Education Analytics INC.

SCHOOL PROGRESS REPORT ORAL PRESENTATION

Introduction

About Education Analytics (EA)

- Non-profit organization
- Located in Madison, Wisconsin
- Today: Andrew Rice
  - Executive VP of Research and Operations
  - Advisor to states and districts on accountability measures, data systems, data policy, and advanced analytics.

www.edanalytics.org

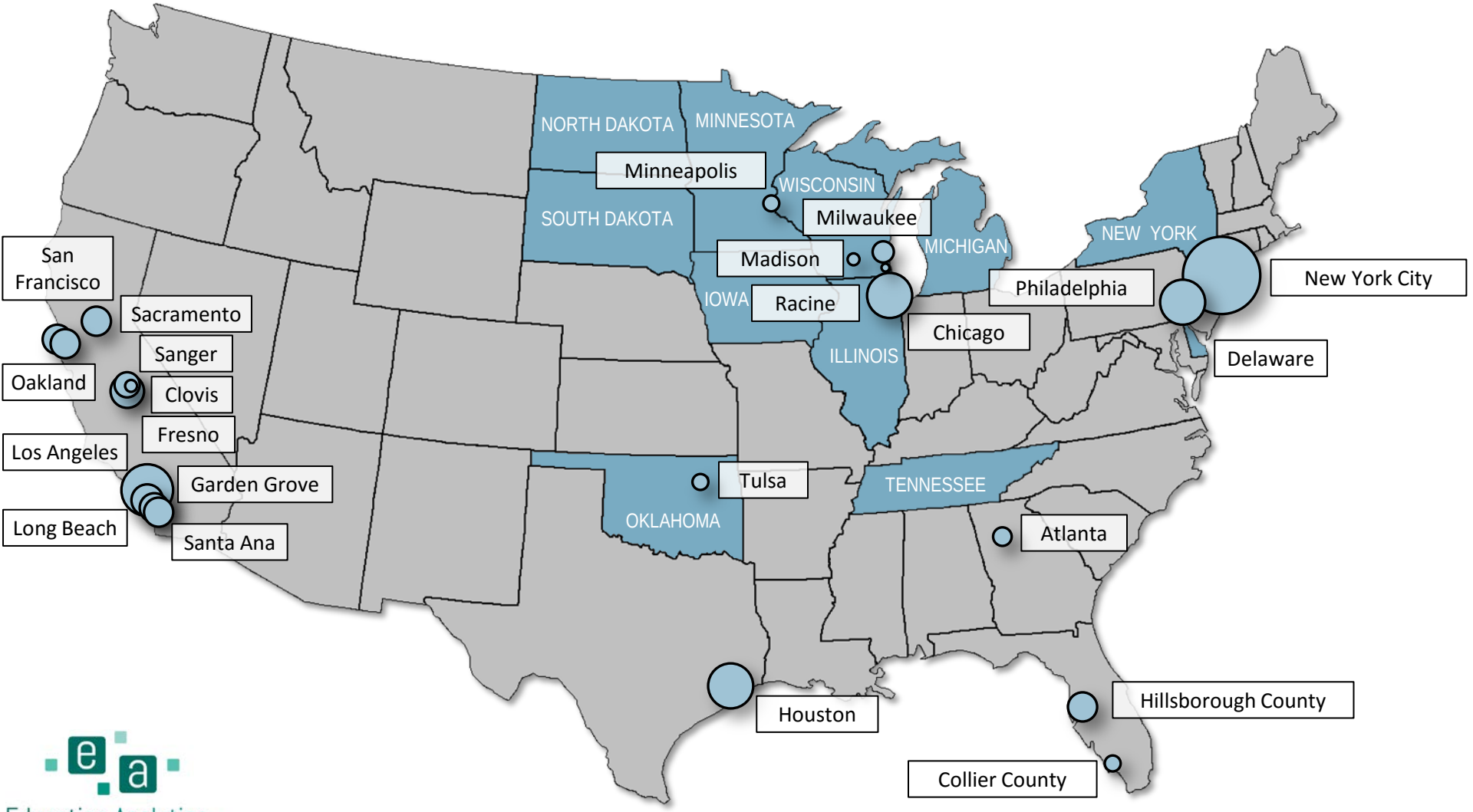
Education Analytics INC.

EA Mission and Service Areas

- Mission: “Conducting research and developing policy and management analytics to support continuous improvement in American education”
- Main Service Areas
  - Accountability and growth metric development and implementation
  - Advanced analytics for policy use
  - District created Assessment design and implementation
  - Education policy
  - Technical assistance

Education Analytics INC.

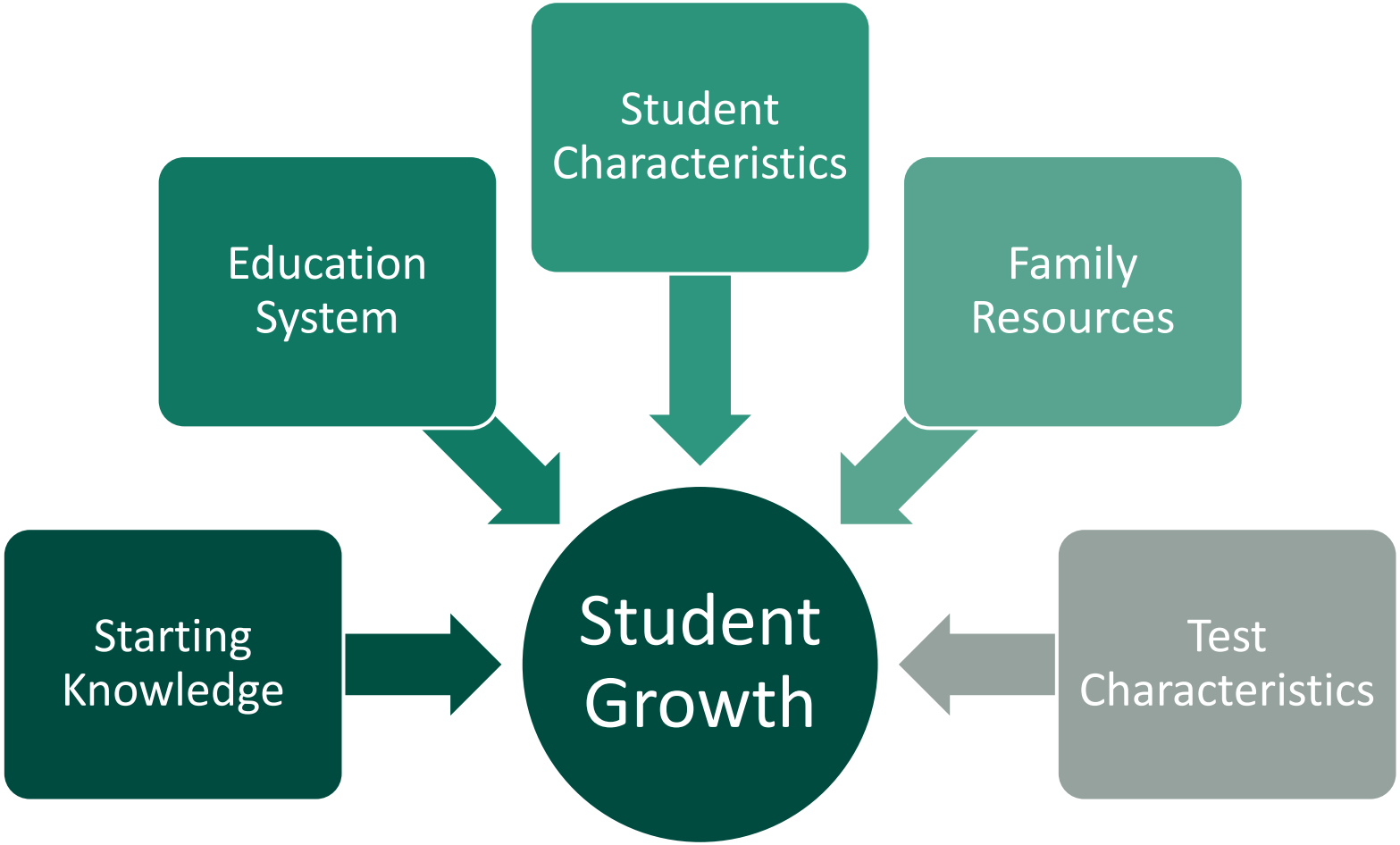
Districts and States Where our Team has Worked on Data and Analytics



Education Analytics INC.

