State Agency should state reasons for incorporating growth into the accountability system

- Schools’ ability to facilitate academic progress is a better indicator of performance than comparing students’ performance to an established target
- Can account for potentially negative relationship between status and growth
- Can account for students’ inputs effects on growth
Rationale for incorporating Growth Models into accountability systems

- Growth models will assess the progress of every student along a performance continuum
- Growth models better assess the achievement gap.
  - Closing the achievement gap implies differential growth rates
  - Implies that instruction and level of support would differ
- Growth models may provide teachers and schools with evidence of achievement gains that are not evident in status models
- Growth information will be used to evaluate programs
- Growth information will support classroom decision making
- Growth models can inform instruction (state tests not sensitive)
Status vs. Improvement

**Status**
- Snapshots of subgroups’ or school’s level of proficiency compared with a target
- Cross sectional
- AYP

**Improvement**
- Change over time between different groups of students
- Cohort growth
- Less strict data requirements
- Safe harbor
- Did students from last year do better than students from this year?
Growth Models

- Measure progress by tracking the same group of students from one year to the next to see whether or not, on average, students made progress.
- Students act as own controls vs. models that consider student input information.
- Account for cumulative process of learning.
- School level growth is aggregate of individual.
- Key issue: How much growth is enough?
  - Statewide or local targeted by stakeholders.
  - Implied in model chosen.
  - Should it be the same for every student?
  - Typical/normal vs. expected/desired.
Value Added

- Use background characteristics, prior achievement and other data as statistical controls to isolate particular teacher, program or school effects.
- VAM—difference between actual and expected growth. Schools can experience growth, but negative value added.
- Little evidence that VAM is valid at the teacher level.
Transition Matrix

- Doesn’t require a vertical scale
- Makes use of performance categories
- Student who scores “proficient” is making expected progress if he scores “proficient” the next year.
- Add or take away points for maintaining or changing categories. (Delaware example)
Transition Matrix

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Basic</th>
<th>Proficient</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>26</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Proficient</td>
<td>4</td>
<td>47</td>
<td>4</td>
</tr>
<tr>
<td>Advanced</td>
<td>3</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
State systems can employ multiple models

- Status models

- Growth models can provide substantially more information that status models, but can benefit from considering multiple analyses of same data and multiple sources of information

- Can simultaneously model improvement (changes in subsequent performance of cohorts) and individual student growth
Types of Growth Measures

- Difference Gain Score
  - Student’s scores at start is subtracted from student’s score at end.
  - Difference is aggregated to obtain group measure.
  - Require ability to link students’ records over time.
  - Requires common scale
  - Is the gain for the group higher or lower than average?
Types of Growth Measures

- Growth in Relation to Performance Standards
  - Difference between student’s current score and the score that would need the standard in a set number of years
  - Divide by number of years to get necessary annual gain
  - Student’s annual gain can be compared to target growth to see if student is “on track” to meet standards (CO model)
Residual Gain Scores

- Students’ current scores are adjusted by their prior scores using regression.
- Each student has a predicted score based on prior scores.
- The difference between predicted and actual scores is the residual gain scores.
- Residual gain scores near zero indicate average growth.
- Residual scores can be averaged to obtain a group growth measure.
Linear Equating

- Student growth is defined as the student’s actual score in year 2 minus the predicted score for year 2.
- Predicted score for year 2 is the score in the distribution that corresponds to the student’s year 1 score.
- Expected growth is defined as maintaining location in the distribution.
- Heavily sample dependent.
Date Requirements

- Database of matched student records over time at statewide level
- Common scale
  - Differences in scores across grades and consistent and meaningful
  - Tests are created with growth measurement in mind
  - Content standards are aligned across grades
Confidence interval

- Take into account uncertainty in measurement
  - Normal measurement error
  - Sampling error
- Narrow-1 standard error-68% certainty
- Wider
  - Decreases chance of incorrectly identifying student or school failing to meet target
  - Increases changes of saying growth has been achieved when it hasn’t
- Multiple measures can reduce error
Missing Data

- Student Mobility
  - Movement across district boundaries
  - Adjust growth target
  - Adjust “years to growth”
  - Exclude students
- Random distribution is fine
- Lack of representation is a big problem
- Lack of precision for subgroups
- Imputation
- Report % missing
Including Alternate Tests

- Alignment of performance levels is clear
- Tests are on common scale
- Transition matrix approach is good
Definitions of Expected Growth

- Transition Matrix: maintaining performance levels from year to year
- Linear equating: maintaining location in the distribution from year to year
- Difference in Gain Scores: set by stakeholders
- Residual Gain Scores: zero is average gain
Timeframe for Growth

- # of years to reach target proficiency
- Spacing of intermediate growth targets
- Description of normal growth that extend beyond the period of observed data are based upon assumptions that have a significant impact on the rate of growth (p. 30).
  - Project future growth by fewer years than amount of observed data
  - Have we done projections?
Including students above “proficient”

- Extra credit for moving students above proficient
Reporting

- At what levels
  - Student
  - Subgroups
  - School

- Accuracy
  - Third party auditing

- Clarity

- Transparency/Credibility

- Completeness
How to use growth data in accountability decisions

- Replacement for status
- In addition to status
- Replacement for safe harbor
- In addition to safe harbor
- In conjunction with status and safe harbor

- If status is X and Growth is Y then overall is Z
Examples

- Projection pg. 22
- Labels pg. 23
- Achievement Gap pg. 25
- Multilevel pg. 28
Exploratory data analysis

- Average scores by time by trade
  - Assesses linearity of growth
- Consider consequences of false positives and false negatives
- Achievement Gap pg. 25
- Year to year fluctuations that may limit accuracy of growth indicates
Short term or long term vision

☐ To what extent are we able to produce models that support longitudinal, multivariate nested analyses of group and individual performance and that attempt to use all available data at once.