Raising Achievement in a Title I Elementary School With a High EL/ Low SES Population Via S.T.E.M.

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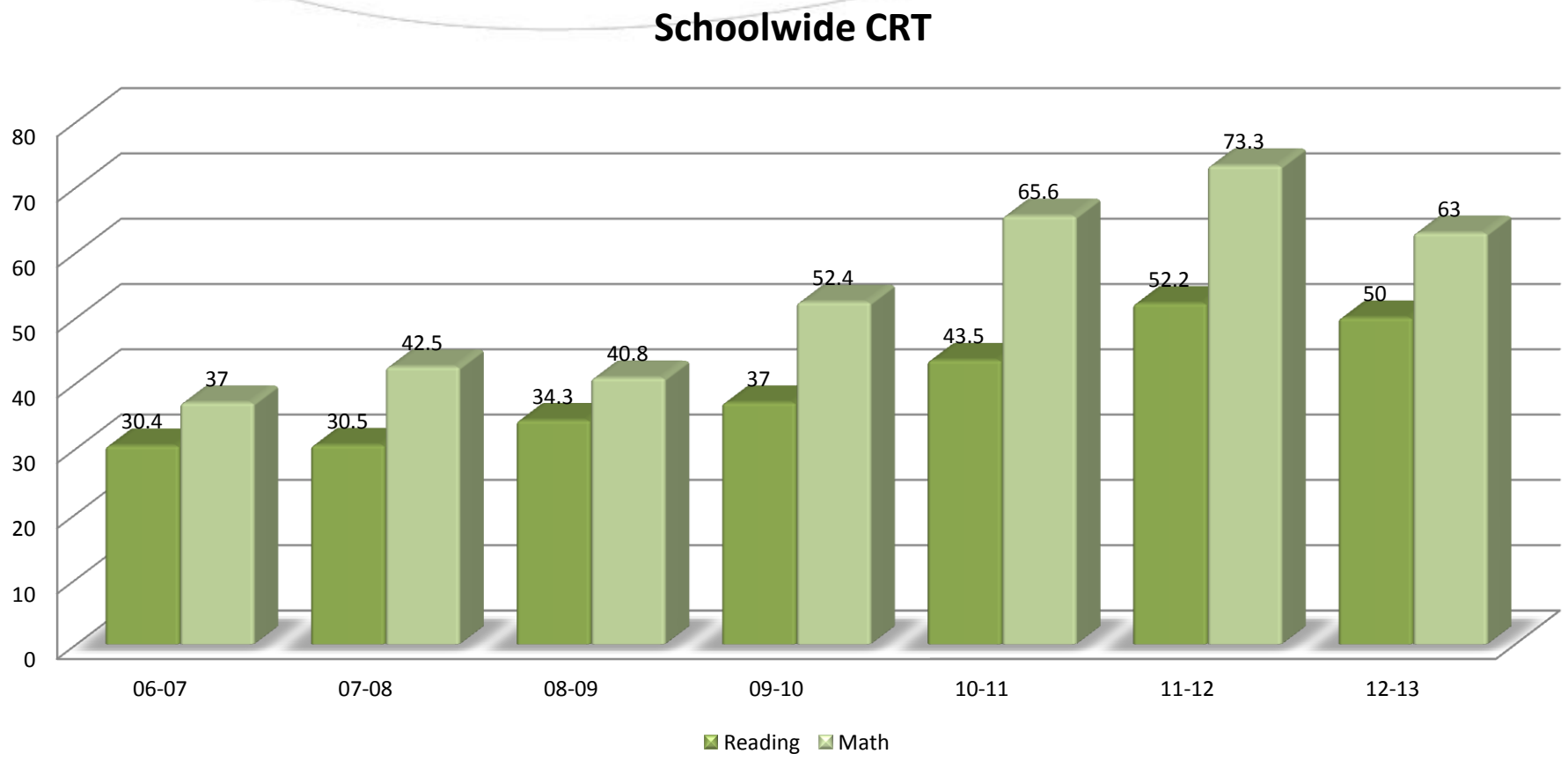
Overview

- About the school
- What have been the results
- What have we done to get those results
- Specific details
- Next steps

Smithridge STEM Academy

- Neighborhood school in Reno, NV
- SIG Turnaround in 10/11 school year
- About 730 students in pre-K through 5th grades
- About 70% ELL and 99% FRL

State Testing Results



Why STEM and PBL?

