Plot Title: Library 312

#	Date Time, GMT-07:00	CO2, ppm (LGR S/	Host Connected (	Stopped (LGR S/I
1	4/1/2016 11:41:00	654.5		
2	4/1/2016 11:42:00	682.5		
3	4/1/2016 11:43:00	636.1		
4	4/1/2016 11:44:00	406		
5	4/1/2016 11:45:00	402.9		
6	4/1/2016 11:46:00	409.6		
7	4/1/2016 11:47:00	382.2		
8	4/1/2016 11:48:00	385.8		
9	4/1/2016 11:49:00	378.5		
10	4/1/2016 11:50:00	386.4		
11	4/1/2016 11:51:00	449.9		
12	4/1/2016 11:52:00	544.6		
13	4/1/2016 11:53:00	562.3		
14	4/1/2016 11:54:00	550.7		
15	4/1/2016 11:55:00	557.4		
16	4/1/2016 11:56:00	573.3		
17	4/1/2016 11:57:00	617.8		
18	4/1/2016 11:58:00	623.3		
19	4/1/2016 11:59:00	640.4		
20	4/1/2016 12:00:00	641		
21	4/1/2016 12:01:00	642.9		
22	4/1/2016 12:02:00	659.3		
23	4/1/2016 12:03:00	670.9		
24	4/1/2016 12:04:00	683.8		
25	4/1/2016 12:05:00	700.9		
26	4/1/2016 12:06:00	710.6		
27	4/1/2016 12:07:00	679.5		
28	4/1/2016 12:08:00	704.5		
29	4/1/2016 12:09:00	703.3		
30	4/1/2016 12:10:00	711.2		
31	4/1/2016 12:11:00	734.4		
32	4/1/2016 12:12:00	744.2		
33	4/1/2016 12:13:00	733.8		
34	4/1/2016 12:14:00	728.3		
35	4/1/2016 12:15:00	766.8		
36	4/1/2016 12:16:00	768		
37	4/1/2016 12:17:00	774.7		
38	4/1/2016 12:18:00	735.7		
39	4/1/2016 12:19:00	736.9		
40	4/1/2016 12:20:00	772.9		
41	4/1/2016 12:21:00	735.7		
42	4/1/2016 12:22:00	727.7		
43	4/1/2016 12:23:00	747.3		
44	4/1/2016 12:24:00	721.6		
45	4/1/2016 12:25:00	703.3		

46	4/1/2016 12:26:00	701.5		
47	4/1/2016 12:27:00	706.3		
48	4/1/2016 12:28:00	701.5		
49	4/1/2016 12:29:00	694.7		
50	4/1/2016 12:30:00	658.7		
51	4/1/2016 12:31:00	667.9		
52	4/1/2016 12:32:00	660		
53	4/1/2016 12:33:00	641		
54	4/1/2016 12:34:00	632.5		
55	4/1/2016 12:35:00	619.7		
56	4/1/2016 12:36:00	623.3		
57	4/1/2016 12:37:00	638.6		
58	4/1/2016 12:38:00	628.8		
59	4/1/2016 12:39:00	605.6		
60	4/1/2016 12:40:00	606.8		
61	4/1/2016 12:41:00	580		
62	4/1/2016 12:42:00	586.1		
63	4/1/2016 12:43:00	586.1		
64	4/1/2016 12:44:00	576.9		
65	4/1/2016 12:45:00	580		
66	4/1/2016 12:46:00	576.3		
67	4/1/2016 12:47:00	569.6		
68	4/1/2016 12:48:00	568.4		
69	4/1/2016 12:49:00	553.7		
70	4/1/2016 12:50:00	562.3		
71	4/1/2016 12:51:00	555.6		
72	4/1/2016 12:52:00	561.7		
73	4/1/2016 12:53:00	551.3		
74	4/1/2016 12:54:00	541.5		
75	4/1/2016 12:55:00	553.7		
76	4/1/2016 12:56:00	553.1		
77	4/1/2016 12:57:00	543.3		
78	4/1/2016 12:58:00	529.3		
79	4/1/2016 12:59:00	584.2		
80	4/1/2016 13:00:00	559.8		
81	4/1/2016 13:01:00	428		
82	4/1/2016 13:02:00	404.8		
83	4/1/2016 13:03:00	434.1		
84	4/1/2016 13:04:00	366.9		
85	4/1/2016 13:05:00	389.5		
86	4/1/2016 13:05:00		Logged	
87	4/1/2016 13:06:00			Logged

End Of File (LGR S/N: 9789942)

Logged

Margaret Koval
ENGR 115
Friday 11-150 Lab
1-Apr-16

Input Parameters	
Measured Coutdoor	408
Assumed Coutdoor	400
Correction Factor	-8

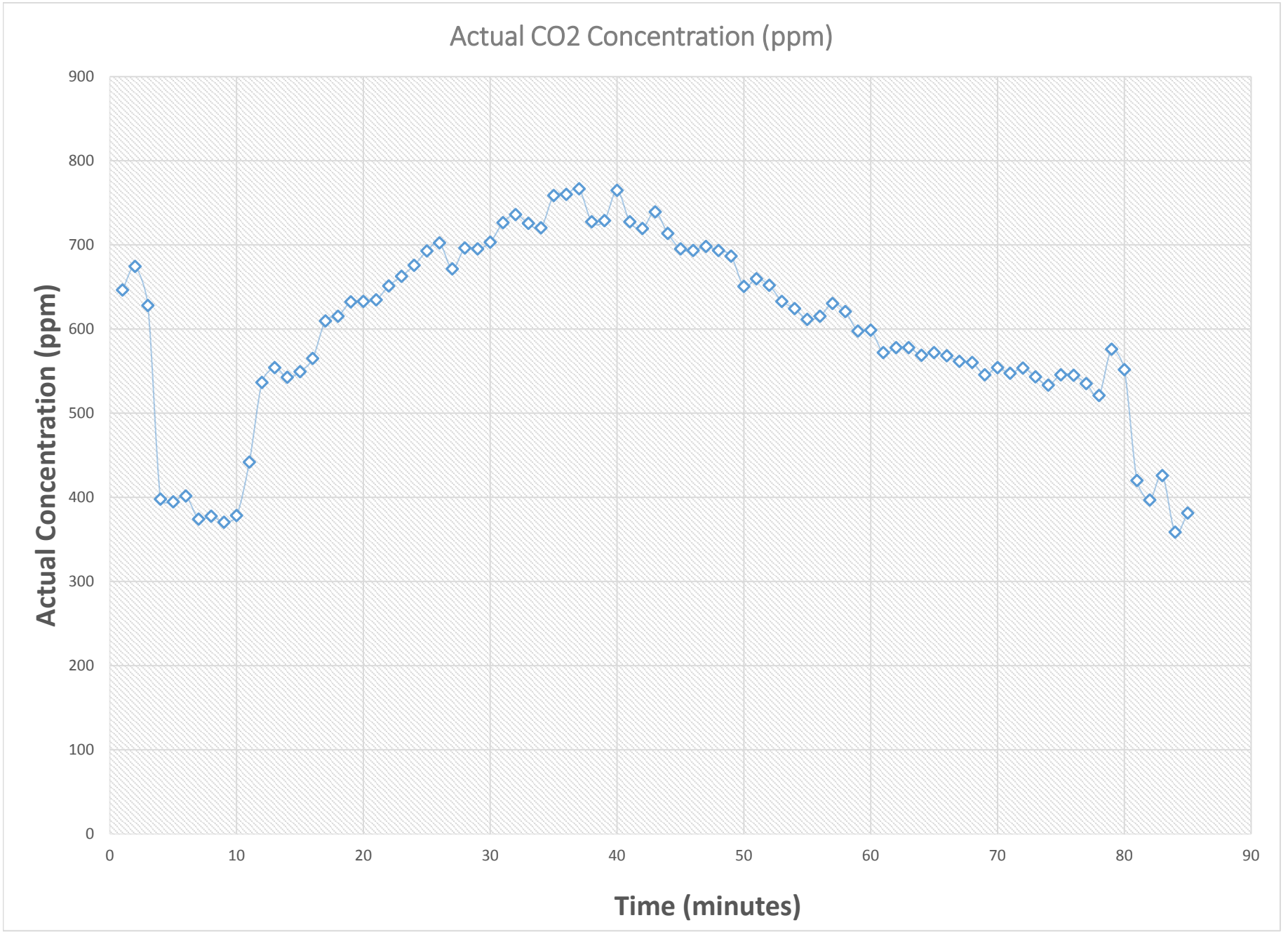
Analysis

Measurement	Date Time, GMT-07:00	Hobo CO2 Concentration
1	4/1/2016 11:41:00	654.5
2	4/1/2016 11:42:00	682.5
3	4/1/2016 11:43:00	636.1
4	4/1/2016 11:44:00	406
5	4/1/2016 11:45:00	402.9
6	4/1/2016 11:46:00	409.6
7	4/1/2016 11:47:00	382.2
8	4/1/2016 11:48:00	385.8
9	4/1/2016 11:49:00	378.5
10	4/1/2016 11:50:00	386.4
11	4/1/2016 11:51:00	449.9
12	4/1/2016 11:52:00	544.6
13	4/1/2016 11:53:00	562.3
14	4/1/2016 11:54:00	550.7
15	4/1/2016 11:55:00	557.4
16	4/1/2016 11:56:00	573.3
17	4/1/2016 11:57:00	617.8
18	4/1/2016 11:58:00	623.3
19	4/1/2016 11:59:00	640.4
20	4/1/2016 12:00:00	641
21	4/1/2016 12:01:00	642.9
22	4/1/2016 12:02:00	659.3
23	4/1/2016 12:03:00	670.9
24	4/1/2016 12:04:00	683.8
25	4/1/2016 12:05:00	700.9
26	4/1/2016 12:06:00	710.6
27	4/1/2016 12:07:00	679.5
28	4/1/2016 12:08:00	704.5
29	4/1/2016 12:09:00	703.3
30	4/1/2016 12:10:00	711.2
31	4/1/2016 12:11:00	734.4
32	4/1/2016 12:12:00	744.2
33	4/1/2016 12:13:00	733.8
34	4/1/2016 12:14:00	728.3
35	4/1/2016 12:15:00	766.8
36	4/1/2016 12:16:00	768
37	4/1/2016 12:17:00	774.7
38	4/1/2016 12:18:00	735.7
39	4/1/2016 12:19:00	736.9

40	4/1/2016 12:20:00	772.9
41	4/1/2016 12:21:00	735.7
42	4/1/2016 12:22:00	727.7
43	4/1/2016 12:23:00	747.3
44	4/1/2016 12:24:00	721.6
45	4/1/2016 12:25:00	703.3
46	4/1/2016 12:26:00	701.5
47	4/1/2016 12:27:00	706.3
48	4/1/2016 12:28:00	701.5
49	4/1/2016 12:29:00	694.7
50	4/1/2016 12:30:00	658.7
51	4/1/2016 12:31:00	667.9
52	4/1/2016 12:32:00	660
53	4/1/2016 12:33:00	641
54	4/1/2016 12:34:00	632.5
55	4/1/2016 12:35:00	619.7
56	4/1/2016 12:36:00	623.3
57	4/1/2016 12:37:00	638.6
58	4/1/2016 12:38:00	628.8
59	4/1/2016 12:39:00	605.6
60	4/1/2016 12:40:00	606.8
61	4/1/2016 12:41:00	580
62	4/1/2016 12:42:00	586.1
63	4/1/2016 12:43:00	586.1
64	4/1/2016 12:44:00	576.9
65	4/1/2016 12:45:00	580
66	4/1/2016 12:46:00	576.3
67	4/1/2016 12:47:00	569.6
68	4/1/2016 12:48:00	568.4
69	4/1/2016 12:49:00	553.7
70	4/1/2016 12:50:00	562.3
71	4/1/2016 12:51:00	555.6
72	4/1/2016 12:52:00	561.7
73	4/1/2016 12:53:00	551.3
74	4/1/2016 12:54:00	541.5
75	4/1/2016 12:55:00	553.7
76	4/1/2016 12:56:00	553.1
77	4/1/2016 12:57:00	543.3
78	4/1/2016 12:58:00	529.3
79	4/1/2016 12:59:00	584.2
80	4/1/2016 13:00:00	559.8
81	4/1/2016 13:01:00	428
82	4/1/2016 13:02:00	404.8
83	4/1/2016 13:03:00	434.1
84	4/1/2016 13:04:00	366.9
85	4/1/2016 13:05:00	389.5
86	4/1/2016 13:05:00	
87	4/1/2016 13:06:00	

Actual CO2 Concentration (ppm)		
646.5		
674.5		
628.1		
398		
394.9		
401.6		
374.2		
377.8		
370.5		
378.4		
441.9		
536.6		
554.3		
542.7		
549.4		
565.3		
609.8		
615.3		
632.4		
633		
634.9		
651.3		
662.9		
675.8		
692.9		
702.6		
671.5		
696.5		
695.3		
703.2		
726.4		
736.2		
725.8		
720.3		
758.8		
760		
766.7		
727.7		
728.9		

764.9		
727.7		
719.7		
739.3		
713.6		
695.3		
693.5		
698.3		
693.5		
686.7		
650.7		
659.9		
652		
633		
624.5		
611.7		
615.3		
630.6		
620.8		
597.6		
598.8		
572		
578.1		
578.1		
568.9		
572		
568.3		
561.6		
560.4		
545.7		
554.3		
547.6		
553.7		
543.3		
533.5		
545.7		
545.1		
535.3		
521.3		
576.2		
551.8		
420		
396.8		
426.1		
358.9		
381.5		
Logged		
	Logged	Logged


Actual CO2 Concentration (ppm)
Actual Concentration (ppm)
900
800
700
600
500
400
300
200
100
0
0
10
20
30
40
50
60
70
80
90
Time (minutes)

Margaret Koval
ENGR 115
Friday 11-150 Lab
8-Apr-16

Input Parameters	
Measured Coutdoor(ppm)	408
Assumed Coutdoor(ppm)	400
Correction Factor(ppm)	-8
Room Volume(ft^3)	2194.5
Room Capacity(people)	4
1 hour = x minutes	60

Calculations:	
Air Exchange Rate(1/hr)	1.584
Time to remove non-reactive chemical (hr)	1.894
Ventialation Rate(ft3/min/person	14.486

Measurement	Date Time, GMT-07:00
0	4/1/2016 12:17:00
1	4/1/2016 12:18:00
2	4/1/2016 12:19:00
3	4/1/2016 12:20:00
4	4/1/2016 12:21:00
5	4/1/2016 12:22:00
6	4/1/2016 12:23:00
7	4/1/2016 12:24:00
8	4/1/2016 12:25:00
9	4/1/2016 12:26:00
10	4/1/2016 12:27:00
11	4/1/2016 12:28:00
12	4/1/2016 12:29:00
13	4/1/2016 12:30:00
14	4/1/2016 12:31:00
15	4/1/2016 12:32:00
16	4/1/2016 12:33:00
17	4/1/2016 12:34:00
18	4/1/2016 12:35:00
19	4/1/2016 12:36:00
20	4/1/2016 12:37:00
21	4/1/2016 12:38:00
22	4/1/2016 12:39:00
23	4/1/2016 12:40:00
24	4/1/2016 12:41:00
25	4/1/2016 12:42:00
26	4/1/2016 12:43:00

