RATE OF IMPROVEMENT: THE CORNERSTONE OF PROGRESS MONITORING

Psychological Services, Division of Special Education

Los Angeles Unified School District

March 29, 2017


IMAGINE

OBJECTIVES: BY THE END OF THIS TRAINING, YOU WILL UNDERSTAND:

- Progress Monitoring
- Universal Progress Monitoring Data Tool (UPM)
- Rate of Improvement (ROI)
- Graphing and Interpreting Individual Student and Group Data
- Instructional Implications
- GAP Analysis Using ROI
- Data-Based Decision Making

PROGRESS MONITORING

- Progress monitoring is a scientifically based practice that is used to assess students' academic and behavioral performance and evaluate the effectiveness of instruction. *
- Progress monitoring can be implemented with individual students or an entire class.
- The student's current levels of performance are determined and goals are identified for learning that will take place over time.
- The student's academic or behavioral performance is measured on a regular basis (weekly, bi-weekly or monthly). Progress toward meeting the student's goals is measured by comparing expected and actual rates of learning.

PROGRESS MONITORING

- Based on these measurements, teaching is adjusted as needed.
- Thus, the student's progression of achievement is monitored and instructional techniques are adjusted to meet the individual student's learning and/or behavioral needs.

PROGRESS MONITORING: COMMON CORE PERFORMANCE SKILLS

- **Early Literacy Skills** (phonemic awareness/letter sound symbol relationships/ phoneme segmentation)*
- **Reading Comprehension**
  - Cause and Effect
  - Character Descriptions
  - Character Traits
  - Context Clues
  - Drawing Conclusion
  - Fact and Opinion
  - Making Inferences
  - Story Elements
  - Identifying Text Features

CONTINUED...

- **Grammar**
  - Parts of Speech
  - Mechanics
  - Parts of Sentence
  - Word Usage
  - Punctuation
  - Sentence Structure

- **Vocabulary**
  - Alphabet
  - Dictionary Skills
  - Dolch Sight Words
  - Phonetics
  - Homographs
  - Homophones
  - Prefixes
  - Proverbs and Adages
  - Shades of Meaning
  - Suffixes
  - Synonyms Antonyms

CONTINUED...

- **Composition**
  - Editing and Proofing
  - Sentence Patterns
  - Topic Sentences
  - Transition Words
  - Writing Introductions
  - Writing Conclusions
  - Writing Prompts

- **Mathematics**
  - Counting and Cardinality
  - Operations and Algebraic Thinking
  - Numbers and Operations in Base 10
  - Numbers and Operations-Fractions
  - Measurement and Data
  - Geometry
  - Ratios and Proportional Relationships
  - The Number System
  - Expressions and Equations
  - Functions
  - Statistics and Probability

PROGRESS MONITORING CRITICAL 21ST CENTURY SKILLS:

- Problem Solving
- Creativity
- Analytical Thinking
- Collaboration
- Communication
- Ethics, Action and Accountability

(Literacy is Not Enough (Crockett, Lee et. al.; 2011)

PROGRESS MONITORING: BEHAVIOR AND SOCIAL EMOTIONAL LEARNING

- Self-Awareness
- Responsible Decision Making
- Relationship Skills
- Social Awareness
- Self-Management

All skills must be operationalized in order to be progress monitored. *

BENEFITS OF PROGRESS MONITORING

- Establishes a baseline for student performance.
- Accelerates learning through targeted instruction.
- Guides/informs instructional practices.
- Documentation of student progress.
- Efficient communication with families and other professionals about student progress.
- Higher expectations for students by teachers.
- Reduces achievement disparities amongst student subgroups.
- Results in fewer Special Education referrals.
- Overall, the use of progress monitoring results in more efficient and appropriate targeted instructional techniques and goals, which together, accelerates learning for all students.

CHALLENGES FACING PROGRESS MONITORING

- Educators and families need information about the effectiveness of progress monitoring that would encourage them to adopt the practice.
- Teachers and other practitioners need support in translating progress monitoring into easily implemented, usable strategies.
- Technical assistance on progress monitoring must transfer knowledge in ways that accommodate differences in background, training, and beliefs, as well as differences in the nature and philosophy of the instructional programs and practices already in place.
- The dissemination of information must take place in a variety of formats, in usable forms, and at different levels of specificity.

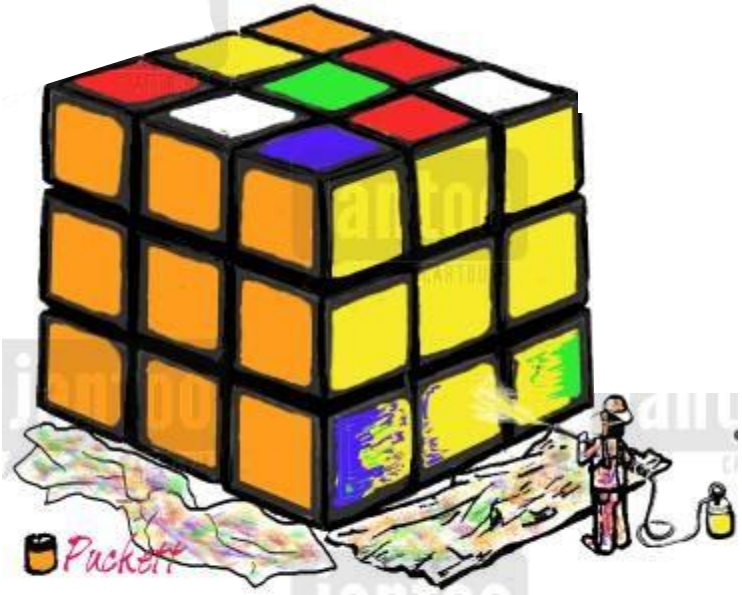
RATE OF IMPROVEMENT (ROI): WHAT IS IT?

- Is a psychometrically sound and objective method to progress monitor student growth over time using a linear regression trendline (slope). *
- Helps school teams understand whether or not a student is learning and acquiring information at a rate that is commensurate with peers, with and without intensive supports.*
- Provides information on whether the instruction in the intervention is adequately meeting the needs of the individual student or group receiving the intervention

IMPORTANCE OF ROI

- Easily utilized within a Multi-tiered System of Support framework
- Most reliable method for progress monitoring
- Provides a visual and empirical inspection of the slope
- Serves as a foundation for setting goals (Shapiro, 2008)
- Informs Instructional Services
- Provides information for data-based decision making
- Guides future outcomes

HOW IS ROI CALCULATED? WHICH WAY IS BEST?



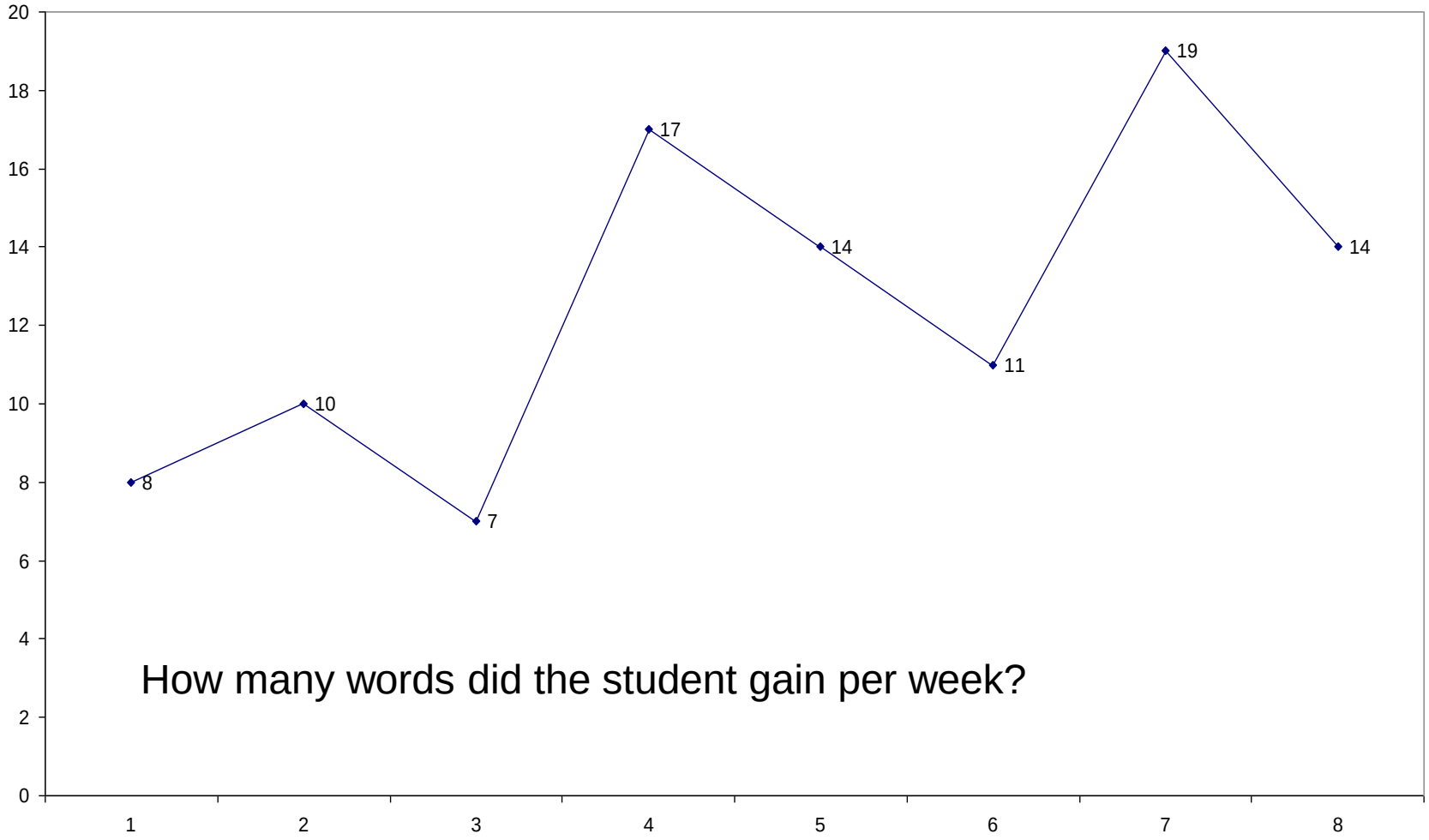
Citation: Caitlin S. Flinn, Ed.S., N.C.S.P. Andrew E. McCrea, M.S., N.C.S.P NASP Convention, March 3, 2010