- Students need 21st Century skills to graduate high school college/career ready- STEM and PBL are appropriate tools
- PBL enables authentic, engaging learning experiences
- U.S. schools need to graduate more high school students prepared for STEM majors/careers
- Common Core shift to 50% informational text

S.T.A.T.- A clear vision

- Standards: Nevada and shift to CCSS, NGSS
- Teaching: Evidence-based best practices; PBL; MTSS/PBIS
- Assessment: Weekly on specific standards; IAs; DRA; MAP
- Teamwork: grade level teams meet minimum 3x/week (PDSA), everyone on the same page- true PLCs

SIG and STAT

- SIG obviously provided a rare opportunity; however much can be done without it too
- STAT- A clear vision that will foster greater student achievement and sends the message that our students do not have time for us to “figure it out”
- “If you are not on board, our district has a great transfer policy…”
- After year 2, leadership becomes more collaborative

Standards

- ELA and math: Grade levels map out pacing calendar with one flex week/quarter depending on IA results
- Science: Quarterly PBLs based on 4 DCIs (physical; Earth/space; life; engineering, technology, and applications).
  - School-wide EQ
  - Vertical alignment document includes vocabulary focus

Quarterly Pacing

ELA

.2.7: Use information gained from the illustrations and
ds in a print or digital text to demonstrate
erstanding of its characters, setting, or plot.

2.3(a): Distinguish long and short vowels when
ling regularly spelled one-syllable word.

.2.1: Ask and answer such questions as who, what,
re, when, why, and how to demonstrate understanding
ey details in a text.

2.2: Recount or describe key ideas or details from a
read aloud or information presented orally or through
r media.

2.6: Identify the main purpose of a text, including
t the author wants to answer, explain, or describe.

.2.2: Recount stories, including fables and folktales
n diverse cultures, and determine their central
ssage, lesson, or moral.

MATH

2.NBT.2: Count within 1000; skip-count by 5s, 10s, and 100s.

2.NBT.1: Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases.

2.NBT.1a: 100 can be thought of as a bundle of ten tens — called a "hundred."

2.NBT.1b: The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

2.NBT.3: Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

NBT.4: Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

2.NBT.6: Add up to four two-digit numbers using strategies based on place value and properties of operations.

2.NBT.9: Explain why addition and subtraction strategies work, using place value and the properties of operations.

WRITING

W.2.7: Participate in shared research and writing projects.

SCIENCE

N.2.A.1 Students know how to make observations and descriptions using words, numbers, and drawings. E/S

