

California Practitioners Advisory Group Meeting

Item 3: Student-level Growth Model

Analysis, Measurement, and Accountability Reporting Division

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Growth Model Criteria

- SBE discussed criteria for a growth model at the January 2017 SBE meeting:
 - Conform to rigorous technical standards
 - Capable of being included in accountability systems
 - Provide a measure of academic growth across the continuum of performance
 - Provide for inclusion of all students
 - Provide information on academic progress that is easily communicated to educators and the public

Growth Model Simulations

- Based on the January 2017 SBE discussion and feedback from advisory groups, the California Department of Education (CDE) requested that the Educational Testing Service (ETS) run simulations on three growth models that best matched the criteria.
 - Selection of three growth models for simulation
 - Change in Distance to Met (CDTM)
 - Conditional Percentile Ranks of the Gain Scores (CPR)
 - Residual Gain (RG)
- The SBE received the ETS Growth Model report via a February, 2018 Information Memorandum (<https://www.cde.ca.gov/be/pn/im/documents/memo-pptb-amard-feb18item01a1-rev.docx>).

Data Used for Analysis

- Spring 2016 CAASPP English language arts/literacy (ELA) and mathematics test scores
- Corresponding Spring 2015 test scores from those same students

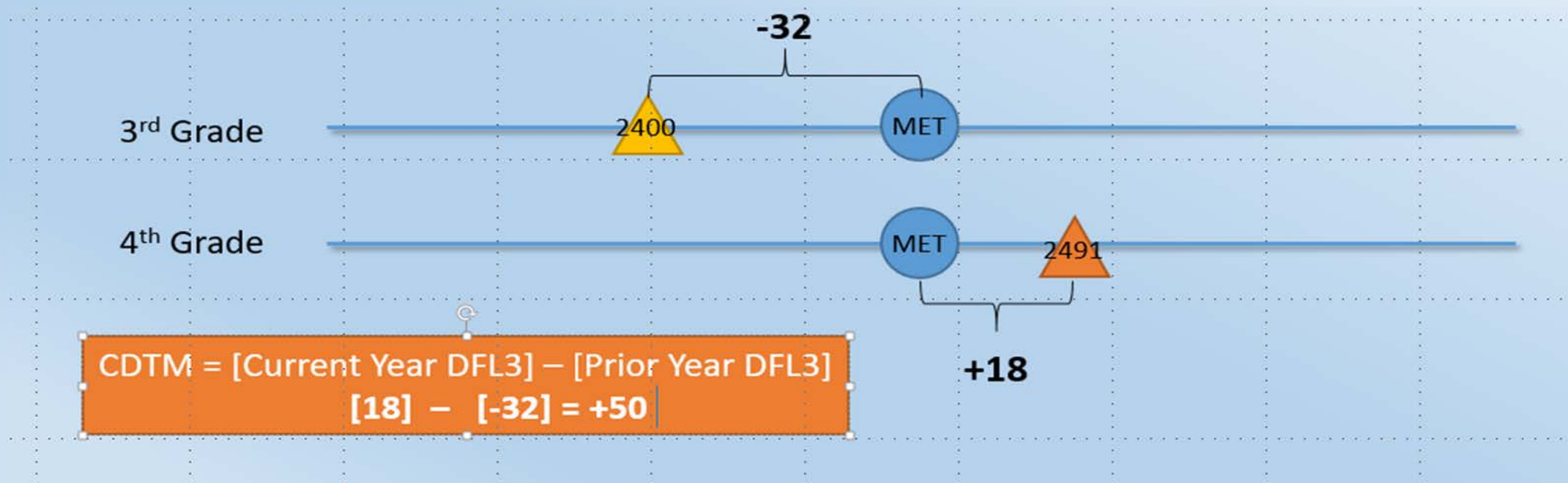
Goals of the Analyses

- Use the statistical properties to identify advantages and disadvantages of the three candidate growth models for use in California's accountability system.
- Evaluated the three growth measures on the following criteria:

