

SCHOOL DESIGN:

Leveraging
Talent, Time,
and Money

SECTION 3

Providing Individual Attention

PRACTICAL TOOLS
for District Transformation

ANALYSES AND DO-IT-YOURSELF WORKSHEETS

THE SCHOOL DESIGN WORKSHEET SERIES INCLUDES worksheets with step-by-step instructions to help you calculate and measure effective school design and portfolio management. These analyses can help identify

your largest challenges and greatest opportunities for action. Armed with this knowledge, you will be able to quantify transformational opportunities for your district. This document contains Analyses 5 and 6.

GET THE REMAINING WORKSHEETS AT WWW.ERSTRATEGIES.ORG.

Analyses for effective school design and portfolio management

	ANALYSIS	WORKSHEET
IMPROVING TEACHING EFFECTIVENESS	1. Collaborative planning time	1. Elementary school contracted teacher planning time
	2. Expert support	2a. Coaching and lead teacher support spending per teacher 2b. School teacher-to-coach ratio
	3. Principal span of review	3. Principal span of review
MAXIMIZING INSTRUCTIONAL TIME	4. Instructional time	4a. Total time in school 4b. Instructional time by subject
PROVIDING INDIVIDUAL ATTENTION	5. Class size	5. Average class size by course type
	6. Teacher load	6. Average teacher load
SERVING SPECIAL POPULATIONS EFFECTIVELY	7. Special education placement	7a. Special education placements as a percentage of total enrollment 7b. General education class size versus student-to-teacher ratio
PORTFOLIO MANAGEMENT	8. Student needs by school type	8. Student needs by school type
	9. School cost	9a. Distribution of schools by enrollment 9b. Per-pupil spending differential between small- and medium-size schools
	10. School capacity utilization	10. Seat vacancy by school
	11. Mix of school programs	11. Special education fill rate

Data checklist

Use this list to gather the data and files that you will need to complete the worksheets. All data files listed are for the current school year.

District K–12 course file by student, by grade, by school.

This file will allow you to:

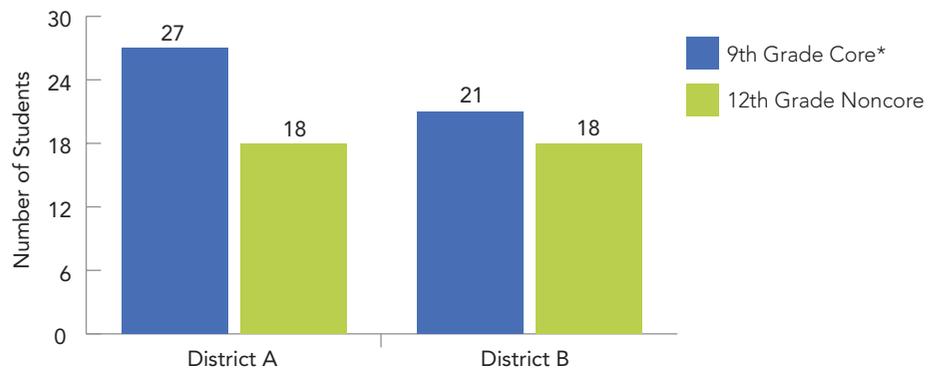
- a. Determine average class sizes by school, grade, subject.
- b. Determine average teacher loads by school, grade, subject.

ANALYSIS AND WORKSHEET 5

Analysis 5: Class size

The goals of individual attention and personalized learning can be difficult to achieve, especially in high-priority subjects at critical grade levels. In most districts, general education class size guidelines do not differentiate among subjects, levels, and grades. Uniform class sizes, student demographics, and subject requirements result in unintentional overinvestment in lower-need courses (e.g., higher grade, higher academic level, and elective) and a corresponding underinvestment in core academic courses at lower grades and levels. Figure 5 illustrates these class size trends in two metropolitan school districts.

Figure 5: Average Class Size by Course Type



*Core class defined as English language arts, math, science, social studies; non-core defined as art, computer literacy, vocational, foreign language

Here, the highest class sizes occur in 9th grade core academic classes (English language arts, math, social studies, science, foreign language), while the lowest are in 12th grade electives (excluding physical education). This pattern is just the opposite of what you would do if you deliberately set out to invest in strategies for your highest-need students. Actual class size can be difficult to calculate districtwide. However, individual schools can easily analyze class-size variations to see where under- or overinvestment may be occurring and to target reductions in high-need grades or subjects.

Worksheet 5: Average class sizes by course type

OBJECTIVE: To understand how secondary school class size varies by grade and subject.

SUMMARY OF METRICS

STEP 1: Categorize all the classes at each school by subject and grade.

STEP 2: Calculate the average class size by subject and grade.

STEP 3: Graph the average class size by subject and grade within schools and across schools.