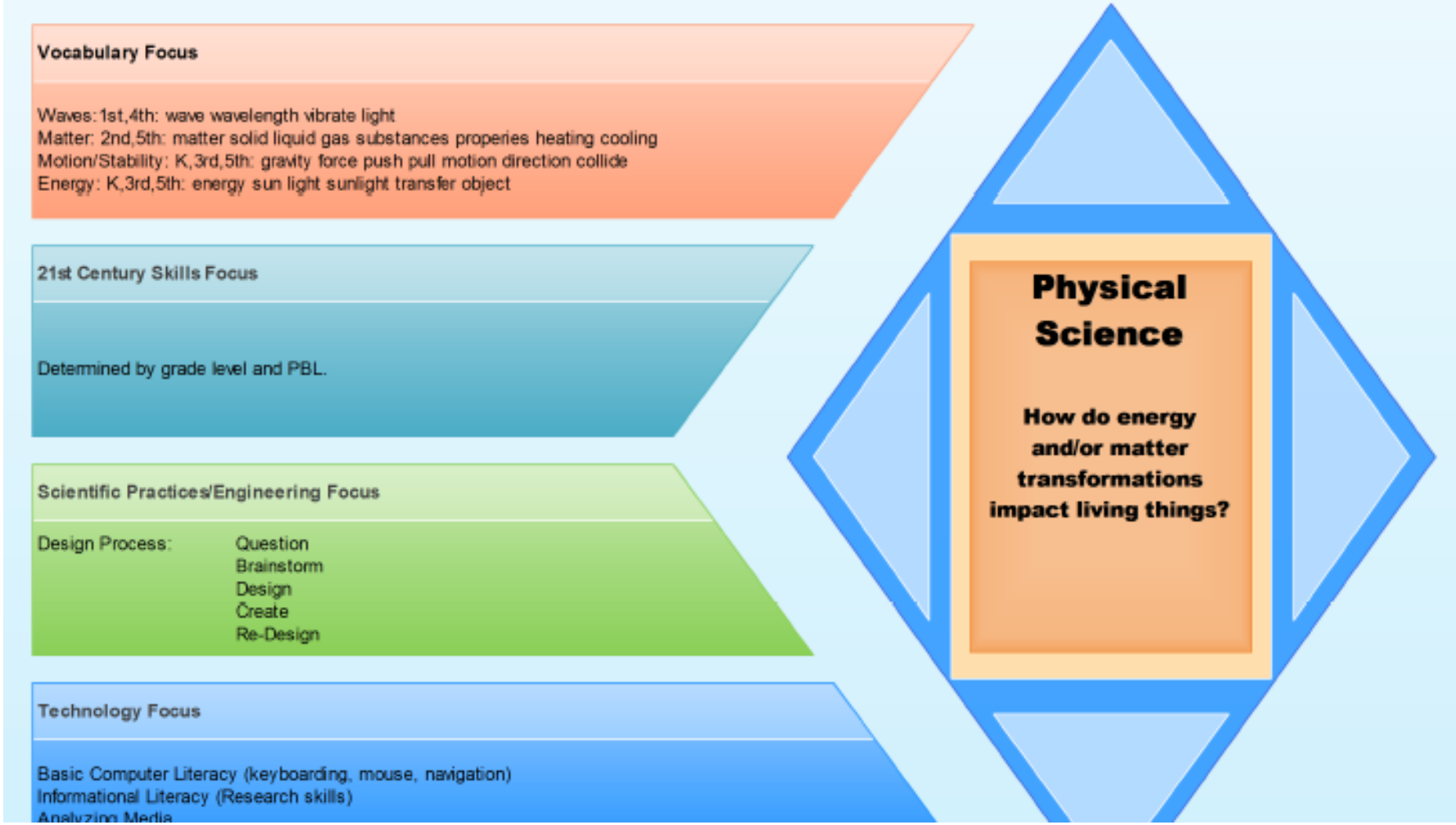
N.2.A.2 Students know tools (instruments) can be used safely to gather data and extend the senses ..ie: using thermometers, magnifying glass, rulers, etc.) I/L

N.2.A.3 Students know observable patterns can be use predict future events or sort and compare items. E/S

