Connecticut's Growth Model for the Smarter Balanced Summative Assessments:

English Language Arts (ELA) and Mathematics

September 2016

Last slide from presentation to Mastery Examination Committee, April 28, 2016

Summary

The test development procedures used by SBAC provide sufficient evidence that

- the test scores can validly be used as measures of overall proficiency
- the proficiency scores obtained through the CAT administration are reliable
- the IRT proficiency scores based on the vertical scale can be used to measure growth in proficiency across grades

Agenda

- What is growth? How is it different from achievement?
- What is Connecticut's approach to measuring growth?
- What factors are considered when establishing ambitious yet achievable targets?
- How and when will growth be incorporated into the Next Generation Accountability System for districts and schools?

What is growth? How is it different from achievement?

Achievement or Proficiency:

- A one-time snapshot measurement of a student's academic performance

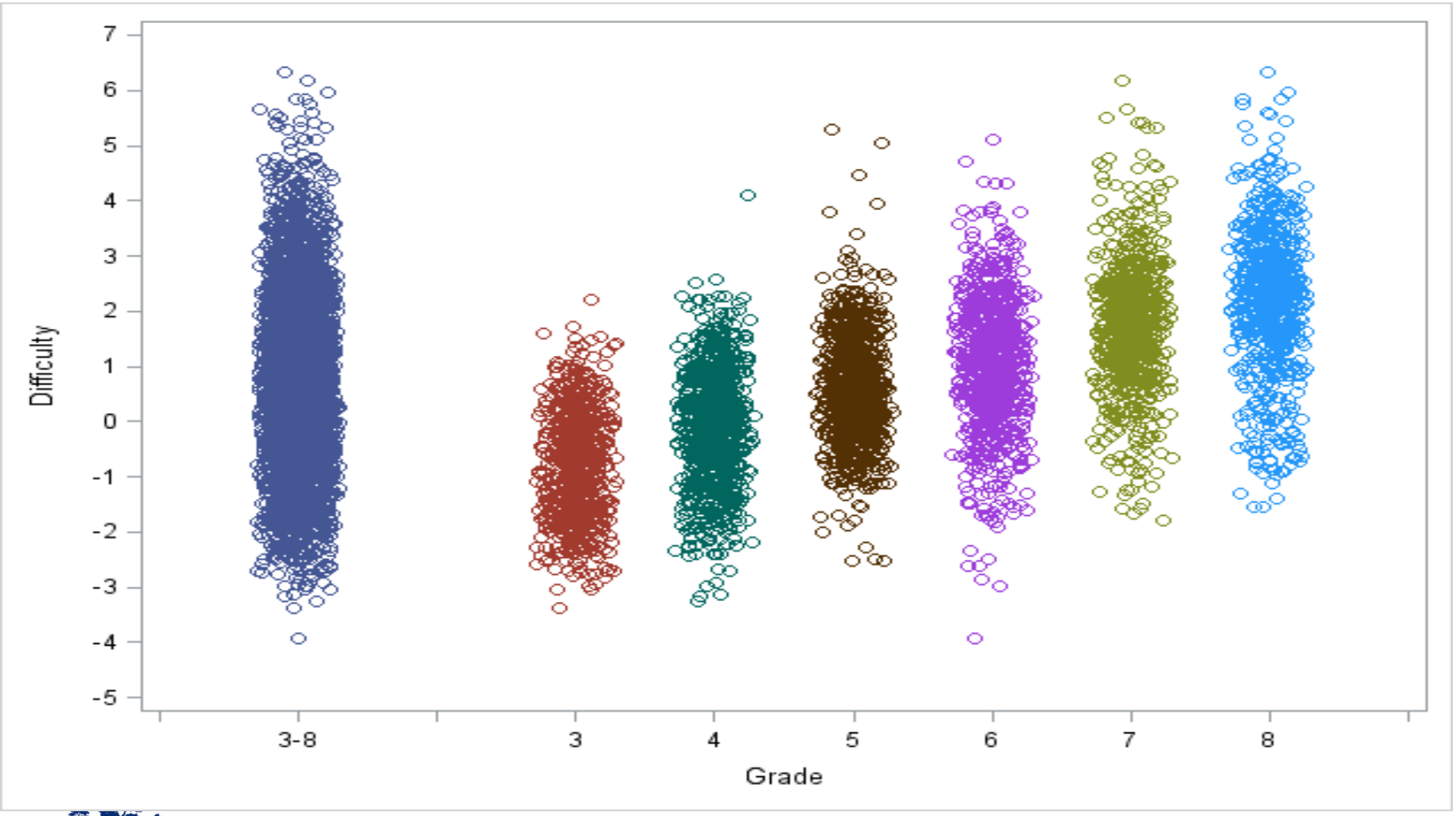
Growth:

