Capstone Project I

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A note for the Coding Temple instructor

My coding journey began when my boss, the curriculum director for a small, rural public school district asked me the question:

Why does our data collection tool suck?

I won't map out exactly how arrived here from there, however, I think my relationship to the data I am presenting is important.

I am not an educator and I do not have K-12 education experience in any professional capacity. Quite frankly, before starting this project I didn't really understand these numbers at all.

In my role as the curriculum director's assistant, however, I am regularly given lengthy documents full of complex ideas and asked to turn them into guides, manuals and graphics for educators to use. This presentation will feature some of those graphics and they'll be clearly labeled as such. All other data, numbers and visualizations, however, were developed for this project.

Furthermore, as my own boss is knowledgeable about what this data means, the hypothetical audience for this project will be her bosses- the members of the school board.

Thank you,

Liz Francese

AimsWeb Data

Understanding WCSU's Primary Benchmark Assessment Tool

Introduction

As a public school district, we rely on assessment data so that teachers can provide the most effective differentiated instruction with the least amount of disturbance.

AIMsWeb is our largest and most widely used benchmark assessment. It is taken by all students in grades K-8 in the fall, winter and spring.

Goals for analyzing AimsWeb data:

- Visualize math and literacy scores across grade levels, schools and classrooms
- Get a clear indication of student skill tiers at a glance
- Find trends to aid in lesson planning, professional development and intervention
- Protect student identities so as to reduce stigma
- Analyze data as a subset of all assessments and progress monitoring tools*

*This goal will be met at a later date (maybe in Capstone II)

Battery Score

Assessments differ from other types of testing in the use of **norms or standardization**. Unlike scoring a quiz out of 100 or grading on a curve, an assessment conduct a **standardization study** hat controls for various demographics to determine how students are scored.

When analyzing this data, we'll start by looking at the **battery or composite scores** which use research based formulas to combine scores from various skills tested. The resulting score is a measure of skill in math and literacy more broadly.

The AIMSWeb formula for composite scores can be seen to the right. Fortunately, these scores are already included in the data set extracted from their database.

The first line shows that a Kindergartener's overall Early Literacy score (only calculated in 2 & 3 trimesters of the school year), is determined by adding together scores from the **Letter Naming Fluency, Letter Word Sounds Fluency and Phoneme Segmentation** test sections.

Subject	Grade	Season	Composite
Early Literacy	K	W, S	LNF + LWSF + PS
Early Literacy	I	F	LWSF + ORF
Reading	2–3	F, W, S	(1/2*ORF) + VO + RC
Reading	4–8	F, W, S	(1/2*SRF) + VO + RC
Early Numeracy	K	F	(1/3*NNF) + QTF + CA
Early Numeracy	K	W, S	(1/3*NNF) + QTF + CA + QDF
Early Numeracy	I	F	NCF–P + MFF–1D + CA
Early Numeracy	I	W, S	NCF–P + MFF–1D + CA + MFF–T
Math	2–8	F, W, S	(NCF–T + MCF) + CA

Battery Scores in Dataset

Right: Sample from AimsWeb

The column labeled 'IsBatteryScore' indicates if the row will results from individual tests or the student's composite scores.

Rows 8, 11 and 14 in this sample are composite or battery scores.

```
aims_23[['IsBatteryScore','MeasureName']].head(20)
```