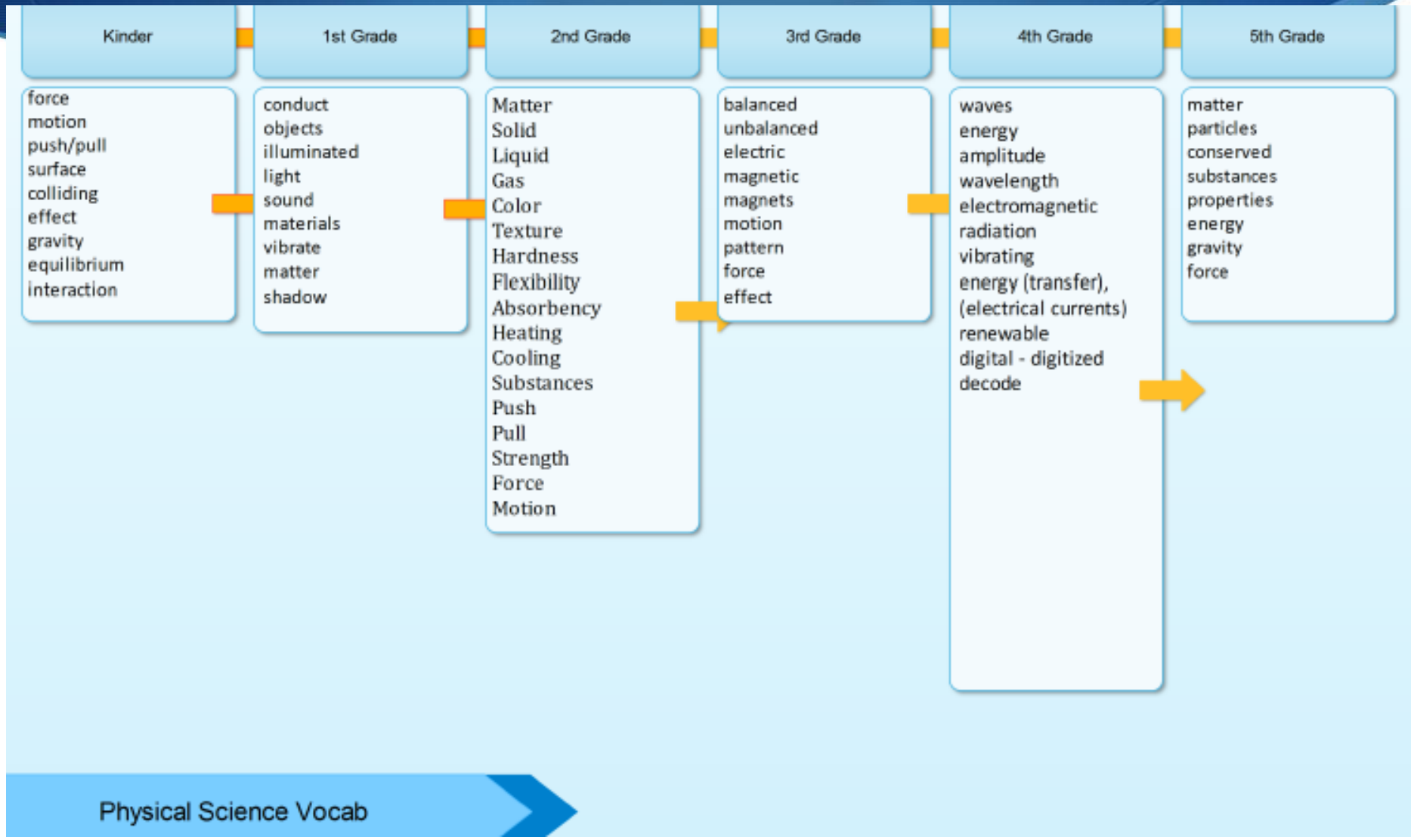
N.2.A.4 Students know how to make predictions, ask questions, and draw conclusions. I/L

N.2.A.5 Students kjnow how to record observations of investigations over time in a notebook or journal (e.g., growth of a plant, changes in weather). I/L

STEM Alignment



Alignment Continued



Teaching

- Bell-to-bell; no ‘parties/movies’ during instructional time
- No programs (Everyday Math as resource)
- Lots of guided reading, word work, close reads, number talks, centers, small group
- PBLs are typically 2-4 weeks- Buck Institute For Education, *PBL in the Elementary Grades*, 2011 (www.bie.org)

Assessment

- Short, weekly ELA and math assessments scored on 1-4 scale
- Quarterly IA's
- DRA and MAP (3x/year)
- 2nd and 4th Quarter informational writing assessments (new this year)
- Continuous formative assessment

Teamwork- True PLC

- 5-7 person grade level teams (including ELL teacher)
- Meet minimum 1x/week for 75 min and 2x for 45 min
- Plan, review data, revise plans/interventions
- Teaching in one room is very similar to what is happening in every room- this is the only way to compare data and learn from each other

4th Grade Meeting Schedule

- *Wed*: report math and ela formative scores, meet with Special Ed and STEM lab teachers plan next math standard, design math formative
- *Thurs*: begin to plan next ela standard, design ela formative
- *Fri*: check in with STEM support staff, pbl planning
- *Mon*: continue ELA planning – mini lessons, notetaker/foldables
- *Tues*: continue pbl planning – resources, next steps