REMINDER

Figure 5: Average Class Size by Course Type



Note: This guide illustrates this analysis at the district level and shows the comparison between 9th grade core class sizes and 12th grade non-core class sizes. For your analysis, it is most useful to do this comparison for each school to understand the school-level resource use. You can also do a more in-depth analysis by comparing class sizes across specific grades, proficiency levels, and subjects. While this analysis is most relevant for high schools, it can also be useful at the middle school level.

STEP 1: Categorize all the classes at each school by subject and grade.

1. Use your district course file to identify all the classes offered at each school.
2. For each school, assign a grade, subject, and category to each class:
 - a. Grade: The grade level of a class can be determined either by the course name (i.e., Algebra 1 is considered a 9th grade class) or by the student composition (i.e., math classes that have 50%+ 9th graders are considered to be 9th grade math classes). Use whichever method is more appropriate for your district.
 - b. Subject: The subject of a class can usually be determined by the course name. Subjects to be identified include English language arts, math, science, social studies, foreign language, art, music, health, computer literacy, vocational/career, and internship.
 - c. Category: Core classes include: English language arts, math, science, social studies, and foreign language. Non-core classes include art, music, health, computer literacy, vocational/career, and internship. Note that physical education (PE) is excluded from this definition of non-core for the purposes of this analysis because PE class sizes are generally quite large and can skew the average non-core class size.

STEP 2: Calculate the average class size by subject and grade.

1. Calculate the class size for each class by counting the number of students assigned to it.
2. Calculate the average class size for all possible subject and grade combinations (i.e., 12th-grade English, 11th-grade math, etc.).

STEP 3: Graph the average class size by subject and grade within schools and across schools.

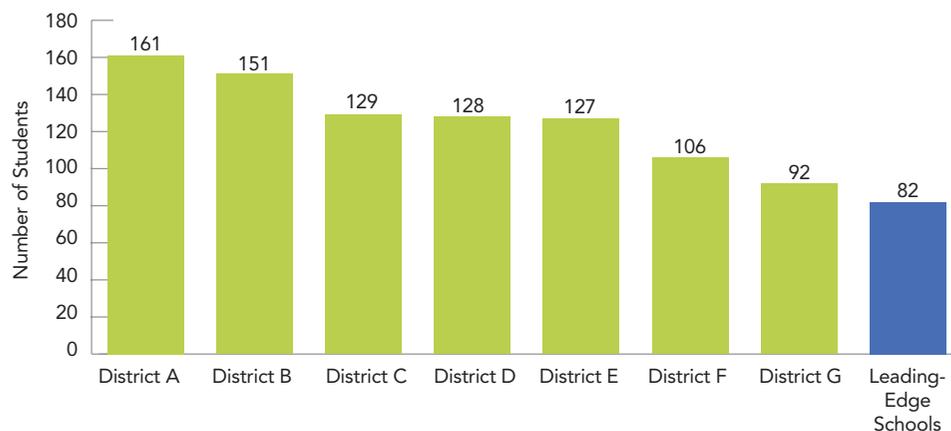
1. The chart in this guide graphs the average class sizes for 9th grade core classes versus 12th grade non-core classes.
2. You will get the most value out of this analysis by comparing differences in classes across school subjects and grades, for example:
 - a. Class sizes decrease in higher grades, generally because more students have dropped out and (in high school) more students are taking electives. A better strategy may be to target the smallest classes in transition years (6th and 9th grade). Do you see this trend at any of your schools?
 - b. We often see that class sizes in core classes are significantly lower than non-core classes — do you see this at any of your schools?
 - c. Be sure to look at differences both within schools and across schools.
3. Construct a bar graph with:
 - a. Y-axis: Average class size.
 - b. X-axis: List of individual schools, subjects, grades, etc., for which you want to compare class size.

ANALYSIS AND WORKSHEET 6

Analysis 6: Teacher load

While concerns about individual attention are often connected to class size, teacher load—the number of students that a teacher sees during a year—is also an important indicator of a teacher’s ability to individualize attention for students. While the average teacher load is typically 20 to 25 students at the elementary school level when teachers keep the same group of students all day long, teacher loads can rise to more than 170 students per teacher in some high schools. A teacher who sees this number of students over the course of a day is less likely to know his or her students well and have the time to devote to the needs of each student. Figure 6 shows the range of average high school teacher loads in six urban school systems, compared to the average teacher load in high-performing leading-edge schools.¹

Figure 6: Average Teacher Load by District



In an ERS study of high-performing small urban high schools, we found that at high-performing schools—we call them leading-edge schools—teacher loads averaged 82, compared to 128 in six other districts. District A’s teacher load was as high as 161. Teachers in these districts have less time to grade each student’s work, reflect on student performance, and prepare for lessons—all critical for improving teaching performance. And despite the importance of targeting attention in core subjects, in four of these districts the teaching load is higher in core than in non-core subjects. By calculating the average teacher loads in both core and non-core subjects, you can gauge the ability of teachers in your district to tailor instruction around the needs of individual students.

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¹ Frank, S. (2010).

