

# Using Formulas in the Gradebook

## Quick Summary

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You may have cases where you want a grade to be calculated based on more than one grade item or specific conditions. Using a grade formula allows you to automatically calculate a grade based on which grade items you include in the formula and how you define the relationship between them.

This article will first describe considerations for using formulas in your Brightspace grade book, then describe the steps to create a formula grade book item, explain how to use the Formula Editor, and explain how to use formulas to calculate a final grade.

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## Video

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If you prefer a video version that covers the first portion of this content, please click the hyperlink below. Note that this video shows an older version of the Tri-C Brightspace course site; aspects of the layout may appear slightly different. However, the steps are the same.

[Create a Formula Grade book Item](#)

## Applications & Considerations

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There are many possible reasons for using formulas to calculate grades in your course. For example, you may want a final homework grade to be calculated as the sum or average score of all submitted homework assignments throughout the course. Additionally, you may want to exclude, or drop, the lowest score(s) of a set of graded items from the final calculated grade. Alternatively, you may allow students to choose one assignment from a set of optional assignments to complete and only want the completed assignment included in the final grade. These calculations can be achieved by creating a grade book formula item.

**There are considerations and limitations to using grade book formulas, however.**

To create a formula grade book item, all grade items included in the formula must already exist in your grade book. Therefore, using a formula grading system requires careful planning, and, in some cases, a Weighted grade system may be more appropriate.



You can create a new category for a formula grade book item or items, but you cannot associate a formula grade book item within Assignments, Discussions, or Quizzes. You can use items from these categories in your formula, but you cannot add a formula item to these Brightspace tools.

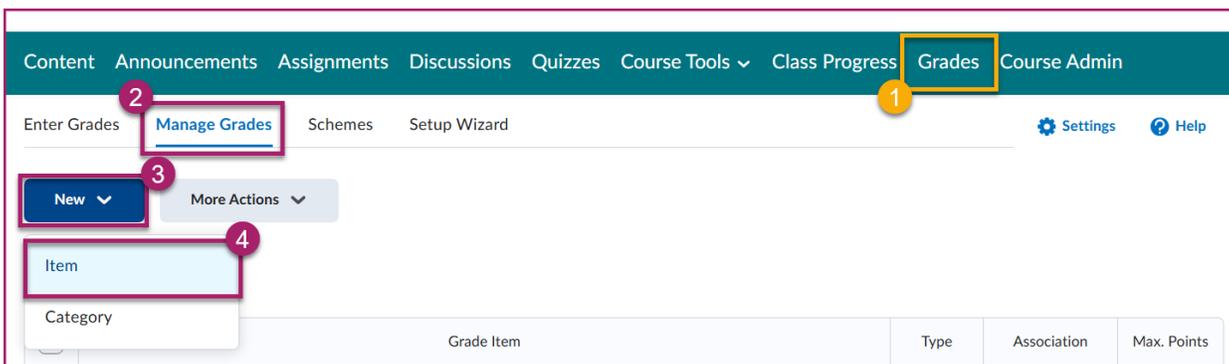
Although you can create grade book formula items within any grading system, you must use the **Formula** grading system to calculate the final grade or final adjusted grade with formulas. (The Formula Grading System can be selected in Step 1 using the **Setup Wizard** or in the **Calculation Options** of the Grades tool **Settings**.)

## Creating a Formula Grade Item

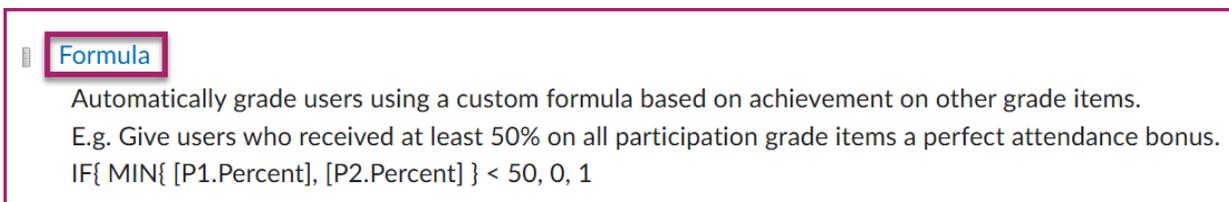
The steps to create a formula grade book item are straightforward once you have already created the grade items that will be included in the formula. You will be able to edit basic properties, including maximum points, category, and display options, as well as edit the formula.