CRITERIA
Strength of relationships with background characteristics
Sensitivity to school configuration and assessment content area (mathematics and ELA)
Statistical precision

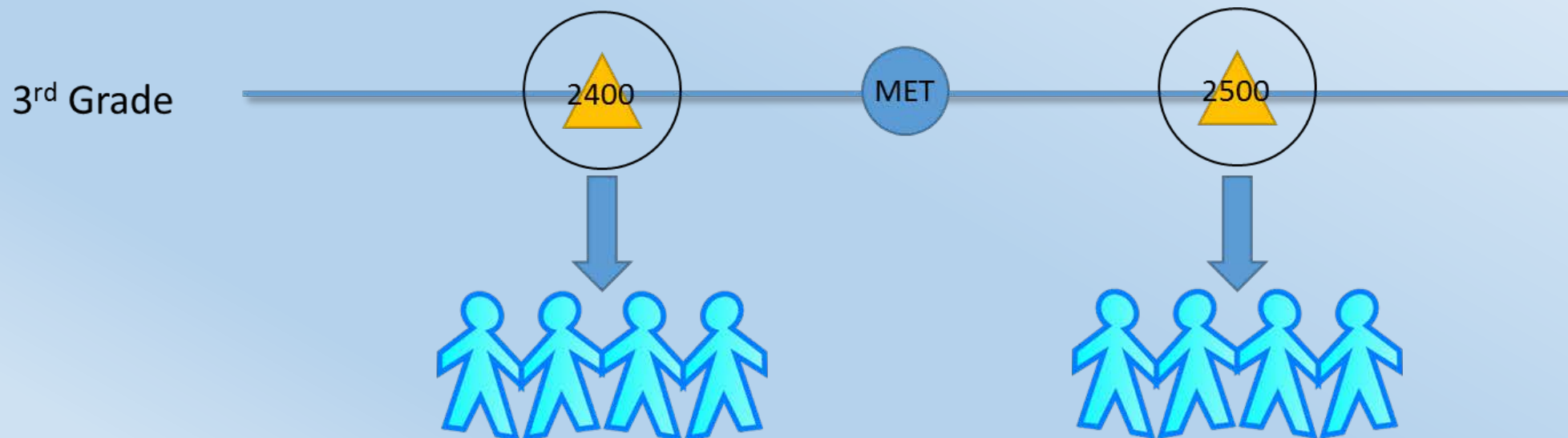
Change in Distance to Met (CDTM)

- CDTM determines if a student is scoring higher relative to the proficiency threshold (“Met”) in the current year than in the previous year.