MULTIPLE METHODS FOR CALCULATING GROWTH

- "Eye ball" Approach
- Last point minus First point Approach
- Split Middle Approach
- Linear Regression Approach

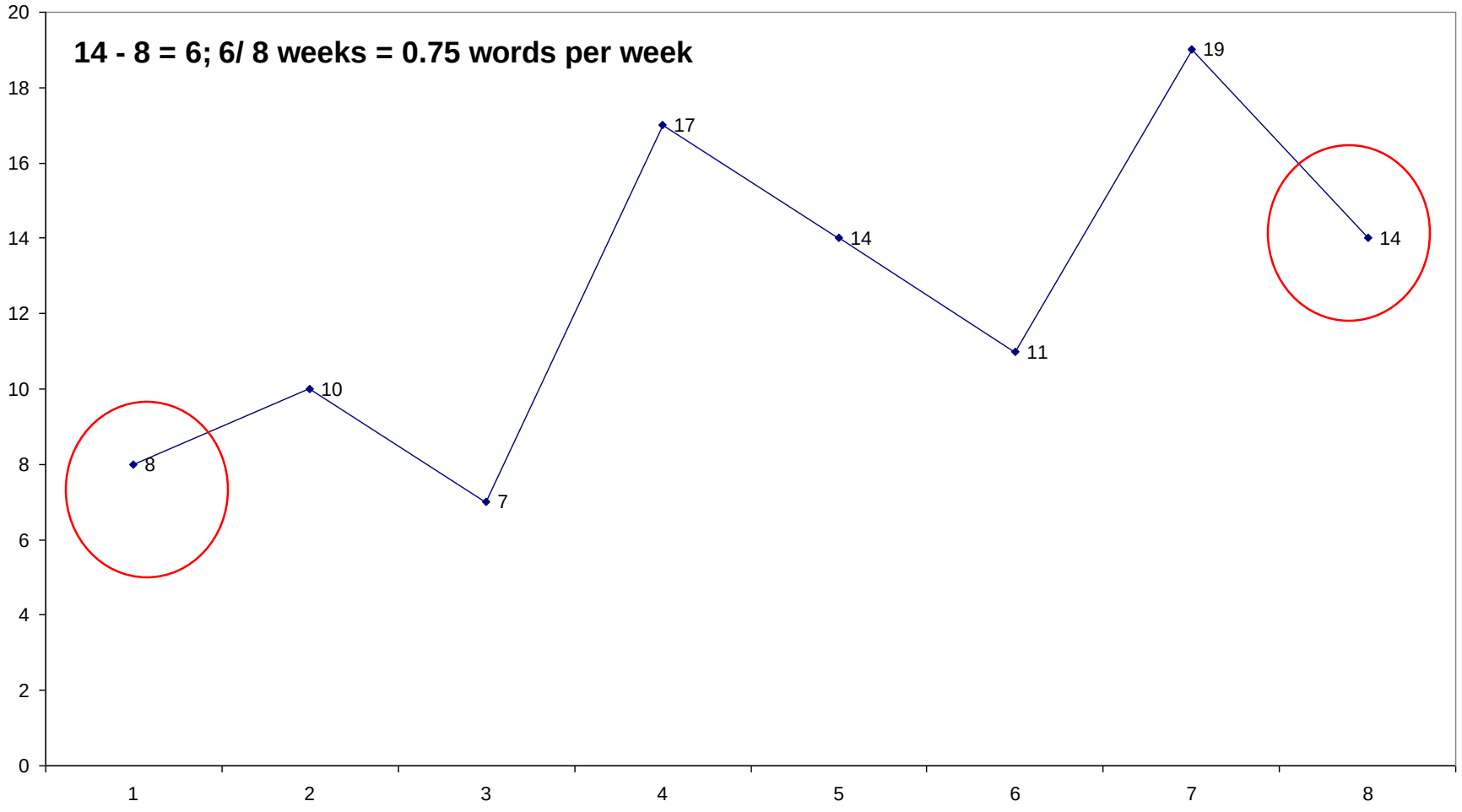
Citation: Caitlin S. Flinn, Ed.S., N.C.S.P. Andrew E. McCrea, M.S., N.C.S.P NASP Convention, March 3, 2010

Eye Ball



Citation: Caitlin S. Flinn, Ed.S., N.C.S.P. Andrew E. McCrea, M.S., N.C.S.P NASP Convention, March 3, 2010

Last minus First



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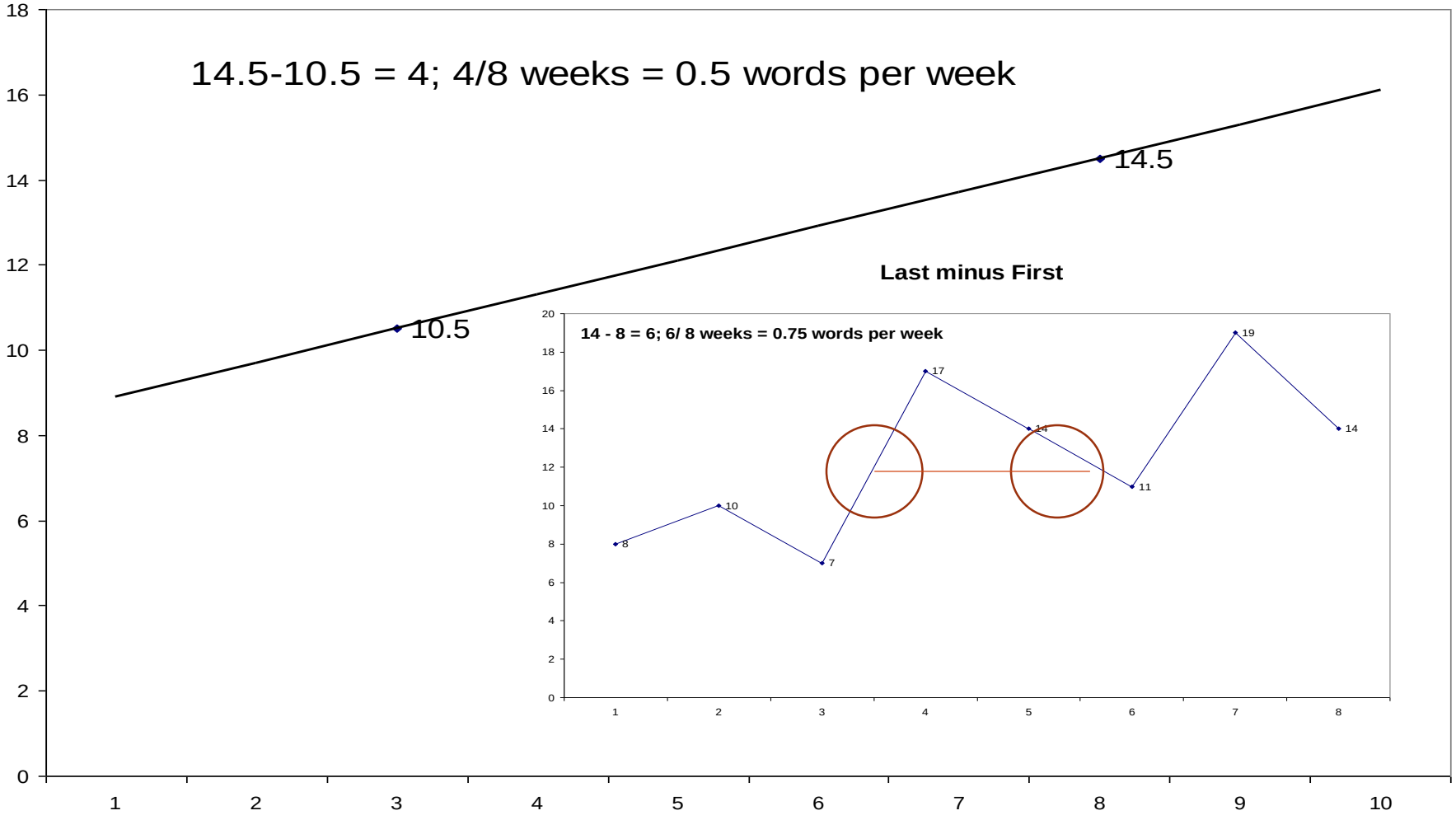
Split Middle



