

Save Our Spine

Subject: Mathematics

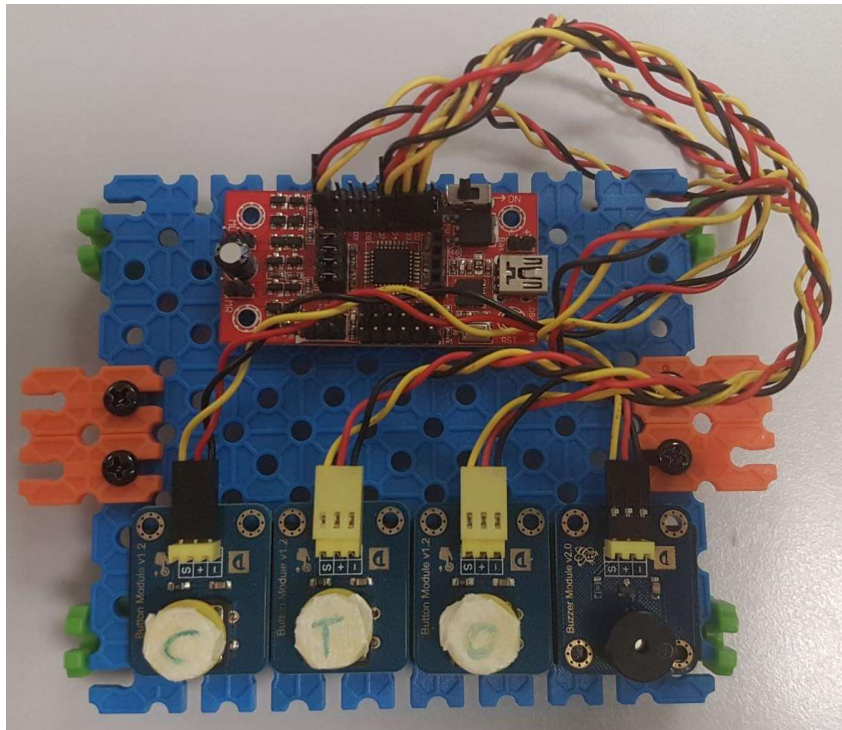
Level: Secondary 1 and 2

Unit: Inequalities & Percentages

Topic: Mathematic Calculations

Summary

The students have to work in group to make a weighing machine that helps parent to calculate their children's backpack as it is recommended that child's backpack should not weigh more than 20% of the child weight.

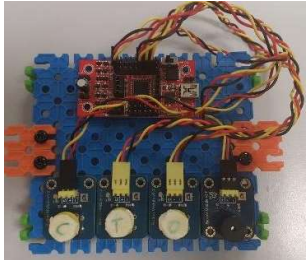


Prior Knowledge:	Students should already know: <ol style="list-style-type: none"> 1. Basic Coding Knowledge (eg. Scratch) 2. Understanding of Maths concepts 3. Simple usage of tool, Eg: Scissors, pen knife, glue etc.
Learning Objectives:	By the end of the lesson, students should be able to: <ol style="list-style-type: none"> 1. Learning GUI and Arduino software for arduino 2. Recognising different hardware and its usage 3. Write program using maths and logic concepts in Arduino

Lesson Plan

Time	Teacher Activities	Purpose	Resources Needed
Introduction/Pre-activity			
	<p>Mathematics topic</p> <p>Percentage: Students should be able to make the child's weight as a variable e.g. x and calculate 20% of x, which would give the max weight that the school bag can be.</p> <p>Inequalities: The weight of the school bag would need to be less than or equal to $0.2x$. Students should be able to understand the difference between $<$, $<=$, $>$ and $>=$ and be able to apply the correct inequality sign</p>	To let students to have basic knowledge of mathematics concepts so that they can apply knowledge while design Arduino to make the Maths class more interactive.	Text books and videos
Lesson development/Main activities			
Day 1 – 1 hr	<ul style="list-style-type: none"> • Introduction to Arduino and sample projects • Familiarising Arduino block program software 	To let students recognise <ul style="list-style-type: none"> • the different parts of the hardware • the GUI of Arduino programming software 	Sample project videos, PPT slides
Day 2 – 1 hr	<ul style="list-style-type: none"> • Controlling button and buzzer 	<ul style="list-style-type: none"> • Simple program to understand the use of buzzer and button • Changing the output based on the button inputs with a time interval 	PPT slides
Day 3 – 1 hr	<ul style="list-style-type: none"> • Introduction to loops and variables • Multiple button control 	To let students understand what are variables and conditional statements	PPT slides
Day 4 – 1 hr	<ul style="list-style-type: none"> • Tinkering process • Using recycled materials and connect to the appropriate pin in the Arduino 	To let students have a better understanding on how did the circuit work, troubleshooting on their program on why it is not working	NA
Day 5 - 1 hr	<ul style="list-style-type: none"> • Programming and troubleshooting • Develop logic and testing 	To let students have a better understanding on how did the circuit work, troubleshooting on their program on why it is not working	NA
Closure and consolidation/Post-activity			
15	Survey to ask if the students like		

Lesson Plan

minutes	the activity, what else will they like to learn		
Project 1	<p>Save our Spine Parents can calculate the weight of the school bag and a buzzing sound will be generated to alert parents if it's overweight for children.</p> 	Building block, Lego, tapes	Remarks / Tips to be shared

Contributed by:

Name of School: Yishun Secondary School

Name of Teacher (Optional):

Date: