

# Engineering Notebook

# Engineering Notebook Sections

- Title Page
- Table of Contents
- General Chronological Entries

2	Updating Schedule, Research Pool Chemicals	9-16-10
3	Group Meeting, Research Total Alkalinity	9-17-10
4	System Sketch, Research Chlorine	9-20-10
5	Product Specifications, Chlorine Specifications	9-21-10
6	Temperature Research	9-22-10
7	Solubility Research	9-23-10
8	Borax Research	9-24-10
9	Ideal chemical levels Research	9-27-10
10	Brainstorm and Research Power Systems	9-28-10
11	Brainstorm pH Specifications, Chlorine Matrix	9-29-10
12	Sodium Dichloroisocyanurate Anhydrous Research	9-30-10
13	pH Sensor Research	10-1-10
14	Chlorine : pH Buffer Decisions, Alkalinity Testing Research	10-4-10
15	pH down Decision, Alkalinity Testing Research	10-5-10
	Calcium Hardness Testing Research	10-6-10
	Water Hardness Up/Down Decisions	10-7-10
	Valve Research	10-12-10
	Valve Research	10-13-10
	Chlorine Sensor Specifications, Valve Research	10-14-10
	Valve Research	10-15-10
	Valve, Actuator Research	10-18-10
	Specifications, Solenoid valve Research	10-19-10
	Update, Solenoid Valve Research	10-20-10
	Research	10-21-10
	Applications	10-22-10
	Research	10-25-10
	ns	10-26-10
		10-27-10
	Box Diagram	10-28-10
	Research, TA matrices	10-29-10

# Standard Page Layout

- Quad ruled paper
- All pages are
  - Numbered
  - Dated
  - Signed by the designer

Found on: [www.backyardcitypools.com/chemicals/Ideal-Chemical-Lewis.htm](http://www.backyardcitypools.com/chemicals/Ideal-Chemical-Lewis.htm). (References 2).

• To increase the amount of stabilizer add cyanuric acid.

Increase	10K	15K	20K	25K	30K	35K	40K	45K	50K
10ppm	1.75	1.25	2.0	1.75	2.5	3.0	3.25	3.75	4.25
20ppm	1.75	2.5	4.0	3.25	5.0	5.75	6.25	7.5	8.25
30ppm	2.5	3.75	6.25	5.0	7.5	8.75	10.0	11.25	12.5
40ppm	3.25	5.0	8.25	6.75	10.0	11.5	13.25	15.0	16.5

• All increases are in pounds

• Found on: [www.backyardcitypools.com/chemicals/Raising-Stabilizer.htm](http://www.backyardcitypools.com/chemicals/Raising-Stabilizer.htm). (References 3).

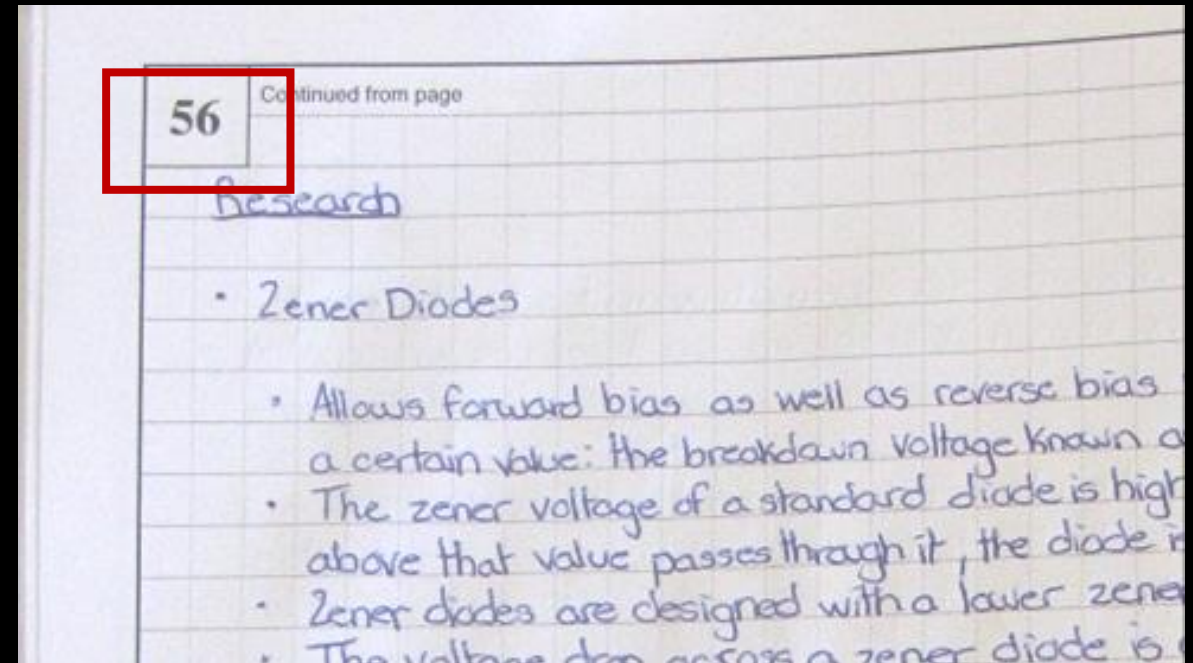
Increase	10K	15K	20K	25K	30K	35K	40K	45K	50K
10ppm	1.75	1.88	2.5	3.13	3.75	4.38	5.0	5.63	6.25
20ppm	2.5	3.75	5.0	6.25	7.5	8.75	10.0	11.25	12.5
30ppm	3.75	5.63	7.5	9.38	11.25	13.13	15.0	16.88	18.75
40ppm	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0
50ppm	6.25	9.38	12.5	15.63	18.75	21.88	25.0	28.13	31.25
60ppm	7.5	11.25	15.0	18.75	22.5	26.25	30.0	33.75	37.5
70ppm	8.75	13.13	17.5	21.88	26.25	30.63	35.0	39.38	43.75
80ppm	10.0	15.0	20.0	25.0	30.0	35.00	40.0	45.0	50.0

Increases are in pounds

[www.backyardcitypools.com/chemicals/Raising-Stabilizer.htm](http://www.backyardcitypools.com/chemicals/Raising-Stabilizer.htm)

# Best Practices

- All work is in pen.
- Markers that bleed through the paper are not used.
- Pages are sequentially numbered in ink on the top outside edge.
- Notebooks are bound.
  - Cannot add pages
  - Cannot remove pages



# Best Practices

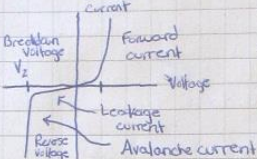
- Entries begin at the top of the page, working left-to-right and top-to-bottom
- Do not leave blank space. If there is extra space, draw an X or a line across it and sign.

Christopher B. Deumel

56 Continued from page

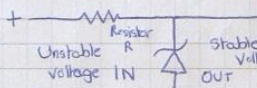
Research

- Zener Diodes
  - Allows forward bias as well as reverse bias when the voltage is above a certain value: the breakdown voltage known as the zener voltage
  - The zener voltage of a standard diode is high, but if a reverse current above that value passes through it, the diode is permanently damaged
  - Zener diodes are designed with a lower zener voltage
  - The voltage drop across a zener diode is equal to the zener voltage regardless of how high the reverse bias voltage is.



- The voltage vs. current graph shows forward bias as well as reverse bias when the voltage overcomes the breakdown voltage ( $V_Z$ ).

- Zener diodes can be used to regulate voltage



- The output voltage is fixed at the zener voltage of the zener diode used

- As the input voltage increases, the current passing through the zener diode increases, but the output voltage remains constant.