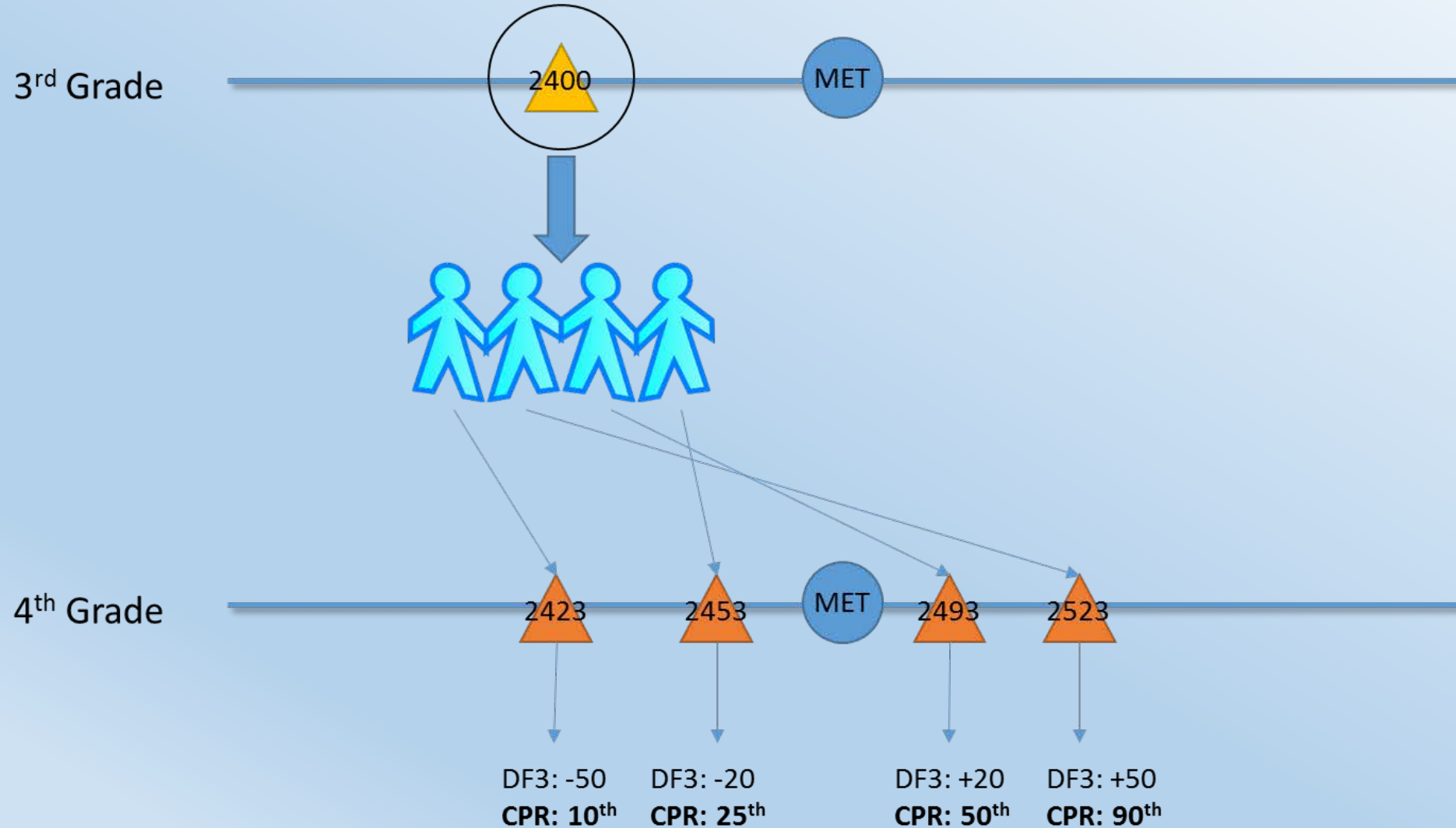
Conditional Percentile Rank (CPR)

- CPR provides a relative measure of student growth on the percentile rank scale.
 - Ranking students who scored X in 3rd grade within percentiles based on their 4th grade test scores



