



The Education Equality Index (EEI), powered by GreatSchools

The Education Equality Index (EEI) is a national measure of how well schools and cities are closing the achievement gap between students from low-income families and their more advantaged peers. We're able to make national comparisons using categories based on average EEI performance for low-income students, the overall population, and non low-income students.

EEI scores range from 0 to 100 with higher scores indicating better low-income student performance relative to the overall student population. If your school receives a score of 24, the percentage of low-income students who reach proficiency puts your school in the 24th percentile of overall student proficiency in the state. As a national comparison, average scores for the overall student population are in the 50th percentile, and the average of non low-income students' scores would land them in the 68th percentile. A score of 24 means your school is not serving its low-income students equitably in the state or national context.

While no measure is perfect, we believe the EEI provides some distinct advantages:

1. First, we have gathered income-focused proficiency data at the school and grade levels that is not easily obtainable across all states.
2. Second, rather than comparing FRL students and non-FRL students at the same school to measure the achievement gap, we are comparing to students across the state, equalizing differences in non-FRL populations from school to school.
3. Third, because our methodology is a relative measure, it allows for comparisons of how well low-income students perform in a city relative to the state average. You can compare cities across the country based upon the extent to which they have closed the achievement gap in their state.
4. Fourth, the EEI focuses specifically on the performance of low-income students rather than incorporating FRL performance as a piece of a larger quality measure.
5. And finally, we are working to get data for all cities in the country, rather than relying on a sampling of schools or cities that participate in a particular assessment, such as NAEP.

Data Included

The dataset powering the EEI is one of the largest collections of school and grade level data specifically focused on the performance of students eligible for free or reduced price lunch (FRL).

We have:

Data from 2010-2014

43,038,346 students¹

78,575 schools

15,551 cities

42 states

1,187 unique tests

The Education Equality Index relies on the performance of students in every classroom that receive free or reduced price lunch (FRL) through the National School Lunch Program. To receive a free or reduced price meal, households must meet income eligibility requirements. Children in food stamp or Temporary Assistance for Needy Families (TANF) families are automatically eligible for free school meals. Families who receive commodity assistance through food distribution programs in American Indian tribal areas are also automatically eligible for free meals.

We collect data from each state's Department of Education on student performance on annual standardized assessments². For each school for which data are available, and each year, we know the number of students tested and the number that scored proficient or advanced in every grade and subject tested. We also know the number of students that are eligible for free or reduced-price lunch (FRL) who scored proficient or advanced for each grade and subject tested.

Calculating EEI Scores

The most common question we get is: *"How can you compare across states? They're taking different tests?"* The EEI is not an absolute measure of quality, it is a measure of equality. We are interested in the proportion of students from low-income communities who are able to succeed, compared to the proportion of all students and non-FRL students who are able to succeed. By standardizing overall

¹ Estimated number of students represented in our data using enrollments. We do not collect individual student-level data.

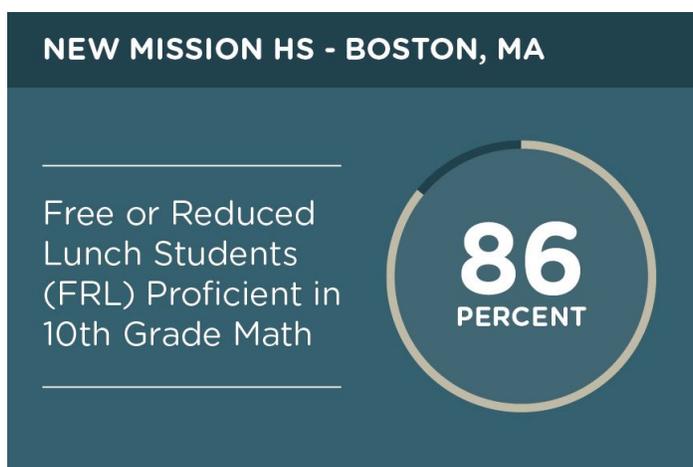
² Assessments are given annually in reading and math for grades 3-8 as required by law. Students are also required to test at least once in grades 10 through 12. Every student must also be tested in science in at least one grade in elementary, middle, and high school.

student proficiency rates³, we show how low-income students are doing compared to all students in each state on an even playing field.