- Change in achievement score for the same student between two or more points in time.

Three Ways to Understand Change in Performance

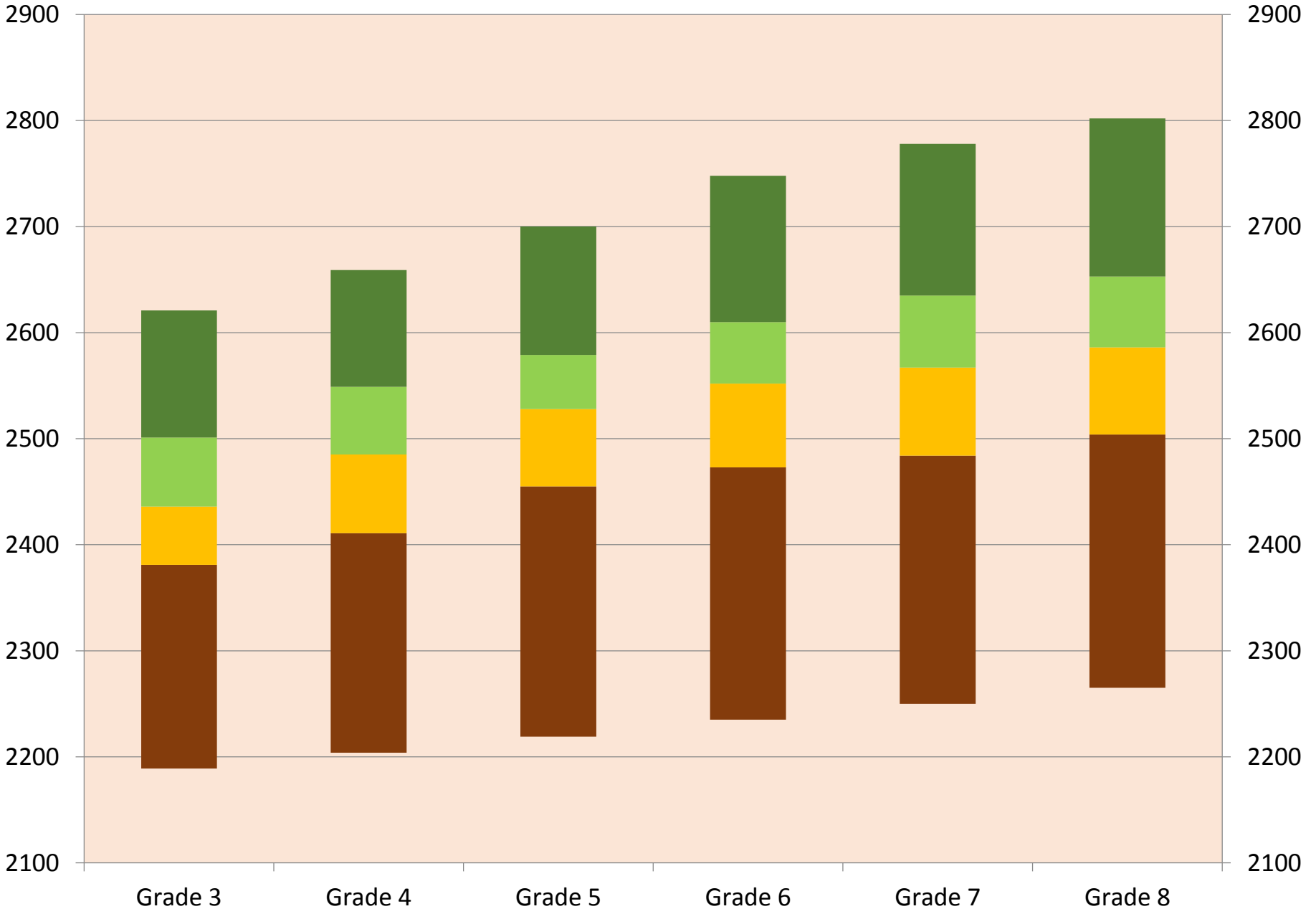
	Achievement Change	"Rough Cohort" Change	Matched Student Cohort Growth
What is it? ***How does it work?***	Compares student achievement across years (e.g., achievement of grade 3 students in 2014-15 is compared to the achievement of grade 3 students in 2015-16)	Compares the achievement of a group of students from one grade in year 1 to a group of students in the next higher grade in year 2 (e.g., grade 3 in 2014-15 to grade 4 in 2015-16)	Compares the achievement of the **same student** from one grade in year 1 to the next higher grade in year 2 (e.g., student in grade 3 in 2014-15 to grade 4 in 2015-16)
Who is compared?	Different students across different years	Mostly the same students though there can be some mismatches due to student mobility, entry, and exit	The same students from one year to the next… no mismatches
What is measured?	Proficiency rate (e.g., percent at or above level 3) and/or average scale scores	Proficiency rate (e.g., percent at or above level 3) and/or average scale scores	The amount of growth to standard achieved by each student and groups of students
What does it offer?	The starting point for understanding change	A "rough estimate" of growth	The gold standard for growth and for understanding curricular and instructional effectiveness