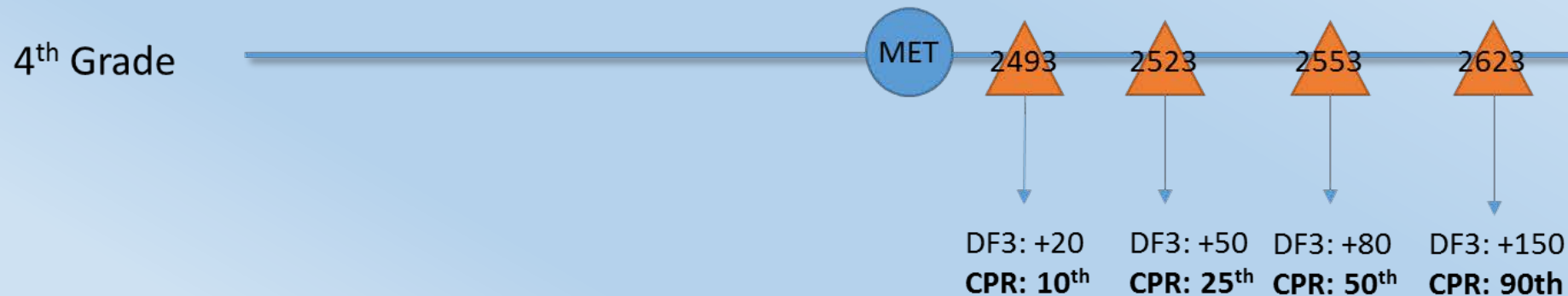
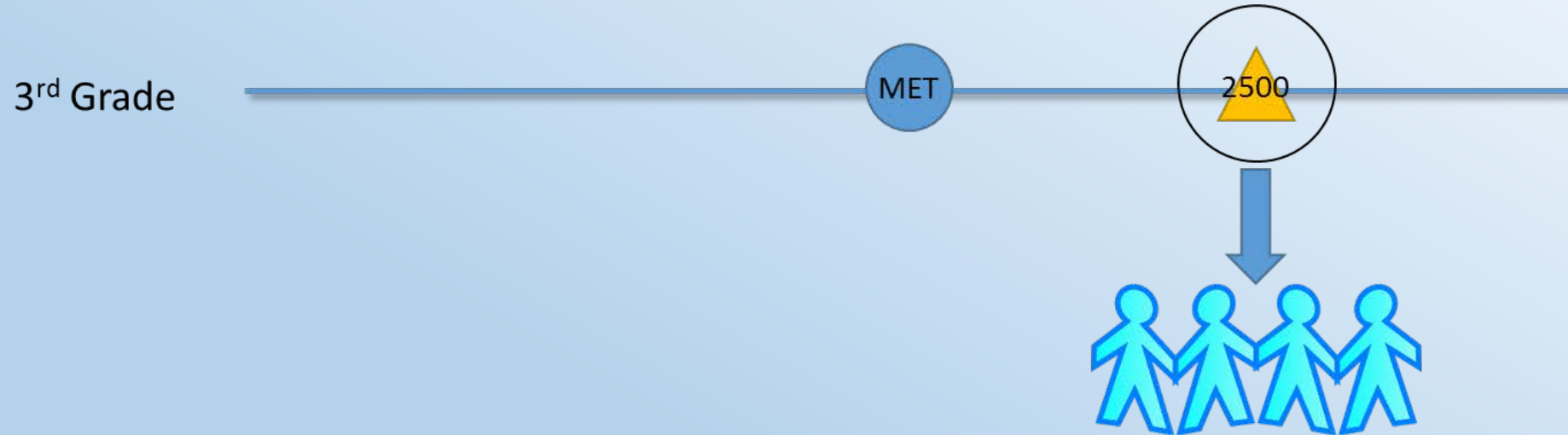
Conditional Percentile Rank (CPR)

Example: Students' Prior Score 2400



Conditional Percentile Rank (CPR)