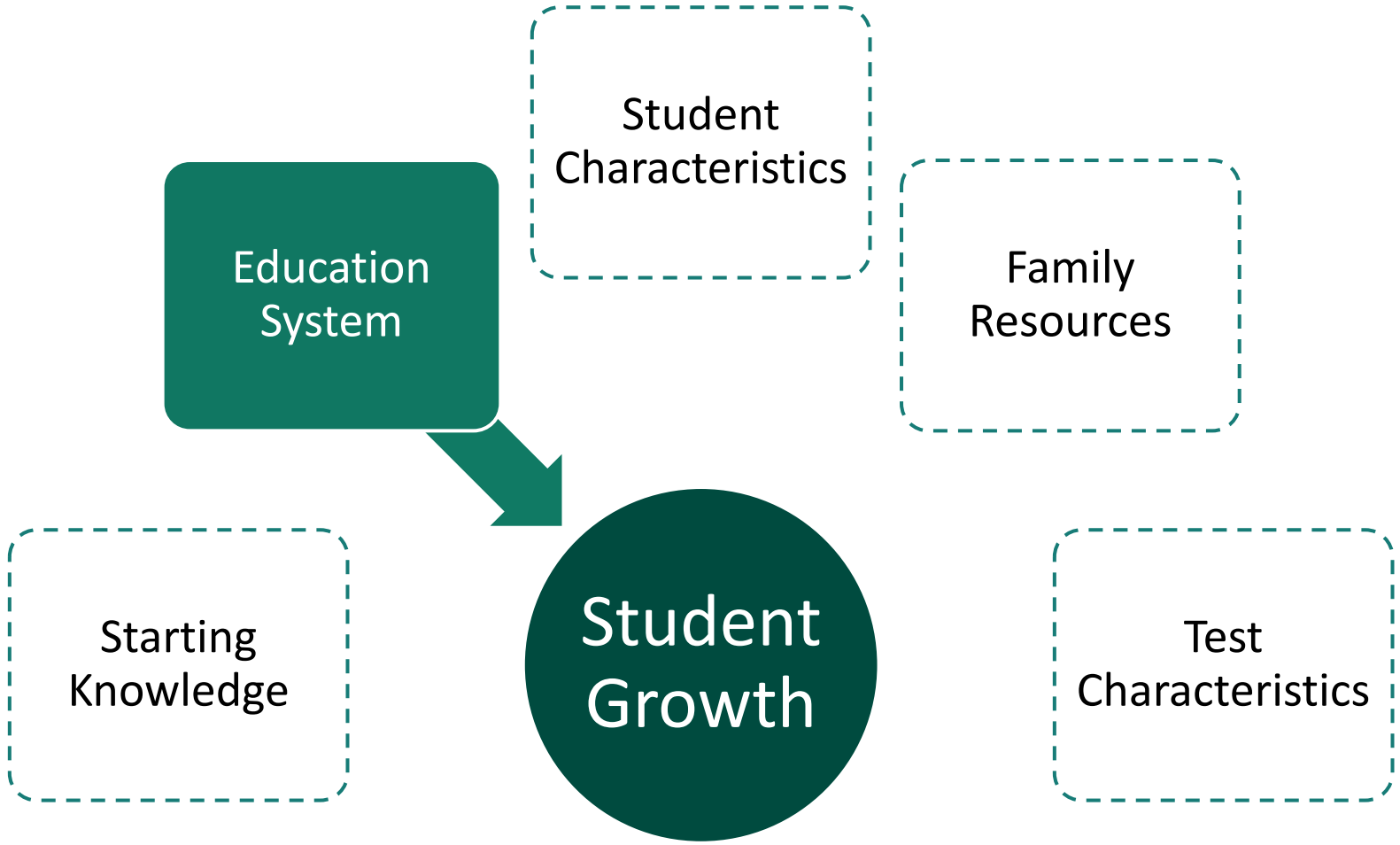
Growth Models in General

A Growth Model is Designed to Measure the Effect of the Education System on Student Growth



Education Analytics INC.

Growth models use statistical techniques to isolate the impact of the education system from non-school factors



Education Analytics INC.

Types of Growth Models

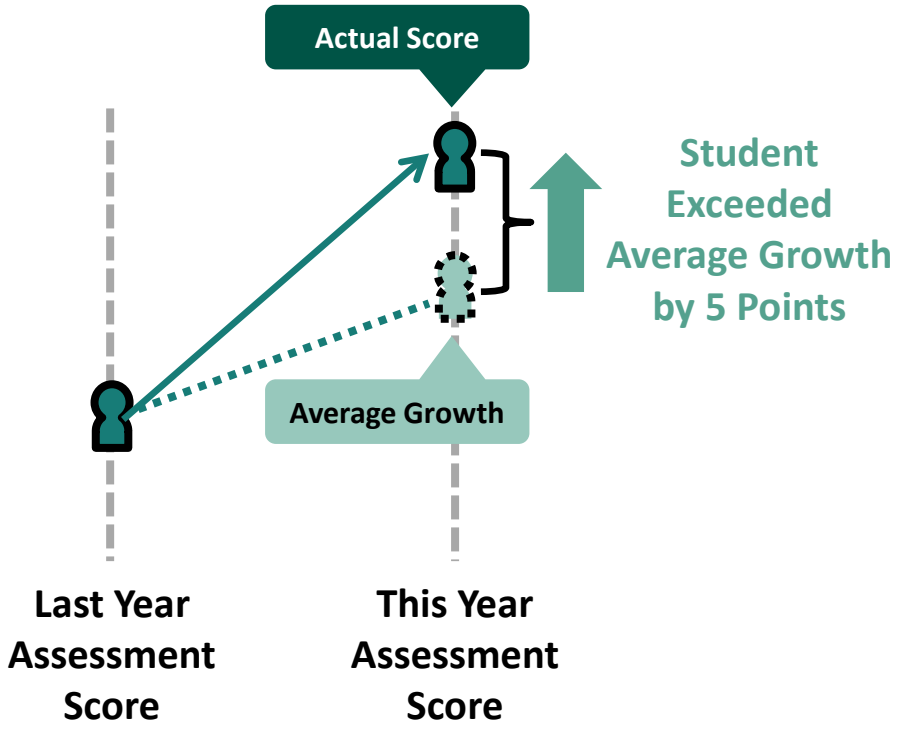
- Simple Growth
  - Simple subtraction
  - Value Tables
- Regression Based Growth
  - SGP
  - Value-added
  - Growth to Proficiency

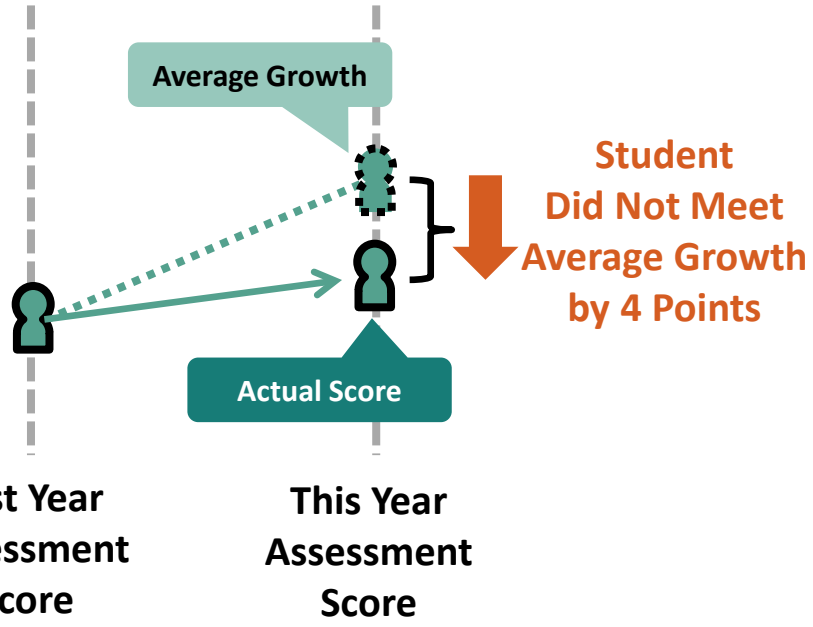
Education Analytics INC.

Scale Score Models

- Subtraction – points for scale score movement
  - Only available in vertically equated assessment
  - Pro: simple as can be
  - Con: Comparison between grades is bad -- more on this later
- Value Table – points for movement between proficiency levels
  - Pro: Allows value judgment on band movement
  - Con: Very high grain size – can get very complicated if many policy values being measured