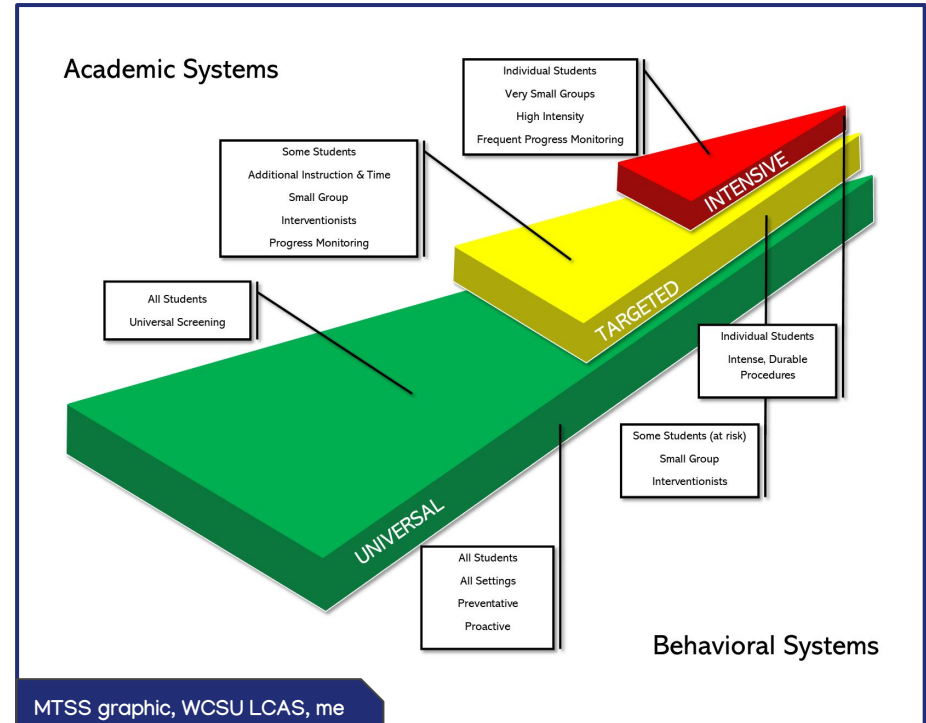|	IsBatteryScore	MeasureName
0	0	Number Sense Fluency
1	0	Concepts & Applications
2	0	Silent Reading Fluency
3	0	Vocabulary
4	0	Mental Computation Fluency
5	0	Number Comparison Fluency-Triads
6	0	Concepts & Applications
7	0	Vocabulary
8	1	Reading
9	0	Oral Reading Fluency
10	0	Reading Comprehension
11	1	Math
12	0	Number Sense Fluency
13	0	Mental Computation Fluency
14	1	Math
15	0	Oral Reading Fluency

Sample shows first 20 of 15,053 rows

Multi-tiered Systems of Support

The final piece needed to understand the AimsWeb scoring system is the concept of multi-tiered systems of support.

As the diagram to right demonstrates, MTSS looks at various components of the student's assessment results and breaks those results/skills into three tiers, which determine the level of intervention needed in the child's learning or emotional support system.