Example: Students' Prior Score 2500



Conditional Percentile Rank (CPR) Comparison of Two Groups

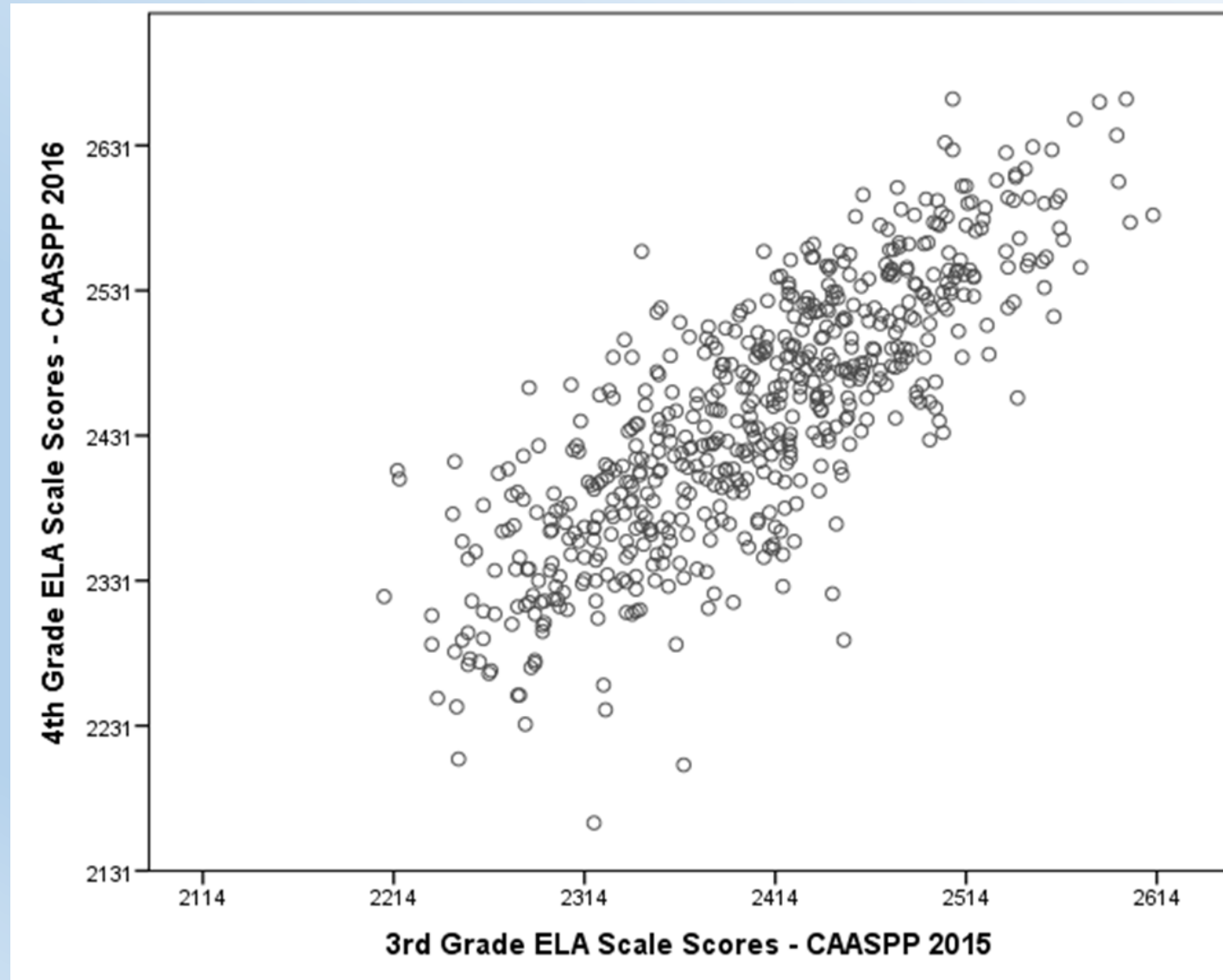
- CPR Example of a student with a DF3 of +50 in 4th grade:
 - Scored 2400 in 3rd Grade: 90th Percentile
 - Scored 2500 in 3rd Grade: 25th Percentile

Residual Gain (RG)