We present EEI scores at the school and city levels. The following example details how we arrive at scores starting with individual schools.

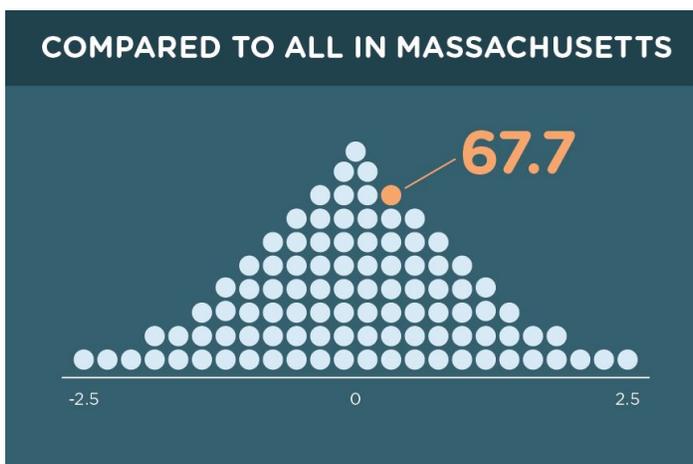
STEP 1: Look at the percent of FRL students at one school who are “proficient” on a specific assessment.

We begin with the percentage of students from low-income families (FRL) who were proficient on the state’s assessment in each subject/grade for a given year. We also have data on all students (including FRL) who were proficient.



STEP 2: Compare the percent of FRL students who reached proficiency at that school to ALL students in the state who took that assessment.

Next, we look at the distribution of proficiency rates for all students tested in the state for each subject/grade, standardize the data, and transform the raw data. Standardizing proficiency rates allows us to fairly compare different subject/grade assessments for which students reach proficiency at different rates. (For example, 25% proficiency might be a relatively high rate for 8th grade geometry but very low for 3rd grade reading.) Data are distributed from -2.5 to 2.5 standard deviations from the mean. Then, we look at how low-income students testing in the same

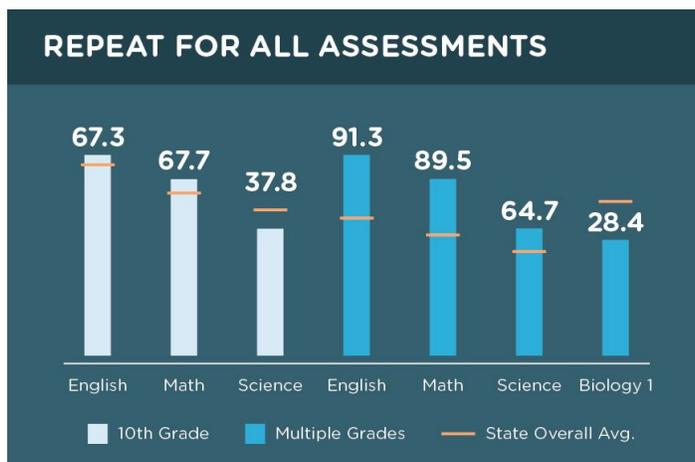


³ We include overall student proficiency rates for each subject/grade assessment within a given state and fit data points to a standard normal distribution. Next, we place low-income student proficiency rates for each school that offered the same assessment on the same distribution. The result is a measure of the proficiency rate gap between low-income students in a campus and the overall student population statewide. We apply the same process to all subject/grade assessments in the country and because overall student proficiency rates are always fitted to standard normal distributions, we can make accurate comparisons about the relative equity of performance.

subject/grade compare within the standard normal distribution of scores for all students. In the example pictured on the right, the rate of low-income students who reached proficiency in this 10th grade class is 0.46 standard deviations from the mean, and the subject/grade was assigned a normalized score of 67.7. This process allows us to identify how FRL students at a given school are performing relative to all students statewide. Note: This is not a comparison of how FRL students at a given school are performing relative to other FRL students.