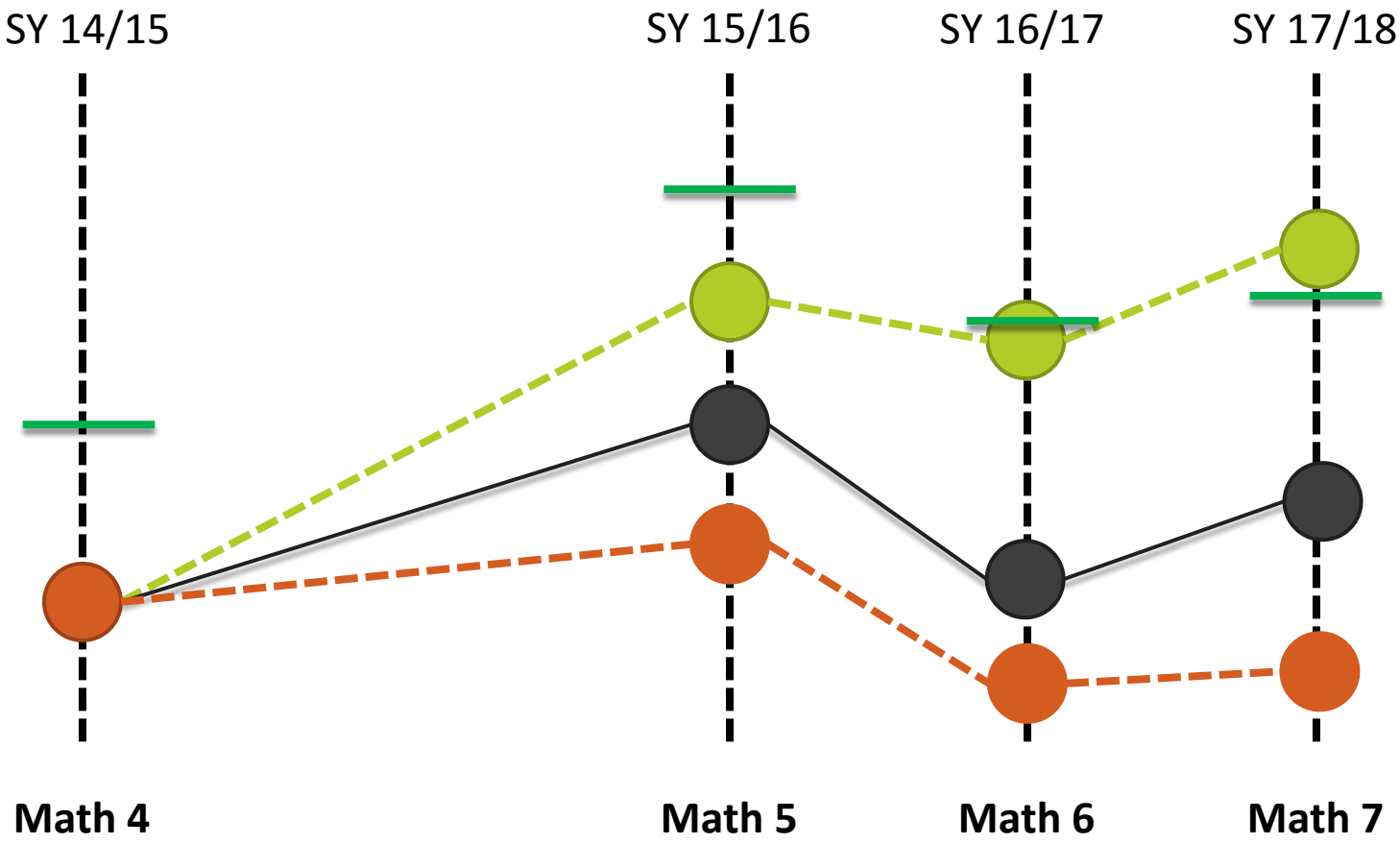
Growth Models





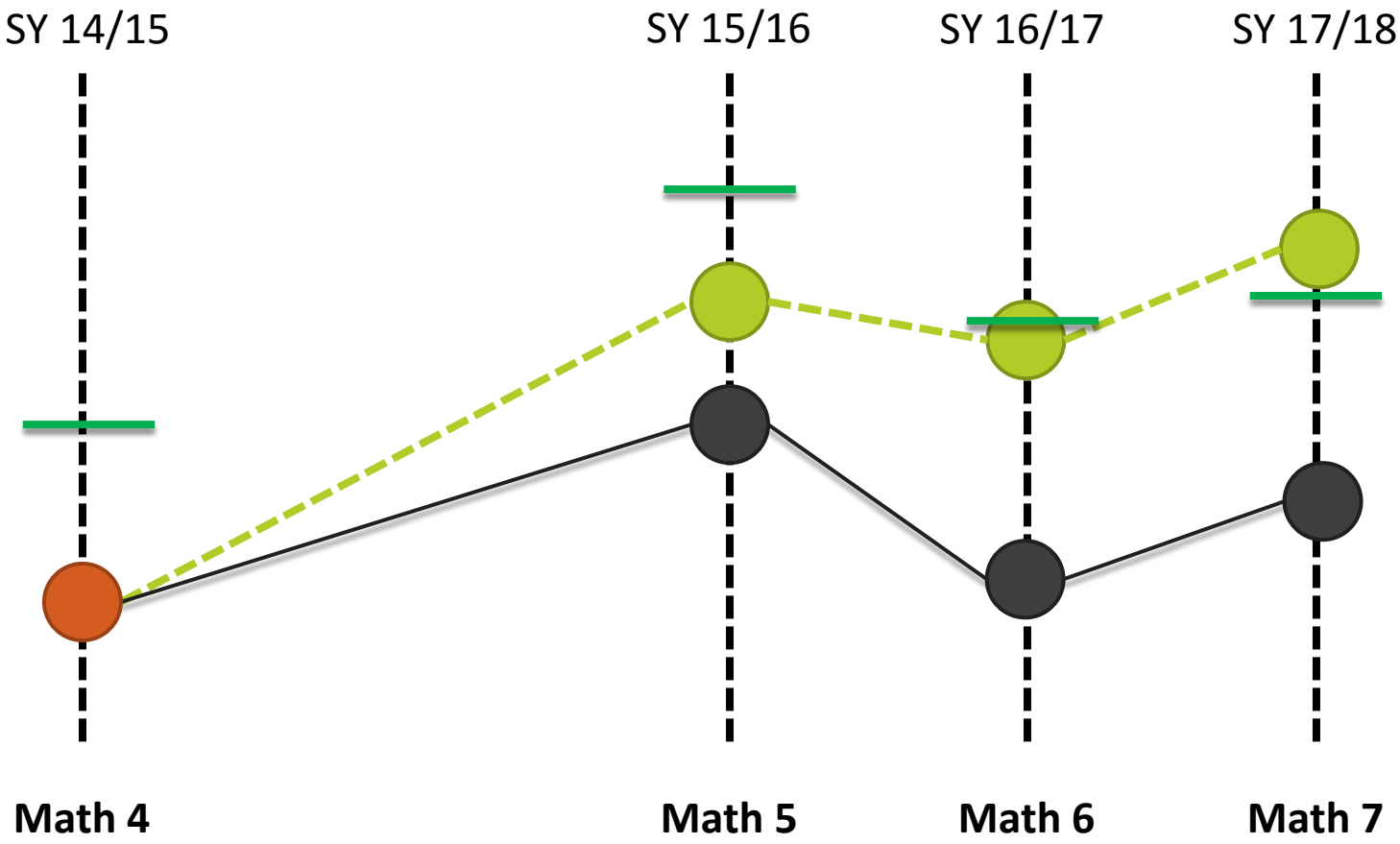
Education Analytics INC.

Growth to Proficiency (AGP)



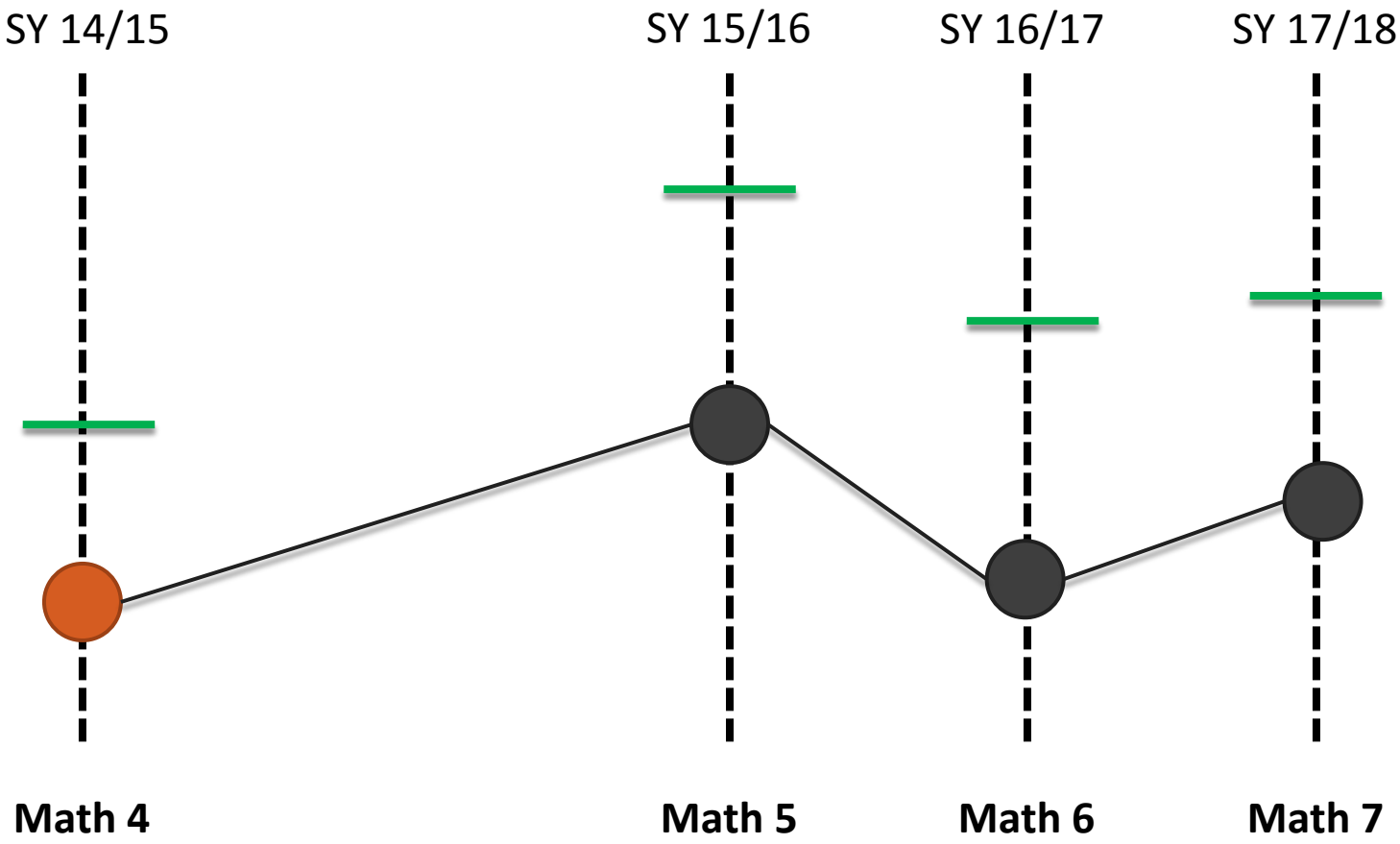
Education Analytics INC.

Growth to Proficiency (AGP)



Education Analytics INC.

Growth to Proficiency (AGP)



Education Analytics INC.

Regression Models

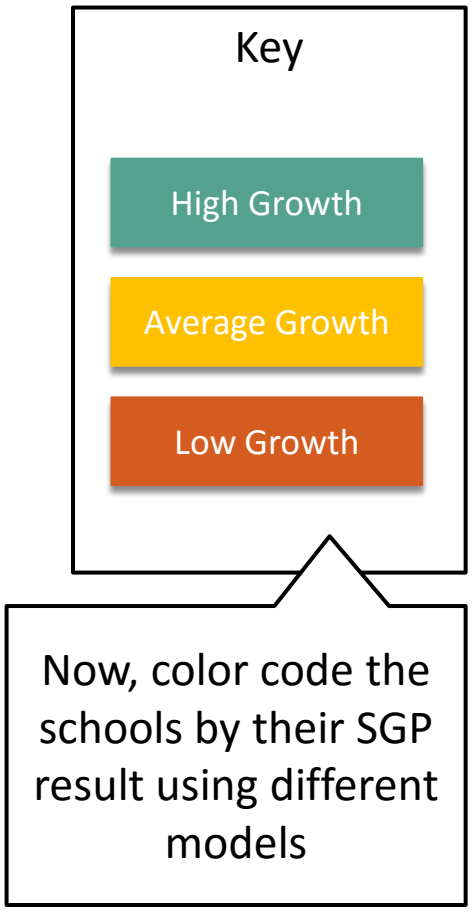
- Growth Models
  - Pro: well specified models can really isolate impact of schools on student growth
  - Con: relatively complex for stakeholder understanding
- Growth to Proficiency
  - Pro: relatively easy to explain (on track to proficiency)
  - Con: significant portion of measure is dependent on starting point
  - A mix of growth and proficiency

Education Analytics INC.

