

## ATI Research

Making a measurable difference



ATI uses state-of-the-art measurement techniques to provide reliable and valid assessments and accurate forecasting to facilitate data-driven decision-making for instruction, professional development, and strategic planning. ATI's ongoing research helps make it possible for Galileo K-12 to continuously evolve in ways that are relevant to changes in client needs, federal and state legislation, assessment and instruction research findings, and technology.

### ONGOING RESEARCH POWERING GALILEO

- application of Item Response Theory (IRT) techniques to establish item characteristics (difficulty, discrimination, and guessing)
- application of IRT placing scores from multiple assessments on a common scale to assess student growth
- identification of cut scores forecasting likely student performance on statewide assessments
- annual determination of expectations for student growth



### Powered by ATI Research

IRT analyses for district assessments go beyond percent correct to measure growth & achievement & to forecast state test performance.

### RAW SCORES VS. IRT

Systems that don't use IRT must rely on raw scores such as number or percent correct that ignore variations in difficulty across items and tests. Without IRT, these systems can only consider test scores in isolation and attempts to measure student growth may produce inaccurate and potentially misleading information.

### EASE OF ACCESS TO HIGH POWERED DATA

Galileo *Dashboard* reports transform high-powered data analysis procedures, into practical, interactive reports. IRT makes it possible for Galileo to place scores from multiple assessments over the course of the year on a common scale to accurately measure student growth. IRT supports Galileo forecasts of student performance on state-wide tests based on periodic district-wide benchmark assessments.

Galileo's categorical growth analyses indicates whether students have maintained, exceeded or not maintained expected growth. Using IRT, Galileo evaluates the relative difficulty of items and tests. With this information in hand, scores from different tests are placed on the same scale so that growth can be accurately measured.

Galileo also uses IRT to place the student on a developmental path and provide teachers with easy-to-use graphical reports about what students have mastered and what they are ready to learn next.

| Forecast Report   |         |         |                     |                          |                            |                              |             |                             |  |
|---|---------|---------|---------------------|--------------------------|----------------------------|------------------------------|-------------|-----------------------------|--|
| District: ATI Demo District<br>Title: District 5th Math Tests and Statewide Test<br>Subtitle: Three 5th Math Tests and Statewide Test |         |         |                     |                          |                            |                              |             |                             |  |
| Benchmark Performance   |         |         | Risk Classification |                          | Statewide Test Performance |                              |             | Percent Accurately Forecast |  |
| Test 1  | Test 2  | Test 3  | Risk Group          | Student Count            | Met                        | Not Met                      | Percent Met |                             |  |
| Met   | Met     | Met     | On Course           | 269                      | 255                        | 14                           | 95          | 95                          |  |
| Met   | Met     | Not Met | Low Risk            | 26                       | 19                         | 7                            | 68          | 68                          |  |
| Met   | Not Met | Met     |                     | 62                       | 41                         | 21                           |             |                             |  |
| Not Met   | Met     | Met     |                     | 15                       | 10                         | 5                            |             |                             |  |
| Met   | Not Met | Not Met | Moderate Risk       | 32                       | 7                          | 25                           | 28          | 72                          |  |
| Not Met   | Met     | Not Met |                     | 14                       | 1                          | 13                           |             |                             |  |
| Not Met   | Not Met | Met     |                     | 29                       | 13                         | 16                           |             |                             |  |
| Not Met   | Not Met | Not Met | High Risk           | 97                       | 8                          | 89                           | 8           | 92                          |  |
| Correlations with Statewide Test  |         |         |                     | Total Student Count: 544 |                            | Overall Percent Accuracy: 88 |             |                             |  |
| 0.78  | 0.76    | 0.8     |                     |                          |                            |                              |             |                             |  |
| Test 1 Title: Demo 5th Math #1<br>Test 2 Title: Demo 5th Math #2<br>Test 3 Title: Demo 5th Math #3                                    |         |         |                     |                          |                            |                              |             |                             |  |

FORECASTING STATEWIDE TEST PERFORMANCE

Forecasting information can be used by teachers, administrators, specialists, and parents to improve instructional effectiveness and student learning.