Students are not classified by their tier name or color. Tiers simply refer to a point in time assessment of a necessary component of a student's academic performance or, as seen to the right, their social and emotional health.
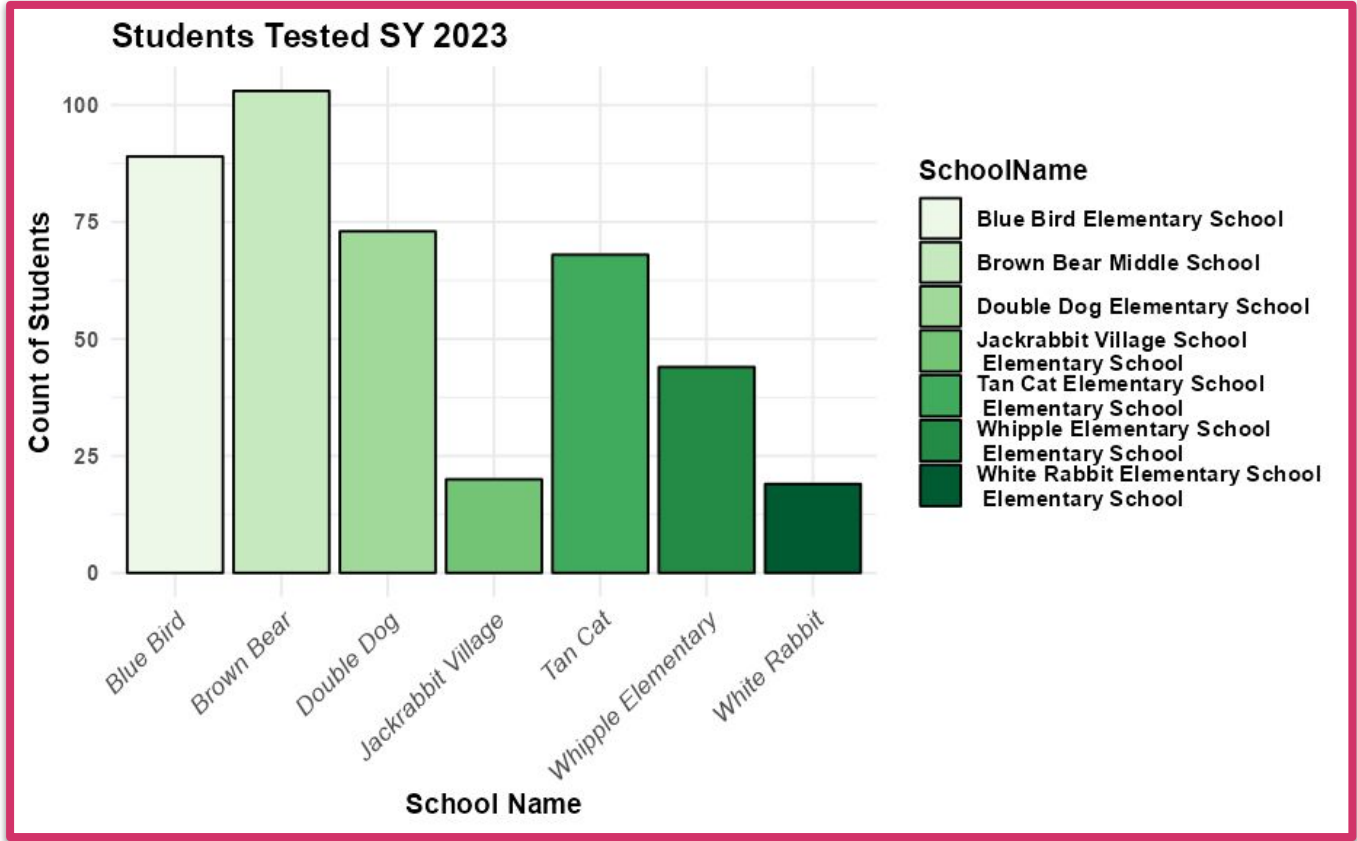
When looking at the data, **Tier 1, Tier 2 and Tier 3** will also be referred to as **Low**, **Moderate** and **High** Risk.
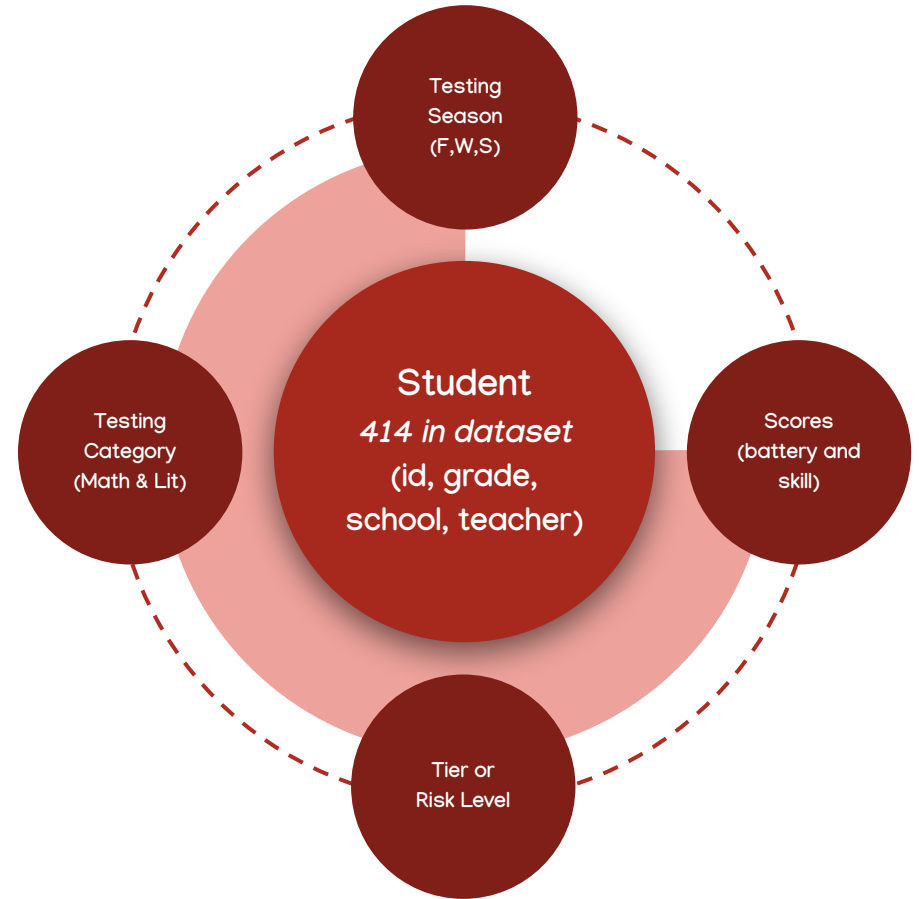