### Step 1: Navigate to Manage Grades to Create a New Item

Select the **Grades** tool from the **Navigation bar**. In the **Manage Grades** tab, select **New Item**.



On the next screen, select **Formula** among the Grade Item Type options.



The page will now display properties you can edit for the item.

Enter a **Name** for your formula and an optional **Short Name** for the grade book column display if desired. The Short Name will also be the name for the item if used in another formula, such as a final calculated grade formula.

You can create a **new category** for your formula item or leave this blank; in either case a grade column for the formula item will be created. If you intend to use multiple formulas, associating formula items within a single category can help with visual organization.

As a reminder, you cannot associate formula items with Brightspace Tools such as Assignments, Discussions, and Quizzes. In other words, you cannot add a grade formula item to these specific categories, but you can use formulas that include items from these categories.

Click on **Show Description** to enter a description if desired. This can be a note to yourself or an explanation to students if you select **Allow users to view grade item description** beneath the text field.

Enter the **Maximum** points; the default value is 100. The value you enter will be factored into a student's final calculated grade if that is how you intend to use the formula.

Name \*

Short Name

Category  
None ▾ [New Category]

▶ Show Description

Grading

Maximum Points \*  
100

## Understanding the Formula Editor

Select **Edit Using the Formula Editor** to access the Formula Editor in a pop-up window.

Points Received  
= {No formula defined.}  
[Edit Using the Formula Editor]

The Formula Editor allows you to write a formula using select items from your grade book. The Formula Editor has several input features that edit, test, and create the formula, shown below.

Formula Editor

Validate Preview

= |

<< < > >>

Grade Item: -- Select a Grade Item -- [Points Received] Insert

Function: -- Select a Function -- Start Next Term End

Insert Cancel

		Backspace	Clear
( )	7	8	9 /
= <>	4	5	6 *
< >	1	2	3 -
<= >=	0	.	+

1. The Function inputs are featured along the bottom row of this area. Start begins the function with an open curly bracket, Next Term inserts a comma to separate items in a series, and End closes the function with a closed curly bracket. The Select a Function menu features different calculations you can apply to the grade item(s): MAX (maximum value in a set), MIN (minimum value in a set), SUM (total value in a set), and AVG (average value of a set). IF and NOT function as Boolean statements where you must define the conditions of true or false; these can be used to target and apply a function to a specific set within a set of scores. Grade Item inputs are found along the top row of this area. Select a Grade Item allows you to insert existing grade book items into your formula; each separate item is enclosed in brackets and separated by a comma. You can select among values associated with the grade item: Points Received, Max Points, and Percent. Once you have made a selection from the Grade Item and Function dropdowns, click Insert to place it in the formula.
2. On the right side of the formula editor are the operators and keypad. Operators (**AND**, **OR**, and mathematical symbols) allow you to further define conditions of relationships between items within your formula. These operators would typically be used with an **IF** function. On the keypad, **Backspace** deletes the item before the cursor, and Clear deletes the whole formula.
3. Cursor keys move the cursor forward (>) and backward (<) in a series of inserted grade items, or to the front (<<) and back (>>) of your formula.
4. **Preview** will show you how the formula applies to up to ten students in your course. Validate allows you to test if your formula is written to be acceptable by the system. A validation error will appear if your formula is not written to be acceptable. Check your formula to ensure that items are separated by commas and that the function is both opened and closed with brackets.
5. Once you have defined your formula and checked that your formula will work as expected, click **Insert**. The Formula Editor will close, and you will return to the main Edit Item window.