Neutrality in Urban Contexts

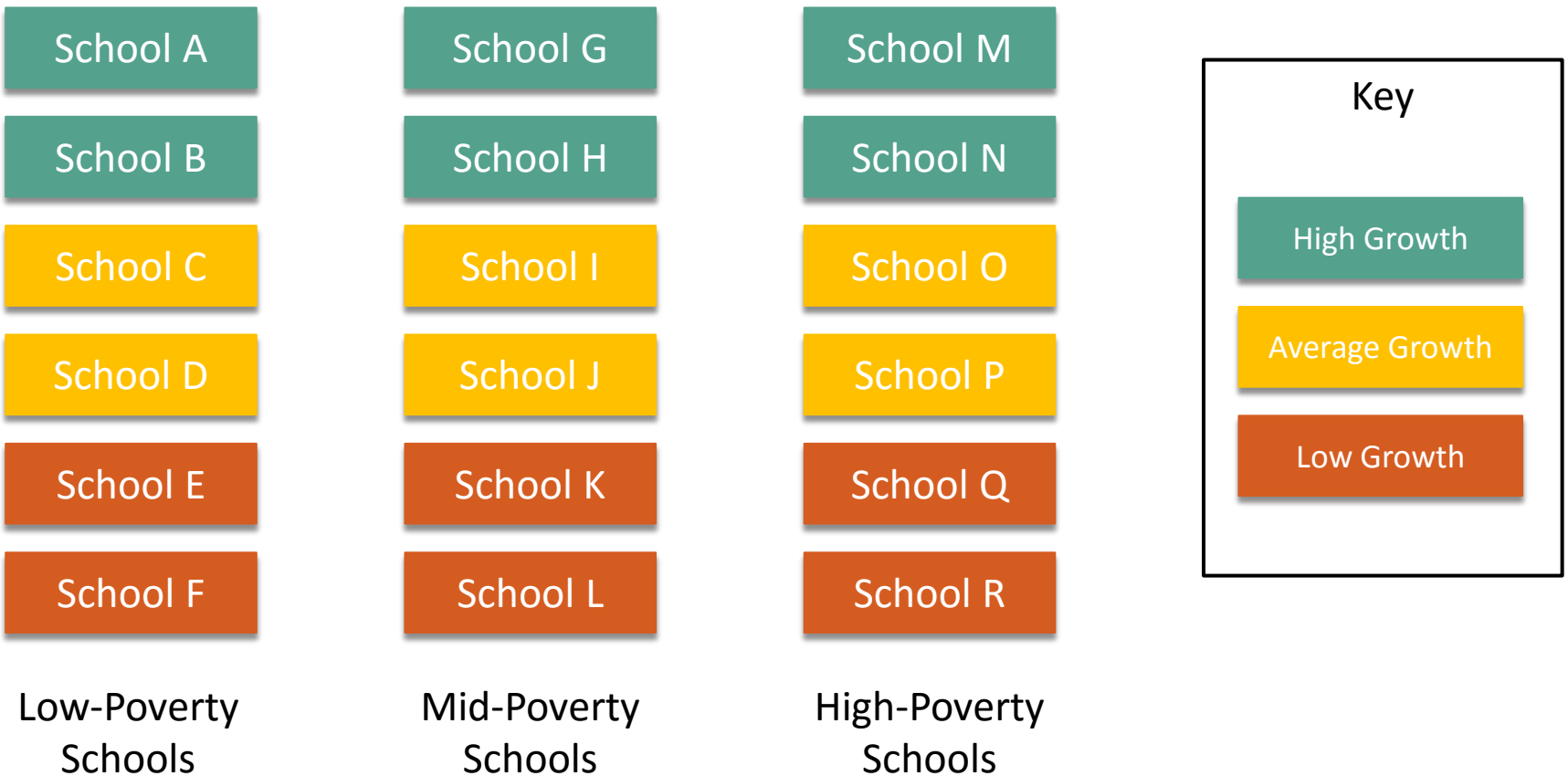
Schools Sorted by Poverty Group

Low-Poverty Schools	Mid-Poverty Schools	High-Poverty Schools
School A	School G	School M
School B	School H	School N
School C	School I	School O
School D	School J	School P
School E	School K	School Q
School F	School L	School R



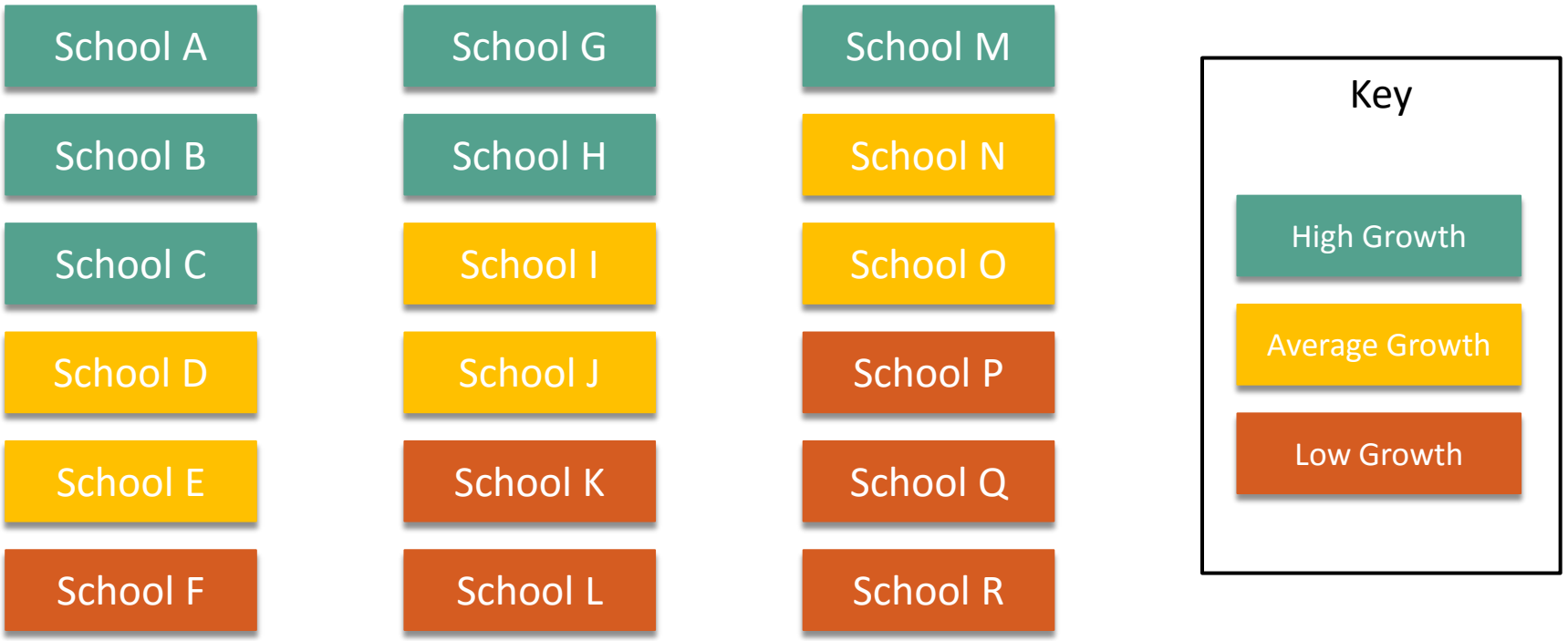
Education Analytics INC.

Completely Neutral Model



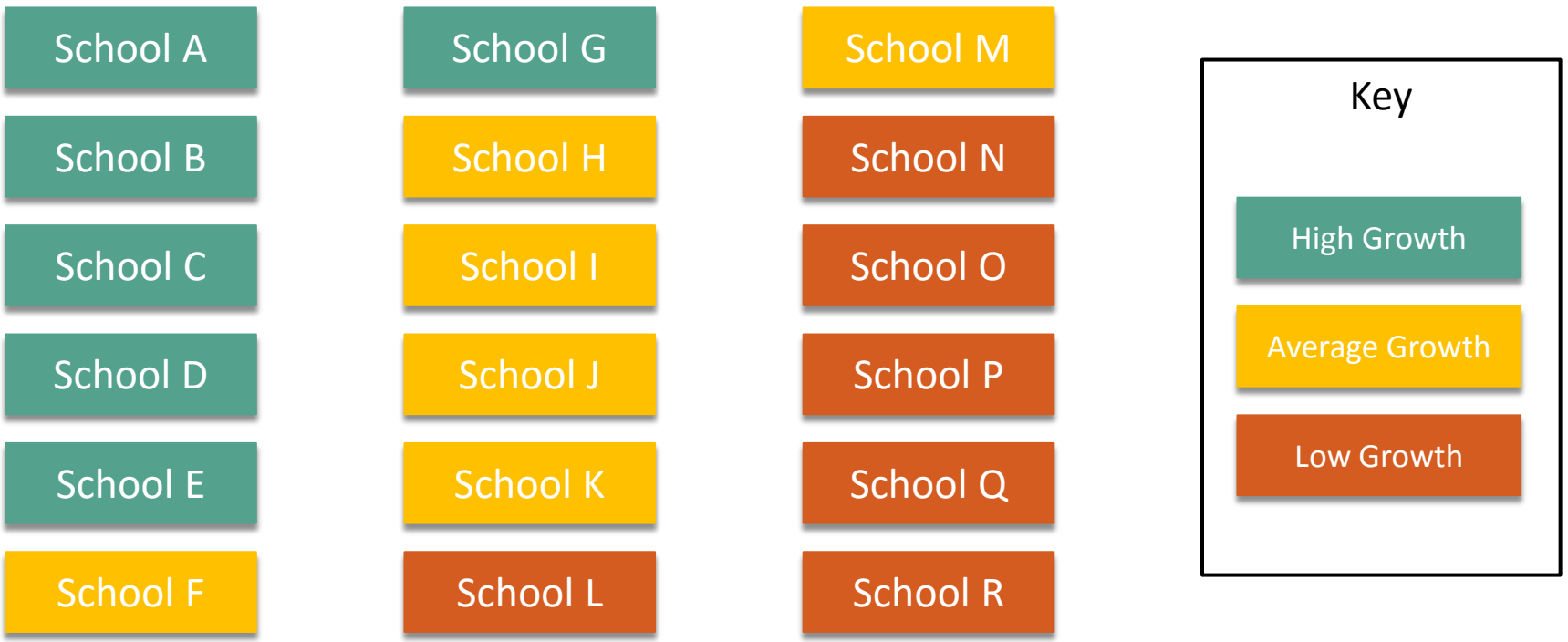
Education Analytics INC.