Smarter Balanced Item Difficulty Across Grades: Math



- All items are part of one item bank with one difficulty scale.
- When separated by grade, each grade has many items that range from easy to hard.

The Smarter Balanced Vertical Scale - Mathematics



What is Connecticut's approach to measuring growth?

- Similar to approach used with CMT growth model
- Criterion referenced
- Uses Smarter Balanced vertical scale that spans grades/years
- Preserves achievement level concept for interpretability
- Provides ambitious yet achievable individual student targets
- Expects all students to grow, including those performing in Levels 3 and 4
- Can be aggregated for group level results
- Reviewed by Connecticut Technical Advisory Committee

What factors are considered when establishing ambitious yet achievable targets?

- Empirical:
  - What is the actual growth achieved by students performing at different segments of the vertical scale?
- Measurement Error:
  - Does the growth expectation exceed the pooled average measurement error from both year 1 and year 2 assessments?
- Time:
  - Are students on a path to higher levels of achievement in the future?

ELA Achievement Level Ranges and Growth Targets

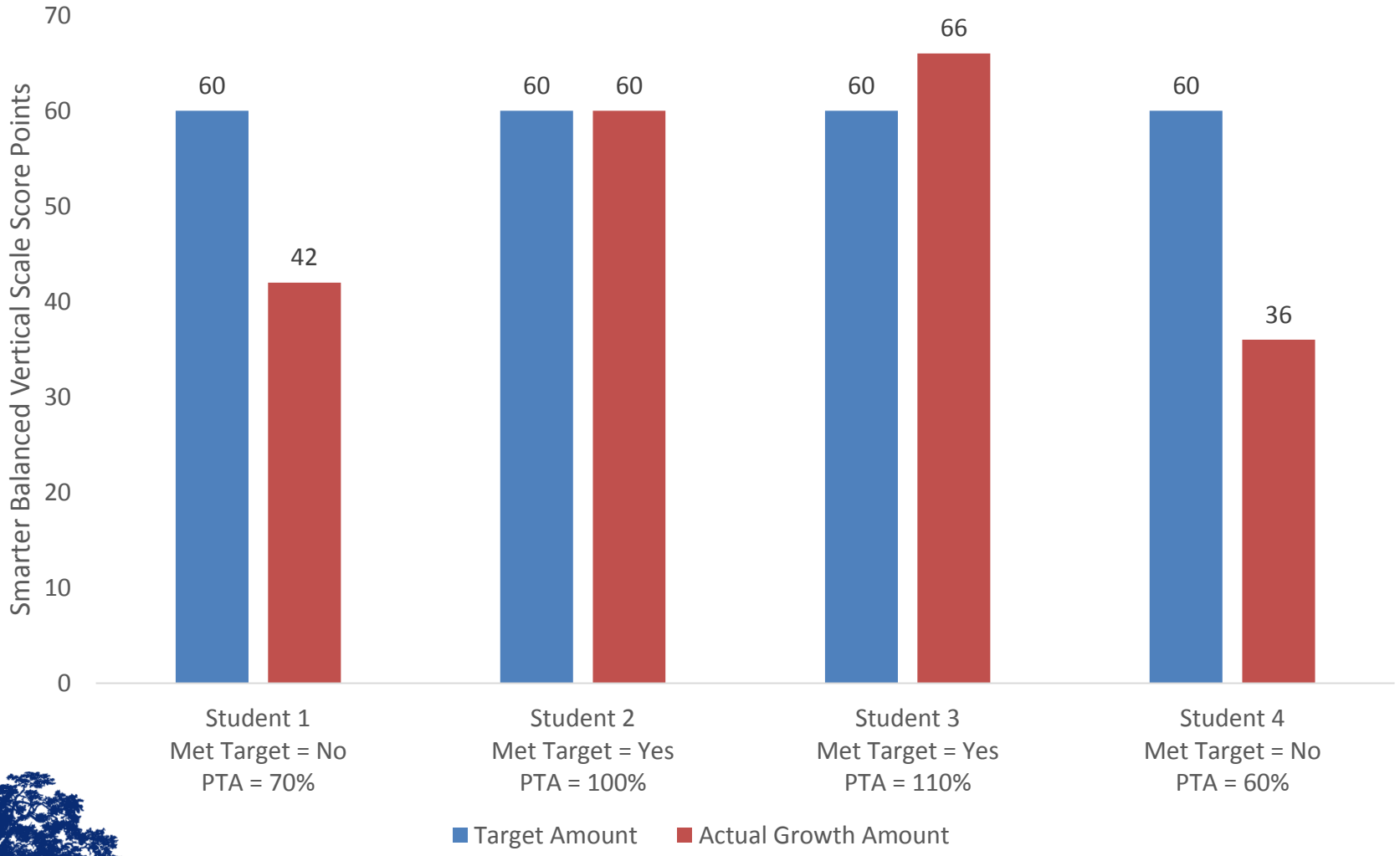
Grade in Yr. 1	Level	Level 1: Not Met		Level 2: Approaching		Level 3: Met		Level 4: Exceeded	
		1 - LOW	2 - HIGH	3 - LOW	4 - HIGH	5 - LOW	6 - HIGH	7 - LOW	8 - HIGH
3	Range	2114-2330	2331-2366	2367-2399	2400-2431	2432-2460	2461-2489	2490-2522	2523+
	Target	82	71	70	69	68	64	60	45/maintain
4	Range	2131-2378	2379-2415	2416-2444	2445-2472	2473-2502	2503-2532	2533-2568	2569+
	Target	82	69	69	64	58	55	49	34/maintain
5	Range	2201-2405	2406-2441	2442-2471	2472-2501	2502-2541	2542-2581	2582-2619	2620+
	Target	69	56	55	48	43	39	30	16/maintain
6	Range	2210-2417	2418-2456	2457-2493	2494-2530	2531-2574	2575-2617	2618-2656	2657+
	Target	73	58	53	47	44	38	33	21/maintain
7	Range	2258-2438	2439-2478	2479-2515	2516-2551	2552-2600	2601-2648	2649-2687	2688+
	Target	69	50	49	44	40	31	20	12/maintain
8	Range	2288-2446	2447-2486	2487-2526	2527-2566	2567-2617	2618-2667	2668-2703	2709+