## Step 2: Using the Formula Editor

Complete the following steps to create a formula using the Formula Editor. Keep in mind that

I would add a section here called Using the Formula Editor. Outline each step, noting that they will be different for each formula.

1. Choose a Function.
2. Select **Start**.
3. Choose a Grade Item.
4. Decide what value to add for the grade item.
5. Select **Insert**.
6. Select **Next Term**.
7. Follow steps 3 to 6 until all grade items are added to the formula.
8. Select **End**.

If multiple functions are being used, follow steps 1 to 8 for all functions. Use the numbers and symbols as needed to complete the calculations necessary for your formula.



When you have entered your formula, select **Validate** to check it. Select **Preview** to see the Formula previewed in the Grade Book and check it there. Select **Insert** when you are ready to apply the Formula to the Grade Book. Continue to **Finish Creating the Formula Grade book Item** to complete the process.

### Step 3: Finish Creating the Formula Grade Item

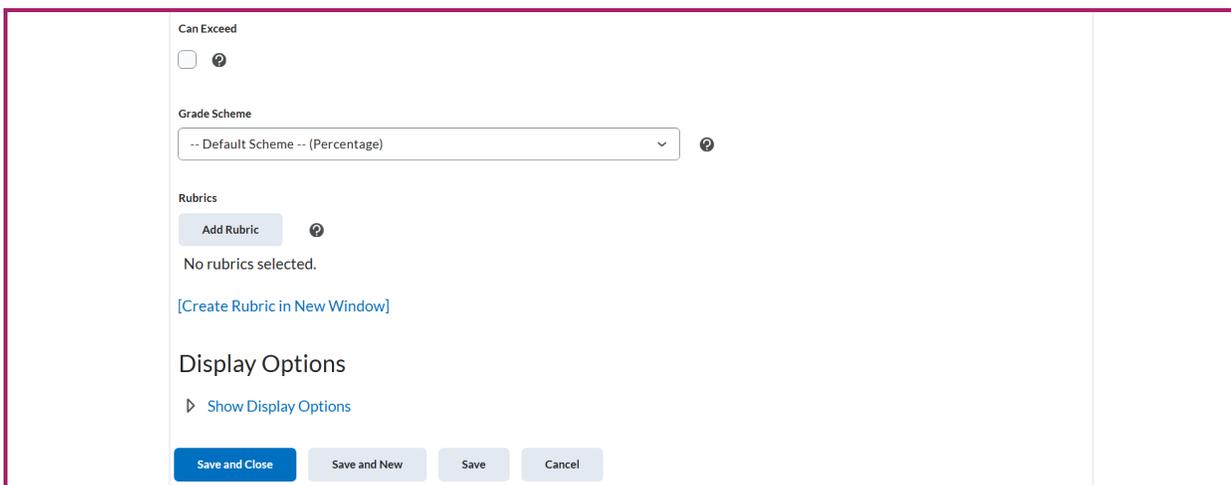
Once you have inserted your formula, you can continue editing before saving your formula.

As with other types of grade items in your course, you have the option to mark as **Can Exceed**, which may be applicable if you are incorporating extra credit in any included items.

You can also apply a **Grade Scheme** or **Rubric**, if you wish.

You can override default **Display Options** in terms of what students see (Student View) and what you as an instructor see (Managing View) in the grade book for this item.

Finally, when you have made all appropriate elections, click **Save and Close**.



The screenshot shows a form with the following sections:

- Can Exceed:** A checkbox that is currently unchecked, with a help icon to its right.
- Grade Scheme:** A dropdown menu showing "-- Default Scheme -- (Percentage)" with a help icon to its right.
- Rubrics:** An "Add Rubric" button with a help icon, followed by the text "No rubrics selected." and a blue link "[Create Rubric in New Window]".
- Display Options:** A blue link "Show Display Options" with a right-pointing triangle icon.
- Buttons:** Four buttons at the bottom: "Save and Close" (blue), "Save and New", "Save", and "Cancel".