- Found on [www.reuk.co.uk](http://www.reuk.co.uk) (Reference 84)

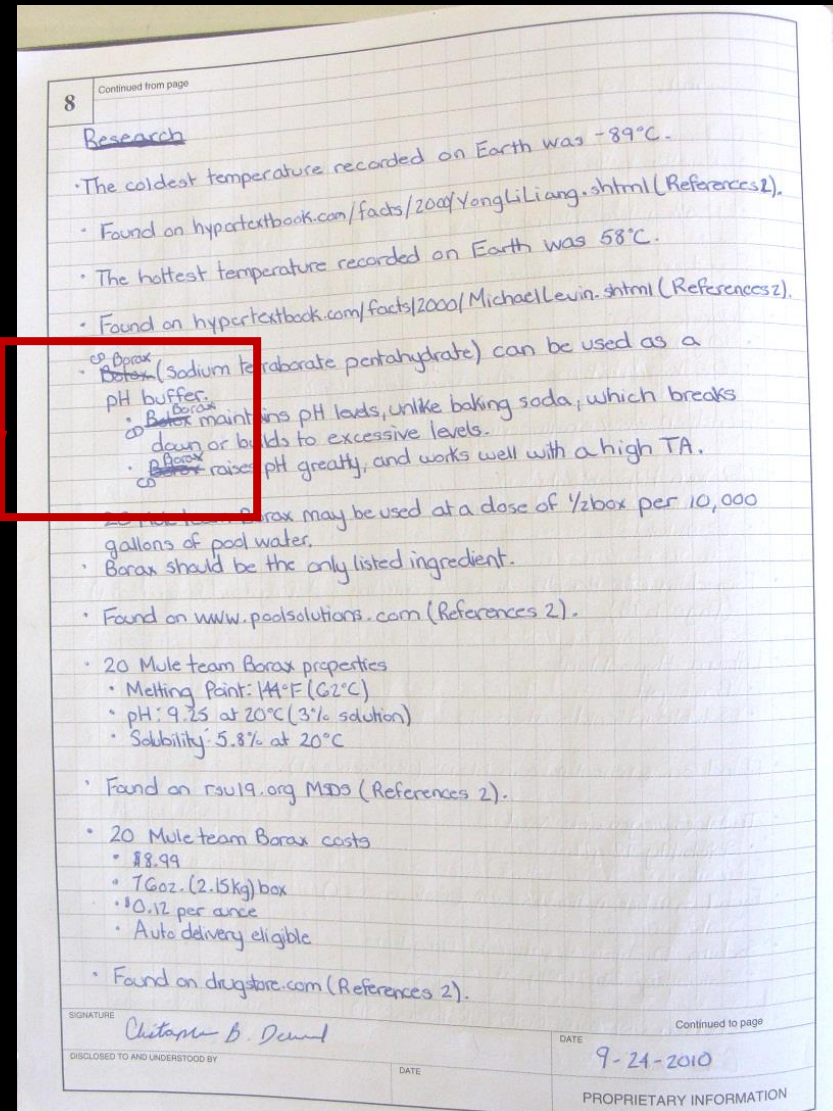
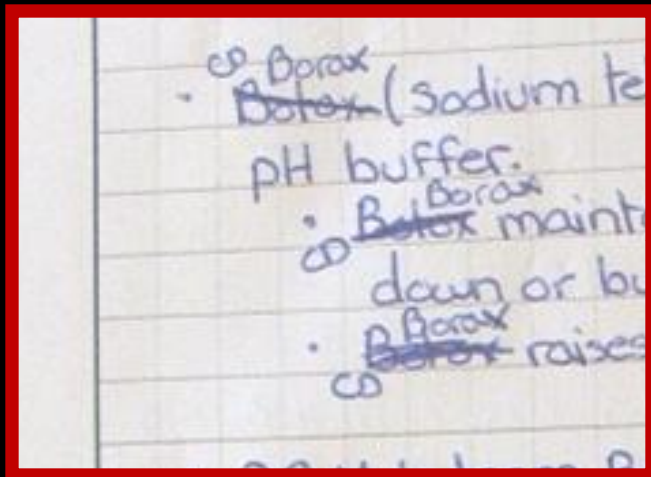
Christopher B. Deumel