Worksheet 6: Average teacher load

OBJECTIVE: Understand average teacher load by school level to gauge the ability of teachers in your district to tailor instruction around the needs of individual students and to identify opportunities to reduce load for priority subjects and students.

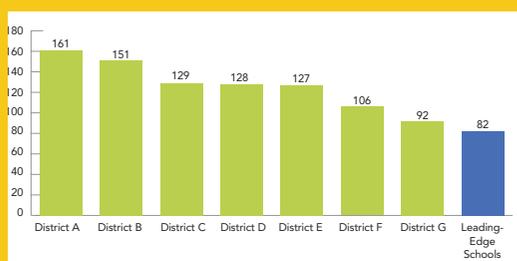
SUMMARY OF METRICS

STEP 1: Calculate average teacher load by school level and for select schools within each school level.

STEP 2: Graph comparison metrics by school.

REMINDER

Figure 6: Average Teacher Load by District



Note: This guide illustrates this analysis at the district level. For your analysis, it may be most useful to do this comparison for each school or across grades or subjects to understand whether teacher load is being reduced in high-need areas.

STEP 1: Calculate average teacher load by school level and for select schools within each school level.

1. For this analysis, we have defined *teacher load* as the number of students a teacher teaches during a single school year. Use your district course file to identify all courses that a teacher teaches to students in each school.
 - a. For each school in the course file, each student ID should be linked to a course and a teacher ID. For our purposes, we only care about student ID and teacher ID pairs.
 - b. For each teacher ID, identify the distinct student IDs across all terms. Terms may be defined by semester, quarter, year, or some other category.
 - c. To aggregate the teacher load for a teacher, simply count the number of distinct student IDs.
 - d. Calculate average teacher load by school and by school type.

STEP 2: Graph comparison metrics by school.

1. You may choose to graph both average teacher load by school level and average teacher load by individual school. The latter will help you identify schools with unusually high or particularly low teacher loads. If you also analyze teacher load by grade, proficiency level, and subject, you can identify opportunities to reduce teacher loads in priority areas.
 - a. Y-axis: Teacher load defined by number of students.
 - b. X-axis: List of individual schools, subjects, grades, etc., for which you wish to compare teacher load.

QUESTIONS TO CONSIDER AND ACTION STEPS

Questions to Consider

1. Does your district have uniform class-size distribution, regardless of student need?
2. Are you actively targeting high-need grades, subjects, and students for smaller classes and groups?
3. Are there opportunities to more actively match class and group size with student need?
4. What are the teaching loads across grades, course levels, and subjects in your district?
5. Are there opportunities to lower teacher loads by reducing the number of daily or weekly periods and introducing block or alternative schedules?
6. Does your district use other strategies for providing individual attention, including differentiated instruction and flexible grouping throughout the day?

Take Action!

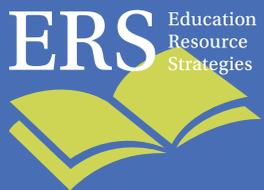
- Encourage targeted approaches to student grouping, time, and instructional practice. The most successful programs vary time, student groupings, and instructional practice for students in direct response to student needs as identified on an ongoing basis.² These approaches can be radical departures from the standard “one teacher with one class all year” model, and in some cases are still unproven, but they can have significant positive impact on student performance and save costs over the long run by reducing special education referrals. Examples include fluid grouping models in elementary schools in which groups of students move from classroom to classroom and teacher to teacher weekly or more often, based on learning progress; using computers for skills practices for part of the day and to leverage teachers in much smaller classes for the remainder; leveraging online instructional resources for individualized programming; or using large 100-plus student lectures for high school students two or three times per week paired with two or three much smaller discussion groups. Districts can encourage innovation by providing high-performing principals and/or “innovation zone” schools with additional flexibility around scheduling and staffing choices.
- Use flexible grouping strategies to provide individual attention without reducing class size. Since reducing class sizes can consume significant resources without necessarily providing struggling students with enough attention, flexible grouping that brings specialists and even administrators into general education classrooms for higher-need students at key junctures during the school day can increase individual attention, while reducing teacher loads.
- Strategically manage class size. Increase class-size guidelines for non-core subjects and for lower-needs students to free up the additional resources needed to reduce class size or teaching loads for critical subjects, grades, and students.

2 Frank, S. (2010).

- Strategically manage teacher load. Changing bell schedules can help you reduce teacher load (the number of students that a teacher teaches each day) across all core subjects. But districts and schools can also focus teacher load reductions in key areas. For instance, many high-performing secondary schools target the lowest teaching loads in English language arts, either through smaller class sizes or double block scheduling, allowing those teachers to assign and review significantly more student writing. Other schools lower teacher loads for new teachers, teachers in transitional grades, or teachers of students significantly below grade level.
- Provide teacher support and development. Provide training and guidance for teachers on differentiated instruction to best meet the specific learning needs of individual students.

ABOUT ERS

ERS is a non-profit organization dedicated to helping urban school systems organize people, time, and money to create great schools at scale.



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