### Excluding Grade Items from the Final Calculated Grade

Keep in mind that both individual grade book items and formula grade book items will contribute to the final calculated grade in a Points system unless you exclude them from the final grade.

To exclude an individual grade item from the final grade, navigate to the **Grades** tool, select the **Manage Grades** tab.

Next, select the grade item you wish to exclude from the final calculated grade. In the **Properties** tab, scroll down to view the **Grading** options. Select the checkbox beneath **Exclude from Final Grade Calculation**, then click **Save and Close**.



The screenshot shows a single checkbox labeled "Exclude from Final Grade Calculation" with a help icon to its right. The checkbox is currently unchecked.

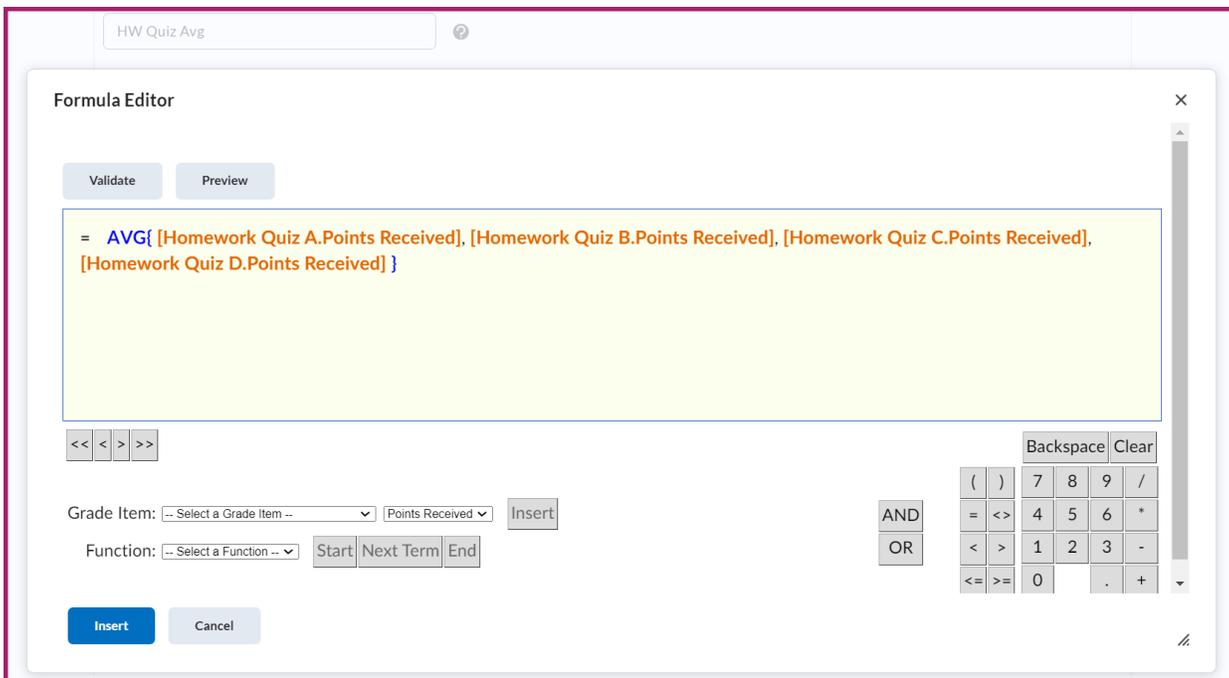
# Formula Grade book Item Examples

Every formula will be unique to your course according to how you have named your grade book items and which items you elect to include in your formula, as well as the functions you will need to use to calculate the formula. You can reflect on how you might set up your own formula items while we examine the following two examples to understand how formulas work using the editor.