Somewhat Neutral Model



Education Analytics INC.

Non-Neutral Model



Education Analytics INC.

Neutrality for Urban Districts

- Neutrality is good:
  - When it makes impact transparent
  - When results are neutral to non-changing factors
- Neutrality is bad:
  - When it hides impact
- Non-neutral models tend to disfavor:
  - High FRL%, high ELL%, high SPED% schools

Education Analytics INC.

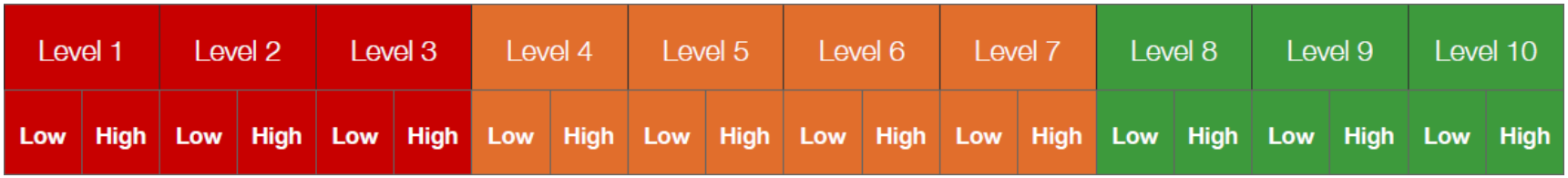
What models relate to neutrality

- Non-Neutral
  - Proficiency
  - Value-Tables
  - Growth to Proficiency
  - Subtraction
- Somewhat Neutral
  - SGP, some value-added models
- Completely-neutral
  - “Fully loaded” regression model

Education Analytics INC.

Ratings

Index Metric Performance Thresholds

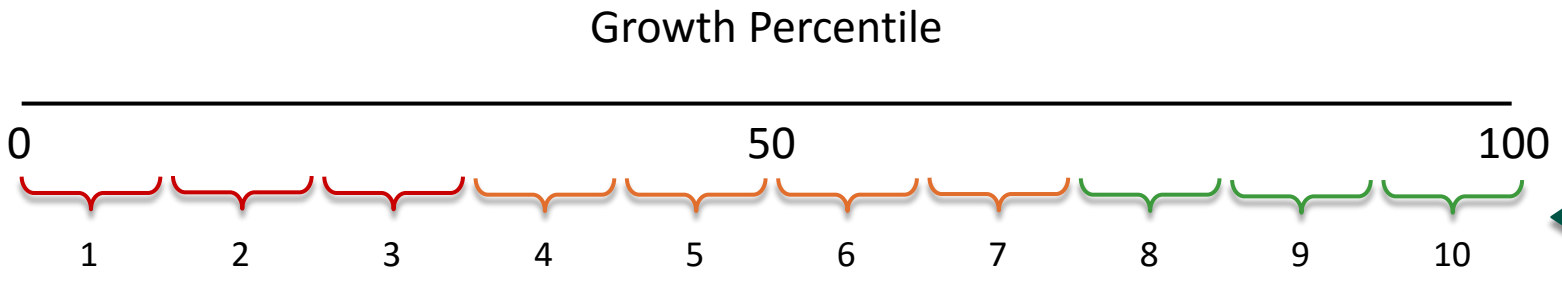


- Stage 1: Red/orange/green
- Stage 2: Levels within colors

- These are all policy decisions

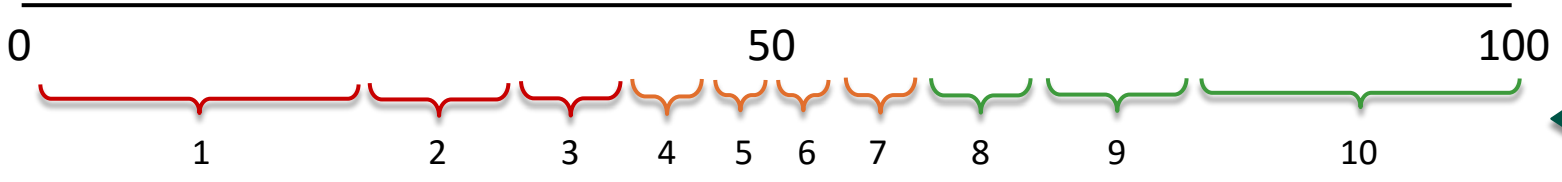
Education Analytics INC.

Method 1: Everything by Growth Percentile Ranges



Equal Percentile Ranges

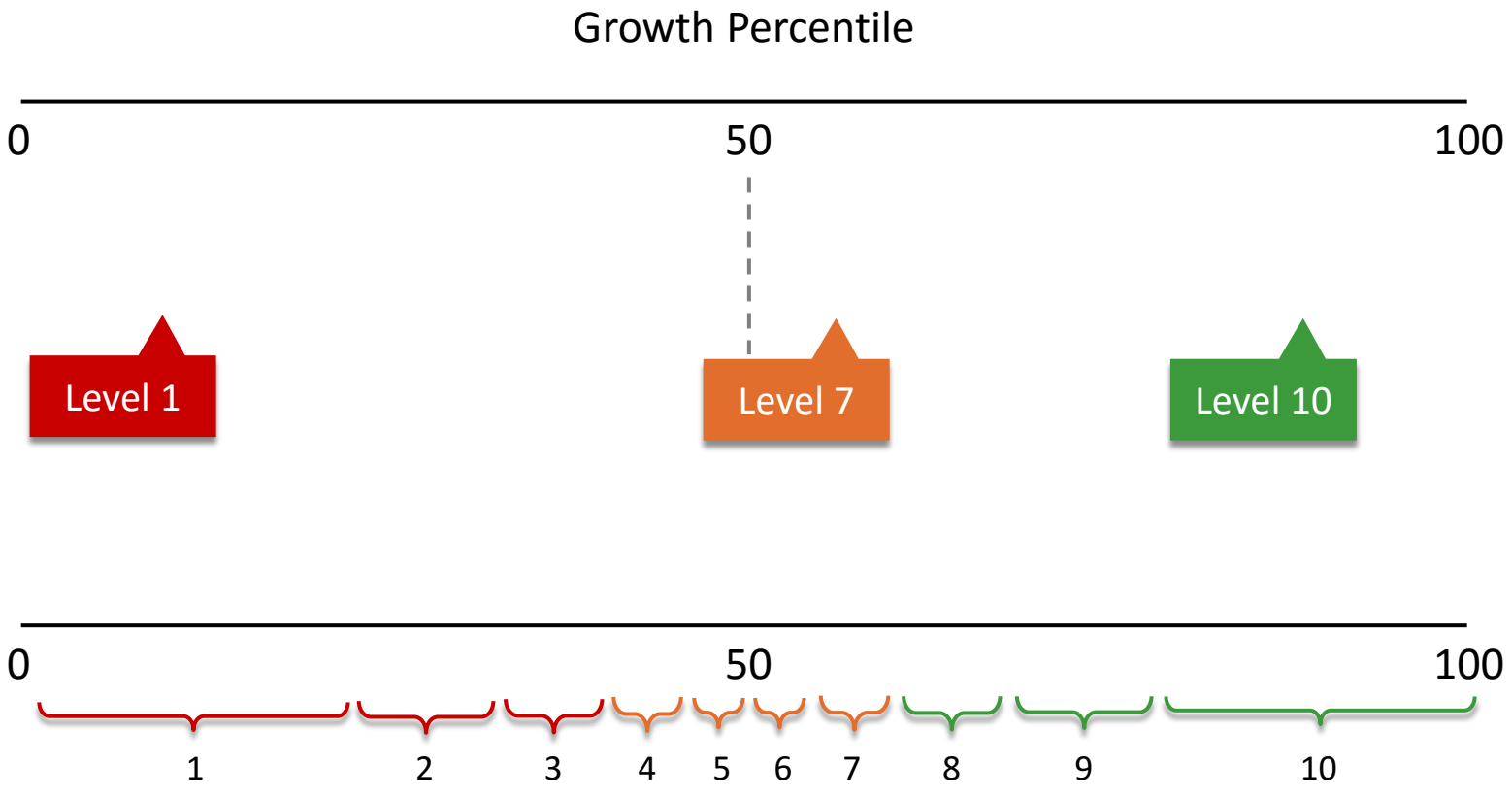
Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8		Level 9		Level 10	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
0	9	10	19	20	29	30	39	40	49	50	59	60	69	70	79	80	89	90	100



