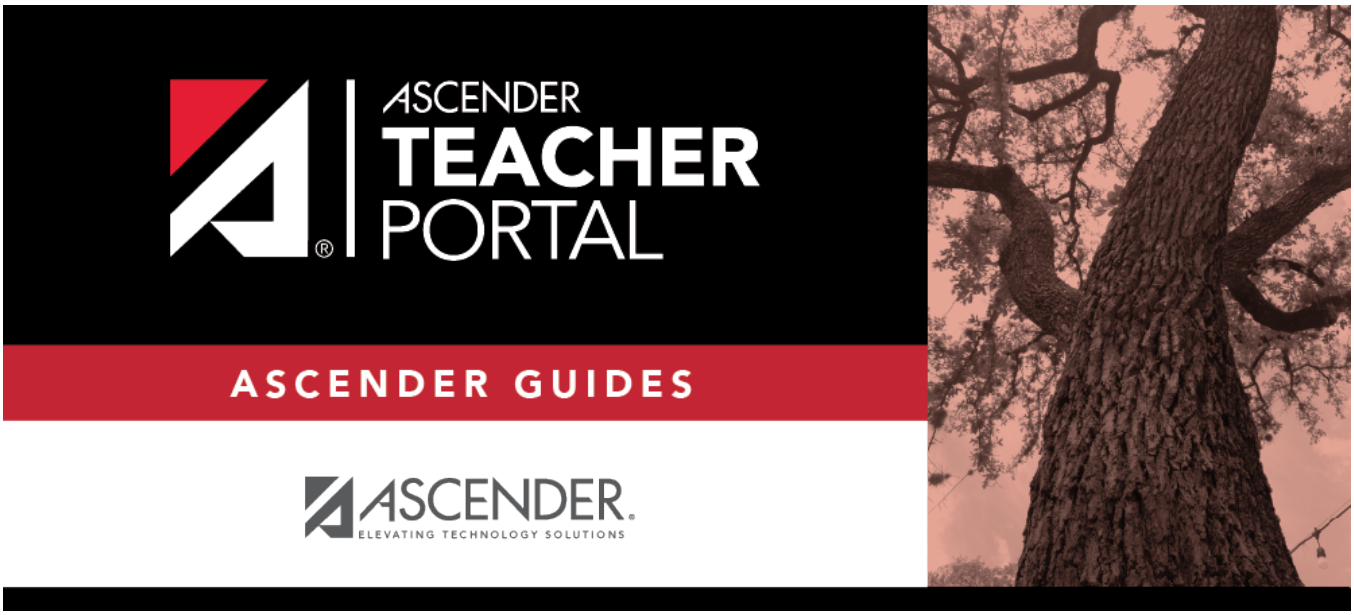

Calculate Averages

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Calculate Averages

To calculate a student's cycle average for a course, you must know the weighting type used for the course (percentage, point, or multiplier).

- **Percentage** - A percentage is assigned to each category. The percentages must total 100%.
- **Point** - A point value is not assigned to each category; instead, point values are determined when the assignment is created. Point values for each category accumulate as assignments are added. When using point-based weighting, the categories are only used for grouping similar assignments. The calculation is based on the total points, not weighting.
- **Multiplier** - A multiplier number (between 1-9) is assigned to each category. For multipliers greater than one, the individual assignment grades are counted multiple times. Multiplier-based weighting is often used in elementary schools.

The weighting types allowed are set by the campus. Perform the calculations for the appropriate weighting type for the course.

- In TeacherPortal, the teacher specifies the weighting type for each course on Settings > Manage Categories under **Weighting Type**. The teacher can only choose weighting types that are allowed by the campus.
- In ParentPortal, the weighting type is displayed to parents on the ***Grades > Cycle Grades*** page (detail view).

For more information, see the following sections at the end of this page:

- Extra Credit & Extra Points
- Transfer Students
- Dropped Assignments
- Rounding Numbers
- Missing & Incomplete Grades
- Power Law Computation
- Calculating Semester Averages

Percent-based

If the course uses percent-based weighting, the teacher assigns a percentage to each assignment category. Examples of assignment categories are homework, tests, labs, quizzes, etc. The percentages for all categories must total 100%.

