Gradebook - Aggregation Methods

Moodle uses the term "aggregation" to refer to the methods used to combine a given set of multiple scores into a single score. Mathematically, there are many different ways to aggregate a set of scores, and different aggregation methods may be useful in different contexts, even within the same course.

For more information about Gradebook, please refer to the "Moodle Tutorial for Instructors" course in your Moodle.

Here is a quick **Aggregation Summary** before we go into the details:

	Can the category maximum be changed?	Can the category include extra credit items?	Can items in the category be weighted?
Natural: Item scores are added together to produce a sum.	No	Yes	Yes
Mean of Grades: Item scores are added together to produce a sum, and then the sum is divided by the number of items.	Yes	No	No
Simple Weighted Mean of Grades: Item scores are added together to produce a sum, and then the sum is divided by the number of possible points.	Yes	Yes	No
Weighted Mean of Grades: Item scores are multiplied by weights, and then added together to produce a sum, and then the sum is divided by the total of all item weights.	Yes	No	Yes

In the examples listed below, there are three grade items contributing to the total:

> **Quiz**: a score of 8 out of 10 total points
> **Assignment**: a score of 15 out of total 20 points
> **Test**: a score of 49 out of total 50 points

There are four aggregation methods available in our Moodle:

Natural (Sum of Points)

Individual grades are added together to produce a sum. By default, the weights are automatically determined based on the points and the total, but they can be adjusted by checking the Weight box and then changing the weight.

- Grade items can be weighted.
- The category maximum cannot be edited.
- Extra credit items are allowed.

For example:

In this example, no weights are assigned. The items' relative weights are based on their points: • Quiz 12.5% • Assignment 25% • Test 62.5%	The simple way to think of it: $= 8 + 15 + 49$ **$= 72$** The actual calculation: $= [[(8/10)*12.5 + (15/20)*25 + (49/50)*62.5)] /100] * 80$ $= [(0.8*12.5 + 0.75*25 + 0.98*62.5) /100] * 80$ $= [(10 + 18.75 + 61.25) /100] * 80$ $= (90/100)*80$ $= 0.9*80$ **$= 72$**
In this example, the weight of the Assignment grade is changed from its default value to 40%, and the other weights adjust automatically.	The actual calculation: $= [[(8/10)*10 + (15/20)*40 + (49/50)*50] / 100] * 80$ $= [(0.8*10 + 0.75*40 + 0.98*50) / 100] * 80$ $= [(8 + 30 + 49) / 100] * 80$ $= (87/100)*80$ $= 0.87*80$ **$= 69.6$**

Mean of Grades (Average)

Individual grades are normalized, and then added together to produce a sum, and then that sum is divided by the total number of grades.

- Grade items cannot be weighted.
- The category maximum can be edited.
- Extra credit items are not allowed.

For example:

In this example, the category maximum is 100. All items have the same weight, regardless of their points.	The actual calculation: = [[(8/10) + (15/20) + (49/50)] / 3] * 100 = [(0.8 + 0.75 + 0.98) / 3)] * 100 = (2.53 / 3)*100 = 0.84333*100 **= 84.333**

Simple Weighted Mean of Grades

Individual grades are added together to produce a sum, and that sum is divided by the number of possible points available for all of the grade items.

- The "weight" of each item is determined by its number of points, assuming that the minimum score for each item is zero. Technically, the weight is calculated as Maximum grade minus Minimum grade.
- The category maximum can be edited.
- Extra credit items are allowed.

For example:

In this example, the category maximum is 100, and the minimum grade for each grade item is 0.	The simple way to think of it: = [(8 + 15 + 49) / (10 + 20 + 50)] * 100 = (72/80)*100 = 0.9*100 **= 90** The actual calculation: = [[((8/10)*(10-0)) + ((15/20)*(20-0)) + ((49/50)*(50-0))] / 80] * 100 = [[(0.8*10) + (0.75*20) + (0.98*50)] / 80] * 100 = ((8+15+49) / 80)*100 = (72/80)*100 = 0.9*100 **= 90**

Weighted Mean of Grades

Individual grades are normalized, and then multiplied by their weights. These weighted scores are then added together to produce a sum, and that sum is divided by the sum of the weights.

- If the items' weights are all equal, then the calculation is the same as Mean of Grades.
- If the sum of the items' weights is equal to 100, then the weights effectively function as percentages.
- The category maximum can be edited.
- Extra credit items are not allowed.

For example:

In this example, the category maximum is 100. The item weights are set as: • Quiz: 1 • Assignment: 4 • Test: 5	= [[(8/10)*1 + (15/20)*4 + (49/50)*5] / 10] * 100 = [(0.8*1 + 0.75*4 + 0.98*5) / 10] * 100 = [(0.8 + 3 + 4.9) / 10] * 100 = (8.7/10)*100 = 0.87*100 **= 87**

Another Example of Weighted Mean of Grades

These are the course grade components and weights:

Homework Assignments:	30%
Discussion Forums:	10%
Chapter Tests:	40%
Exams:	20%
Total:	100%

When setting the aggregation methods in Moodle gradebook:

(1) At the course level, choose "**Editing settings**" in the Edit drop-down menu.
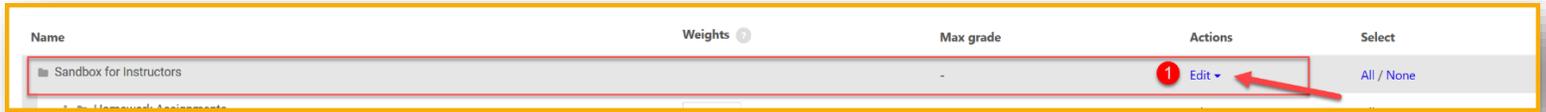
And pick "**Weighted mean of grades**" in the "**Aggregation**" box:
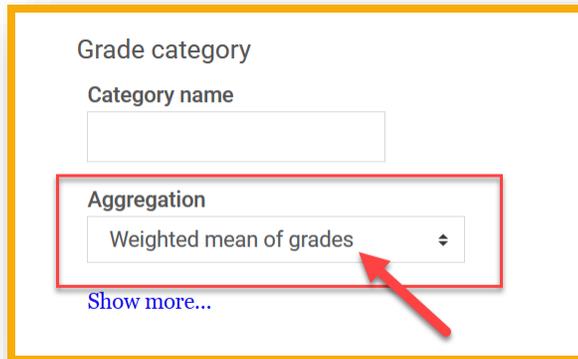
For (2), (3), (4) and (5) – at each category level, choose "**Editing settings**" in the Edit drop-down menu and then pick the aggregation method depending on your grading preference for each category:

- Natural (sum of points)
- Mean of Grades (average)
- Simple Weighted Mean of Grades
- Weighted Mean of Grades

(6) Don't forget to **SAVE CHANGES** when you are done setting up your gradebook.