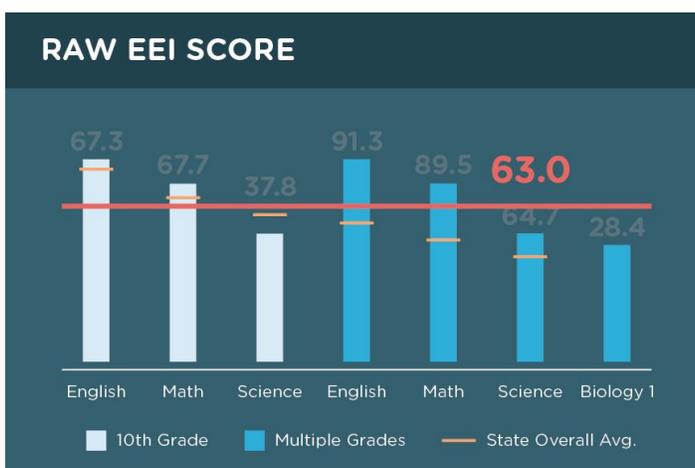
STEP 3: Repeat Steps 1 and 2 to get a score for every subject/grade assessment at that school.

We repeat the process of identifying how students from low-income families performed compared to all other students in the state for every assessment offered at the school. We now have normalized scores for every subject/grade assessment that measure the rates of low-income student proficiency compared to the state.



STEP 4: Take an average of all subject/grade scores to arrive at a school’s raw EEI score.

Next, we take a weighted average of normalized scores for all subject/grade combinations offered at that school using number of students tested. This way, a subject/grade assessment with a high number of students tested makes up more of the school’s final score than a subject/grade assessment with a smaller number of students tested.



STEP 5: Adjust the school's score to more fairly compare schools serving a high percentage of FRL students.

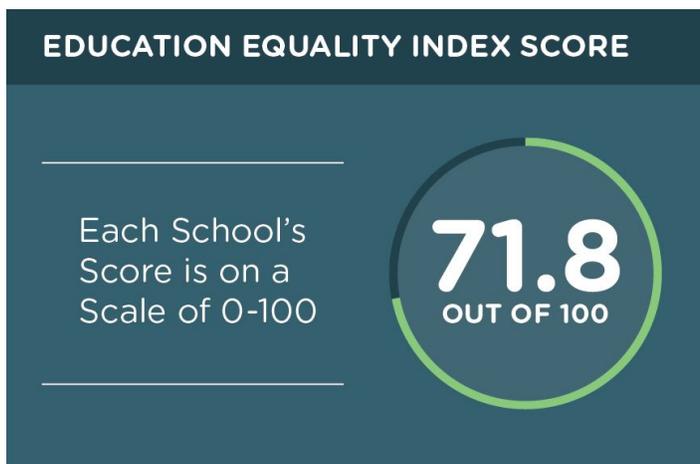
Next, we make an adjustment⁴ to the school-level normalized score depending on how the percentage of FRL students served by the school compares to the national average. Studies have shown that economic background can affect a student's academic performance, and schools that serve a higher percentage of students from low-income families face more significant challenges in educating their students. Adjusting for the student body's economic profile provides a fairer comparison and gauge of school effectiveness. A school that serves a higher



percentage of FRL students than the national average receives a small increase in EEI score, while a school that serves a lower percentage of FRL students than the national average receives a slightly lower score. The average adjustment is 7 points. Note: If school FRL averages are missing for a given school, the district FRL average is used for those individual schools.

STEP 6: Each school's adjusted percentile is its Education Equality Index score.

The Education Equality Index is the adjusted score on the 0-100 range.



⁴ Our adjustment is based on a Bayesian linear regression model that includes all standardized scores nationally for every school in our dataset (2011-2014). School FRL % is based on data from National Center for Education Statistics (NCES) from the 2012-13 school year. Equation: $scalar\ bayes_adj = \frac{e(r^2)^2}{e(r^2)^2 + (1-e(r^2))^2/e(N)}$ *abs(_b[std_frpl])
 $Y = a + bStandardScore + cStandarddFRL + e$

City and State Scores

For city scores, we calculate an average of EEI scores for every school with an address that falls within the city boundaries. We weight each school's score based on total campus enrollment as reported by the state's department of education.

State scores are calculated using the same method, weighing each school in the state based on total campus enrollment as reported by the state's department of education. They should only be used to note trajectory and provide context for city-level scores, but should not be used in isolation to compare states based upon performance of their low-income students⁵.

