ASU Smart Electronics Project User Guide

ASU Smart Electronics Project

Contents

Introduction

Instructions: Complete each step below to create a sketch of your Micro: bit expansion board prototype and put together a budget for prototyping materials!

Review: What was your problem statement?
Write your problem statement from Mission 1 below. It should be in the form of "I need to create a _____ using the Micro: bit expansion board so that _____ can. _____."

What solution did you ideate?

In the space below, answer these two questions:

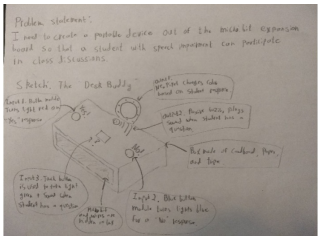
A. What was the winning “idea” from your brainstorming session in this lesson?
B. How does this idea solve your user’s problem?

Sketch your idea!

Draw a rough sketch of your wearable idea below. (You can also draw your idea on a separate piece of paper and upload a photo of your drawing).

Consider the following:

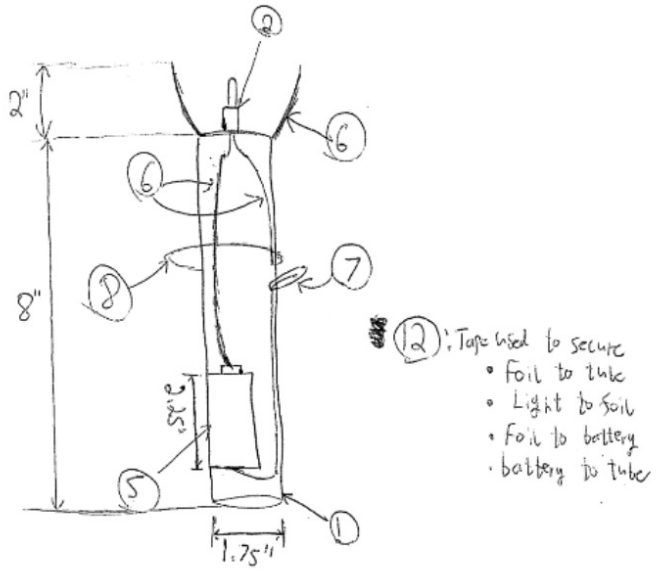
- Where will the Micro: bit go?
- What prototyping materials will you use?
- What are your inputs and outputs?
- How will you wire your design?
- Will your design have case to house the electronics?

Example	Sketch of Idea #1	Sketch of Idea #2	Sketch of Idea #3
			

Let’s look at an example of a budget

In step 5, you will decide what materials you need to build your prototype. The total cost of your materials must not add up to more than 500 VilCoins!

Here is an example of a budget from a similar student project. Here, students had a budget of 1,000 Pesos to build a flashlight out of household items.



FlashLight Material Costs

Item #	Item	Price	Per	Qty	Cost
1	Paper Towel Roll	$100	1 Roll	1	100
2	Copper Wire	$500	1 foot		
3	Christmas Light	$200	1 light	1	200
4	Incandescent Bulb	$250	1 light		
5	D battery	$350	1 battery	1	350
6	Aluminum Foil	$50	1 sq ft	2	100
7	Paper Clip	$50	1 clip	1	50
8	Rubber Band	$50	1 band	1	$50
9	Thumb Tack	$50	1 tack		
10	Construction Paper	$50	1 sheet		
11	Brass Fastener	$50	1 fastener		
12	Duct Tape	$75	1 ft	1	75
13	Scotch Tape	$50	1 ft		
14	Hot Glue Stick	$150	1 stick		
15	Foam cup	$100	1 cup		
16	Popsicle Stick	$25	1 stick		
17	Plastic Straw	$25	1 straw		
18	Toothpick	$25	1 toothpick		
19	Glow Sticks	SOLD OUT			
20	Flashlights	SOLD OUT			
			Total		925

Under budget!!!

Create your own budget!

Fill in the table below with the quantity and cost of the materials you need to build your prototype! Make sure your total cost is less than 500 VilCoins!

Here is an example of a budget for this project (yours can be completely different!)

Not sure what some of the components do (like the soil moisture probe, or RGB LED)? Click here for a complete guide on the sensors available.

Project 3 Prototype Budget
Amount to spend. 500 VilCoins

Item	**Cost (VilCoin)**	**Unit**	**Quantity**	**Total Cost**
Consturction Paper	5	1 sheet	3	15
Aluminum Foil	15	1 sheet	1	**15**
Cardboard	15	1 sheet	2	30
Hot Glue Stick	15	1 stick	2	30
Duct Tape	10	1 foot	3	30
Scotch Tape	10	1 foot		0
Popsicle Stick	5	1 stick		0
Pipe Cleaner	10	1 stick	2	20
String	5	1 foot		0
Rubbermaid	5	1 rubberband	2	10

Micro: bit	15	1 board	1	15
USB Cable	5	1 cable	1	5
Battery Pack w/ AA batteries	10	1 pack	1	10
Expansion Board	15	1 board	1	15
Wires	15	5 wires	3	45
Button Module	20	1 button	2	40
LED Module	25	1 LED	2	50
Servo Motor	40	1 servo		0
Passive Buzzer	20	1 buzzer	1	20
NeoPixel	50	1 neopixel	1	50
Touch Button	25	1 module	1	25
Soil Moisture Probe	40	1 probe		0
Water Level Sensor	40	1 sensor		0
RGB LED	35	1 LED		0
Ultrasonic Distance Sensor	45	1 sensor		0
PIR Motion Detector	30	1 sensor		0
Potentiometer	25	1 knob		0
Final Project Cost:				425

Item	**Cost**	**Unit**	**Quantity**	**Total Cost**
Construction paper	5	1 sheet		
Aluminum Foil	15	1 sheet		
Cardboard	15	1 sheet		
Hot glue stick	15	1 stick		
Duct tape	10	1 foot		

Scotch tape	10	1 foot		
Popsicle Stick	5	1 stick		
Pipe cleaner	10	1 stick		
String	5	1 foot		
Rubber band	5	1 rubber band		
Micro:bit	15	1 board		
USB Cable	5	1 cable		
Battery pack w/ AA batteries	10	1 pack		
Expansion Board	15	1 board		
Wires	15	5 wires		
Button Module	20	1 button		
LED Module	25	1 LED		
Servo Motor	40	1 Servo		
Passive Buzzer	20	1 buzzer		
Neo Pixel	50	1 neo pixel		
Touch Button	25	1 module		
Soil Moisture Probe	40	1 probe		
Water Level Sensor	40	1 sensor		
RGB LED	35	1LED		
Ultrasonic Distance Finder	45	1 sensor		
PIR Motion Detector	30	1 sensor		

Potentiometer	25	1 knob		
_____–	_____	_____	Final Project Cost:	

Total Cost

Answer the following questions:

A. What was your total cost?
B. Are you under the 500 Vicon budget?
C. Did you have to make any changes to your design based on the budget?

Optional Challenge

Do you have another idea for a Micro: bit prototype that could solve this problem? If so, draw it in the space below. If your original design doesn't work out, you can always use this one as a backup.

Documents / Resources

	ASU Smart Electronics Project [pdf] User Guide Smart Electronics Project, Smart, Electronics Project, Project