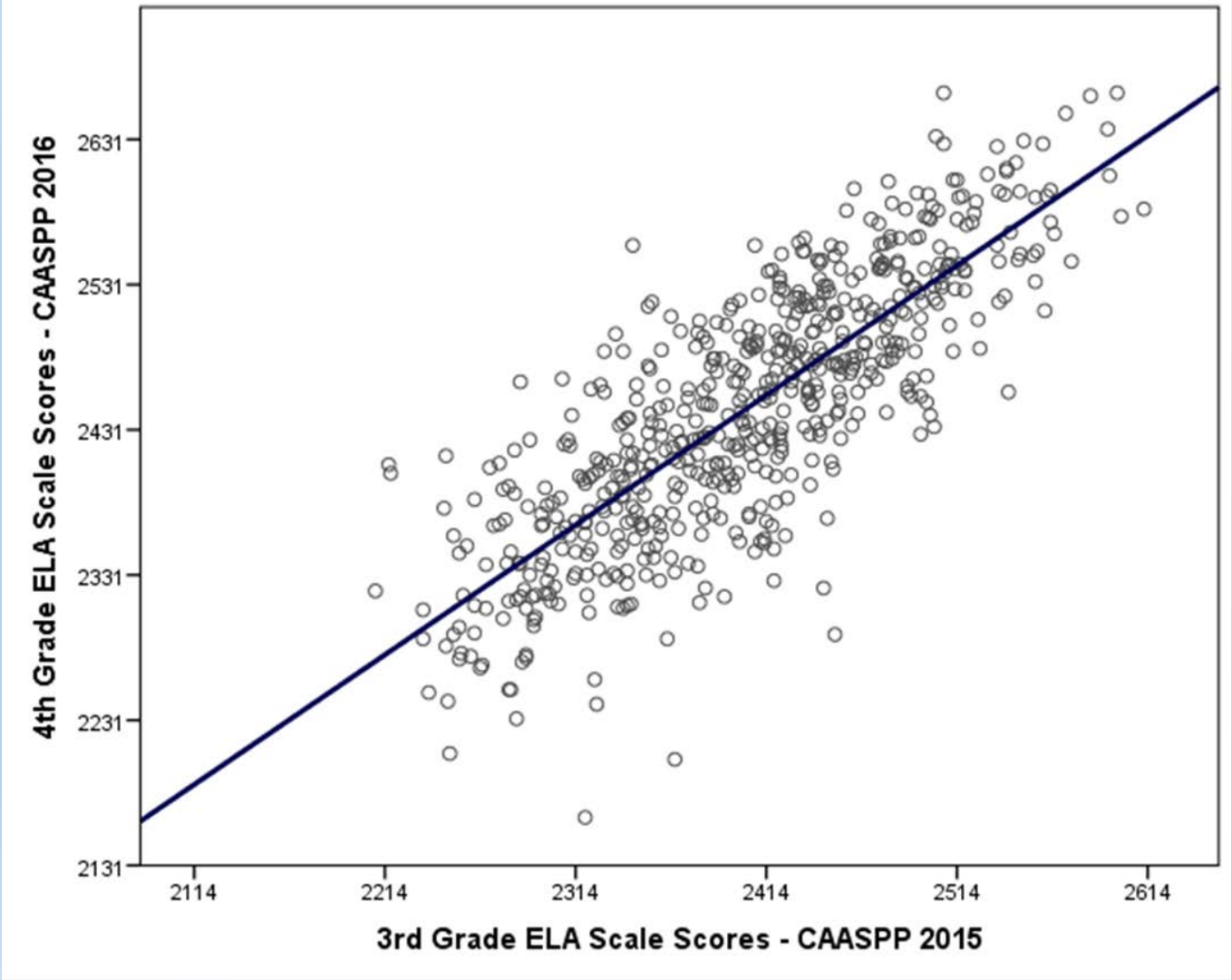
- RG provides a relative measure of student growth on the current test scale.
 - **Predict** the student's current-year score in either mathematics or ELA using the student's prior-year mathematics *and* ELA scores.