Weekly PDSA to Drive Instruction

- Weekly assessments analyzed for percentage of student meeting or exceeding standard
- Determine what interventions/remediation/extension should occur with that standard
- Plan next weeks activities- include vocabulary focus, common misconceptions, high-yield strategies that will be utilized.
- https://docs.google.com/forms/d/1ROirl4rEdMzKaxBDitKx1mXHcQOe2NOeMmXF0eEwsyA/viewform

Quarterly Interim Assessments

- IAs include several questions for each standard (ideally 1 at approaching, meets, exceeds standards); Datawise/teacher created
- Data analyzed by standard, by grade level, class, and student. Drill down to question level to determine what specific errors each student is making to plan specific remediation.
- Based on *Driven by Data* by Paul Bambrick-Santoyo

Interim Data Report

Q2 4th grade math interim

Item Analysis - Distribution Summary With Students

Test Date: 12/2/2013
Subject: Math
Student Count: 26
Grade: 04
KR20: Insufficient Data
Student Count: N/A

Correct Response
Most Common Incorrect Response

Questions 1 to 21 (of 21)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Standard	Number and Operations in Base Ten 4.NBT.1	Number and Operations in Base Ten 4.NBT.2	Number and Operations in Base Ten 4.NBT.1	Operations and Algebraic Thinking 4.OA.4	Number and Operations in Base Ten 4.NBT.2	Number and Operations in Base Ten 4.NBT.3	Number and Operations in Base Ten 4.NBT.4	Number and Operations in Base Ten 4.NBT.3	Number and Operations in Base Ten 4.NBT.4	Number and Operations in Base Ten 4.NBT.5	Operations and Algebraic Thinking 4.OA.3	Number and Operations in Base Ten 4.NBT.5	Operations and Algebraic Thinking 4.OA.3	Operations and Algebraic Thinking 4.OA.4	Operations and Algebraic Thinking 4.OA.2	Operations and Algebraic Thinking 4.OA.5	Operations and Algebraic Thinking 4.OA.2	Operations and Algebraic Thinking 4.OA.1	Number and Operations in Base Ten 4.NBT.6	Number and Operations in Base Ten 4.NBT.6	Operations and Algebraic Thinking 4.OA.1
Correct Response %	69%	85%	92%	62%	77%	65%	69%	23%	38%	27%	46%	31%	42%	19%	42%	19%	15%	96%	19%	31%	35%
Total Points Poss = 25	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1	1	1	1	1	1	1
Correct Response	B	A	B	C	D	C	1	C	1	1	B	1	2	4	1	1	1	n/a	1	B	B
Selected A or Received 0 pts	4%	85%	4%	19%	8%	12%	27%	31%	54%	69%	19%	65%	31%	19%	50%	73%	81%		77%	42%	23%
Selected B or Received 1 pt	69%		92%	8%	4%	19%	69%	38%	38%	27%	46%	31%	23%	23%	42%	19%	15%		19%	31%	35%
Selected C or Received 2 pts	8%	8%	4%	62%	12%	65%		23%			23%		42%	19%						8%	23%
Selected D or Received 3 pts	19%	8%		12%	77%	4%		8%			12%			12%						15%	
Selected E or Received 4 pts														19%							15%
No Response							4%		8%	4%		4%	4%	8%	8%	8%	4%	4%	4%	4%	4%

MTSS Academics

- Meet 3x/year to review progress of every student
- Teacher, ELL teacher, SPED teacher, counselor, administrator
- Majority of interventions occur in the classroom in small groups
- Some interventions occur in before/after school tutoring
- Tier 3 students progress monitored using Aimsweb, a CBM

MTSS Behavior

- PBIS and effective instruction for Tier I (Diamond/Gold/Silver SPURRS, self managers)- effective for over 90% of students
- Check-in/check-out, counseling groups for Tier II and III students
- Specific behavior plans for students when needed
- ISS when needed, OSS in very rare circumstances

Project Based Learning

“Project Based Learning is a systematic teaching method that engages students in learning important knowledge and 21st century skills through an extended, student-influenced inquiry process structured around complex, authentic questions and carefully designed products and learning tasks” (PBL in the Elementary Grades).

