Subsystem/ Function/ Feature Name:	pH Sensor
Date Completed:	2/17/18
Performed By:	Nate
Tested By:	Nate

Green - Passed	Red - Failed	Yellow - Not Completed
Concluded Condition of meeting Engineering Specification		

I. TESTING SPECIFICATION

Specification Number	Importance	Source	Function	Specification	Unit of Measure	Ideal Value	Acceptable Rang	Comments
S5	3	PRP	System	PH Levels	PH Scale 1 - 14	Depends	1- 14	Ideal value would be 7 (water)

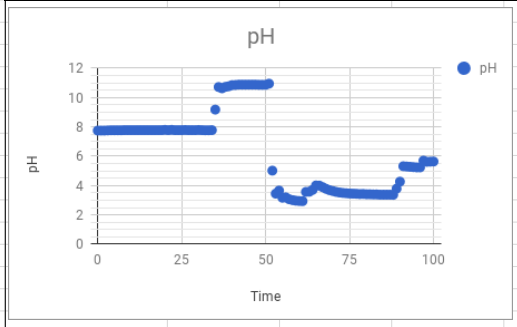
II. EQUIPMENT REQURIED

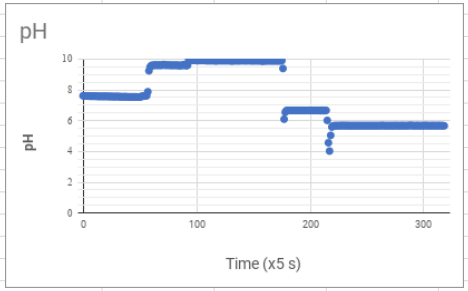
Specification Number	Equipment or Instrumentation required
S5	Water Resovoir, Nutrient Solution, Arduino Mega, Computer, PH Sensor, PH Mixing Kit

III. DATA COLLECTION STRATEGY

Specification Number	Data acquisition strategy
S5	This test will show how fast the pH sensor can detect changes in the water. The probe will read the pH every 5 seconds while sitting in a solution, after 25 measurements or so, the pH will be increased slowly and recorded 25 more time. It will be increased again and recorded 25 times and then will be decreased twice and recorded the same. This test will confirm both the accuracy of the probe as well as the response time. For each diferent pH level the solution wil be tested with indicator solution to coroborate the meter's result.

V. Results





VI. Conclusions

During this test, the functionality of the pH sensor was test to ensure if meets the accuracy and requirement specified in the engineering requirements. As shown in the graphs above, the sensor needed a few milliseconds to get an accurate reading if the pH of the solution abruptly changed. The meter's results matched closely with the color indicator.

IV. Raw Data

Time_1	pH_1	Time_2	pH_2
0	5.72	0	7.75
15	5.73	1	7.75
30	5.73	2	7.75
45	5.74	3	7.76
60	5.74	4	7.77
75	5.74	5	7.77
90	5.75	6	7.77
105	5.75	7	7.77
120	5.75	8	7.78
135	5.76	9	7.78
150	5.76	10	7.78
165	5.75	11	7.78
180	5.76	12	7.78
195	5.76	13	7.78
210	5.77	14	7.78
225	5.76	15	7.78
240	5.77	16	7.78
255	5.76	17	7.78
270	5.77	18	7.78
285	5.77	19	7.78
300	5.76	20	7.8
315	5.76	21	7.78
330	5.76	22	7.8
345	5.77	23	7.78
360	5.76	24	7.78
375	5.76	25	7.78
390	5.76	26	7.79
405	5.75	27	7.78
420	5.75	28	7.78
435	5.76	29	7.78
450	5.76	30	7.79
465	5.76	31	7.78
480	5.77	32	7.77
495	5.76	33	7.77
510	5.76	34	7.78
525	5.76	35	9.18
540	5.76	36	10.72
555	5.76	37	10.63
570	5.75	38	10.73
585	5.75	39	10.77
600	5.75	40	10.85
615	5.76	41	10.86
630	5.75	42	10.88
645	5.76	43	10.88
660	5.76	44	10.88
675	5.76	45	10.88
690	5.76	46	10.88
705	5.76	47	10.88

												720	5.76	48	10.87
												735	5.76	49	10.87
												750	5.76	50	10.87
												765	5.76	51	10.95
												780	5.76	52	5.02
												795	5.76	53	3.45
												810	5.76	54	3.66
												825	5.76	55	3.17
												840	5.76	56	3.2
												855	5.76	57	3.07
												870	5.76	58	3.01
												885	5.75	59	2.97
												900	5.76	60	2.95
												915	5.76	61	2.94
												930	5.75	62	3.57
												945	5.75	63	3.58
												960	5.76	64	3.71
												975	5.75	65	4.01
												990	5.76	66	4
												1005	5.75	67	3.89
												1020	5.76	68	3.78
												1035	5.75	69	3.69
												1050	5.76	70	3.63
												1065	5.76	71	3.57
												1080	5.76	72	3.53
												1095	5.76	73	3.5
												1110	5.76	74	3.48
												1125	5.76	75	3.46
												1140	5.76	76	3.45
												1155	5.76	77	3.44
												1170	5.76	78	3.42
												1185	5.75	79	3.43
												1200	5.76	80	3.41
												1215	5.76	81	3.41
												1230	5.76	82	3.4
												1245	5.76	83	3.4
												1260	5.75	84	3.38
												1275	5.76	85	3.38
												1290	5.75	86	3.38
												1305	5.75	87	3.38
												1320	5.76	88	3.37
												1335	5.76	89	3.79
												1350	5.75	90	4.27
												1365	5.75	91	5.32
												1380	5.75	92	5.3
												1395	5.76	93	5.28
														94	5.26
														95	5.24
														96	5.24
														97	5.7
														98	5.62
														99	5.63
														100	5.64