Math Achievement Level Ranges and Growth Targets

Grade in Yr. 1	Level	Level 1: Not Met		Level 2: Approaching		Level 3: Met		Level 4: Exceeded	
		1 - LOW	2 - HIGH	3 - LOW	4 - HIGH	5 - LOW	6 - HIGH	7 - LOW	8 - HIGH
3	Range	2189-2351	2352-2380	2381-2408	2409-2435	2436-2468	2469-2500	2501-2526	2527+
	Target	77	61	59	60	59	57	56	47/maintain
4	Range	2204-2381	2382-2410	2411-2447	2448-2484	2485-2516	2517-2548	2549-2574	2575+
	Target	51	38	40	44	46	47	43	37/maintain
5	Range	2219-2419	2420-2454	2455-2491	2492-2527	2528-2553	2554-2578	2579-2605	2606+
	Target	43	46	45	44	42	41	41	44/maintain
6	Range	2235-2434	2435-2472	2473-2512	2513-2551	2552-2580	2581-2609	2610-2639	2640+
	Target	49	41	38	36	36	36	38	31/maintain
7	Range	2250-2438	2439-2483	2484-2525	2526-2566	2567-2600	2601-2634	2635-2664	2665+
	Target	58	35	31	31	36	37	38	35/maintain
8	Range	2265-2455	2457-2503	2504-2544	2545-2585	2586-2619	2620-2652	2653-2685	2686+

Hypothetical Example

Growth Rate = 50% (2 out of 4 students met target)
Average Percent of Target Achieved (PTA) = 85%



Two Aggregate Outcome Metrics

	Growth Rate	Percent of Growth Target Achieved
Measure?	Percent of students meeting their respective growth target	Average percent of growth target achieved for all students
Precision?	Binary (yes/no), less precise	Based on scale score, more precise
Continuous?	No. Students *nearly* meeting target will be deemed *not* meeting target	Yes. Students get "credit" for any growth up to *and* beyond the target
Interpretability?	Simple to understand	More nuanced
Uses?	Reporting only	Reporting and district/school accountability

How *and* when will growth be incorporated into the Next Generation Accountability System?

- Growth (Indicator 2) will be added to the system starting with the 2015-16 results.
- As with achievement, Growth (Indicator 2) points are awarded for All Students *and* High Needs groups.
- The points for Achievement (Indicator 1) will be halved for any school with Growth results.
- Growth will carry slightly more weight in the model than Achievement.
- In light of the discontinuance of the ELA Performance Task in February 2016, the rescored 2014-15 ELA scores that were based on the Computer-Adaptive Test (CAT) only will be used as the ELA baseline for an apples-to-apples comparison.

What about other factors like poverty, language ability, or disability?

- The CSDE is not using a value-added approach to adjust targets or evaluate growth relative to some preconceived expectation based on student characteristics of what a student can achieve or how much he/she can grow.

- The CSDE is not setting different targets for different students. All students at a prior achievement range will have the same growth amount expectation.

Not All Growth Models are Value-Added

- *The terms "growth model" and "value-added" are often used interchangeably. But Value-Added is only one of several types of models that measure student growth. It is also the only model designed to determine which aspect of schooling (e.g., school, teacher, education program) is responsible for a students' growth*. (Center for Public Education).

- *Value-added models are focused on the effects of teachers and leaders… on student score gains. They address whether students grew more or less than expected*. (O'Malley, McClarty, Magda, and Burling, 2011)

Summary

- **Criterion referenced**: does not depend on how others do
- **Continuous**: all growth counts; no golden bands
- **Familiar**: similar to approach used with CMT
- **Transparent**: easily replicable; no “black-box” adjustments
- **Collaborative**: transparency allows for conversation/reflection
- **Fair**: excludes “partial-year” students
- **Achievable**: based on actual growth of Connecticut students
- **Ambitious**: encourages growth above target