Equal Number of Schools Per Level

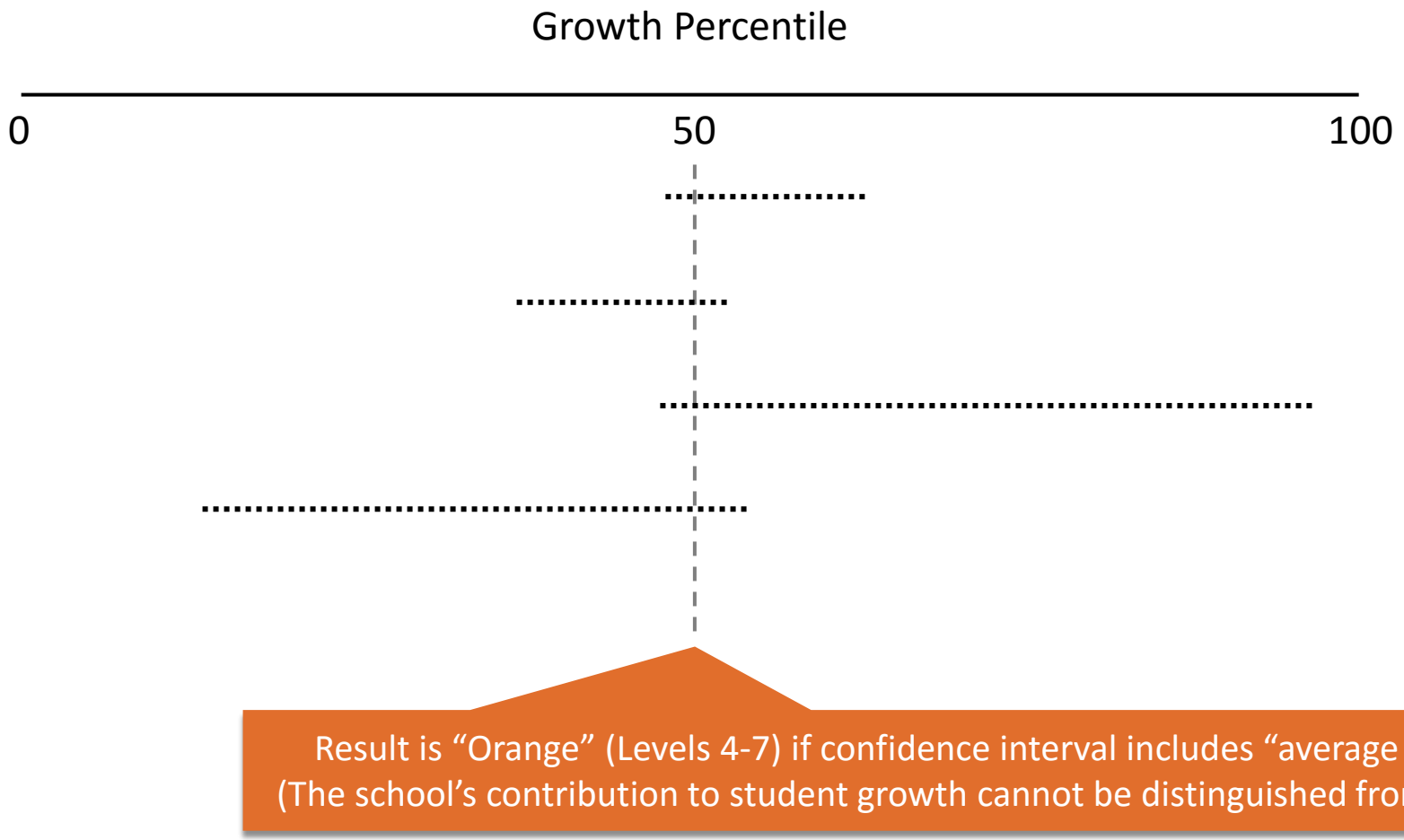
Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8		Level 9		Level 10	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
0	24	25	35	36	42	43	46	47	49	50	52	53	56	57	63	64	74	75	100

Method 1: Everything by Growth Percentile Ranges



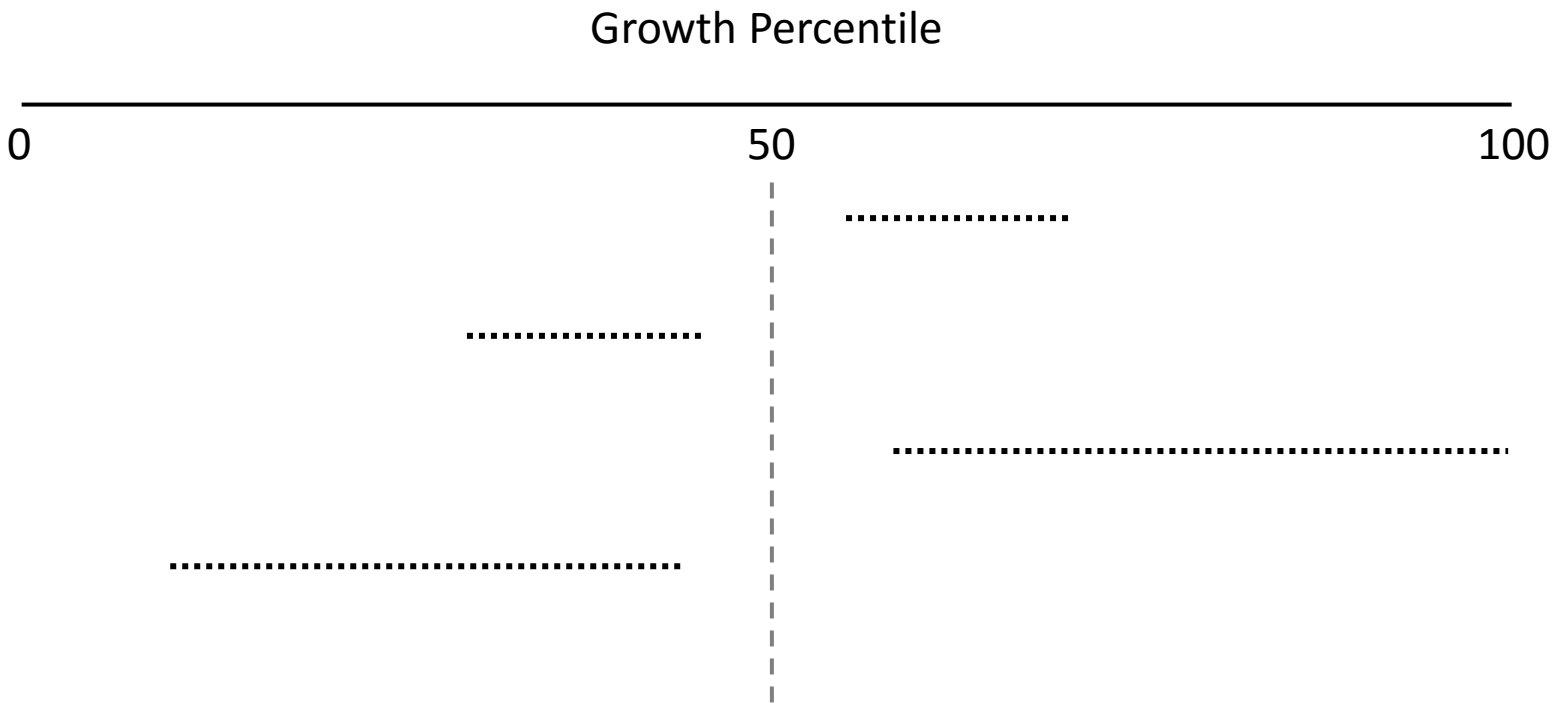
Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8		Level 9		Level 10	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
0	24	25	35	36	42	43	46	47	49	50	52	53	56	57	63	64	74	75	100

Method 2: Color by Confidence Interval, Level by Growth Percentile



Education Analytics INC.

Method 2: Color by Confidence Interval, Level by Growth Percentile

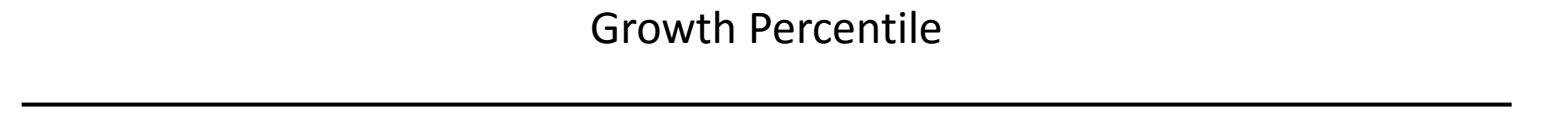


Result is “Red” (Levels 1-3) if confidence interval is entirely below “average growth”

Result is “Green” (Levels 8-10) if confidence interval is entirely above “average growth”

Education Analytics INC.

Method 2: Color by Confidence Interval, Level by Growth Percentile



Level 2

confidence interval is entirely below "average growth"

Level 6

confidence interval includes "average growth" (50th growth percentile)

Level 9

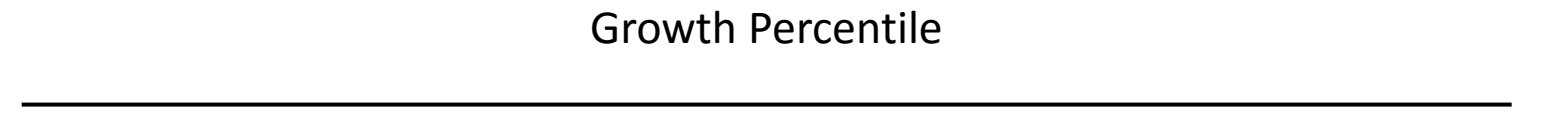
confidence interval is entirely above "average growth"

Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8		Level 9		Level 10	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
0	9	10	29	30	49	0	39	40	49	50	59	60	100	50	69	70	89	90	100

Then determine Level by Growth Percentile

Education Analytics INC.

Method 3: Everything by Confidence Interval



Level 1

confidence interval is entirely below "average growth"

Level 7

confidence interval includes "average growth" (50th growth percentile)

Level 10

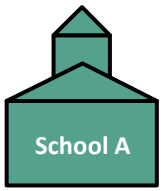
confidence interval is entirely above "average growth"

Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8		Level 9		Level 10	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
UB 0	UB 29	UB 30	UB 39	UB 40	UB 49	LB 0	LB 29	LB 30	LB 39	LB 40	LB 44	LB 45	LB 50	LB 50	LB 59	LB 60	LB 69	LB 70	LB 100

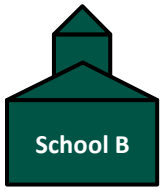
Then determine Level by Confidence Interval Bounds

Education Analytics INC.