Education Equality Index National Categories

We created four categories to put EEI scores in context. We essentially replicate the same methodology used to measure FRL student performance for the overall student population and non-FRL students. Then, we take averages of all school scores nationally. The result is a simple way to see any school or city's progress toward closing the achievement gap.

The average EEI for FRL students is 38. If a school has an EEI below 38, their low-income students are reaching proficiency at a lower rate than low-income students at an average school. The average EEI for all students is 50. If a school has an EEI of 50, their low-income students are reaching proficiency at the same rate as all students nationally; this means they are starting to close the achievement gap. Finally, the average EEI for non-FRL students is 68. If a school's EEI exceeds 68, it is categorized as having no achievement gap. This means FRL students at that school are reaching proficiency at a higher rate than non-FRL students across the country.

Interpreting scores using national categories

68-100 = No Achievement Gap

50-67.9 = Small Achievement Gap

38-49.9 = Large Achievement Gap

0-37.9 = Massive Achievement Gap

⁵ State scores have limited uses in their current form because they are highly correlated to the percentage of free and reduced lunch students in a state. They can be used to provide context for city scores. For example, if two cities have a similar EEI score, but their state scores are different, that provides context for how the city is comparing within the state, as well as nationally. The pace of change measurement shows how much the state's EEI score has changed over the past few years, but again, should only be used to note trajectory and should not be used in isolation to compare the change in achievement gap across states.

Uses and Limitations

The EEI can be used to:

- Identify the schools and cities that are providing an excellent education for students from low-income communities.
- Identify if gaps between students from low-income communities and their more advantaged peers are growing or narrowing over time using school and city scores.
- Rank schools and cities across state lines based on how well they are serving students from low-income communities compared to all students.

Limitations

The EEI is arguably the best tool in the nation to isolate the performance of students from low-income communities and identify schools that are serving them best. However, no measure is perfect. Inherent challenges with the EEI are:

- **The EEI is a measure of equality, not absolute quality.** Scores show the proportion of students from low-income families who reach proficiency compared to all students in the state. States decide proficiency standards and students in each state reach proficiency at different rates. We are careful not to describe a school in Ohio with a higher EEI score as “better” than a school in Florida with a lower score. Instead, we are saying students in the school in Ohio are performing at a level closer to their more-advantaged peers.
- **K-12 focus.** The EEI is not an indicator of student success in college, career, and life. We plan to examine the relationship between EEI scores and college-going rates in the near future.
- **The EEI does not measure individual student performance.** It is not a student growth or value-added measure. Student-level data is not publicly available and would be essentially impossible to collect on a national level.
- **The EEI does not explain a school’s success.** Despite being able to identify the best schools for students from low-income communities, the EEI does not tell you WHY these schools are scoring so high. Additional analysis will be needed to reach these conclusions.
- **We want to use the EEI to measure every school in the country, but we cannot.**
 - Due to federal privacy laws, states suppress FRL student scores if there is a very small population of students in that category.
 - Only schools with publicly reported test scores are included in the index, which means that alternative and private schools are not included in most states.
 - Not all states publish data broken down by FRL. We have attempted to get data from every state’s Department of Education, but data is not available to calculate the measure in some states.
- **Not all state departments of education have responded to our requests for data.** We are aggressively working to add more years of data from more states.
- **We cannot isolate or identify schools that have selective enrollment processes.** We have identified magnet schools as designated by the NCES database.
- **Scores are based on student proficiency data on state standardized assessments.** They are subject to the limitations of all test-based measures.

- **FRL is an imperfect classification and masks income gaps that may exist between low- and middle-income households.**
- **State scores.** State-level EEI scores are not the best way to compare states because their absolute EEI scores are highly correlated to the percentage of students in the state who qualify for free and reduced-price lunch. They are helpful when determining how cities within a specific state performed compared to the state average and for noting state trajectories.
- **City scores.** Though we know that state scores are strongly correlated with the percent of low-income students in a state, there is a weak correlation between city scores and state scores ($r=.312$). Though there is some association, city scores are meaningfully independent from state scores, and we are picking up differences in city performance, regardless of what state they are in.
- **Comparing across states.** No cross-state comparison that can also drill down to the school level is 100% pure, because of myriad of differences in testing inputs across states. However, it is our hope that the EEI contributes by highlighting cities across the country that are making meaningful strides in closing the achievement gap for low-income students.