8 Essential Elements of PBL

- Significant Content
- 21st Century Skills
- In-Depth Inquiry
- Driving Question
- Need to Know (establish with entry event)
- Voice and Choice
- Revision and Reflection
- Public Audience

North Carolina STEM School/Program Attributes

North Carolina Department of Public Instruction's **NC STEM Attributes ***	Early →	Developing →	Prepared ●	Model ●
Integrated Science, Technology, Engineering and Mathematics (STEM) curriculum, aligned with state, national, international and industry standards				
1) Project-based learning with integrated content across STEM subjects				
2) Connections to effective in- and out-of-school STEM programs				
3) Integration of technology and virtual learning				
4) Authentic assessment and exhibition of STEM skills				
5) Professional development on integrated STEM curriculum, community/industry partnerships and postsecondary education connections				
6) Outreach, support and focus on underserved, especially females, minorities, and economically disadvantaged				
On-going community and industry engagement				
7) A communicated STEM plan is adopted across education, communities and businesses				
8) STEM work-based learning experiences, to increase interest and abilities in fields requiring STEM skills, for each student and teacher				
9) Business and community partnerships for mentorship, internship and other STEM opportunities that extend the classroom walls				
Connections with postsecondary education				
10) Alignment of student's career pathway with postsecondary STEM program(s)				
11) Credit completion at community colleges, colleges and/or universities **				

*Attributes define essential components central to 21st Century Skills

**Not required for Elementary or Middle Schools - For High Schools Only

What we haven't been doing…

- Drive-by or one-size fits all PD
- Collecting weekly lesson plans from every teacher
- Using grade level meeting time for anything else- that time is sacred

Next steps

- Continue to monitor, evaluate, coach, and refine (STEM and PBL; MTSS processes; student informational writing; CC shift to 50/50 reading; teaching practices; family engagement)

Tips for successful implementation

- Communicate the vision/mission clearly and frequently
- If you want teachers to do it, you must be willing to get your hands dirty and do it yourself side by side with them.
- You must inspect what you expect- accountability all around
- Make it easy to take risks. Communicate that it doesn't need to be perfect- just do it, and do it a little bit better each time.
- You don't need buy-in at the beginning, you need compliance- if you are asking people to do the right things, buy-in will come
- Ask questions and listen- the staff will tell you what they need

Nuts and bolts… Staffing

- Principal and AP
- 1.5 counselors
- 36 classroom teachers
- 2.5 SPED, 1.5 speech
- 6 ELL
- 5 specials (library, computers, music, STEM lab, STEM push-in)
- PIF
- 5 aides/assistants
- 1, 10/week master teacher/coach; 1, 10/week mentor teacher/coach
- Under SIG we had 2 deans (no AP), STEM coordinator, 2 coaches, RTI coordinator, data specialist

Committees- teachers self-select

- Teacher Focus Team (leadership)
- PBIS
- Literacy
- STEM
- Family/Community Engagement
- Sunshine/Social
- Data/IA
- Alignment

Schedule

Time	Kindergarten	Grade 1	Grade 2	Grades 3	Grades 4	Grade 5
8:45-9:00						
9:00-9:15						
9:15-9:30				Specials		
9:30-9:45						
9:45-10:00						
10:00-10:15	Recess				Specials	
10:15-10:30		Recess	Recess			
10:30-10:45						
10:45-11:00						
11:00-11:15	K lunch					5th Lunch
11:15-11:30	recess					recess
11:30-11:45	11:15 - 11:45			3rd Lunch	4th Lunch	11:15 - 11:45
11:45-12:00				recess	recess	
12:00-12:15		1st Lunch	2nd Lunch	11:45 - 12:15	11:45 - 12:15	Specials
12:15-12:30		recess	recess			
12:30-12:45		12:15 - 12:45	12:15 - 12:45			
12:45 -1:00						
1:00-1:15			Specials			
1:15-1:30						
1:30-1:45						
1:45-2:00	Specials					
2:00-2:15				Recess	Recess	Recess
2:15-2:30						
2:30-2:45		Specials				
2:45-3:00						