Formula for percent-based:

1.	For each category, take the sum of all points earned for all assignments: Points Earned 1 + Points Earned 2 + Points Earned 3 = Total Points Earned **For example:** The Homework category has three assignments. The student earned a 70/100, 80/100, and 90/95 for those assignments. (70 + 80 + 90) = 240 The Test category has two tests. The student earned a 95/100 and 45/50 for those tests. (45 + 100) = 145 The Cycle Exam category has no grades yet. Extra credit If the student has extra credit points, include the extra credit (EC) points in the Total Points Earned. (Points Earned 1 + Points Earned 2 + Points Earned 3 + EC) = Total Points Earned **For example:** The Homework category has three assignments. The student earned a 70/100, 80/100, and 90/95 for those assignments. He also has 10 points for the extra credit assignment. (70 + 80 + 90 + 10) = 250
2.	For each category, take the sum of all possible points for all assignments: Possible Points 1 + Possible Points 2 + Possible Points 3 = Total Possible Points **For example:** The Homework category has three assignments. The student earned a 70/100, 80/100, and 90/95 for those assignments. (100 + 100 + 95) = 295 The student's Total Possible Points for the Homework category is 295. The Test category has two tests. The student earned a 45/50 and 100/100 for those tests. (50 + 100) = 150 The student's Total Possible Points for the Test category is 150.

3.	For each category, divide the Total Points Earned by the Total Possible Points: Total Points Earned / Total Possible Points = Category Average **For example:** The student's Total Points Earned for the Homework category is 240. The student's Total Possible Points for homework is 295. 240 / 295 = .814 The student's Homework Category Average is 81.4. The student's Total Points Earned for the Test category is 145. The student's Total Possible Points for the Test Category is 150. 145 / 150 = .967 The student's Test Category Average is 96.7.
4.	For each category, multiply the Category Average by the Category Weight: Category Average x Category Weight = Category Value **For example:** The weight for the Homework category is 50%. 81.4 x 50% = 40.7 The weight for the Test category is 40%. 96.7 x 40% = 38.7 The weight for the Cycle Exam category is 10%, but there is no category average.
5.	Take the sum of all Category Values: Category Value 1 + Category Value 2 + Category Value 3 = Total **For example:** Add the category values for the Homework and Test categories. There is no category value for the Cycle Exam category. 40.7 + 38.7 = 79.4

6.	Divide the total by the sum of the weights for the categories that have grades, then multiply by 100: (Total / 100) x 100 = Average (if all categories have grades) (Total / Cat Sum) x 100 = Average (if some categories do not yet have grades) **For example:** The sum of the weights of the Homework category and Test category is 90. The Cycle Exam category is omitted from the sum because it does not have grades. The student's Total is 79.4. (79.4 / 90) x 100 = 88.2 The student's average is 88.

Point-based

If the course uses point-based weighting, the teacher assigns point values for each assignment (rather than for each category).

Formula for point-based:

1.	For each category, take the sum of points earned on all assignments. Points 1 + Points 2 + Points 3 = Category Points **For example:** The Homework category has three assignments, each worth 50 points. The student earned a 40, 45, and 50 for those assignments. 40 + 45 + 50 = 135 The Test category has two tests, each worth 50 points. The student earned a 40 and 50 for those tests. 40 + 50 = 90 Extra credit If the student has an extra credit assignment, add the points for the extra credit (EC) assignment to the Category Points: Category Points + EC = new Category Points **For example:** The Homework category has three assignments, each worth 50 points. The student earned a 40, 45, and 50 for those assignments. 40 + 45 + 50 = 135 The student's Homework Category Points is 135. The student was awarded 5 points for a homework extra credit assignment. 135 + 5 = 140
2.	Take the sum of the points earned in all categories. Category 1 Points + Category 2 Points + Category 3 Points = Total Points **For example:** Add the points for the Homework category and the Test category. The third category is omitted from the sum because it does not have grades. 135 + 90 = 225
3.	Divide the Total Points by the Total Possible Points, and multiply by 100. (Total Points / Total Possible Points) x 100 = Average **For example:** The student's total points is 225. The total possible points is 250. (225 / 250) x 100 = 90 The student's average is 90.

Multiplier-based

If the course uses multiplier-based weighting, the teacher assigns a multiplier number (between 1-9) for each category. For multipliers greater than one, the individual assignment grades are counted multiple times. Multiplier-based weighting is often used in elementary schools.