SIGNATURE Christopher B. Deumel DATE 12-9-10

DISCLOSED TO AND UNDERSTOOD BY DATE PROPRIETARY INFORMATION

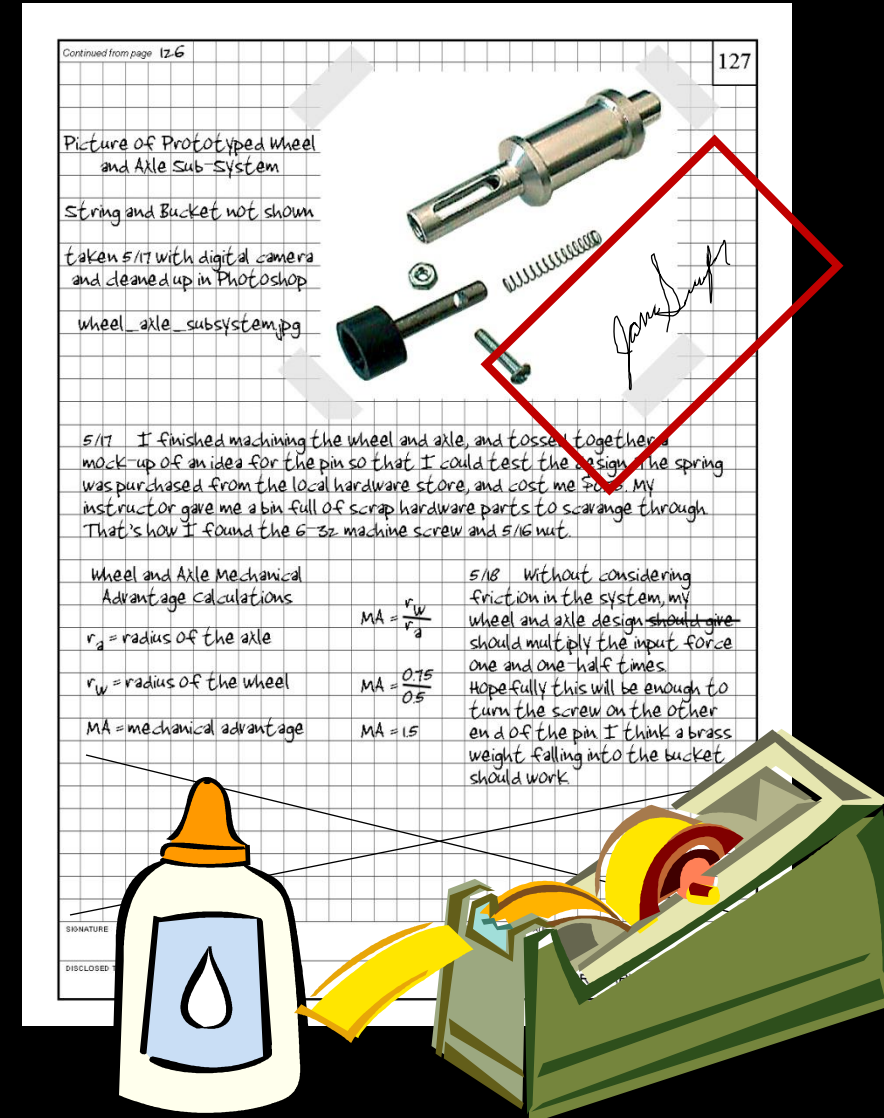
# Best Practices

- If you make a mistake, draw a line through it, enter the correct information, and initial the change.
- Never erase or remove anything.



# Best Practices

- Inserted items are permanently attached
  - No loose leaf items
- Sign your name so that it extends across both the notebook page and the inserted document.



## Best Practices

		Continued on page 126
SIGNATURE <i>William P. Johnson</i>		DATE <i>12-16-11</i>
DISCLOSED TO AND UNDERSTOOD BY <i>Jason Clark</i>	DATE <i>12-16-11</i>	PROPRIETARY INFORMATION

- Sign and date each page before the next page is started.
- Store the notebook in a safe location.

# Best Practices

Be **NEAT**,  
be **ACCURATE**,  
be **LEGIBLE**,  
and be **THOROUGH**.