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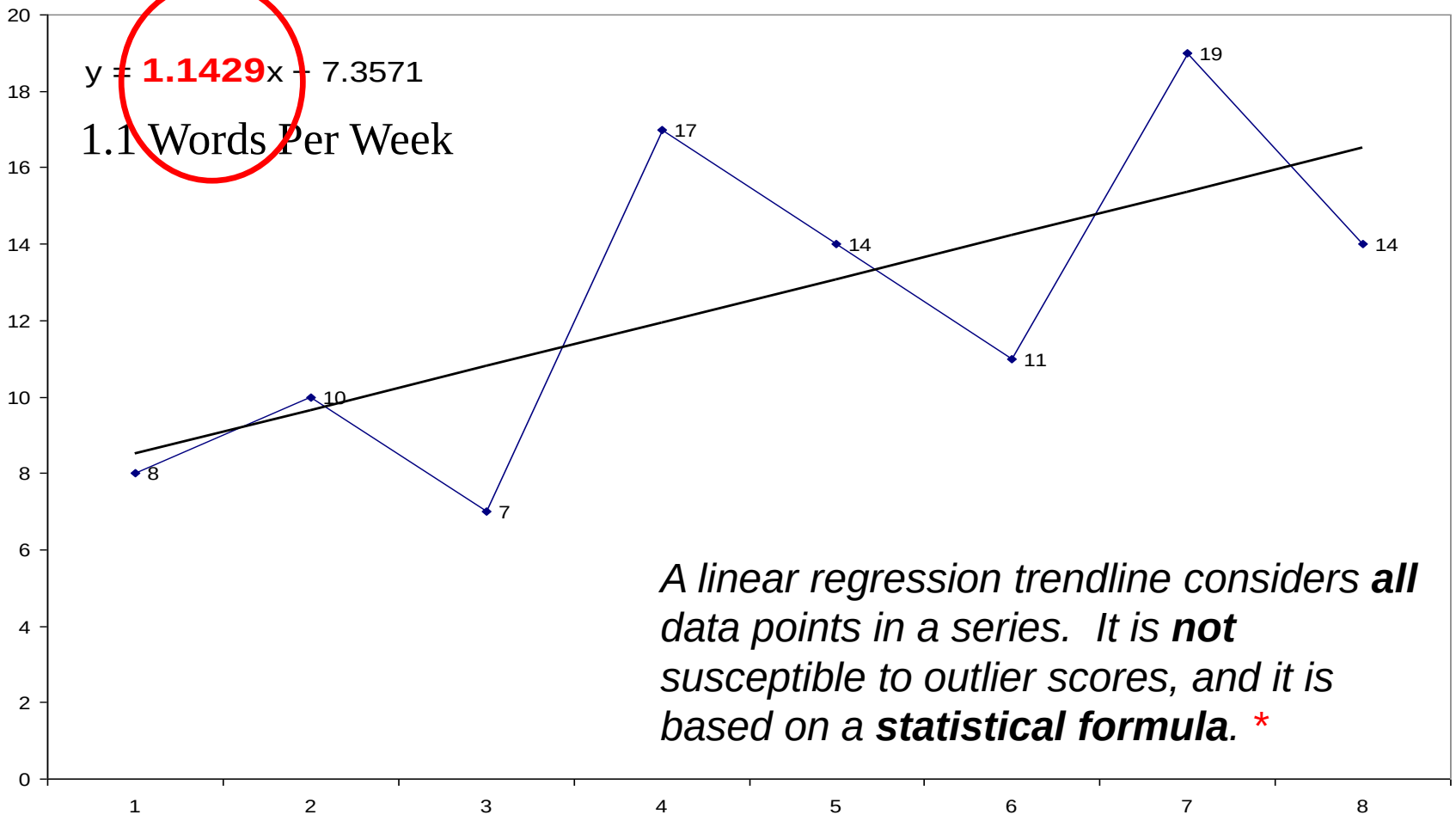
Linear Regression



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WHICH METHOD HAS BETTER ROI CONSISTENCY?

Eye Ball	???
Last minus First	0.75
Split Middle*	0.50
Linear Regression	1.10

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RATE OF IMPROVEMENT IN LAUSD IS BASED ON: ORDINARY LEAST SQUARES ATTAINED ROI CALCULATION

- Mathematical process for establishing the straight line*
- Uses Linear Regression*
- Establishes the LINEAR TREND in the data*
- Takes into account ALL data points in the series*
- Requires mathematical calculation best left to software to do
- Some commercial software (AIMSweb) does it for you
- Some commercial software (DIBELS) gives you the ability to do it
- EXCEL can do it! (But you need a moderate level of EXCEL comfort level)

(*EDWARD S. SHAPIRO, PH.D.; UNIVERSITY CONSULTANT TO THE PENNSYLVANIA RESPONSE TO INSTRUCTION AND INTERVENTION INITIATIVE, 2012*)

MATHEMATICAL FORMULA FOR ROI

Rate of Improvement = Slope of a line

- Vertical change over the horizontal change
- Rise over run*
- $m = (y_2 - y_1) / (x_2 - x_1)$
- Quantification of rate of change

$$\text{Slope} = m = \frac{rise}{run} = \frac{y_2 - y_1}{x_2 - x_1}$$

LAUSD HAS ADOPTED A TOOL THAT WILL AUTOMATICALLY CALCULATE ROI FOR YOU

LAUSD UNIVERSAL PROGRESS MONITORING DATA TOOL*

To rename the tabs at the bottom, right click, choose "rename" and enter new name.

Instructions | Sample Graph | Reading | Speaking-Listening | Language | Math | History-Soc Studies | Science Tech | Behavior | Social-Emotional | Open Tab

How does it work?

1. Open Excel
2. Label the cells at the top

A: Date

B: School Week

C: Benchmark

D: Group Average

E: Student

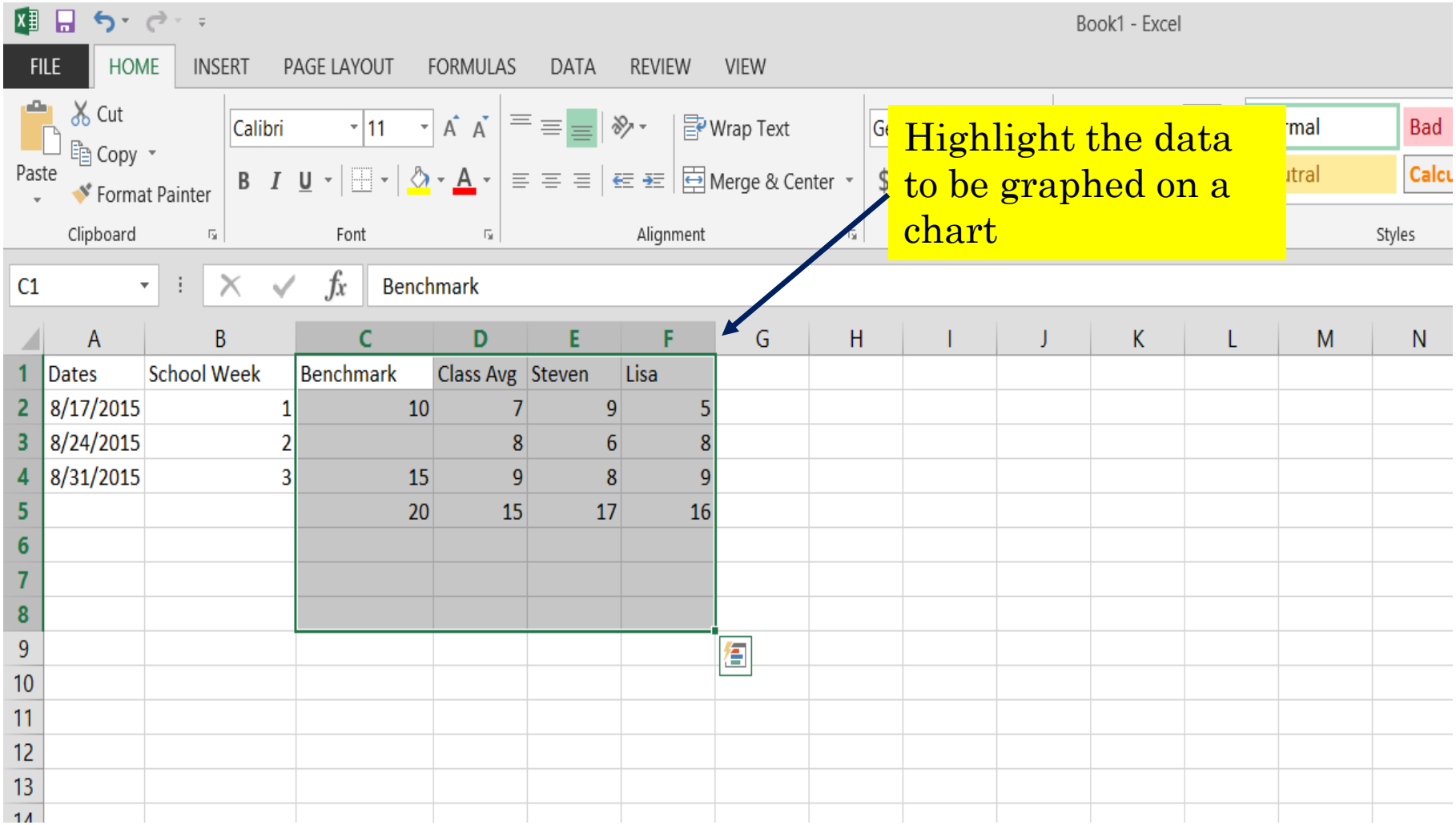
	A	B	C	D	E
1	Date	School Week	Benchmark	Group Average	Student
2	12/16/2015	17	25	20	16
3					
4					
5					
6					

NEXT...

3. Fill in data

	A	B	C	D	E	F	G	H	I
1	Dates	School Week	Benchmark	Class Avg	Steven	Lisa	John	Mary	
2	8/17/2015	1	10	7	9	5	6	2	
3	8/24/2015	2		8	6	8	7	4	
4	8/31/2015	3		9	8	9	8	7	
5			15						
6									

CONT.