# Galileo® K-12 Online

## ACCURATELY MEASURING STUDENT ABILITY WITH IRT

### Developmental Level Scale Score

Galileo provides an IRT Developmental Level (DL) scale score, similar to the scale score on the state test. Systems that don't use IRT can only provide raw scores (i.e., number/ percent correct).

### With Raw Scores

- student responses to items and tests are evaluated in isolation
- nothing is known about the student's underlying ability
- it is difficult to predict student performance on other items assessing a standard or other standards

### With IRT Scale Scores

- a student's ability in a given subject or knowledge area is evaluated, not just their performance on a specific set of items
- for a given ability, it is possible to predict a student's likely performance on any item and any standard
- educators know not only what the student has already mastered, but also what they are ready to learn next
- educators have information about item characteristics including discrimination, difficulty, and guessing
- the Developmental Level (DL) scale score provides educators with information indicating student ability in a grade and subject
- developmental path reports that use the ability score help guide teachers in next instructional steps

### Common Scale Score

Galileo places the DL (IRT) score on a common scale across tests in a grade and subject to measure growth. Systems without IRT can only evaluate a student's score for each test in isolation.

### With Raw Scores

- the relative difficulty of different tests is ignored
- student growth estimates can be inaccurate and misleading

### With IRT Scale Scores

- the score is adjusted based on the relative difficulty of different tests
- student growth estimates are accurate and defensible

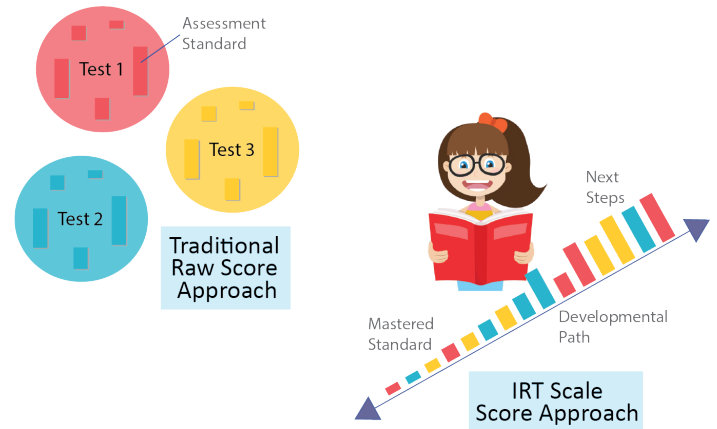


"ATI has supported us with high quality assessments, state-of-the-art metrics and scoring, and excellent customer service."

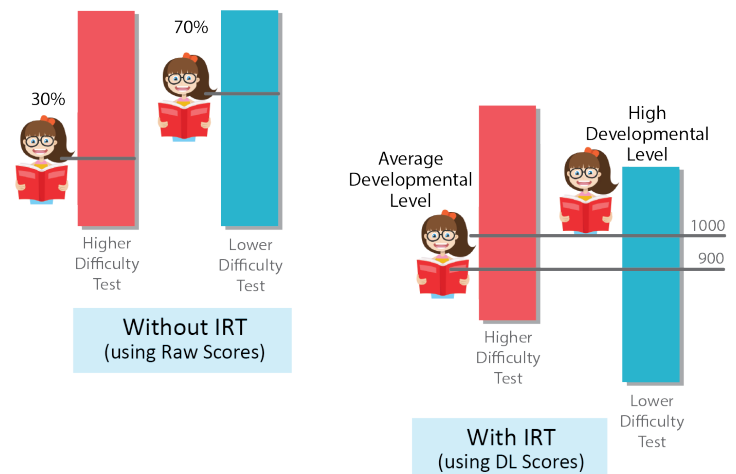
— Jared Prolo, Coordinator of Assessment, Research, and Evaluation Services, San Mateo-Foster City School District, CA

## Galileo Provides the Benefits of IRT Theory

Unlike raw scores, IRT scale scores place the student on a developmental path to illustrate mastery and guide instructional next steps



## Measuring Student Growth Across Tests



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1.800.367.4762

[GalileoInfo@ati-online.com](mailto:GalileoInfo@ati-online.com)

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