Student's current year score – **predicted score** = RG

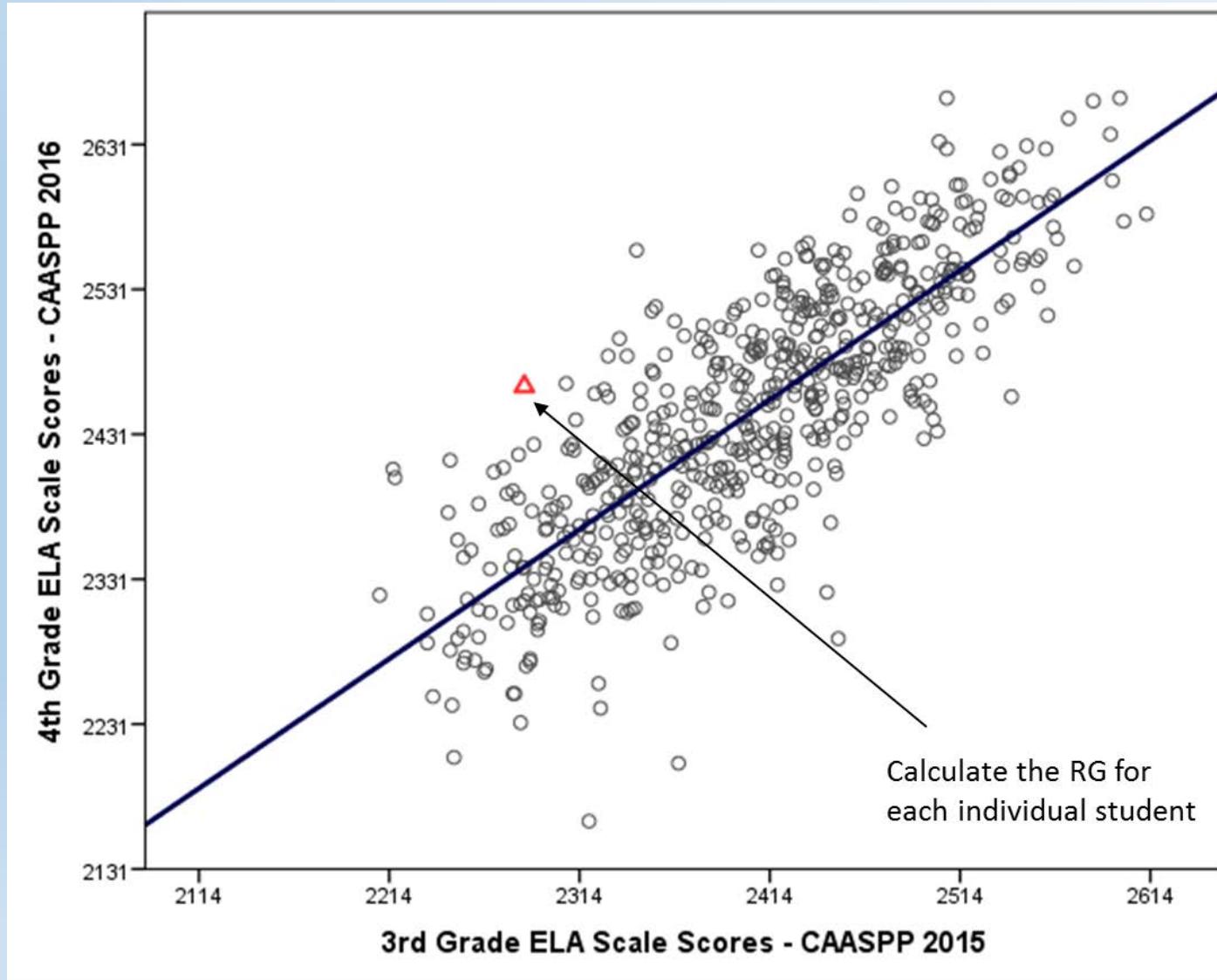
How does RG Work: Scatter Plot of Scores