Academic Systems

Individual Students
Very Small Groups
High Intensity
Frequent Progress Monitoring

Some Students
Additional Instruction & Time
Small Group
Interventionists
Progress Monitoring

All Students
Universal Screening

INTENSIVE

TARGETED

Individual Students
Intense, Durable Procedures

Some Students (at risk)
Small Group
Interventionists

UNIVERSAL

All Students
All Settings
Preventative
Proactive

Behavioral Systems

MTSS graphic, WCSU LCAS, me

Data Structure

Data Demographics

Students Tested SY 2023

Count of Students (y-axis): 0, 25, 50, 75, 100

School Name (x-axis): Blue Bird, Brown Bear, Double Dog, Jackrabbit Village, Tan Cat, Whipple Elementary, White Rabbit

SchoolName
- Blue Bird Elementary School
- Brown Bear Middle School
- Double Dog Elementary School
- Jackrabbit Village School Elementary School
- Tan Cat Elementary School Elementary School
- Whipple Elementary School Elementary School
- White Rabbit Elementary School Elementary School

Data Structure

Testing
Season
(F,W,S)

Student
414 in dataset
(id, grade,
school, teacher)

Testing
Category
(Math & Lit)

Scores
(battery and
skill)

Tier or
Risk Level

High Level View

Risk Levels, Testing Periods & Measures

The data in the first table shows how our students 'risk levels' or tiers came out on each type of assessment. The LOW portion should be at least half of the students.

To the right, we can see that the number of assessments in math and literacy at 'high risk' drops over time, which is the desired output.
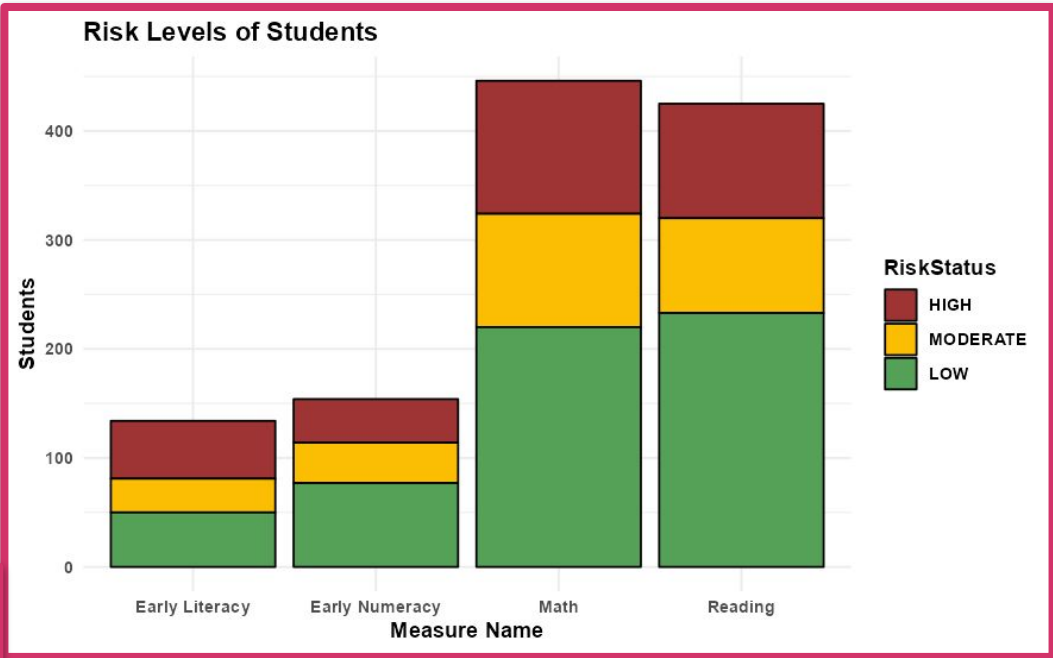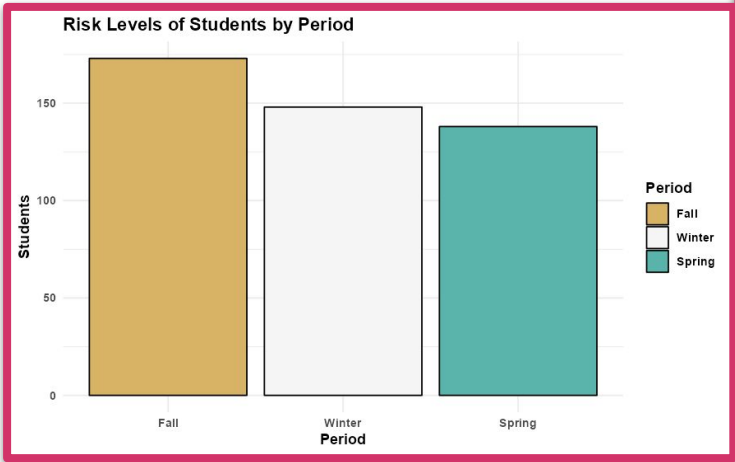
22–23 Student Battery Scores by "Risk Level"