Formula for multiplier-based-based:

1.	Calculate the category actual value:
1a.	For each category, add the sum of the points earned for each assignment: Points Assignment 1 + Points Assignment 2 + Points Assignment 3 = Actual Category Points **For example:** The Homework category has three assignments, each worth 100 points. The student earned a 70, 80, and 90 for those assignments. 70 + 80 + 90 = 240 The Test category has two tests, each worth 100 points. The student earned a 90 and 100 for those tests. 90 + 100 = 190 Extra credit If the student has an extra credit assignment, add the points for the extra credit (EC) assignment to the Actual Category Points: Actual Category Points + EC = new Actual Category Points **For example:** The student's Homework Actual Category Points is 240. The student was awarded 5 points for a homework extra credit assignment. 240 + 5 = 245
1b.	For each category, multiply the Actual Category Points by the multiplier value (M): Actual Category Points x M = Actual Category Value **For example:** The multiplier for the Homework category is 2. 240 x 2 = 480 The multiplier for the Test category is 1. 190 x 1 = 190

1c.	Add the sum of the actual category values for all categories. Actual Category Value + Actual Category Value = Actual Value Total **For example:** Add the actual values for the Homework category and the Test category. 480 + 190 = 670
2.	Calculate the category possible value:
2a.	For each category, add the sum of the possible points for each assignment: Possible Points Assignment 1 + Possible Points Assignment 2 + Possible Points Assignment 3 = Possible Category Points **For example:** The Homework category has three assignments, each worth 100 points. 100 + 100 + 100 = 300 The Test category has two assignments, each worth 100 points. 100 + 100 = 200
2b.	For each category, multiply the Possible Category Points by the multiplier value (M): Possible Category Points x M = Possible Category Value **For example:** The multiplier for the Homework category is 2. 300 x 2 = 600 The multiplier for the Test category is 1. 200 x 1 = 200
2c.	Add the sum of the possible category values for all categories. Possible Category Value + Possible Category Value = Actual Value Total **For example:** Add the possible values for the Homework category and the Test category. 600 + 200 = 800

	Calculate the average: Divide the actual category value by the possible category value, then multiply by 100. (Actual Value Total / Possible Value) x 100 = Average
3.	**For example:** The student's value for actual points earned is 670. The value for possible points is 800. (670 / 800) x 100 = 83.7 The student's average is 84.

Extra Credit & Extra Points

If an assignment is for extra credit, the teacher must select Extra Credit for the assignment on Settings > Manage Assignments.

Extra credit assignments add points to the average for the category selected. If a student ha no grade or a zero for the extra credit assignment, it does not count against him when his average is calculated.

> **NOTE:** If you want to give an extra credit assignment that will be included in the cycle average for the students who do the assignment (but not for those who do not do it), create a regular assignment (not extra credit), and then exclude the grade for all students who do not complete the assignment.

Add extra points to an assignment grade:
Adding extra points to an assignment grade is different from an extra credit assignment. If you enter an assignment with the Total Points field set to 100, you can enter a grade that is greater than 100. In this case, it is not necessary to enter an extra credit assignment.

Add extra points to the cycle average:
If you want to award extra credit points to the overall cycle average, use the cycle **Override** field on the Cycle Grades page.

Transfer Students

If a student transfers into the course during a cycle, the following calculations are used to determine his working cycle average:

Formula for transfer student:

1.	For the transfer grade, multiply the Transfer Average by the Transfer Weight: Transfer Average x Transfer Weight = Transfer Value **For example:** The student's Transfer Average is 74. The student's Transfer Weight is 55%. 74 x 55% = 40.7 The student's Transfer Value is 40.7.
2.	Calculate the average of the student's assignment grades (for the remainder of the cycle) using the steps described above under Percent-based, Point-based, or Multiplier-based. **For example:** The percent-based example above shows a Working Cycle Average of 87.
3.	Calculate the weight for the Working Cycle Average: 100% - Transfer Weight = Working Cycle Average Weight **For example:** The student's Transfer Weight is 55%. 100% - 55% = 45% The student's Working Cycle Average Weight is 45%.
4.	Calculate the Working Cycle Average Value. Working Cycle Average x Working Cycle Average Weight = Working Cycle Average Value **For example:** The student's Working Cycle Average is 87. The student's Working Cycle Average Weight is 45%. 87 x 45% = 39.15 The student's Working Cycle Average Value is 39.15.