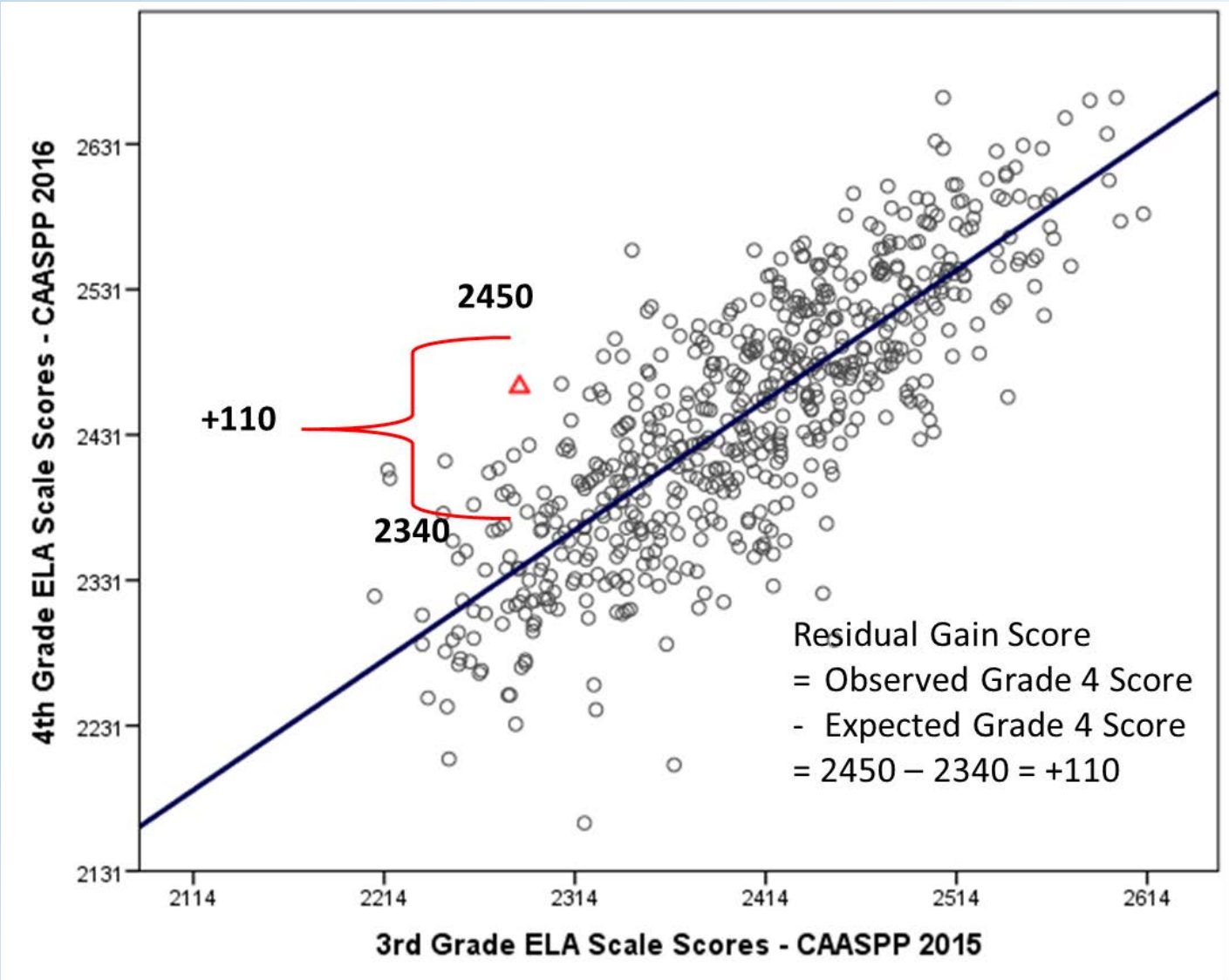
How does RG Work: Line of Best Fit



How does RG Work: Calculate RG for Each Student



How does RG Work: Results for One Student



Conclusion of ETS Analysis

- Of the three considered aggregated student growth statistics under consideration for use in aggregate accountability, **RG appears to have the most promising statistical attributes.**

Statistical Criteria	CDTM	CPR	RG
Strength of Relationship with background characteristics	Blank	X	Blank
Sensitivity to school configuration and assessment content area (ELA and mathematics)	X	Blank	Blank
Statistical precision	X	Blank	Blank

X Indicates growth measure performed the worst

CDE Recommendation on Growth Model

- Based on the results of the ETS Growth Model Report and feedback from the TDG, the CDE is recommending that the SBE adopt the Residual Gain (RG) Model.
- CDE staff will consult with the TDG and stakeholders on possible refinements to the model for the July 2018 SBE meeting.

Next Steps

- **May 2018 SBE Meeting:** SBE decision on which growth model to pursue.
- **July 2018 SBE Meeting:** Present growth model simulation results and any recommended refinements and discussion around expected metrics and indicator placement.
- **September 2018 SBE Meeting:** SBE approval of final model and methodology for inclusion in the 2018 Dashboard.

Feedback and Questions

- Do you have any feedback or refinement suggestions regarding the growth model?
- Do you have any questions regarding next step?