Marvin's Marvellous Parts Bazaar

Parts	Supplier	SKU	List price	NZD $
Parts to Choose			**Plus shipping**	
Snap-Action Switch - 3 Pin SPDT	Pololu	#1403	US$0.95	0.90
QTR-8RC Reflectance Sensor	Pololu	#961	US$14.95	14.20
LV- MaxSonar- EZ1 - MB1010	Pololu	#726	US$29.95	28.45
Sharp 5cm Digital Distance Sensor	Pololu	#1132	US$6.95	6.60
Sharp 4-30cm Analogue Distance Sensor	Pololu	#1136	US$12.99	12.34
LDRs, LEDs, Phototransistors*	Element14	#	US$1-2	2
Parts Given				
Arduino Uno SMD	Sparkfun	DEV-10356	US$29.95	28.45
Ardumoto - motor driver	Sparkfun	DEV-09815	US$24.95	23.70
Tamiya 70097 Twin Motor gearbox (clear)	Pololu	# 1680	US$8.25	7.84
Brushed DC Motor 6V	Pololu	#1117	US$1.79	1.70
XBee			US$25.95	32.60
XBee Shield			US$24.95	31.17
Seeed kit			US$19.95	25.00

* LDRs, LEDs, Phototransistors are useful for simple encoders and phototaxis behaviour. Please see Jason with part numbers from Element14 (Farnell). note batteries may be upgraded to rechargables

DO NOT BUY ITEMS ABOVE YOURSELVES – HAND A LIST IN TO Arthur Your group must decide which parts you wish to purchase. Each group with have a set amount of ECS Dollars to spend at Marvin's Marvellous Parts Bazaar to buy the parts for their vehicle ($200 minus Given parts) = $90. You can not spend over your limit of ECS dollars. No more than 2 of any component can be bought without approval of design by Will, Arthur or Jason.
There are 5 dynamic competitions, plus points for recyclability and for aesthetics. The competition areas are set out in week 8 in CO145 so have a look at them before deciding which parts you want to buy.
There is example code for all of the sensors available or you can write you own – however if you do use the example code in your programs acknowledge the creator of code if it is listed. If it is not listed acknowledge the site you got the code from.
Additional items that you add to your vehicle, e.g. light dependent resistors, will be subtracted from the virtual dollars even though we will not provide you with any additional physical dollars!
Once your design is finalised, please present a signed part list with costings to Jason in order to obtain the items [**DO NOT BUY THEM YOURSELVES!**]
Teams may not trade parts with each other, but we will allow return of goods for credit (less depreciation) subject to no damage, so plan carefully

Arduino Instructions

The software that you will be using to write your programs under is called Arduino Sketch. The machines in CO145 will have it already installed, however you can also choose to install it on your own laptop or pc at home if you choose it can be downloaded from here
- http://arduino.cc/en/Main/Software. There are versions for Linux, Mac and Windows and code written on one version will work on the others.

```
//Feel free to use this code.
//Please be respectful by acknowledging the author in the code if you use or
modify it.
//Original Author: Bruce Allen
//Modified by: Jason Edwards
//Date: 1/12/10
```

Further clarification:

1. Purchase of parts not on the list. A main principle of this task is that we want good design to triumph over the ability to spend lots of money. The tasks are designed so that engineering trade-offs have to be made. We also have budget constraints! Thus, we have limited the amount of sensors available

2. There have been requests for LDRs - upon request in the next seven days we will order & purchase and the total will come off the virtual sensor budget.

3. There have been requests for Lego & Meccano - we will not buy or provide these items. However, they are acceptable for building the chassis, including the wheels, tracks or legs. Any sensor will be costed and taken off the virtual sensor budget. Any gearing, including motors and winches, will result in a $10 loss to the virtual budget.

4. Wheels, tracks and legs from other sources - (for some reason I find this the hardest question to answer) - on one hand, I do not want to buy wheels from the Engineering 101's actual budget as there are plenty of existing wheels that can be repurposed; on the other hand, I would like to see the variety of locomotion tried, e.g. tank tracks ($14-$20), but wheels ($4-$10) are cheaper. Thus, we will not purchase any locomotive parts, but we will look very favourably on designs other than wheels. They will not affect the virtual budget.

Sources for Tamiya tank tracks:
   • Modelcrafts and Hobbies - corner Dixon street and Victoria street
   • Jaycar.co.nz - search tamiya or go instore - taranaki street opposite welly high
   • Mindkits.co.nz - tamiya or look under mechanics
   • Pololu.com - mechanical components -> Wheels, tracks and castors or search tamiya
[note delays in shipping]

5. Weight of vehicle must remain the same for the drag race and for the lifting challenge. The weight must also start the same for the maze and slalom.

6. Timings: a maximum time of 3 minutes will be allowed for each participant in each event. There will be a Parc ferme between each event with only one minute allowed to change the configuration of the robot, including any reprogramming necessary (a series of switches may be easier to determine which mode the vehicle is in)

7. There have been many ingenious (bordering on the devious) suggestions for completing some of the events. Think of us like a customer who wants to buy a product rather than a sport! For example, our intention is to get a vehicle that can shift a mass, this should not be dependent on having an opposite edge of a table which the vehicle can drive off! We're glad people are thinking creatively, but remember to think globally what is needed rather than circumnavigate a stated proble, i.e. we do not want vehicles with long 'noses' so that they can cross the line faster in the drag race.

8. The vehicle must travel at least 5 cm in distance in order to lift the weight off the floor. Thus, winches cannot be used.

One final hint: integration, testing and refining normally takes up more than half of the design cycle!