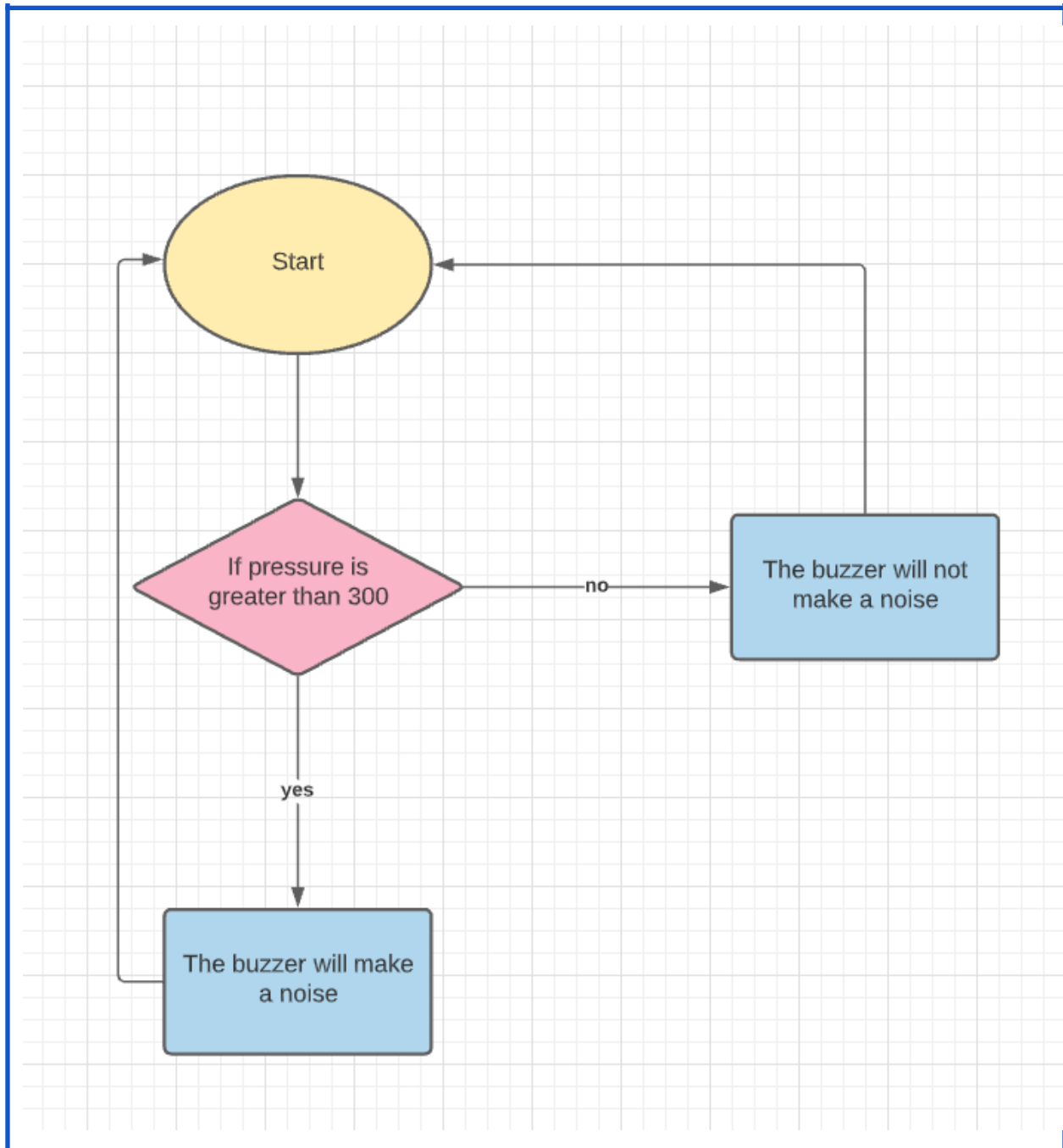📓 **Draw your sketch in Google Drawings or insert a copy of your sketch below. (Sketch by Ally)**
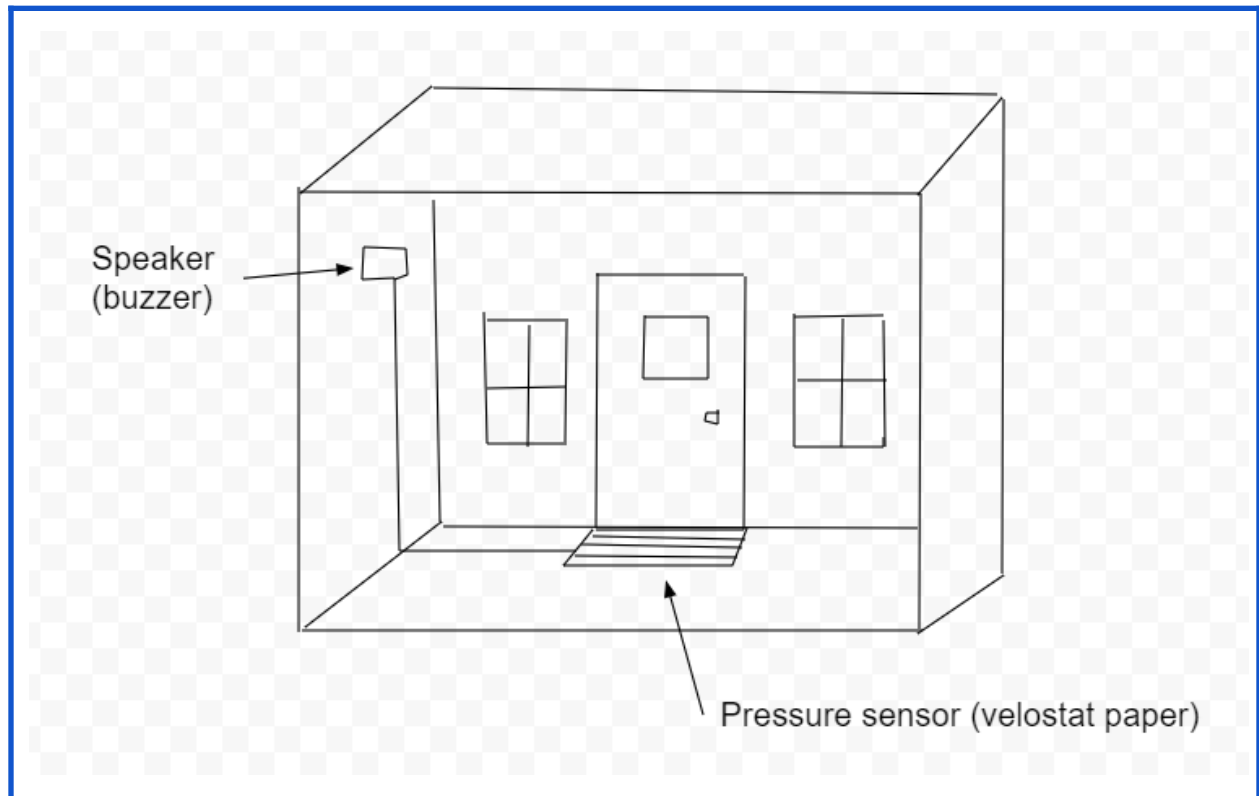