5.	Take the sum of the Transfer Value and the Working Cycle Average Value. Transfer Value + Working Cycle Average Value = Actual Working Cycle Average **For example:** The student's Transfer Value is 40.7. The student's Working Cycle Average Value is 39.5. 40.7 + 39.5 = 80.2 The student's Actual Working Cycle Average is 80.

If a student transferred from a course that posts letter grades to a course that posts numeric grades and a letter grade is entered for his transfer average, the grade conversion table is used to determine the numeric value.

Dropped Assignments

If the teacher has indicated that one or more lowest grades can be dropped for any categories, the following applies:

- For all weighting types (percent, point, and multiplier), the number of assignment grades to drop is figured in when calculating the total points earned. If the number of grades entered is greater than the number of grades to drop, the lowest X grades are dropped, where X is the specified number to drop for that category. If the number of grades to drop is greater than or equal to the number of grades entered, no grades are dropped.
- If a student has an assignment grade of M (missing), the grade is calculated as a zero; therefore, missing grades can be dropped, if applicable.
- The student’s average will always reflect the dropped grades.

WARNING: If all assignments in a category do not have the same total points value (as entered on Settings > Manage Assignments), the calculations for dropping a specified number of assignments for the category may result in an average that is different than expected. If the total points value varies, the grade with the lowest number of points may not necessarily be the lowest grade.

Rounding Numbers

When calculating the student's cycle average, be aware of the following details:

- Assignment grades are always whole numbers (i.e., no decimals).
- When a category average is displayed on the student's Cycle Grades page or progress report (IPR), it is rounded to the nearest whole number. If the number to the right of the decimal is 5 or greater, the displayed grade is rounded up. If the number to the right of the decimal is less than 5, the displayed grade is rounded down.
  For example, if the student's category average is 89.5, the IPR and Cycle Grades page will display 90 for the category average. If the student's category average is 90.49, the IPR and Cycle Grades page will display 90 for the category average.
- When calculating the student's cycle average, the category average is *not* rounded. The program uses the entire unrounded number (i.e., 32-bit precision) to calculate the cycle average.

  WARNING: If you use the rounded category average to calculate the student's cycle average, you may get a different average than the average produced by the program, since the program does not use the rounded category average.

- Once the cycle average is calculated, it is rounded to the nearest whole number. The cycle average is always displayed as a whole number.
- When the semester average is calculated, the rounded cycle averages are used. The semester average is rounded to the nearest whole number. The semester average is always displayed as a whole number.

Missing & Incomplete Grades

When calculating a student's average, be aware of the following details:

- If a student has an assignment grade of M (missing), the grade is calculated as a zero. A missing grade can be dropped, if applicable.
- At campuses that use skills-referenced grading, a campus-wide option determines how a grade of M is calculated in the student's average:
  - The grade M may be set to equal zero when the student's average is calculated. If a student receives a grade of M, the grade can be changed when the student completes the work.
  - If grade M is not set to equal zero when the student's average is calculated, the grade is bypassed.

- If a student has an assignment grade of I (incomplete), no averages are calculated, and an I is displayed in place of the average. The grade remains as an I until a grade is entered for the assignment.

Power Law Computation

For campuses that use standards-based grading, a student's standard score may reflect the average for the standard, which is calculated by adding all scores for all assignments associated with the standard, and dividing by the number of assignments. Or, the student's score may be calculated using the power law computation. The higher of the two is always displayed as the student's standard score, unless the teacher has entered an override score.

The power law computation is based on the idea that a student's later scores should have more weight than his earliest scores, because later scores are more reflective of the student's accumulated knowledge.

The nonlinear power law equation is $y = m * x^b$, where:

- *y* is the score that is being predicted or computed.
- *x* is the score on which the prediction is based, indicating the number of practices the student has had for the standard/skill. For example, if the student has had three assessments to date, starting with a homework assignment, then a quiz, and then a test, the *x* score for the homework assignment would be 1, for the quiz would be 2, and for the test would be 3. Each score must have a corresponding assessment number.

Steps:

1. Calculate the log of x and the log of y for all possible x values and all possible y values.
2. Use the log values for x and y in the linear equation y = m*x* + b (i.e., log(y) = m * log(x) + b).
    - Solve for m in this linear equation to get the value for *b* for the nonlinear equation.

$$m = \frac{\sum xy - \left[\frac{\sum x \sum y}{N}\right]}{\sum x^2 - \left[\frac{(\sum x)^2}{N}\right]}$$

    - Solve for b in this linear equation to get log(m). Calculate m using the formula $m = e^{\log(m)}$ to get the value for *m* in the nonlinear equation.

$$b = \frac{\sum y - m(\sum y)}{N}$$

Use the new values for *m* and *b* in the nonlinear power law equation.