Zooming in and looking at just high risk scores in the Spring, it's clear that first grade literacy continues to needs investigating.
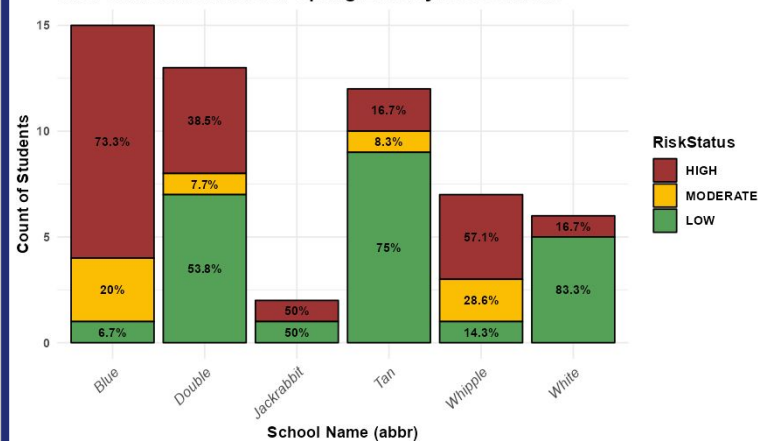
School Level View

Now we can clearly see that students at Jackrabbit, Whipple and Blue Bird Elementary Schools have at least 50% of their 1st grade students at high risk in literacy even at the end of the year.