## Formula Example 1: Average of a Set of Items

As mentioned in a previous example, you may want to use a formula item to calculate the average score of a set of assignments. In this case, the value we will use is an average of **Points Earned** per assignment but recall that you have the options of **Maximum Points** and **Percent** to associate with the grade item. One reason you may do this is because you want these formula grade item to contribute to the final calculated grade in a points-based system.

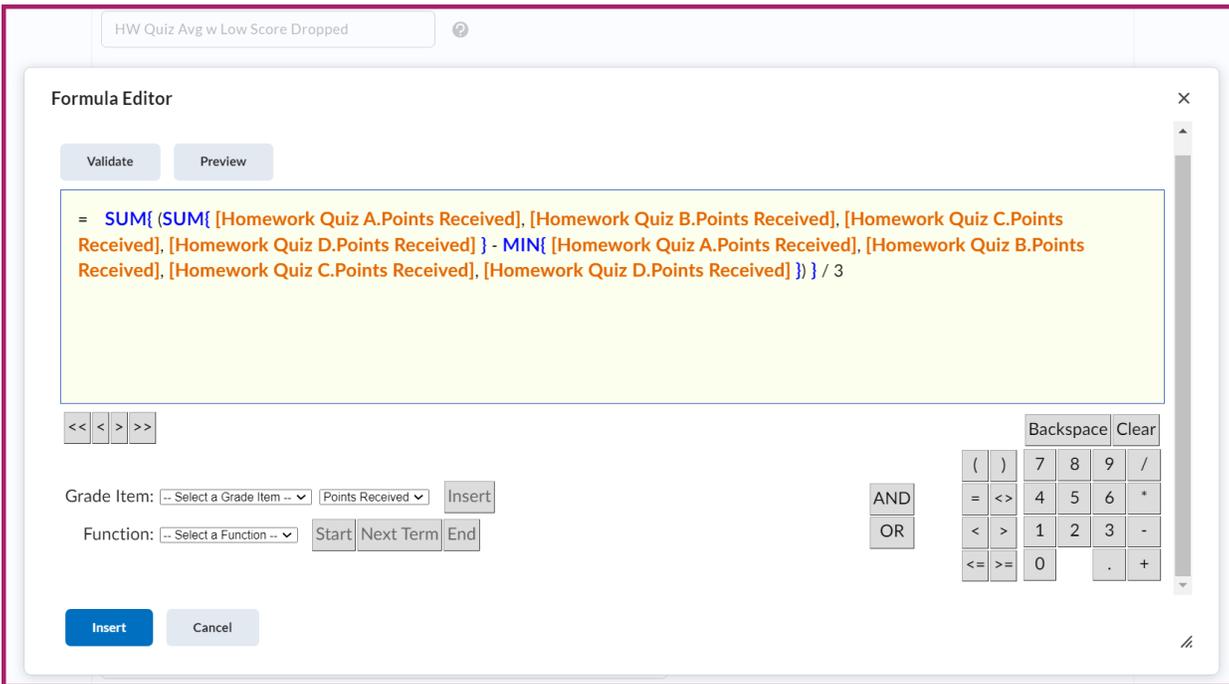
The example below includes a formula to calculate the average of a set of four graded homework quiz assignments.



As you can see, an average function is applied at the beginning of the formula by selecting **AVG** from the Function dropdown menu and pressing **Start** to begin the formula. Next, each item to be included in the set was added by selecting from the **Grade Item** dropdown and clicking **Insert**, then **Next Term** to place a comma between items. Once all items have been added, click **End** to place a closed bracket and end the formula. You can now validate and preview the formula to see if it performs as expected.