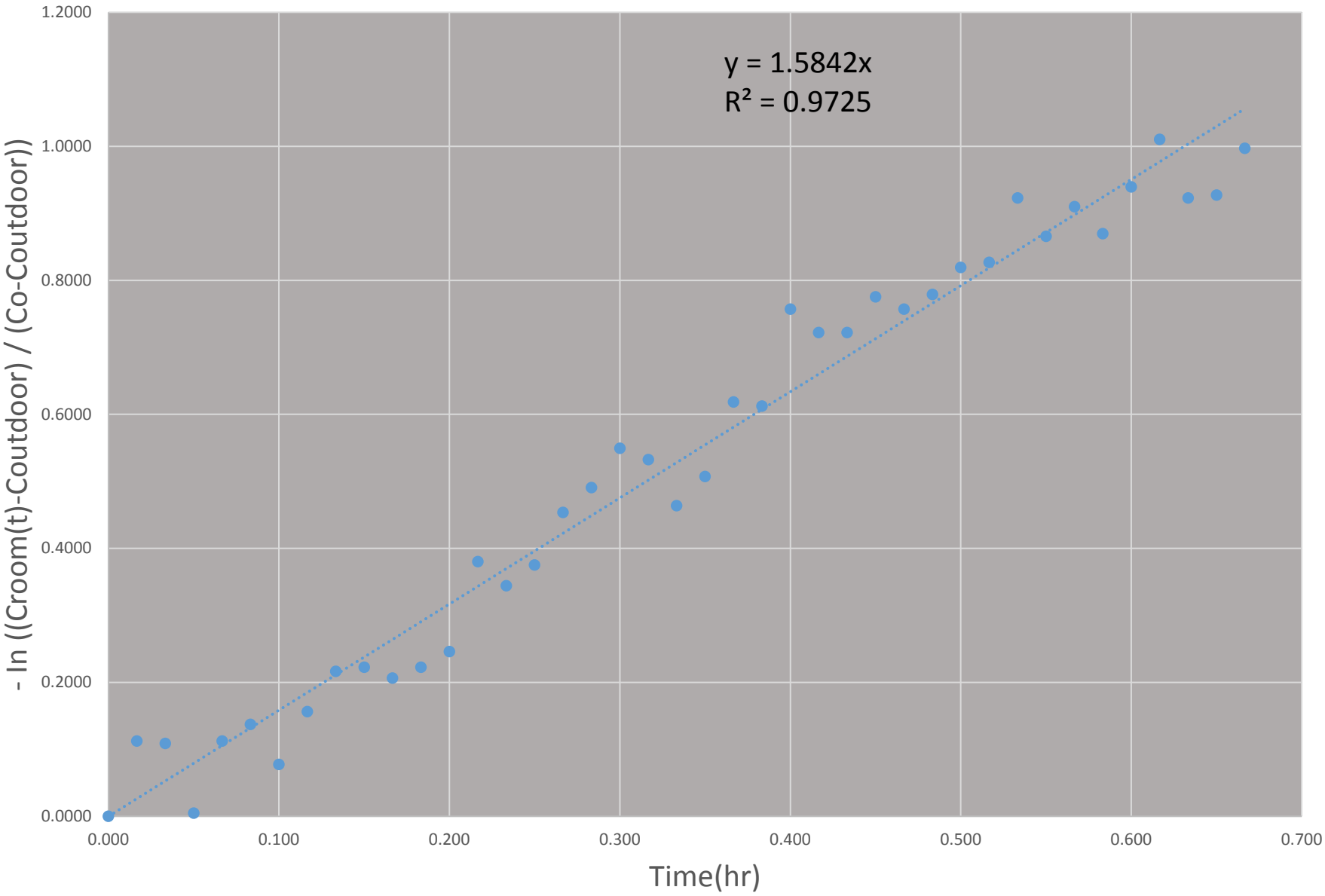
27	4/1/2016 12:44:00
28	4/1/2016 12:45:00
29	4/1/2016 12:46:00
30	4/1/2016 12:47:00
31	4/1/2016 12:48:00
32	4/1/2016 12:49:00
33	4/1/2016 12:50:00
34	4/1/2016 12:51:00
35	4/1/2016 12:52:00
36	4/1/2016 12:53:00
37	4/1/2016 12:54:00
38	4/1/2016 12:55:00
39	4/1/2016 12:56:00
40	4/1/2016 12:57:00