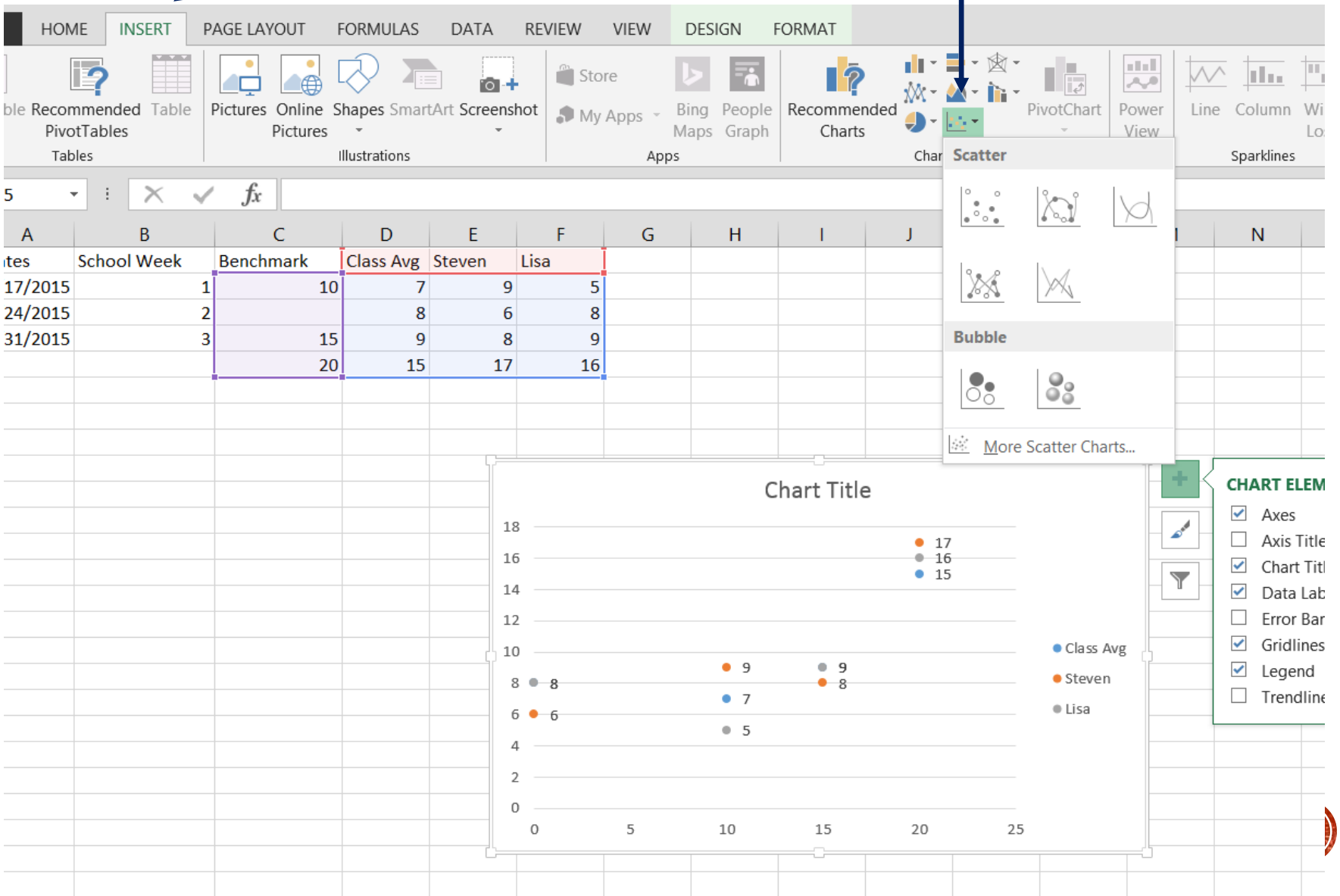


	A	B	C	D	E	F
1	Dates	School Week	Benchmark	Class Avg	Steven	Lisa
2	8/17/2015	1	10	7	9	5
3	8/24/2015	2		8	6	8
4	8/31/2015	3	15	9	8	9
5			20	15	17	16
6						
7						
8						
9						
10						
11						
12						
13						

CONT.

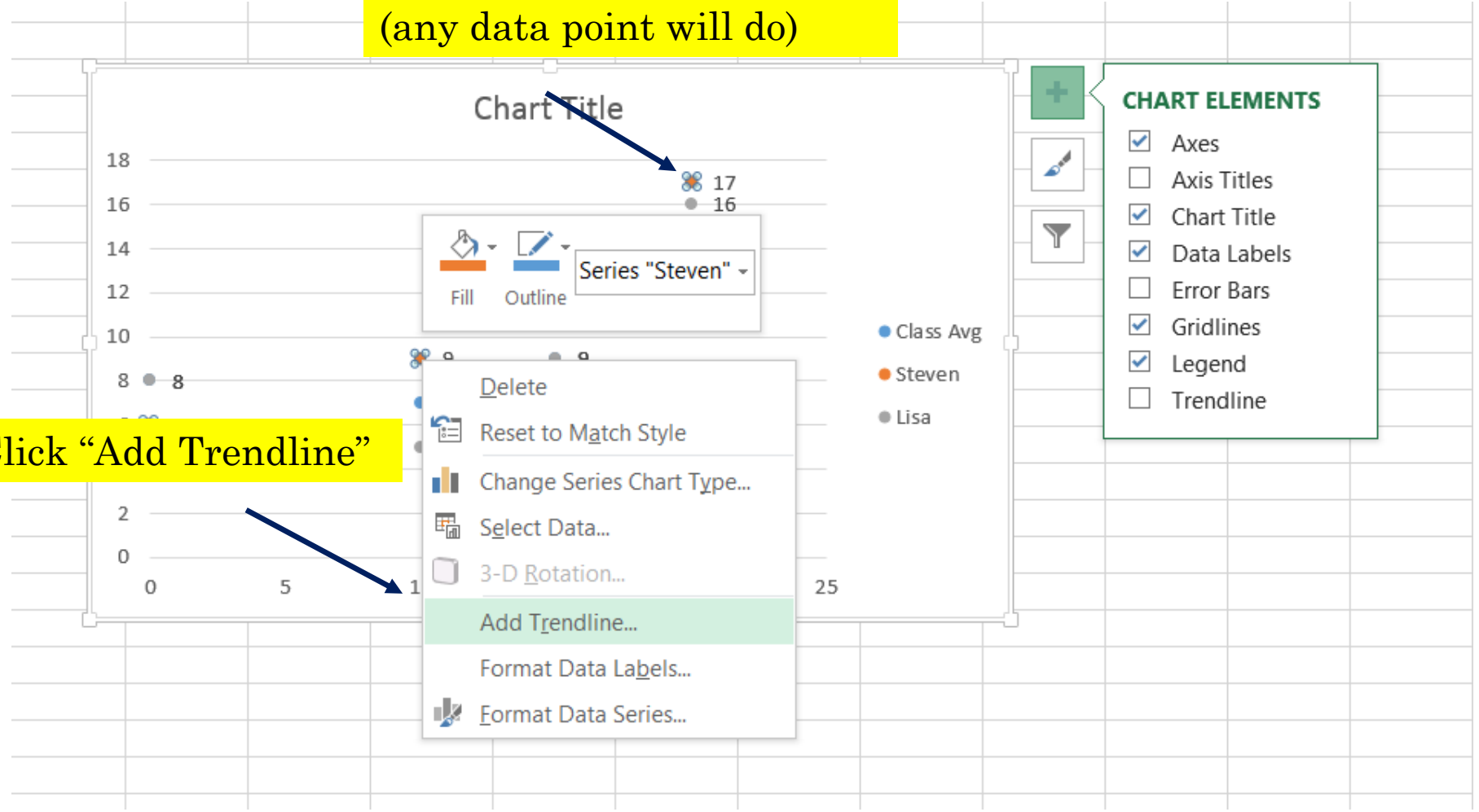
Click Insert

Click Scatter Plot or Line Graph with Markers



CONT.

Right click on a data point (any data point will do)

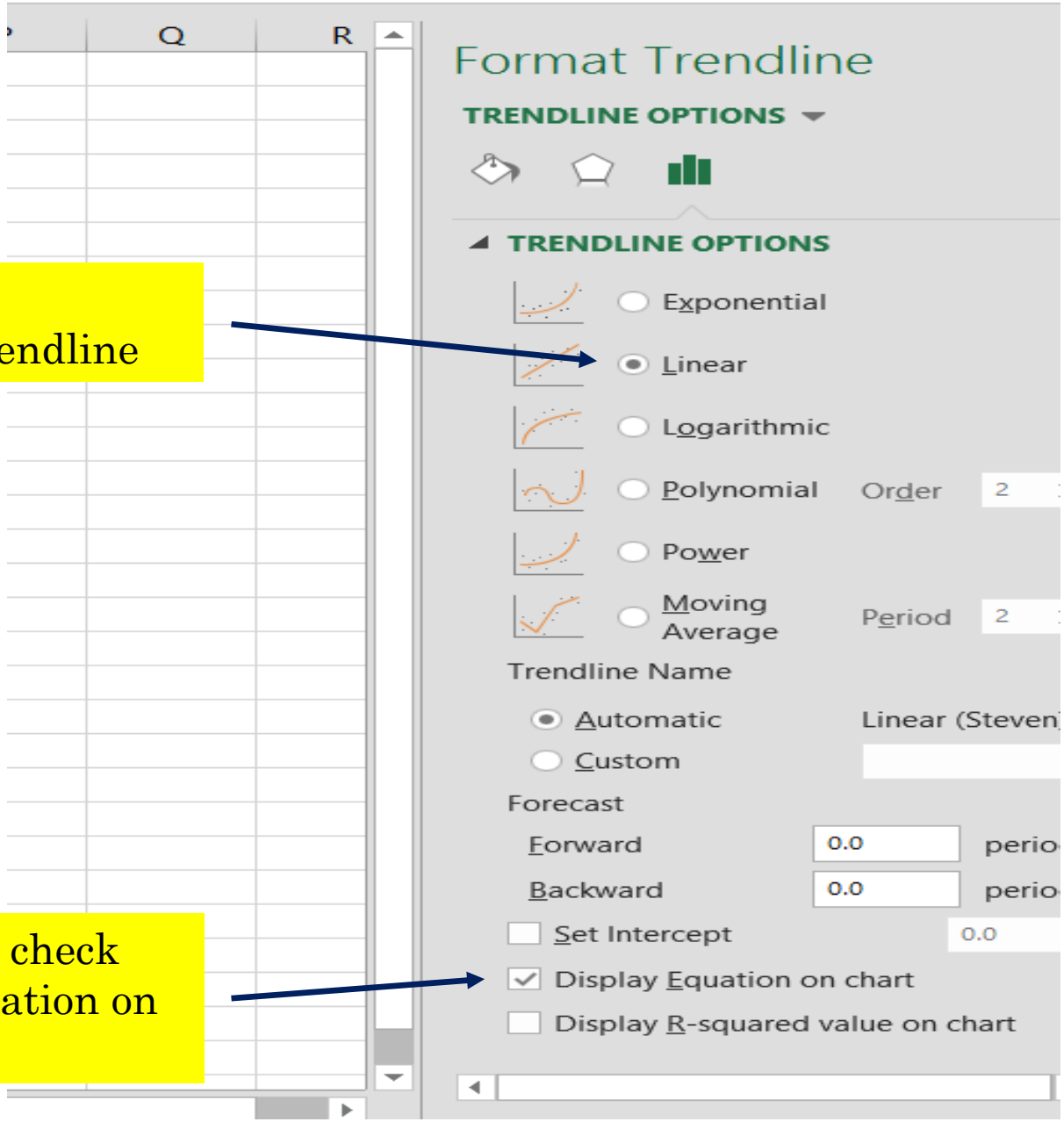


Click “Add Trendline”

CONT.