## Formula Example 2: Average of a Set of Items with Lowest Score Dropped

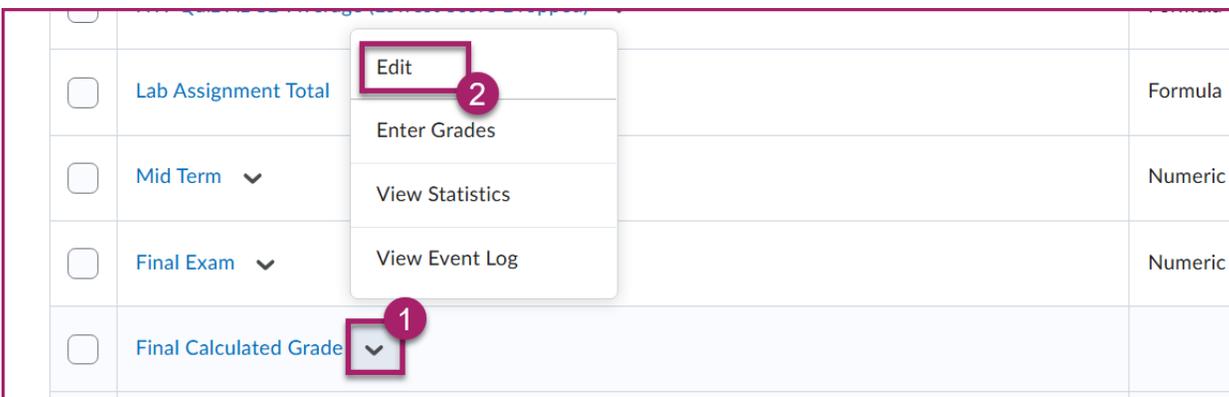
The following formula example is written to find an average score of a set of four grade items while dropping the lowest score dropped from the set.



Notice that although we are defining the formula to calculate an average, because this formula will calculate based on a dropped score, we need to account for one less item in the set to find the average. Therefore, we can write the formula to find the total value (SUM) of all points from the set minus the lowest value (MIN) from the set, then divide the sum of that value by three to get the average score.

## Using Formulas to Calculate Final Grades

The steps to use a formula for the final calculated grade are the same as creating a formula grade item except you are not creating a new item. Instead, click the dropdown menu next to **Final Calculated Grade** (in either **Enter Grades** or **Manage Grades** in the **Grades Tool**) and click **Edit**.



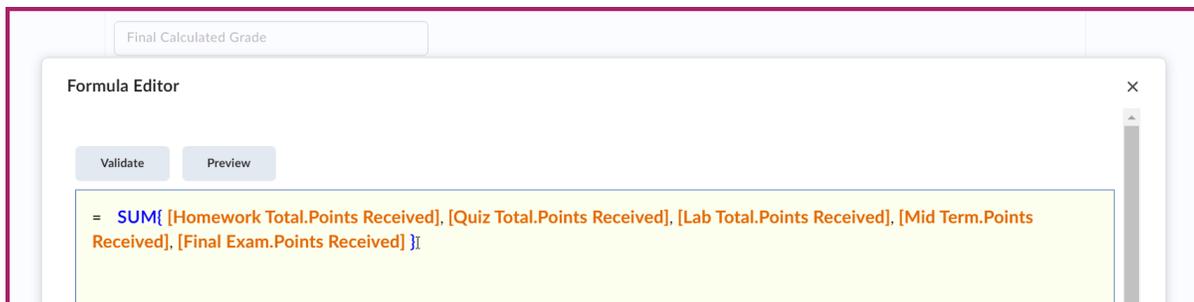
If you plan to use a formula to calculate final grades, it is important to consider that all items that you wish to contribute to the final grade must be defined in the formula, as well as the relationship between them. For this reason, it may be helpful to use formula items within your final calculated grade formula to simplify the formula and reduce the number of items you have to include.

For example, if your grade book has many individual grade items (such as weekly graded assignments), you could create grade item formulas that calculate the totals of each individual assignment category in

your grade book (assignments, quizzes, exams, etc.) with whatever conditions you wish to apply. You would then be able to use these grade item formulas in your final calculated grade formula instead of having to insert every assignment in your grade book in the final calculated grade formula. Creating a few shorter formula items that are included in the final calculated grade formula may be more manageable than creating one long final calculated grade formula with all grade items from the course. You can also show students how their performance in your own defined categories contribute to the final grade.