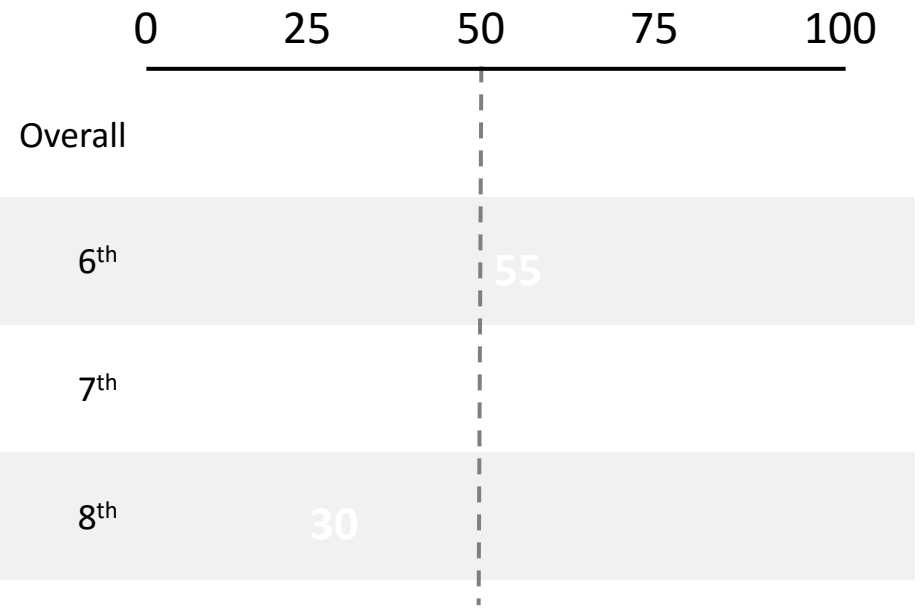
Example Scenario

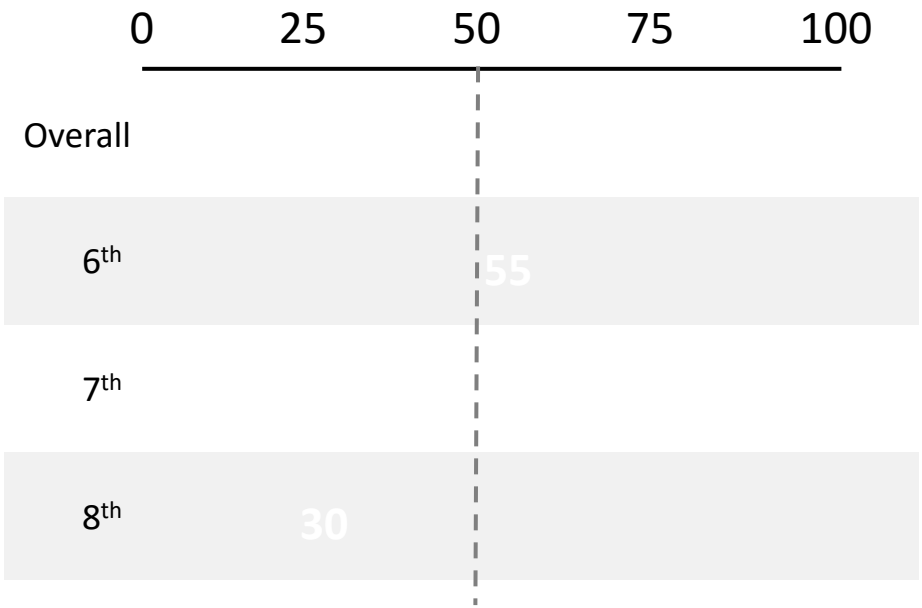


500 students/grade



60 students/grade



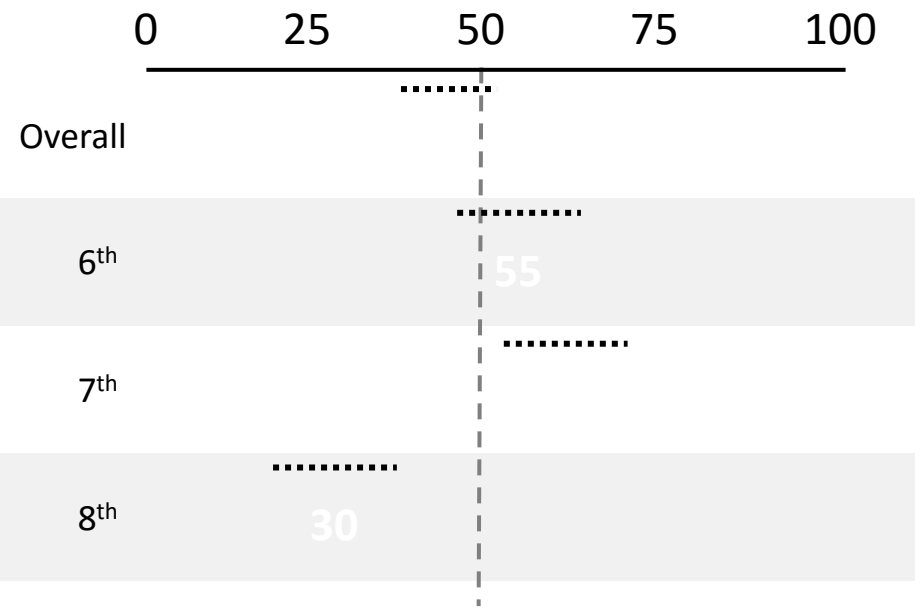


Education Analytics INC.

Example Scenario

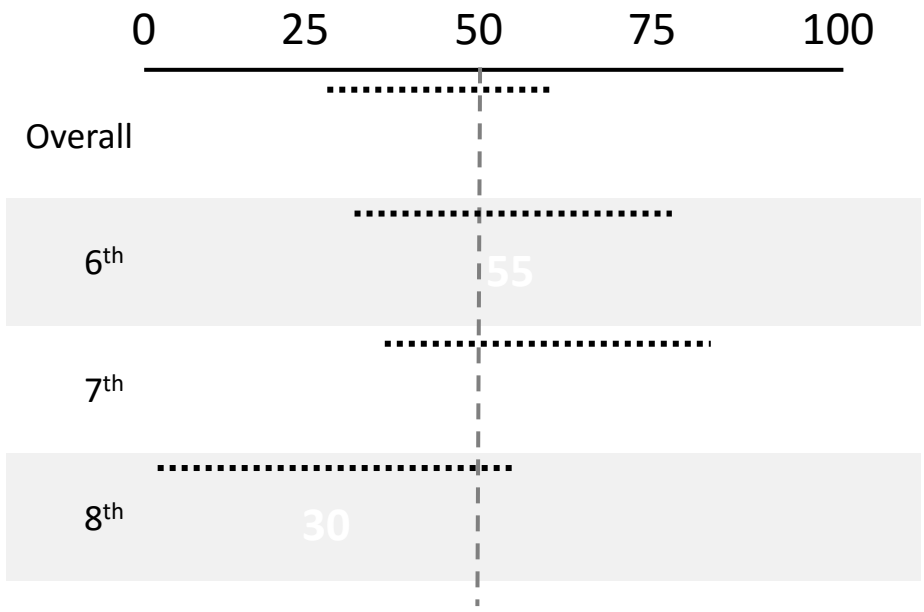
School A

500 students/grade



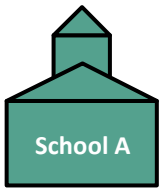
School B

60 students/grade

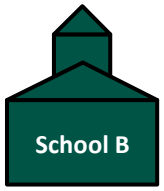


Education Analytics INC.

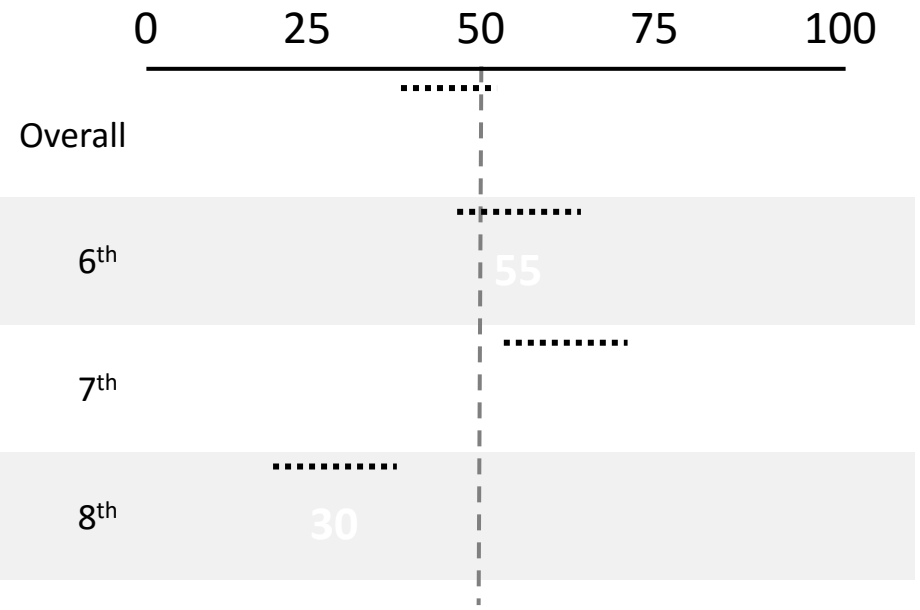
Example Scenario: Method 1 with potential "equal school number per level" cutoffs

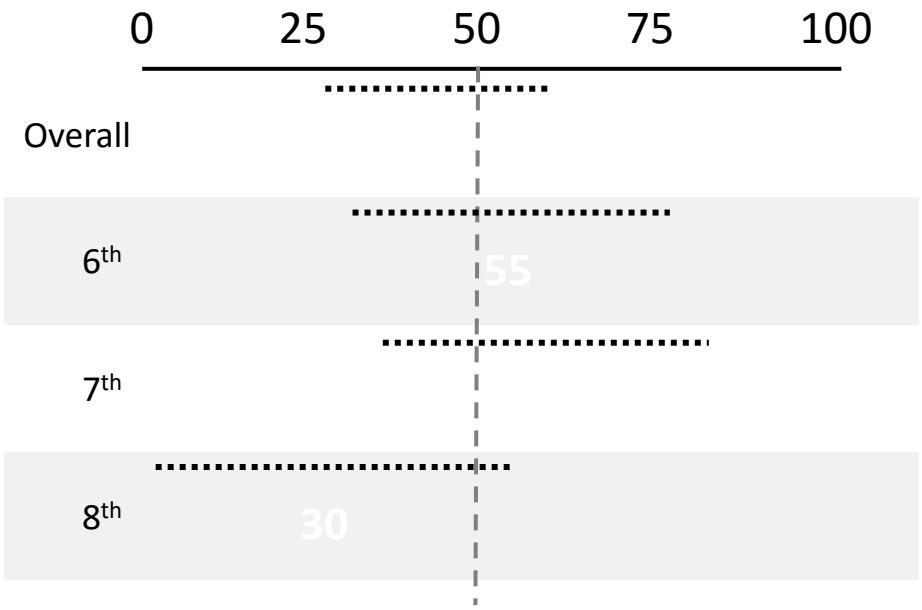


500 students/grade



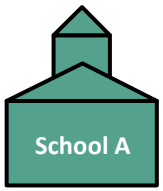
60 students/grade



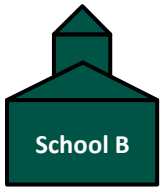


Education Analytics INC.