# 4. Design a Solution: Flowchart

Create a flowchart of your plan.

📔    **Draw your flowchart in Google Drawings, Lucid Chart, or by hand and insert a copy of the flowchart below.**



## 5. Build and Test: Code / Debugging

As you build your code, test regularly and document any issues/bugs you encounter. All entries should be listed in the blue box below.

📓 **Document any bugs below and how you fixed them. Date each entry.**

> We had some issues with the code not sending to the other microbit and the code being continuous and not stopping. So we used the reset button to reset the alarm.

## 6. Evaluate Solution

Does your solution work as expected and solve the problem you identified? If not, go back and make adjustments. When you are satisfied with your code: (a) Answer the reflection questions, (b) Paste a snapshot of your code in the blue box, and (c) Paste the shared code link in the orange box.

📓 **Answer the following reflection questions in the blue box below:**

- **How did my model turn out?**
- **Does my model meet the criteria and constraints of my client?**
- **Am I happy with my work? Would I make any changes? Why or why not?**
- **How well did we work as a team?**
- **Did we have any problems with building/coding our project?**

> Our model turned out very nice. Our model fixed the problem that our client Marjorine was having. I'm happy with our effort and hard work that we put into the project. We both agree that next time we should add an LED light to flash in order to make our device more accessible to disabled people. Ally was a great partner to work with and helped out a lot. We were productive and worked well with fixing problems. Our code had many bugs that took a long time to fix but we decoded them. After a while we fixed it but there was just one glitch.

🔲 **Add your Code Snapshot below (right-click in the makecode editor).**



**Published Code Link** (Add your shared code link below. Click the spacebar after pasting the link so it turns to a hyperlink.)**:**
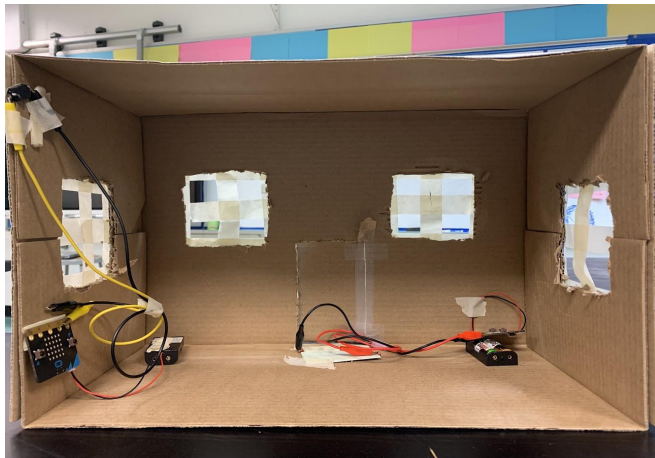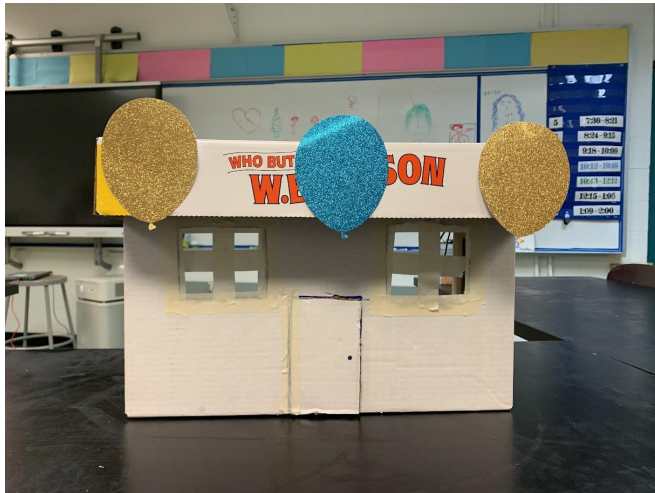
https://makecode.microbit.org/_AsigYzXf6Lou

# 7. Present your Solution

Insert pictures and a video of your working prototype below.

📷 **Picture(s)**

🎥 **Video Link** (Use Screencastify, a phone, or Chromebook to record and upload the video to your Drive. Add the link below.)

https://drive.google.com/file/d/1KsFdzumIjgjJt_NXWFgPkANJdl9ZUQsu/view?usp=sharing