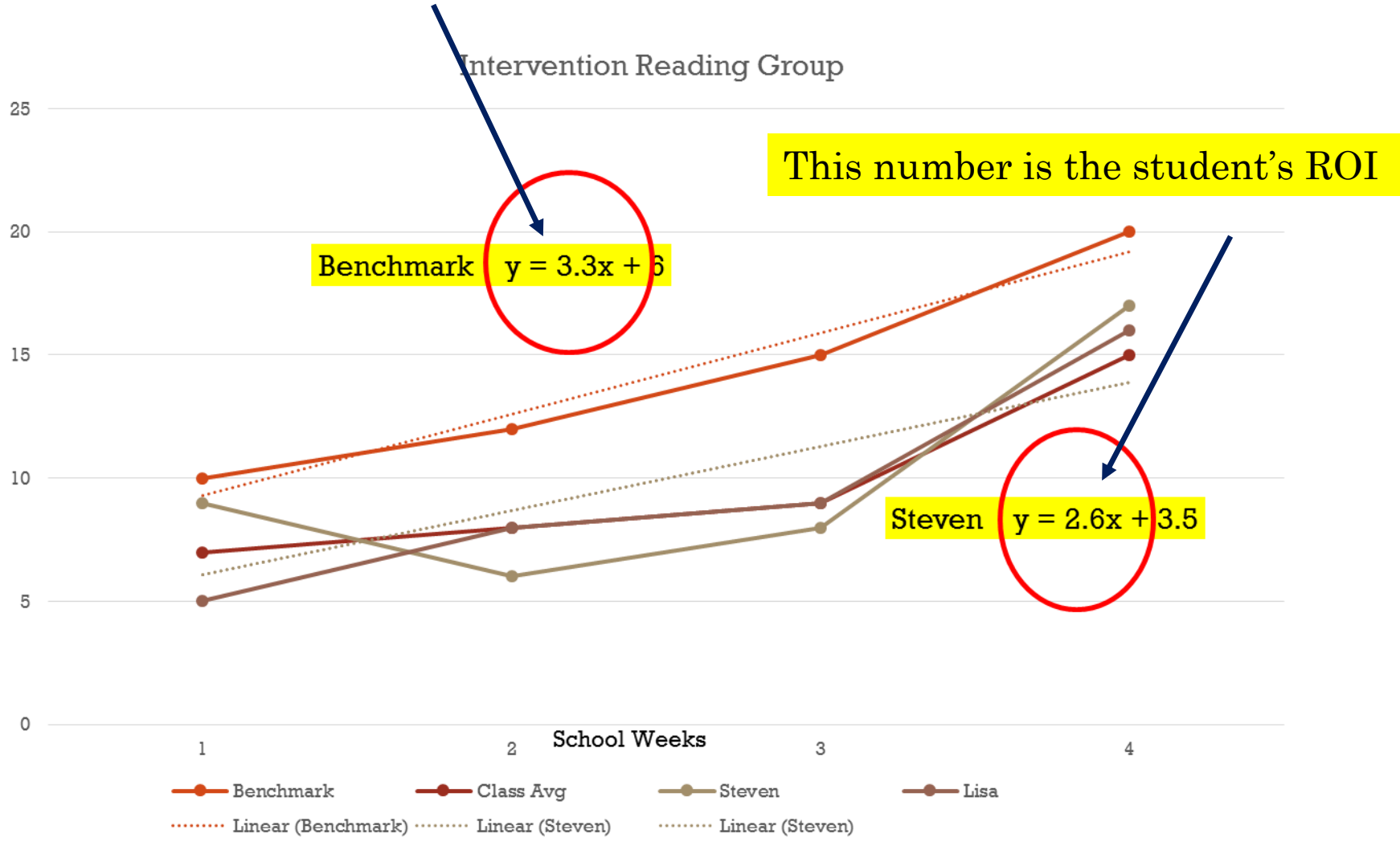
Click Linear Regresion Trendline

Make sure to check "Display Equation on Chart"



CONT.

This number is the benchmark ROI



CALCULATING THE PERCENTAGE OF EXPECTED GROWTH

- The next step in ROI is to calculate the percentage of the student's expected growth. In our previous example, Steven gained an average of 2.6 sight words per week.

- The expected (benchmark) growth was an average of 3.3 words per week.

- The formula for calculating the expected rate of growth is: *student's growth divided by the expected growth x 100*

2.6 / 3.3 x 100= 78.7% Rate of Improvement

- Currently, Steven's rate of improvement is 78.7% of what is expected, based on his target goal.

USING OUR RUBRIC TO INTERPRET STUDENT DATA*

ROI Data Based Decisions (Use the Rubric):	
0-80%	The student is responding slowly to the intervention. Make sure the intervention is being implemented with fidelity and the goals are obtainable and within the student's level of reach. Consider **modifying the goals if necessary** and allow for additional time.
81-95%	The student is responding to the intervention and requires additional time. Make sure the student has the pre-requisite skills, including langauge development and social emotional skills to achieve growth. If necessary, **teach the pre-requisite skills** needed.
95-110%	The student is responding positively to the intervention. Continue to provide the intervention and progress monitor the student's growth. The goals are targeting the student's skill deficits.
110-150%	The student is responding positively to the intervention. The student may be ready for higher level skills and/or return to a less intensive tier or universal tier I instruction.
More than 150%:	The student is responding positively to the intervention. The student has mastered skills at this level and may be ready for higher level skills and/or return to a less intensive tier or universal tier I instruction.

CONSIDERATIONS

- Was the intervention implemented with fidelity?*
- Do we need to increase the frequency of the intervention, duration of the intervention, grouping or time of day delivered?
- Is the instruction in the intervention targeting the student's needs?*
- Are there other intervention approaches and/or strategies that can support or supplement the primary intervention?*
- Do we need to take more frequent progress monitoring probes to more accurately target student needs?
- Is the instruction adjusted to meet the student's needs based on the progress monitoring data?
- Does the student have the pre-requisite skills to reach his goal?

CONSIDERATIONS

- Does the goal need to be modified to increase student success?
- Is the environment conducive to the instructional and/or behavioral intervention?
- What environmental or programmatic changes are needed to increase the likelihood of student success?

Activity- Think, Pair, Share

Reflection

Please take 2 minutes to share with a neighbor

What progress monitoring systems are currently in place at your school site?

How could you support the staff with incorporating the UPM Data Tool and ROI into your school's pre-referral practices?

INSTRUCTIONAL IMPLICATIONS

- After noting the pattern of progress, the teacher can adjust instruction to improve student learning. If the student's performance falls below the benchmark line, the teacher may use more intense instruction (in small groups or one-on-one), reteach the material, or provide additional opportunities for the student to practice certain skills
- Research has demonstrated that when teachers use student progress monitoring data, students learn more, teacher decision making improves, and students become more aware of their own performance.
- A significant body of research conducted over the past 30 years has shown this method to be a reliable and valid predictor of subsequent performance on a variety of outcome measures, and thus useful for a wide range of instructional decisions (Deno, 2003; Fuchs, Deno, & Mirkin, 1984; Good & Jefferson, 1998).

CONT.

- Fuchs and Fuchs (2002) conducted an analysis of research on student progress monitoring and found that when teachers use systematic progress monitoring, they are better able to identify students in need of additional or different forms of instruction, they design stronger instructional programs, and their students achieve better

GAP ANALYSIS USING RATE OF IMPROVEMENT

- Gap analysis is the process by which a student(s) performance is compared to the expected benchmark
- Involves use of the problem solving model for identifying which skills are deficient in progressing toward grade level expectations and/or behavioral expectations
- It is an on-going review of the student's progress monitoring data to determine if the gap between what is expected and actual performance is decreasing (closing the gap)
- It also involves identifying the factors or obstacles interfering with student performance and growth, and making recommendations to remedy the gap
- Tells the school team whether the intervention has been successful to "catch the student up" or not

2 WAYS TO CONDUCT TRENDLINE/GAP ANALYSIS

Manually

- **Requires information to be entered manually onto an excel spreadsheet**
- **Provides the exact difference or gap between what is expected and where the student is performing**
- **Requires teacher or the interventionist to be familiar and have a high level of comfort with Excel.**