Calculating Semester Averages

Semester averages are calculated during the last cycle of the semester according to options set on ***Grade Reporting > Maintenance > Tables > Campus Control Options > Computation***.

If **Include Exam in Semester Average** is selected on the Computation tab, the following occurs:

- If **Exam Weight Equal** is selected, the exam grade is given the same weight as the cycle averages when calculating the semester average. For example, if there are three cycles in the semester, the student's cycle averages are 80, 85, and 90, and the student earned 100 on the semester exam, the semester average calculation is as follows:

  (80 + 85 + 90 + 100) / 4

- If **Exam Weight Equal** is *not* selected, the **Total Weight** and **Exam Weight** fields are used together to indicate the percentage the semester exam should count toward the total semester grade.

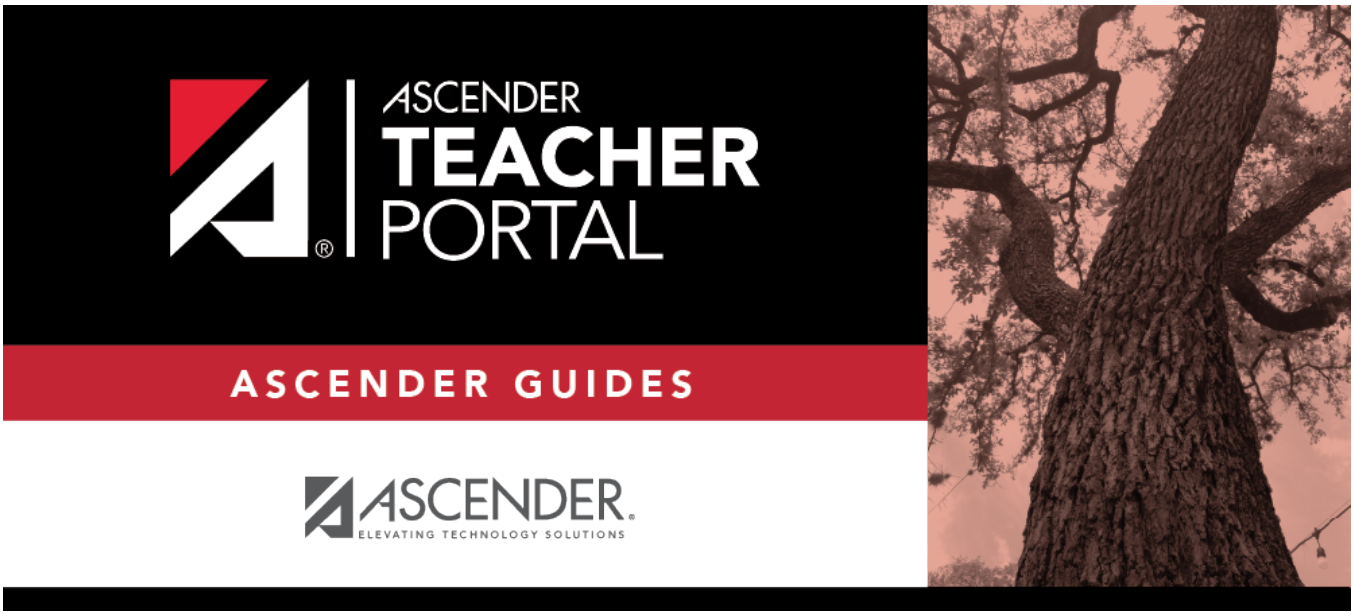
  The **Exam Weight** divided by the **Total Weight** indicates the percentage the semester exam should count toward the total semester grade.

  The semester average calculation for a three-cycle semester is as follows:

  ((Cycle 1 + Cycle 2 + Cycle 3) / 3 x (Total Weight - Exam Weight)) + (Exam Grade x Exam Weight)) / Total Weight

  For example, if there are three cycles in the semester, the student's cycle averages are 80, 80, and 80; the student earned 90 on the semester exam; the **Total Weight** is 50; and the **Exam Weight** is 7, the semester average calculation is as follows:

  (80 + 80 + 80) / 3 x (50 - 7) + (90 x 7) / 50 = 81.4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