The Formula grading system does not allow you to exclude individual scored items from the grade book as you would be able to do in the Points grading system. You can exclude items from the formula simply by not including them in your formula or by subtracting individual items.

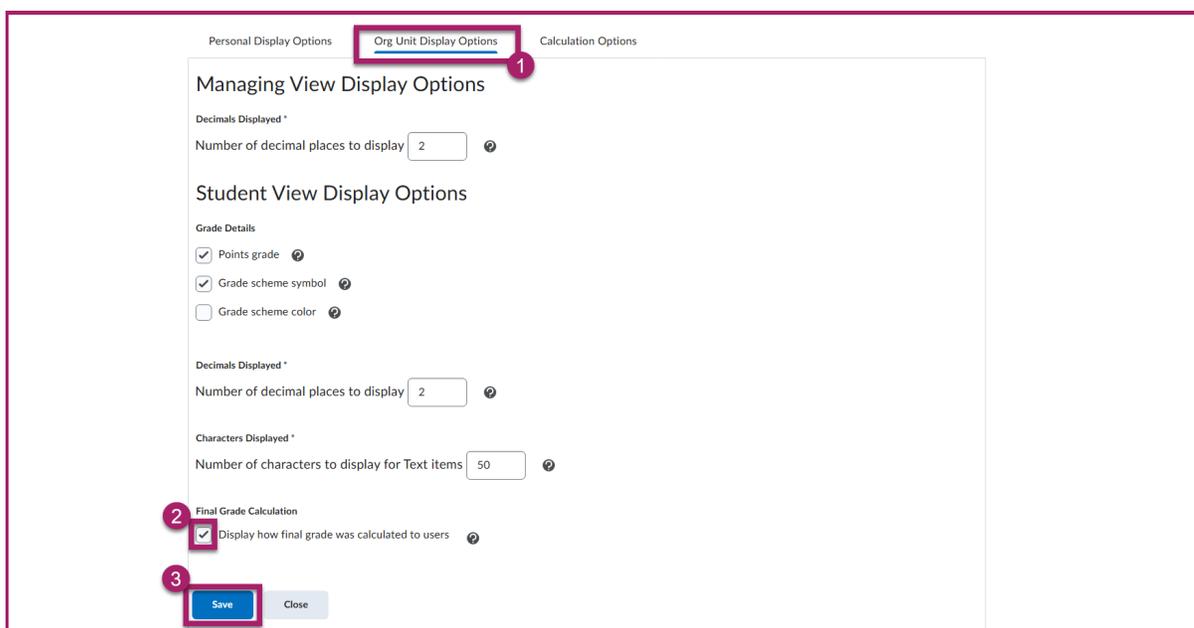
In this case, the formula for final calculated grade might look like the following example:



## Grade Display Options for Students

If you do plan to use formulas in your grade book, it is recommended that grade display options are adjusted for students to understand how their grade is calculated.

1. Access the **Grades** tool, then select **Settings** (next to gear icon in upper right).
2. Select the second menu tab, **Org Unit Display Options**.
3. Under **Final Grade Calculation**, check "Display how final grade was calculated to users, then click **Save**.



Remember that you can display descriptions for each formula if you select **Allow users to view grade item description** beneath the text field when editing the formula (see [Step 1 of Creating a Formula Grade Item](#) in this document for details). Likewise, you can include a description for the formula used to calculate the Final Calculated Grade when using a Formula grading system. Although following the steps 1-5 above will allow students to see how their final grade is calculated by listing all the grade items and associated scores that contribute to the final grade, providing additional written explanation of the formula can help clarify.

## Need Help?

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If you need help accessing Brightspace or your Grades, finding and changing specific settings, or have other technical issues, please contact the [Help Desk](#).

If you would like to discuss authentic assessments, appropriate settings for your course, or have an instructional designer review your grade book, please [book a consultation](#).