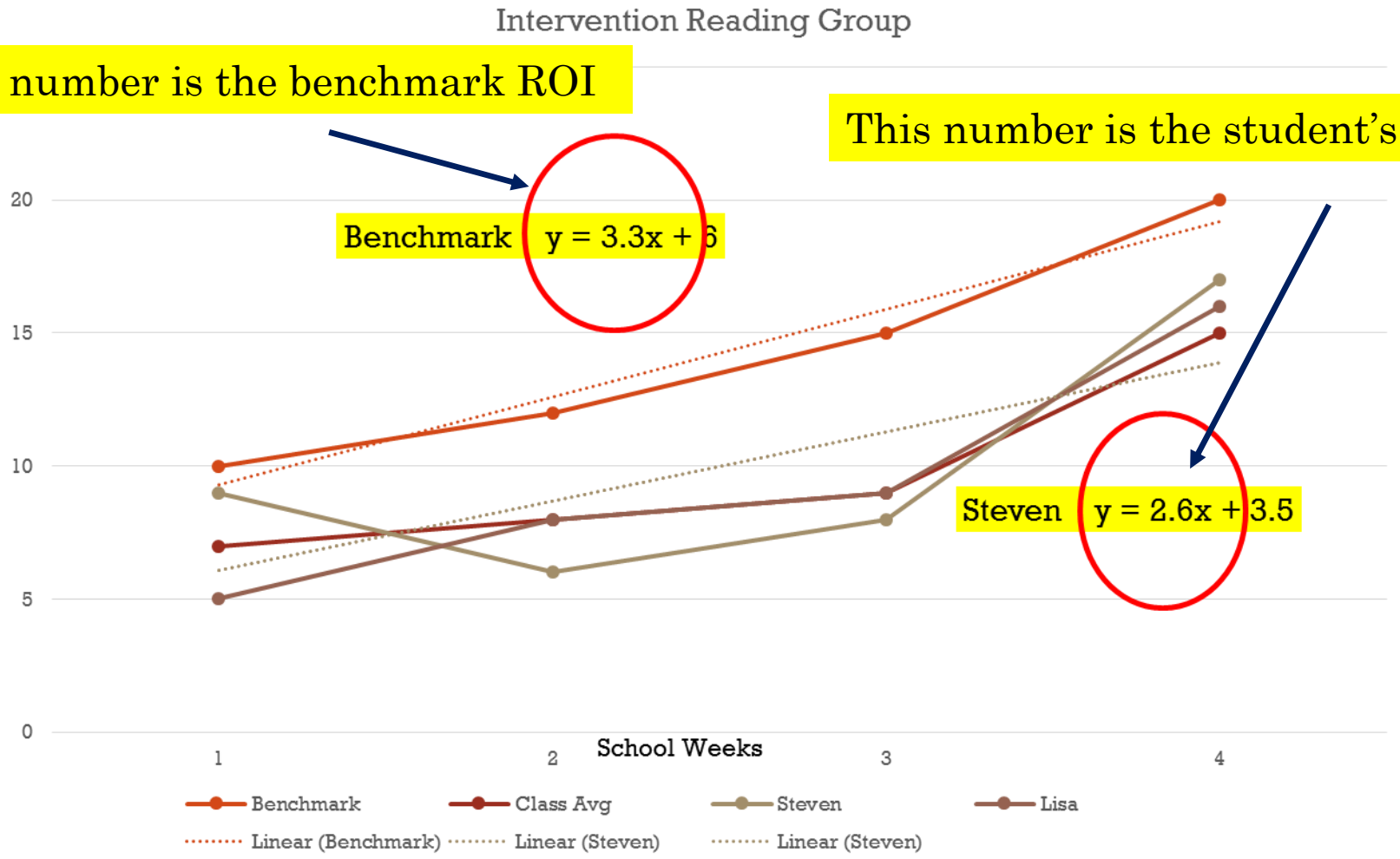
UPM Data Tool

- **Will automatically calculate the gap and trend line analysis graphically for inspection**
- **Provides the rate of improvement of both the benchmark score and the student's performance to determine the gap difference**
- **Easy to use and interpret.**

MANUAL METHOD FOR DETERMINING GAP ANALYSIS

This number is the benchmark ROI

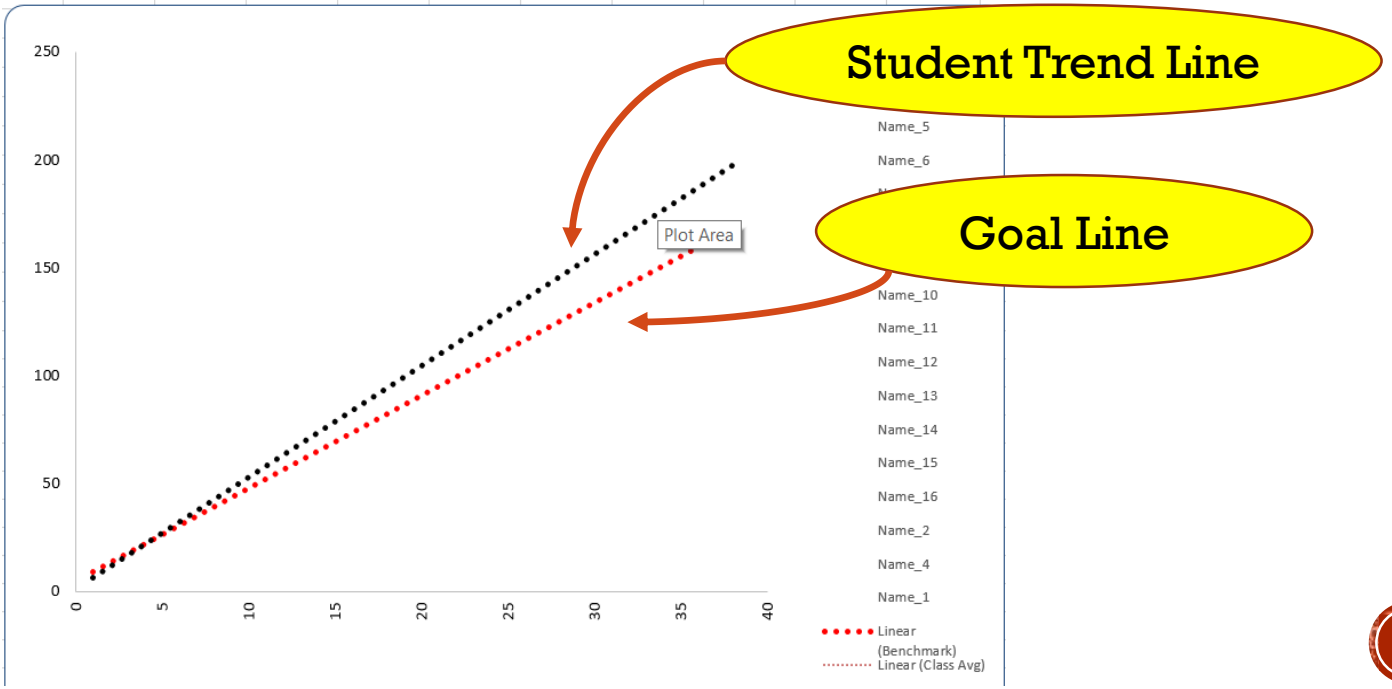
This number is the student's ROI



TREND LINE ANALYSIS USING THE ROI DATA TOOL

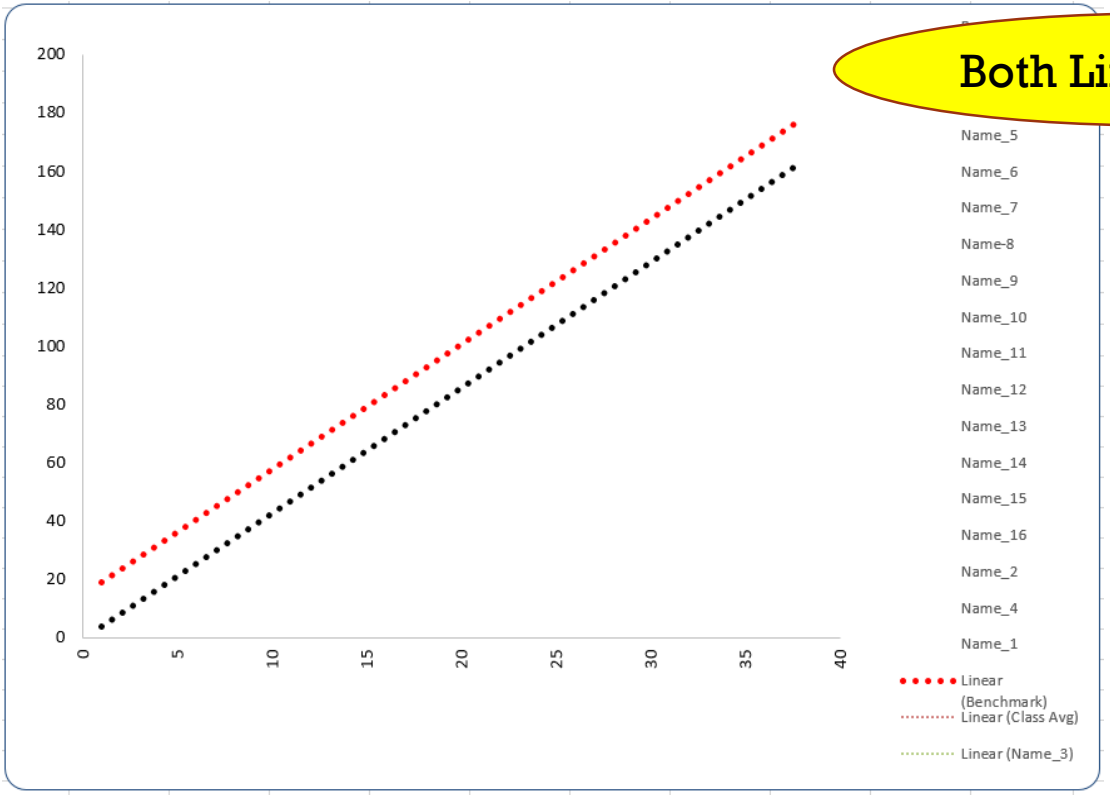
Students should have at least 10 data points for trend line analysis.

- If the trend line is **steeper** than the goal line, consider raising the goal or move the student back to the prior tier (i.e., Tier III to Tier II).



CONT.