First Grader Risk Level in Spring Literacy Assessments

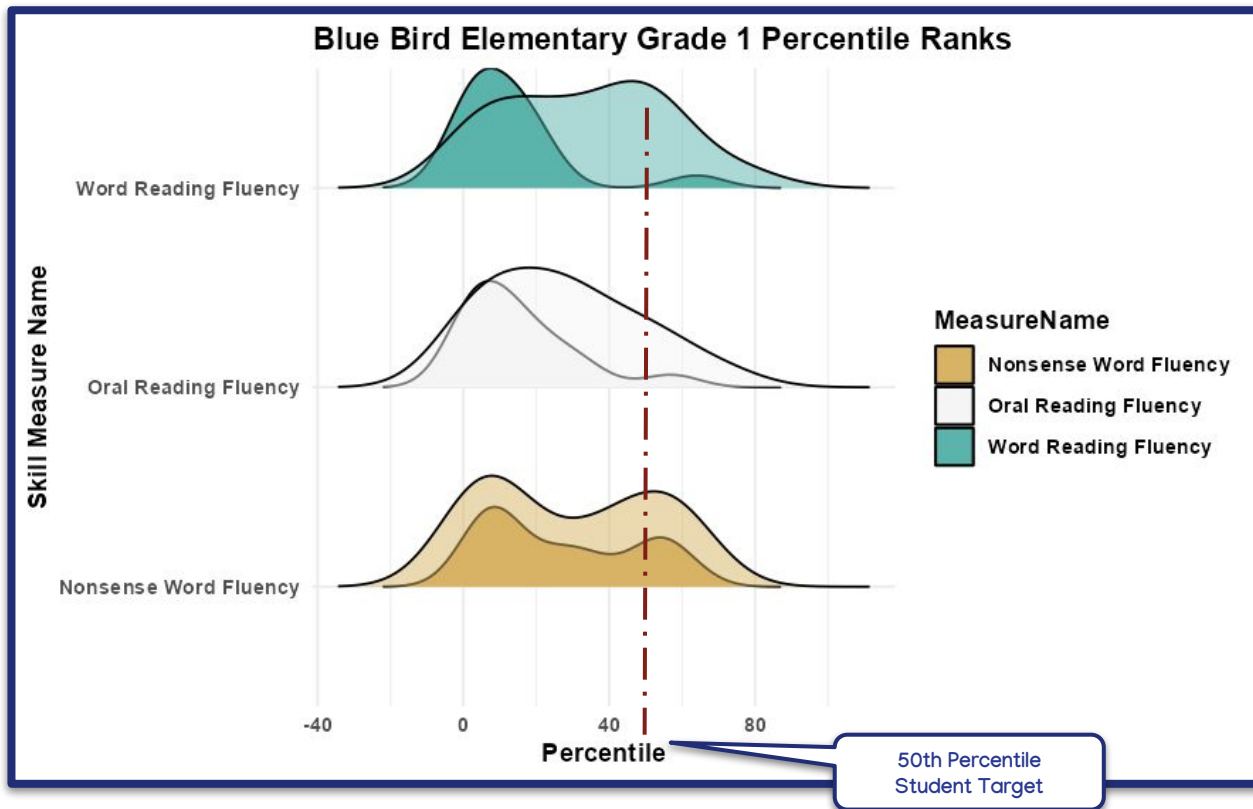Students Ranked 'High Risk' in Spring Time Assessments

If less than 80% of the class score above the 50th percentile – as determined by AimsWeb standardized scores – whole classroom support should be practiced before small group or 1 to 1 student intervention.

Universal Instruction

ASSESS ALL STUDENTS

<80% of class		>80% of class
meet or exceed the 50th percentile at the benchmark assessment		meet or exceed the 50th percentile at the benchmark assessment

STRENGTHEN CORE		

Push-In	**Curriculum**	• Assess data for all students below 50th percentile
		• Do they need interventions?
		
		Spring benchmarks used to:
		  • Review student progress
		  • Data meeting with next year's teacher
		  • Consider summer services
		  • Create preliminary groups for next fall

Push-In:
• 4-6 Weeks
• Assess/Data
• AST- Coaching
• Tiered Support

Curriculum:
• Grade appropriate?
• Past Data
• Evidenced Based
• Teacher Training

Tiered Supports

ANALYZE SUBTESTS

51st - 99th Percentile	11th - 50th Percentile	10th Percentile & Below
• Consider Enrichment • Varies on Subtest	Diagnostic Assessments • Pull-out if available • Individualized or small group targeted instruction • Push-in small group instruction	Diagnostic Assessments Same as 11th - 50th Percentile and… • Frequency increases • Duration 40-60 min, 4-5 times per week • Smaller group size • Case managed (SPED, 504, EST)

P R O G R E S S   M O N I T O R (P M)

IF NEEDED, TWICE A MONTH	TWICE A MONTH	WEEKLY

Assessment and Support Procedure

Tiered Supports, WCSU LCAS, me

School Level View

Blue Bird Elementary Grade 1 Percentile Ranks

This is significant because it shows that the core instruction is need of support. This is crucial for our analysis because it not only finds the broadest target for improvement but it pacifies the instinct to look at individual students first, which is not only a less accurate representation of the learning context, but all to frequently creates stigma. In case of standardized testing in particular, we should be more focused on the population at large than on individual students.

Data Protocol Organizer

Term: ☐ FALL ☐ WINTER ☐ SPRING

Content area: ☐ READING ☐ MATH

Number of Students:	Number of Students:
% of Class:	% of Class:
intensive	*low*
Number of Students:	Number of Students:
% of Class:	% of Class:
strategic	*low average*
Number of Students:	Number of Students:
% of Class:	% of Class:
benchmark	*average/high*

ASSESSMENT NAME:	**ASSESSMENT NAME:**
i.e. AimsWeb Math	*i.e. PNOA*

Appendix B

Assessment Chart

Put in links to LCAS, data protocol