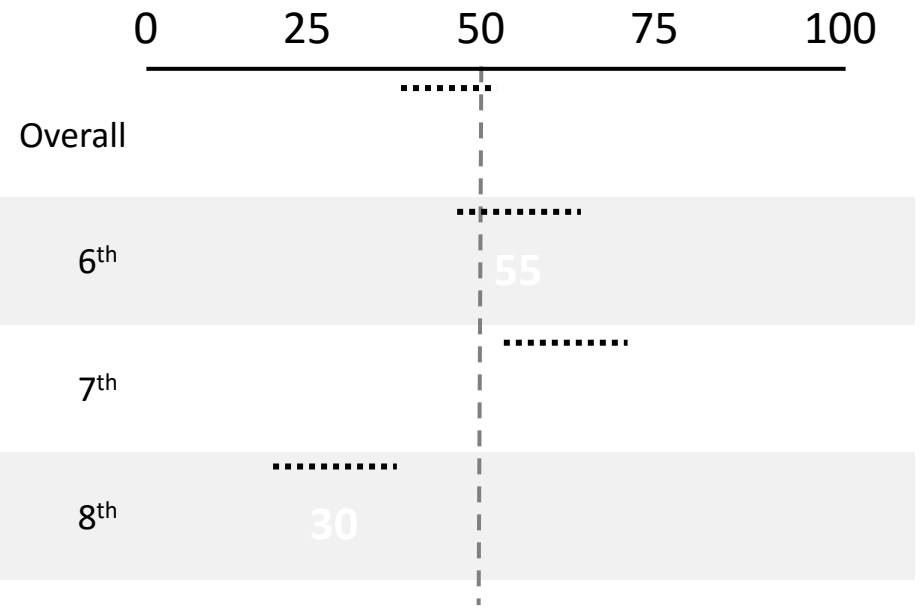
Example Scenario: Method 2 / Method 3 with potential confidence interval rules

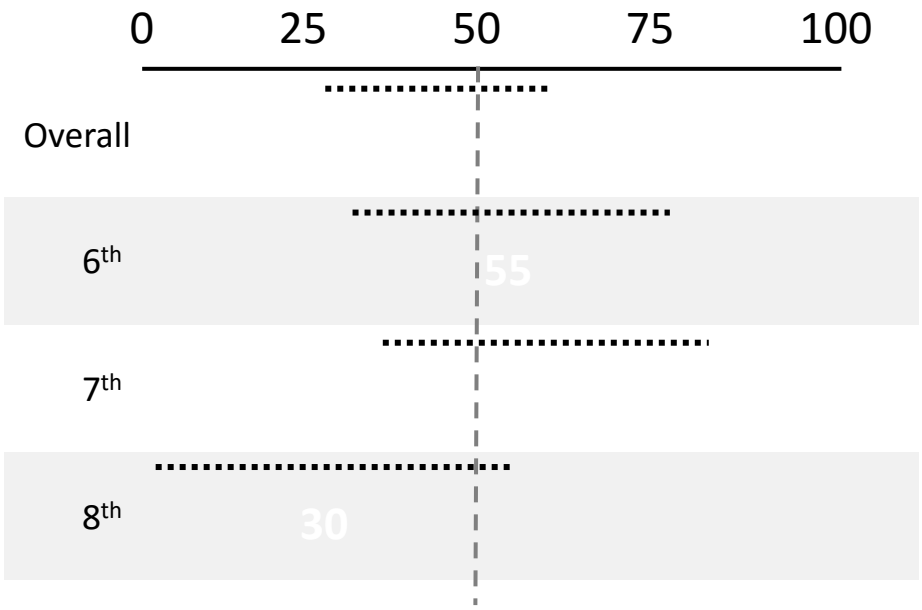


500 students/grade



60 students/grade





Education Analytics INC.

So What?

- Small schools have more noise in growth models
  - Especially true with SGP
- Real measures of error are important to know when rating schools
  - True of other measures too but tends to be ignored

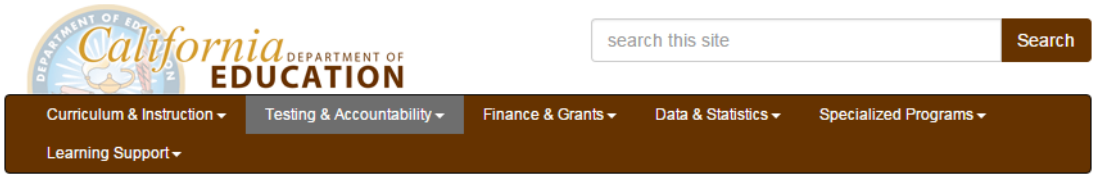
Scale for Reporting

Reporting in Scale Score Growth

- This section: Illustrating the difficulty of reporting school-level metrics in scale score growth

Education Analytics INC.

Scale Score Growth



Home / Testing & Accountability / Testing / California Assessment of Student Performance and Progress (CAASPP) System

Smarter Balanced Scale Score Ranges

Scale score ranges for English Language Arts/Literacy and Mathematics, by Content Area, Grade Level, and Achievement Level.

English Language Arts/Literacy

Grade	Minimum Scale Score	Maximum Scale Score	Achievement Level Scale Score Range for Standard Not Met	Achievement Level Scale Score Range for Standard Nearly Met	Achievement Level Scale Score Range for Standard Met	Achievement Level Scale Score Range for Standard Exceeded
3	2114	2623	2114–2366	2367–2431	2432–2489	2490–2623
4	2131	2663	2131–2415	2416–2472	2473–2532	2533–2663
5	2201	2701	2201–2441	2442–2501	2502–2581	2582–2701
6	2210	2724	2210–2456	2457–2530	2531–2617	2618–2724
7	2258	2745	2258–2478	2479–2551	2552–2648	2649–2745
8	2288	2769	2288–2486	2487–2566	2567–2667	2668–2769
11	2299	2795	2299–2492	2493–2582	2583–2681	2682–2795

SBAC score ranges used in illustrative example

Assumption for illustration: Typical student growth puts students “on track” to stay in their achievement level

Education Analytics INC.

“Standard Met” Scale Score Range

Grade	Minimum Scale Score	Maximum Scale Score	Achievement Level Scale Score Range for Standard Not Met	Achievement Level Scale Score Range for Standard Nearly Met	Achievement Level Scale Score Range for Standard Met	Achievement Level Scale Score Range for Standard Exceeded
3	2114	2623	2114–2366	2367–2431	2432–2489	2490–2623
4	2131	2663	2131–2415	2416–2472	2473–2532	2533–2663
5	2201	2701	2201–2441	2442–2501	2502–2581	2582–2701
6	2210	2724	2210–2456	2457–2530	2531–2617	2618–2724
7	2258	2745	2258–2478	2479–2551	2552–2648	2649–2745
8	2288	2769	2288–2486	2487–2566	2567–2667	2668–2769
11	2299	2795	2299–2492	2493–2582	2583–2681	2682–2795

Education Analytics INC.

“Growth to Meet Standard” if Score Ranges are Horizontally Stable

Grade	Achievement Level Scale Score Range for Standard Met	
3	2432–2489	+42
4	2473–2532	+39
5	2502–2581	+32.5
6	2531–2617	+26
7	2552–2648	+17
8	2567–2667	

A 3rd grader in the middle of the “Standards Met” range (2460.5) needs to grow 42 scale score points to remain in the middle of the “Standards Met” range in 4th grade (2502.5)

Education Analytics INC.

Scale Score Growth at School Level

Grade	Achievement Level Scale Score Range for Standard Met	
3	2432–2489	
		+42
4	2473–2532	
		+39
5	2502–2581	
		+32.5
6	2531–2617	
		+26
7	2552–2648	
		+17
8	2567–2667	

Elementary Grades
~40 points of growth

Middle Grades
~25 points of growth

Education Analytics INC.

Growth in Accountability Systems

Where does Growth Fit

- Theory of accountability models:
  - Hold the education system accountable for outcomes it has impact on
- Proficiency measures are mostly about neighborhood: useful information but not actionable
- Growth measures take away the free pass to rich neighborhoods
- Urban districts tend to look better on growth than proficiency

Education Analytics INC.

Growth on Other Metrics

- ESSA makes strong requirements on ELP growth
  - WIDA can be used in a growth model
  - Relatively new ground in the field
- Graduation rates can be used in a "growth model"
  - "4% above schools with similar students"
- Measuring impact properly can only help urban districts
  - History of status driven metrics that disfavor urban districts

Education Analytics INC.

Discussion

Discussion Questions

- Given the information presented, what opportunities do you see to improve your state/district's current implementation and use of growth models?
- How is your state/district thinking about the new opportunities/requirements afforded by the ELP growth components of ESSA?
- How could your district/state best use the growth idea on non-assessment measures like graduation or chronic absenteeism?

Education Analytics INC.