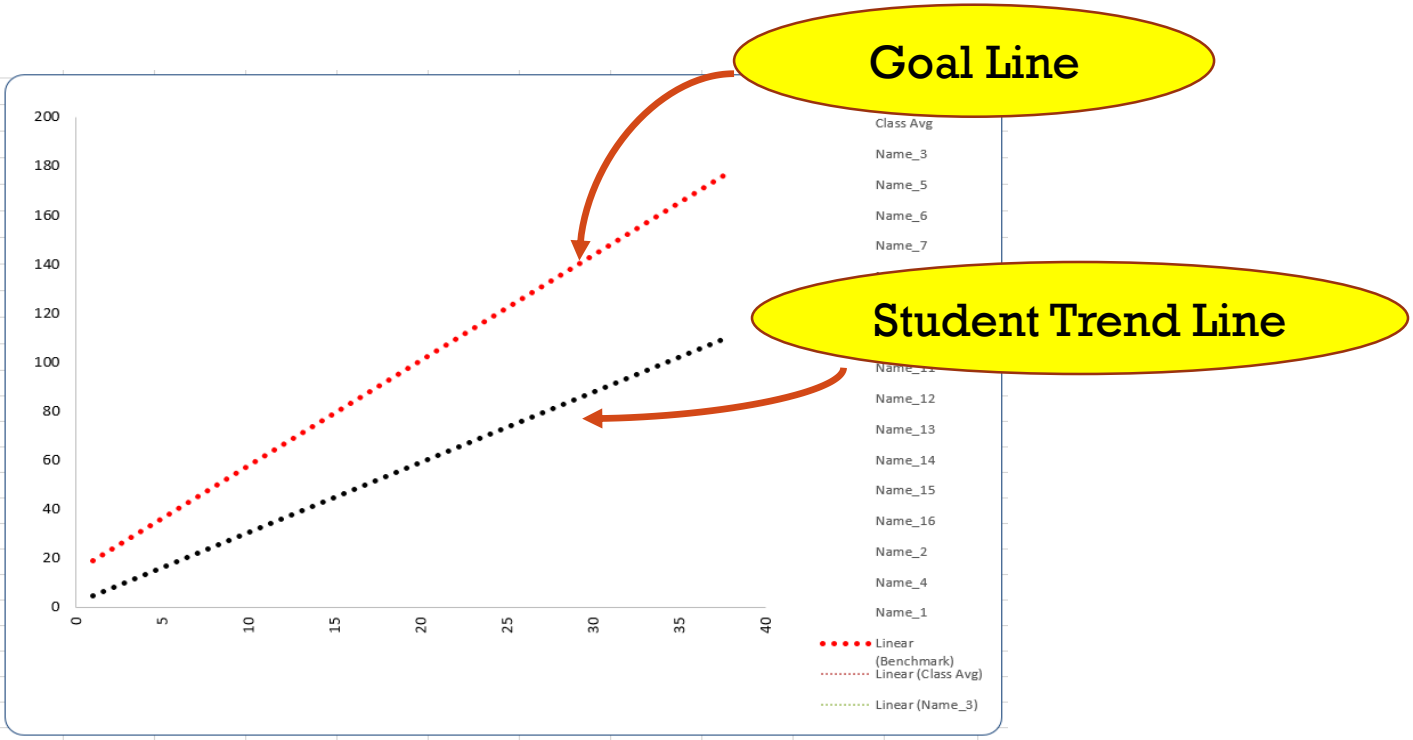
- If the trend line is in the same direction and **parallel** to the goal line, continue the intervention.



Both Lines Parallel

CONT.

- If the **gap is increasing** between the goal line and the student's rate of improvement, revisit the intervention plan and make any necessary revisions to the target goal and/or instruction in the intervention.



SO, WHY ARE THERE SO MANY OTHER ROI MODELS?

- Ease of application
- How many of us want to calculate OLS Linear Regression formulas (or even remember how)?

ROI AS A DECISION TOOL

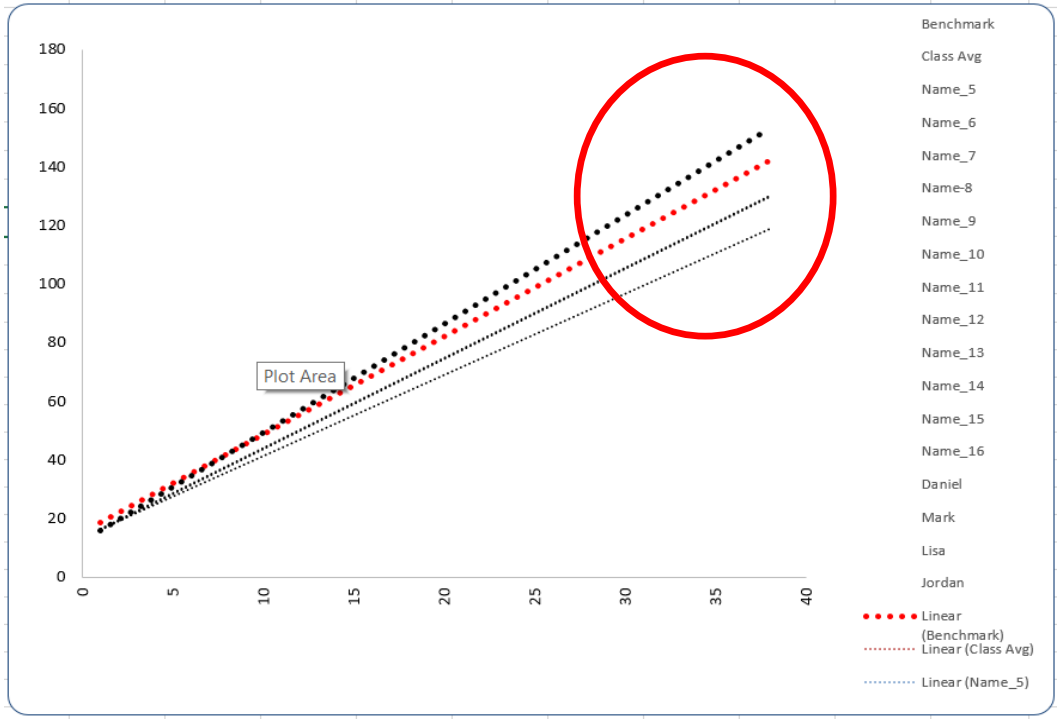
MULTIPLE WAYS TO LOOK AT GROWTH

- What is expected to achieve California State Standards and grade level norms?
- What is the student's Rate of Improvement toward his/her individualized goal?
- What is the gap that exists between what is expected and where the student is currently performing?
- How quickly can we expect the student to reach grade level? (This depends on how deficient the student's skill levels are and how quickly he/she is responding to the intervention).

*Best Practices in Setting Progress Monitoring Goals for Academic Skill Improvement (Shapiro, 2008)

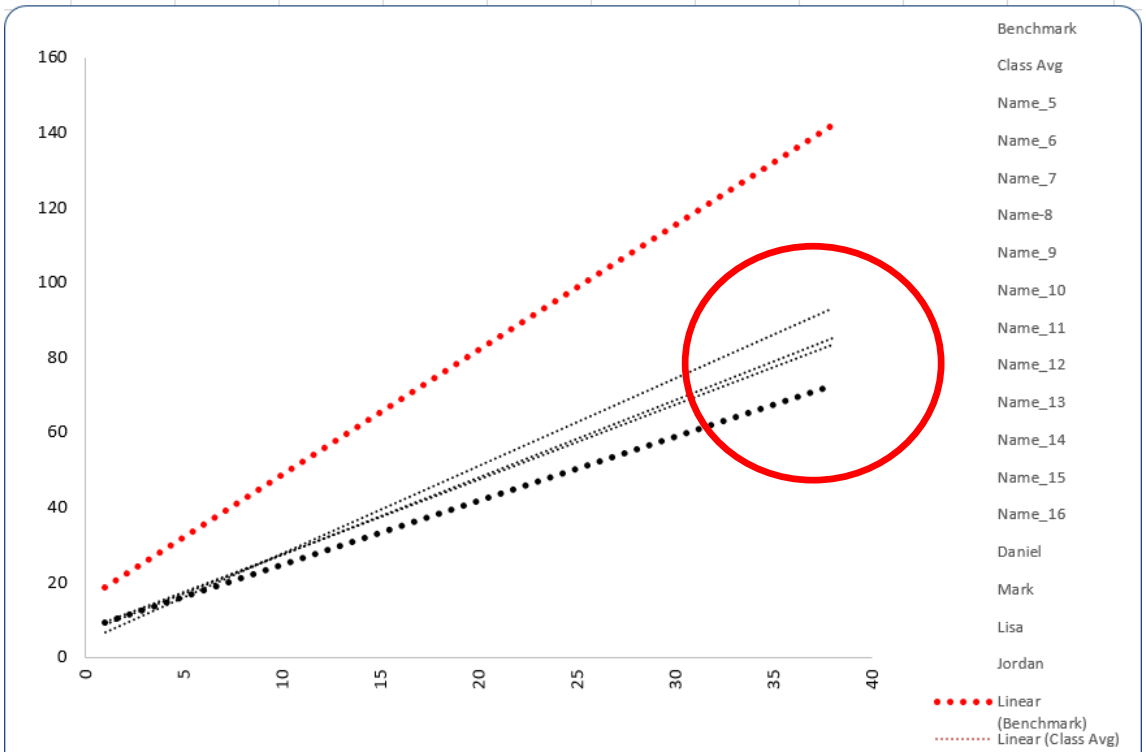
INTERPRETING ROI RESULTS WITHIN AN INTERVENTION GROUP

- When conducting an intervention group, we need to consider how many students are responding successfully to the intervention?



INTERVENTION GROUP HOVERING BELOW THE BENCHMARK SCORE

- Can we assume fidelity of intervention based on results?
- Who needs more time and/or intensive instruction?



USING THE UPM DATA TOOL RUBRIC

ROI Data Based Decisions (Use the Rubric):

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More than 150%:	The student is responding positively to the intervention. The student has mastered skills at this level and may be ready for higher level skills and/or return to a less intensive tier or universal tier I instruction.

WHEN TO MAKE A CHANGE IN INSTRUCTION AND INTERVENTION?