Hobo CO2 Concentration	Actual CO2 Concentration (ppm)
774.7	766.7
735.7	727.7
736.9	728.9
772.9	764.9
735.7	727.7
727.7	719.7
747.3	739.3
721.6	713.6
703.3	695.3
701.5	693.5
706.3	698.3
701.5	693.5
694.7	686.7
658.7	650.7
667.9	659.9
660	652
641	633
632.5	624.5
619.7	611.7
623.3	615.3
638.6	630.6
628.8	620.8
605.6	597.6
606.8	598.8
580	572
586.1	578.1
586.1	578.1

576.9	568.9
580	572
576.3	568.3
569.6	561.6
568.4	560.4
553.7	545.7
562.3	554.3
555.6	547.6
561.7	553.7
551.3	543.3
541.5	533.5
553.7	545.7
553.1	545.1
543.3	535.3

Experiment Time(hr)	- ln ((Croom(t)-Coutdoor) / (Co-Coutdoor))
0.000	0.0000
0.017	0.1124
0.033	0.1088
0.050	0.0049
0.067	0.1124
0.083	0.1372
0.100	0.0777
0.117	0.1564
0.133	0.2166
0.150	0.2227
0.167	0.2064
0.183	0.2227
0.200	0.2461
0.217	0.3803
0.233	0.3442
0.250	0.3751
0.267	0.4535
0.283	0.4907
0.300	0.5494
0.317	0.5325
0.333	0.4639
0.350	0.5073
0.367	0.6183
0.383	0.6122
0.400	0.7570
0.417	0.7222
0.433	0.7222

0.450	0.7752
0.467	0.7570
0.483	0.7788
0.500	0.8194
0.517	0.8269
0.533	0.9230
0.550	0.8656
0.567	0.9100
0.583	0.8695
0.600	0.9396
0.617	1.0104
0.633	0.9230
0.650	0.9271
0.667	0.9970


Air Exchange Rate for the Library Study Room
y = 1.5842x
R² = 0.9725
- ln ((Croom(t)-Coutdoor) / (Co-Coutdoor))
1.2000
1.0000
0.8000
0.6000
0.4000
0.2000
0.0000
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
Time(hr)

CO2 Lab Questions:

What is the air exchange rate (λ) of the room you tested? Be sure to include the units for the air exch

--The air exchange rate is 1.5482/hr.

In general it takes 3/λ hours to remove a non-reactive chemical from indoor air. Based on this time, w to the occupants of the room?

--Since it takes about 1.9 hours to remove a non-reactive chemical from indoor air, I would recommer open a window to help speed up the process.

Compare your ventilation rate for a typical number of occupants to the ASHRAE recommended ventila the occupants wasting energy heating and cooling the air or are the occupants being too cheap and n answer.

--The ventilation rate I calculated was 14.486 ft3/min/person and the ASHRAE recommended ventilati calculated ventilation rate just meets the recommended rate, and therefore not supplying enough air

Given the ASHRAE standard ventilation standard, what is the maximum number of people you would time? Use your model to determine this number.

--Following the ventilation standard, I used the volume of the room 2194ft3 and then divided it by 15ft3/min/p divide that by 60 minutes. My final answer was 2.43, and therefore the room should really only be occupied by

ange rate in your answer.

hat recommendations would you make

ıd that the occupants of a room should

ation rate. Based on this comparison, are
ot supplying enough air? Justify your

ion rate is 15ft3/min/person. The
.

recommend having in this room at one

person to get 146.27min/person and then
/ 2 people at one time.