- Enough data points (6 to 10)?
- Less than 80% Rate of Improvement for expected growth and/or when the student is responding slowly to the intervention despite **multiple attempts** to make instructional changes to the intervention
- Ideally, students should receive a minimum of three intervention intervals of 6-8 weeks in length, with on-going progress monitoring
- Not on track to meet the individualized benchmark score (the student's individual goal)

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DATA-BASED DECISION MAKING

As the school team reviews the on-going progress monitoring data, the team will make several key decisions based on the data:

- Continue the intervention
- Modify the intervention (i.e., instructional strategy, intervention program, goals, grouping, duration and frequency)
- Adjust the level of tiered support, based on student outcome data (i.e., Tier I, II, or III)
- Recommend Reclassification
- Consider a Section 504 Plan
- Exit the pre-referral team process and make data-based decisions regarding educational needs and next steps

RATE OF IMPROVEMENT AND BEHAVIOR

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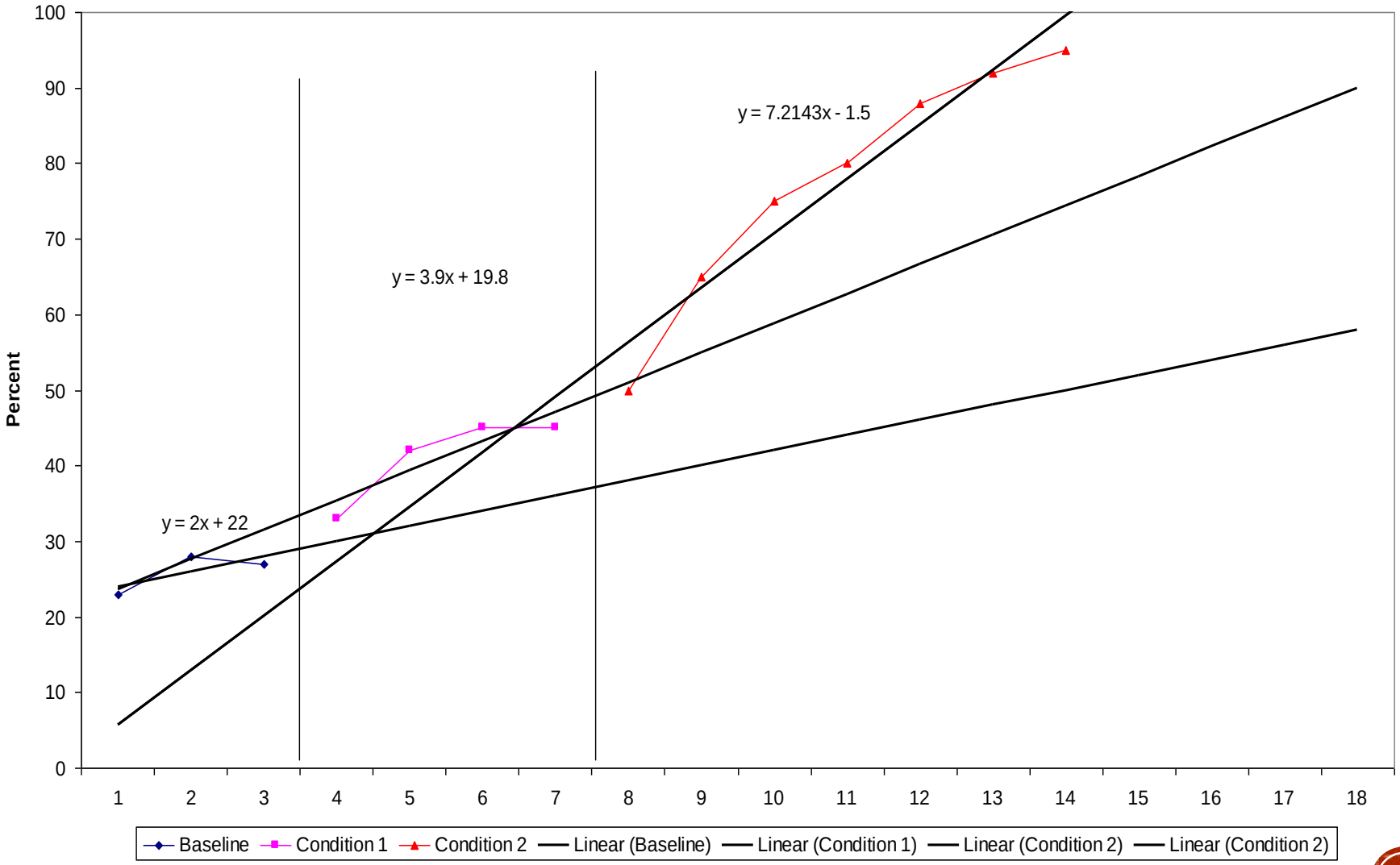
Percent of Time Engaged in Appropriate Behavior



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ADDITIONAL CONSIDERATIONS AS PART OF A SCHOOL-WIDE PRE-REFERRAL SYSTEM

- Who is At-Risk and needs progress monitoring?
- Who will collect, score, enter the data?
- Who will monitor student growth, when, and how often?
- What changes should be made to instruction & intervention?
- What about monitoring off of grade level?

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RESOURCES

- www.interventioncentral.com
- www.aimsweb.com
- http://dibels.uoregon.edu
- www.nasponline.org

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RESOURCES

- www.fcrr.org

  Florida Center for Reading Research

- http://ies.ed.gov/ncee/wwc//

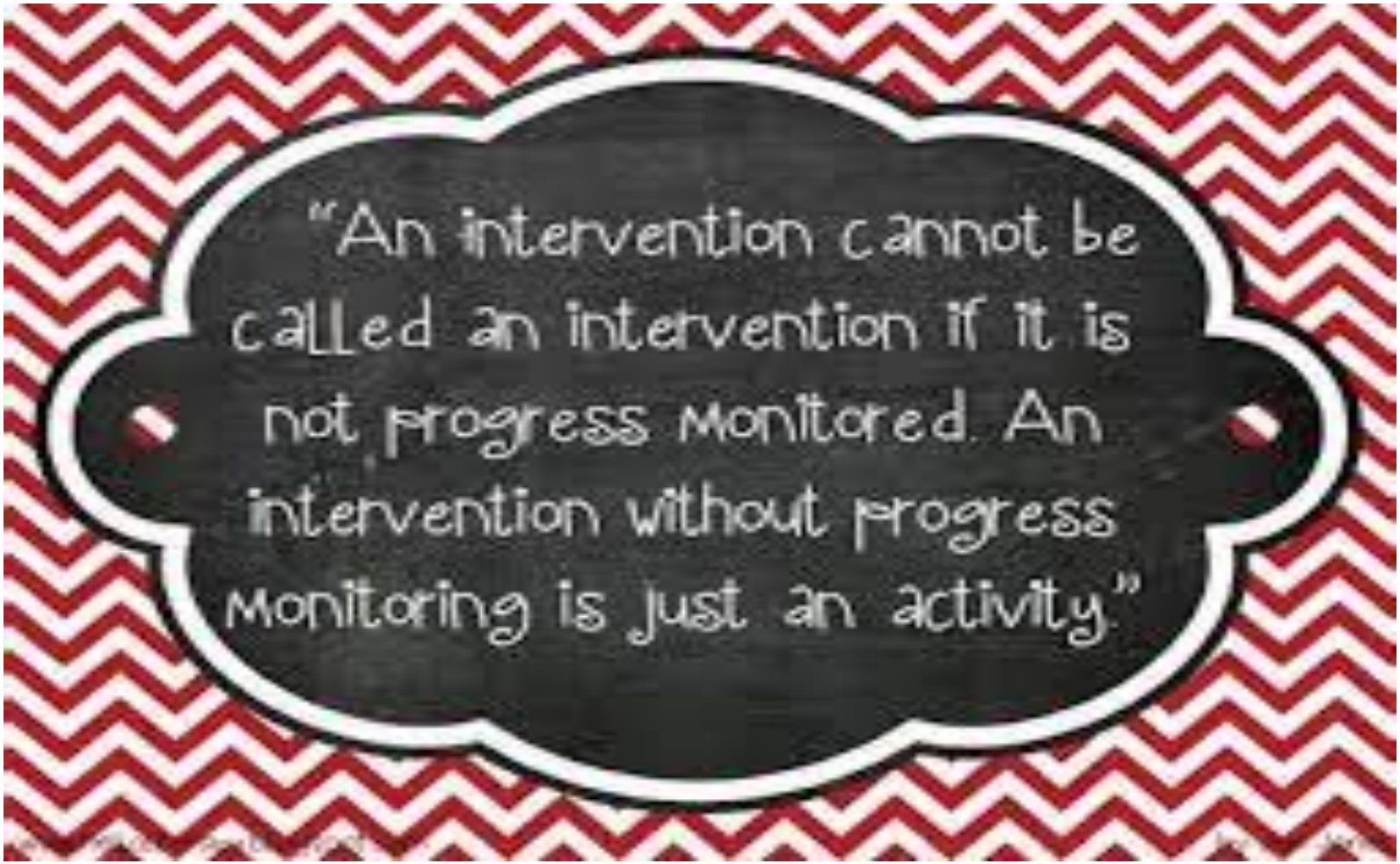
  What Works Clearinghouse

- http://www.rti4success.org

  National Center on RtI

- Best Practices in Setting Progress Monitoring Goals for Academic Skill Improvement (Shapiro, 2008)
- Caitlin S. Flinn, Ed.S., N.C.S.P. Andrew E. McCrea, M.S., N.C.S.P NASP Convention, March 3, 2010
- Joseph F. Kovaleski, Amanda M. VanDerHeyden, Edward S. Shapiro

FINAL QUOTE


"An intervention cannot be called an intervention if it is not progress Monitored. An intervention without progress Monitoring is just an activity."

QUESTIONS


For questions and support,
please contact your Intervention Coordinator
Central/East: Arvin Garcia
Northeast: Kashmiri Sidhu
Northwest: Rudy Gutierrez
South: Annmarie Serrano
West: Susan Mora

LITERATURE SHOWS THAT LINEAR REGRESSION IS BEST PRACTICE

- Student's daily test scores…were entered into a computer program…The data analysis program generated slopes of improvement for each level using an Ordinary-Least Squares procedure (Hayes, 1973) and the line of best fit.
- This procedure has been demonstrated to represent CBM achievement data validly within individual treatment phases (Marston, 1988; Shinn, Good, & Stein, in press; Stein, 1987).

Shinn, Gleason, & Tindal, 1989

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RESEARCH ON RATE OF IMPROVEMENT

- Christ, T. J. (2006). Short-term estimates of growth using curriculum based measurement of oral reading fluency: Estimating standard error of the slope to construct confidence intervals. *School Psychology Review*, 35, 128-133.

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